

La Porte County, IN
La Porte County Water and Sewer Extensions
(SR 421 & CR 300 North Utility Extensions)

ADVERTISEMENT FOR BIDS

Sealed Bids for the construction of the La Porte County Water & Sewer (SR 421 & CR 300 North Utility Extensions) Project will be received, by the County, at La Porte County Office of Economic Development (555 Michigan Ave., Suite 203, La Porte, IN. 46350) until 2:00 PM local time on **Wednesday, October 27th**, the Bids received will be publicly opened and read aloud at the October 27th Redevelopment Commission meeting at 4:00 p.m. local time. (LaPorte County Complex, 809 State St, LaPorte Indiana-Meeting Room #3) Bids will be reviewed by the LaPorte County Engineer and Attorney and the successful low bid Contractor will be awarded at a subsequent meeting room at the La Porte City Complex Building Rm #3. The project consists of installing Approx. 2700ft of 6-inch DIP, 2640ft of 12-inch DIP, 8000ft of 20-inch DIP watermain pipes, 5100ft of 6-inch HDPE Force Main, 250ft 8-inch, 3500ft of 18-inch Sanitary sewer, bore and jack beneath I-94 and 421, a 250 gpm Lift Station and all valves, hydrants, manholes piping and all other necessary equipment required by the Construction Contract Documents along SR 421 and CR 300 within La Porte County, IN.

Bids will be received for a single prime Contract. Bids shall be on a unit price basis.

A pre-bid meeting will be held on Thursday October 14th at 1:00 pm at the LaPorte County Court House Complex Room #2.

Bids shall be good for 120 days from acceptance.

The bidding documents can be viewed and downloaded at: <https://laporteco.in.gov/boards-commissions/redevelopment/>.

Neither Owner nor Engineer will be responsible for full or partial sets of Bidding Documents, including Addenda if any, obtained from sources other than the Issuing Office. Any questions about bidding conditions must be addressed to the LaPorte County Engineer, Jerry Sullivan at: jgsullivan@laporteco.in.gov no later than **Monday October 12th**.

Prospective bidders shall notify the LaPorte County Engineer, Jerry Sullivan at: jgsullivan@laporteco.in.gov so the bidder will be added to a bidders list and notified of any addendum to the bid documents.

Bid security shall be furnished in accordance with the Instructions to Bidders.

Owner: **La Porte County Redevelopment Commission**

By: **Mitch Bishop**

Title: **La Porte County Planner**

Date: **October 27, 2021**

++ END OF ADVERTISEMENT FOR BIDS ++

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ARTICLE 1 – DEFINED TERMS

- 1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:
- A. *Issuing Office* – The office from which the Bidding Documents are to be issued. The Issuing Office is as stated in Section 00 11 13 - Advertisement for Bids.

ARTICLE 2 – COPIES OF BIDDING DOCUMENTS

- 2.01 Complete sets of the Bidding Documents may be obtained from the Issuing Office in the number and format stated in the advertisement to bid.
- 2.02 Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 2.03 Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license for any other use.

ARTICLE 3 – QUALIFICATIONS OF BIDDERS

- 3.01 To demonstrate Bidder's qualifications to perform the Work, Bidder shall submit with its Bid (a) written evidence establishing its qualifications such as financial data, previous experience, and present commitments, and (b) the following additional information:
- A. Evidence of Bidder's authority to do business in the state where the Project is located.
- B. Bidder's state or other contractor license number, if applicable.
- C. Subcontractor and Supplier qualification information; coordinate with provisions of Article 12 of these Instructions, "Subcontractors, Suppliers, and Others."
- D. Contractor's Bid for Public Work - Form 96
- 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. No requirement in this Article 3 to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.
- 3.03 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. 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.
- B. 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. Bidders must advise Mr. Jay Sullivan at (219) 362-2051 Ext. 6506 of the date and time they desire to conduct their Site visit.
- B. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.
- C. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site.
- D. Bidder shall comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.
- E. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

4.04 *Owner's Safety Program*

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

4.05 *Other Work at the Site*

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

ARTICLE 5 – BIDDER’S REPRESENTATIONS**5.01 It is the responsibility of each Bidder before submitting a Bid to:**

- A. examine and carefully study the Bidding Documents, and any data and reference items identified in the Bidding Documents;
- B. visit the Site, conduct a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfy itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;
- C. become familiar with and satisfy itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work; 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;
- D. consider the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder’s safety precautions and programs;
- E. agree, based on the information and observations referred to in the preceding paragraph, that at the time of submitting its Bid no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents;
- F. become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;
- G. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder;

- H. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work; and
- I. agree that the submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 6 – PRE-BID CONFERENCE

- 6.01 A Pre-Bid conference will be held at the time and location stated in the advertisement to bid. Representatives of Owner and Engineer will be present to discuss the Project. It is mandatory for prospective Bidders to attend and participate in the conference. Engineer will transmit to all planholders 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.

ARTICLE 8 – BID SECURITY

- 8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of 5 percent of Bidder's maximum Bid price and in the form of a certified check, bank money order, or a Bid bond (on the form included in the Bidding Documents) issued by a surety meeting the requirements of Paragraphs 6.01 and 6.02 of the General Conditions.
- 8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract Documents, furnished the required contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited. Such forfeiture shall be Owner's exclusive remedy if Bidder defaults.
- 8.03 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of seven days after the Effective Date of the Contract or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.

- 8.04 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within 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 Substantial Completion, or completion of the Work in readiness for final payment, are set forth in the Agreement.

ARTICLE 11 – SUBSTITUTE AND “OR-EQUAL” ITEMS

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

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 The apparent Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening, submit to Owner a list of the Subcontractors or Suppliers proposed for the following portions of the Work:
- A. Directional Drilling Subcontractor
 - B. Ductile Iron Water Main Pipe Supplier
 - C. HDPE Pipe Supplier
 - D. Valve and Hydrant Supplier
 - E. Manhole and Air Release Valve Supplier

F. Lift Station Valves, Pumps, Wet Well, and Valve Vault Supplier

Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, or other individual or entity. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder shall submit a substitute, Bidder's Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.

- 12.04 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.
- A. All blanks on the Bid Form shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.
 - B. 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."
- 13.02 A Bid by a corporation shall be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate seal must be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown.
- 13.03 A Bid by a partnership 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.
- 13.04 A Bid by a limited liability company shall be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.
- 13.05 A Bid by an individual shall show the Bidder's name and official address.
- 13.06 A Bid by a joint venture shall be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.
- 13.07 All names shall be printed in ink below the signatures.
- 13.08 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.

- 13.09 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.
- 13.10 The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder's state contractor license number, if any, shall also be shown on the Bid Form.

ARTICLE 14 – BASIS OF BID

14.01 Base Bid with Alternates

- A. Bidders shall submit a Bid on a lump sum basis for the base Bid and include a separate price for each alternate described in the Bidding Documents and as provided for in the Bid Form. The price for each alternate will be the amount added to or deleted from the base Bid if Owner selects the alternate.
- B. In the comparison of Bids, alternates will be applied in the same order of priority as listed in the Bid Form.

14.02 Allowances

- A. For cash allowances the Bid price shall include such amounts as the Bidder deems proper for Contractor's overhead, costs, profit, and other expenses on account of cash allowances, if any, named in the Contract Documents, in accordance with Paragraph 13.02.B of the General Conditions.

ARTICLE 15 – SUBMITTAL OF BID

- 15.01 A Bid shall be received no later than the date and time prescribed and at the place indicated in the advertisement to bid and shall be enclosed in a plainly marked package with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid shall be addressed to:

Mr. Mitch Bishop, La Porte County Planner
La Porte County Redevelopment Commission
809 Michigan Ave.
La Porte, IN 46350

- 15.02 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 to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

ARTICLE 18 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE

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

ARTICLE 19 – EVALUATION OF BIDS AND AWARD OF CONTRACT

- 19.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible. If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, then the Owner will reject the Bid as nonresponsive; provided that Owner also reserves the right to waive all minor informalities not involving price, time, or changes in the Work.
- 19.02 If Owner awards the contract for the Work, such award shall be to the responsible Bidder submitting the lowest responsive Bid.
- 19.03 Evaluation of Bids
- A. In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.
 - B. In the comparison of Bids, alternates will be applied in the same order of priority as listed in the Bid Form. To determine the Bid prices for purposes of comparison, Owner shall announce to all bidders a “Base Bid plus alternates” budget after receiving all Bids, but prior to opening them. After determination of the Successful Bidder based on this comparative process and on the responsiveness, responsibility, and other factors set forth in these Instructions, the award may be made to said Successful Bidder on its base Bid and any combination of its additive alternate Bids for which Owner determines funds will be available at the time of award.
- 19.04 In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers

proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.

- 19.05 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.

ARTICLE 20 – BONDS AND INSURANCE

- 20.01 Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance, payment, and maintenance bonds and insurance. When the Successful Bidder delivers the Agreement (executed by Successful Bidder) to Owner, it shall be accompanied by required bonds and insurance documentation.

ARTICLE 21 – SIGNING OF AGREEMENT

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

ARTICLE 22 – SALES AND USE TAXES

- 22.01 Owner is exempt from Indiana state sales and use taxes on materials and equipment to be incorporated in the Work. Said taxes shall not be included in the Bid. Refer to Paragraph SC-7.09 of the Supplementary Conditions for additional information.

(NO TEXT FOR THIS PAGE)

BID FORM

La Porte County, Indiana
La Porte County Water & Sewer Extensions
(SR 421 & CR 300 North Utility Extensions)

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ARTICLE 1 – BID RECIPIENT

- 1.01 This Bid is submitted to:
- La Porte County Redevelopment Commission**
809 Michigan Ave.
La Porte, IN 46350
- 1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 – BIDDER’S ACKNOWLEDGEMENTS

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

ARTICLE 3 – BIDDER’S REPRESENTATIONS

- 3.01 In submitting this Bid, Bidder represents that:
- A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents, and hereby acknowledges receipt of the following Addenda:

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

- B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
- C. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work.
- D. Bidder has 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):

LA PORTE COUNTY - SANITARY SEWER, FORCEMAIN, AND WATERMAIN EXTENSION					
I-94/US 421 TIF					
Contract Incidentals				ENGINEER'S ESTIMATE	
ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
S1	Maintenance of Traffic	LS	1		
S2	Compaction Tests	Ea	10		
S3	Contractor Trailers	LS	1		
S4	Bonds & Insurance	LS	1		
S5	Mobilization/De-Mobilization	LS	1		
SUB-TOTAL Contract Intangibles					
GRAVITY SEWER G-1: STARTING AT MANHOLE #10 AT 5' DEEP ALONG CR 300N WEST OF SR 421				ENGINEER'S ESTIMATE	
ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
S1	18" PVC SDR 35 Gravity Sewer, 8'-12' Depth, Complete	LF	1650		
S2	18" DI Gravity Sewer, 8'-12' Depth, Complete	LF	85		
S3	18" PVC SDR 35 Gravity Sewer, 12'-14' Depth, Complete	LF	540		
*S4	18" PVC SDR 26 Gravity Sewer 14'-19' Depth, Complete	LF	625		
S5	18" DI Gravity Sewer 14'-19' Depth, Complete	LF	50		
S6	48" Dia. Precast Manhole, 8-12' Depth, Complete	EA	4		
S7	48" Dia. Precast Manholes, 12-14' Depth, Complete	EA	1		
S8	48" Dia. Precast Manholes, 14-19' Depth, Complete	EA	2		
S9	48" Dia. Outside Drop Precast Manhole, 8-12' Depth, Complete	EA	1		
S10	48" Dia. Outside Drop Precast Manhole, 12-14' Depth, Complete	EA	1		
S11	48" Dia. Outside Drop Precast Manholes, 14-19' Depth, Complete	EA	2		
S12	36" Steel Casing Pipe, Jack & Bore, Crossing SR 421 B/W MH 1 and 2 (For 18" DI Carrier Pipe), Including Spacers and End Seals, Complete	LF	270		
S13	36" Steel Casing Pipe, Jack & Bore B/W MH 4 and 5 (For 18" DI Carrier Pipe), Including Spacers and End Seals, Complete	LF	168		
S14	Granular Backfill, No.53 Compacted Aggregate	TON	100		
*S15	Commercial Concrete Drive Replacement, 4000 PSI, 8" Depth, Compacted No. 53 Aggregate	SY	55		
S16	Seeding and Mulching	SY	5278		
S17	Grubbing	AC	2.56		
S18	Erosion Control	LF	1969		
S19	Dewatering	LS	1		
SUB-TOTAL G1					

LA PORTE COUNTY - SANITARY SEWER, FORCEMAIN, AND WATERMAIN EXTENSION					
I-94/US 421 TIF					
GRAVITY SEWER LINE SEGMENT G-2: STARTING AT MANHOLE #27 ALONG SR 421 TO MANHOLE #1				ENGINEER'S ESTIMATE	
ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
S1	18" PVC SDR 35 Gravity Sewer, 0-8' Depth, Complete	LF	455		
S2	18" PVC SDR 35 Gravity Sewer, 8'-12' Depth, Complete	LF	78		
S3	48" Dia. Precast Manholes, 8-12' Depth, Complete	EA	2		
S4	Seeding and Mulching	SY	1185		
S6	Dewatering	LS	1		
SUB-TOTAL G2					

LA PORTE COUNTY - SANITARY SEWER, FORCEMAIN, AND WATERMAIN EXTENSION					
I-94/US 421 TIF					
GRAVITY SEWER LINE SEGMENT G-3: STARTING AT MANHOLE #29 ALONG SR 421 TO MANHOLE #27				ENGINEER'S ESTIMATE	
ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
S1	18" PVC SDR 35 Gravity Sewer, 0-8' Depth, Complete	LF	295		
S2	48" Dia. Precast Manholes, 0-8' Depth, Complete	EA	1		
S3	48" Dia. Precast Manholes, 8-12' Depth, Complete	EA	1		
S4	Seeding and Mulching	SY	656		
S6	Dewatering	LS	1		
SUB-TOTAL G3					

LA PORTE COUNTY - SANITARY SEWER, FORCEMAIN, AND WATERMAIN EXTENSION					
I-94/US 421 TIF					
GRAVITY SEWER				ENGINEER'S ESTIMATE	
LINE SEGMENT G-4: FROM MANHOLE #30 TO #27, CROSSING SR 421				ENGINEER'S ESTIMATE	
ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
S1	8" DI Gravity Sewer, 8'-12' Depth, Complete	LF	35		
S2	48" Dia. Precast Manholes, 8-12' Depth, Complete	EA	1		
S3	24" Steel Casing Pipe, Jack & Bore of Crossing SR 421 (For 8" DI Carrier Pipe), Including Spacers and End Seals, Complete	LF	100		
S4	Seeding and Mulching	SY	30		
S5	Erosion Control	LF	31		
S6	Dewatering	LS	1		
SUB-TOTAL G4					

LA PORTE COUNTY - SANITARY SEWER, FORCEMAIN, AND WATERMAIN EXTENSION					
I-94/US 421 TIF					
GRAVITY SEWER				ENGINEER'S ESTIMATE	
LINE SEGMENT G-5: FROM MANHOLE #40 TO #1, CROSSING CR 300N				ENGINEER'S ESTIMATE	
ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
S1	8" PVC SDR 35 Gravity Sewer, 8'-12' Depth, Complete	LF	185		
S2	48" Dia. Precast Manholes, 12-14' Depth, Complete	EA	1		
S3	Granular Backfill, No.53 Compacted Aggregate	TON	90		
*S4	HMA Surface Replacement, 9.5 mm, 1.5" Depth	TON	5		
*S5	HMA Base Replacement, 25.0 mm, 6" Depth	TON	20		
S8	Seeding and Mulching	SY	125		
S9	Erosion Control	LF	90		
S10	Dewatering	LS	1		
SUB-TOTAL G5					

LA PORTE COUNTY - SANITARY SEWER, FORCEMAIN, AND WATERMAIN EXTENSION					
I-94/US 421 TIF					
LIFT STATION & FORCE MAIN				ENGINEER'S ESTIMATE	
LINE SEGMENT F: LIFT STATION TO DISCHARGE LOCATION					
ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
F1	16" Steel Casing Pipe, Jack & Bore of Crossing I-94 (For 6" DI Carrier Pipe), Including Spacers and End Seals, Complete	LF	240		
F2	6" DIPS 11 HDPE, HDD	LF	4815		
F3	6" DIPS 11 HDPE, Open Cut	LF	245		
F4	6" DIP, Open Cut	LF	5		
F5	Air Release Valves + Valve Structures (4' Dia.)	EA	6		
F6	Flow Meter Pit/Vault (8'x7')				
*MP1	Disconnect Switch & Installation, Complete	EA	1		
*MP2	Circuit Breaker & Installation, Complete	EA	1		
*MP3	MAG 6000	EA	1		
*MP4	MAG 5100W	EA	1		
*MP5	Sch. 80 1/2" PVC Conduit	LF	12		
*MP6	Right Angle 1/2" PVC Conduit	EA	4		
*MP7	24" x 24" Aluminum Access Hatch	EA	1		
*MP8	8' x 5' x 7' Precast Concrete Structure & Installation, Complete	EA	1		
*MP9	Dialog Scout Wireless with Nema 4X Enclosure & Installation, Complete	EA	1		
*MP10	6" DeZurick Series 100 Plug Valve	EA	3		
F7	6" 45 Degree DIMJ Restrained Bend With Harvey Adapters	EA	4		
F8	Connection to Existing Sanitary Sewer, Core Drill	EA	1		
F9	Surface Milling (Cold Planing), Asphalt	SY	10		
F10	Granular Backfill, No.53 Compacted Aggregate	TON	250		
F11	HMA Surface Replacement, 9.5 mm, 1.5" Depth	TON	66		
F12	HMA Base Replacement, 25.0 mm, 6" Depth	TON	263		
	Lift Station				
*LS1	Concrete Pad & Installation, Complete	CF	350		
*LS2	Fence & Installation, Complete	LF	92		
*LS3	Wet Well & Installation, Complete	EA	1		
*LS4	Valve Vault & Installation, Complete	EA	1		
*LS5	Halliday Products (Model No: S2S6648) & Installation, Complete	EA	2		
*LS6	Two ABS Pump (XFP100E CB1.4 PE90/4) & Installation, Complete	EA	1		
*LS7	6" DIP CL. 50	EA	65		
*LS8	6" DIP 90° Elbow CL. 250	EA	5		
*LS9	6" DIP Mechanical Joint CL. 250	EA	2		
*LS10	4" DIP CL. 50	EA	10		
*LS11	4" DIP 90° Elbow CL. 250	EA	2		
*LS12	8" PVC Sch. 40	LF	11		
*LS13	4" PVC Sch. 80	LF	15		
*LS14	2" PVC Sch. 80	LF	15		
*LS15	4" PVC Check Valve Flap Type	EA	1		
*LS16	6" DIP Check Valve w/flanged end	EA	2		
*LS17	6" DeZurick Series 100 Plug Valve	EA	2		
*LS18	2" DeZurick Series 100 Plug Valve w/threaded ends & op. nut	EA	1		
*LS19	Raven Epoxy (Raven 760 HPPC Base Coat & Raven 405FS Top Coat)	SY	85		
*LS20	Electrical Hookup Lift Station Site 3 ph	LS	1		
*LS21	Electrical Hookup Flow Meter Site 1 ph	LS	1		
F13	Seeding and Mulching	SY	1475		
F14	Erosion Control	LF	102		
F15	Dewatering (Lift Station)	LS	1		
SUB-TOTAL Lift Station and Force Main					
TOTAL SEWER CONSTRUCTION COST					
(LINE SEGMENTS G-1, G-2, G-3, G-4, G-5, LS and FM)					

LA PORTE COUNTY - SANITARY SEWER, FORCEMAIN, AND WATERMAIN EXTENSION					
I-94/US 421 TIF					
WATERMAIN				ENGINEER'S ESTIMATE	
LINE SEGMENT A1 & A2: FROM CR 300 N WEST OF SR 421 TO CR 950 N NORTH OF I-94				ENGINEER'S ESTIMATE	
ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
W1	20" DIP Watermain with Poly-Wrap	LF	7940		
W2	Fire Hydrant Assembly with 6" Gate Valve, Complete	EA	14		
W3	20" Butterfly Valve with Valve Box, Riser & Cover	EA	22		
W4	20" DIP for Stream/Gas Crossings, HDD	LF	348		
W5	36" Steel Casing Pipe, Jack & Bore I-94 Crossing (For 20" DI Carrier Pipe), Including Spacers and End Seals, Complete	LF	240		
W6	36" Steel Casing Pipe, Jack & Bore SR 421 Crossing (For 20" DI Carrier Pipe), Including Spacers and End Seals, Complete	LF	190		
W7	36" Steel Casing Pipe, Jack & Bore ANR Pipeline Crossing (For 20" DI Carrier Pipe), Including Spacers and End Seals, Complete	LF	170		
W8	Air Release Valve and Pit	Ea	1		
W9	Granular Backfill, No.53 Compacted Aggregate	TON	1694		
W10	HMA Surface Replacement, 9.5 mm, 1.5" Depth	TON	55		
W11	HMA Base Replacement, 25.0 mm, 6" Depth	TON	210		
W12	Concrete Curb	LF	30		
W13	Concrete Curb Removal	LF	30		
W14	Compacted No. 53 Aggregate	SY	45		
W15	Stone Drive Repair, No.53 Compacted Aggregate, 6" Depth	TON	49		
W16	Seeding and Mulching	SY	8822		
W17	Tree Clearing	LS			
W18	Grubbing	AC	0.66		
W19	Erosion Control	LF	6470		
SUB-TOTAL Water Line A1 & A2					

LA PORTE COUNTY - SANITARY SEWER, FORCEMAIN, AND WATERMAIN EXTENSION					
I-94/US 421 TIF					
WATERMAIN				ENGINEER'S ESTIMATE	
LINE SEGMENT B: ALONG EAST SIDE OF SR 421				ENGINEER'S ESTIMATE	
ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
W1	12" DIP Watermain with Poly-Wrap	LF	266		
W2	Fire Hydrant Assembly with 6" Gate Valve, Complete	EA	1		
W3	12" Butterfly Valve with Valve Box, Riser & Cover	EA	1		
W4	Erosion Control	LF	818		
SUB-TOTAL Water Line B					

LA PORTE COUNTY - SANITARY SEWER, FORCEMAIN, AND WATERMAIN EXTENSION					
I-94/US 421 TIF					
WATERMAIN				ENGINEER'S ESTIMATE	
LINE SEGMENT B-1: EXTENSION OF LINE B, NORRIS DITCH CROSSING				ENGINEER'S ESTIMATE	
ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
W1	12" DIP Watermain with Poly-Wrap	LF	980		
W2	Fire Hydrant Assembly with 6" Gate Valve, Complete	EA	2		
W3	12" DI Tee, With Blind Flanges, For Future Watermain Connection	EA	1		
W4	12" Butterfly Valve with Valve Box, Riser & Cover	EA	2		
W5	12" DIP for Stream/Gas Crossings, HDD	LF	183		
W7	Seeding and Mulching	SY	1384		
W8	Grubbing	AC	0.2		
W9	Erosion Control	LF	50		
SUB-TOTAL Water Line B1					

LA PORTE COUNTY - SANITARY SEWER, FORCEMAIN, AND WATERMAIN EXTENSION					
I-94/US 421 TIF					
WATERMAIN				ENGINEER'S ESTIMATE	
LINE SEGMENT C: ALONG WEST SIDE OF SR 421					
ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
W1	12" DIP Watermain with Poly-Wrap	LF	1395		
W2	Fire Hydrant Assembly with 6" Gate Valve, Complete	EA	3		
W3	12" Butterfly Valve with Valve Box, Riser & Cover	EA	4		
W4	12" DIP for Stream/Gas Crossings, HDD	LF	24		
W6	Granular Backfill, No.53 Compacted Aggregate	TON	545		
W8	Seeding and Mulching	SY	1550		
W9	Grubbing	AC	0.1		
W10	Erosion Control	LF	100		
SUB-TOTAL Water Line C					
TOTAL WATERMAIN CONSTRUCTION COST (LINE SEGMENTS A, B, B-1, C)					
TOTAL PROBABLE CONSTRUCTION COST (LINE SEGMENTS G-1, G-2, G-3, G-4, G-5, F, A, B, B-1, C)					
Project Grand Total					

The undersigned understands that after a contract is awarded, the Owner may select items of the Alternate Bids listed above. If awarded the contract, the Bidder agrees to furnish and install any Owner selected Alternate items for the add or deduct indicated. The total base bid will then be adjusted accordingly. The add or deduct amounts listed above are “installed” prices and take into consideration and include any cost of the design or construction changes that may be required as a result of selecting the Alternate.

Alternate Contract Item prices are subject to acceptance by the Owner, and rejection of one or more Alternate Contract Item prices will not invalidate acceptance of this Bid.

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. List of Proposed Subcontractors;
 - C. List of Proposed Suppliers;
 - D. List of Project References;
 - E. Bidder’s License No.: XXXXXXXXXX demonstrating evidence of authority to do business in the state of Indiana.
 - F. Required Bidder Qualification Statement (Form 96) with supporting data;
 - G. Wage/Fringe Benefit Certification (Exhibit B);
 - H. GPR Bid Breakdown (Exhibit D);
 - I. American Iron and Steel Certification (Exhibit E);
 - J. Goof Faith Efforts Worksheet (Exhibit F)

M. E-Verify Affidavit

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.:

(where applicable)

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BID BOND

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

BIDDER (*Name and Address*):

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

OWNER (*Name and Address*):

La Porte County Redevelopment Commission
809 Michigan Ave.
La Porte, Indiana 46350

BID

Bid Due Date: October 27, 2021

Description (*Project Name— Include Location*): Water Main Replacement – Laporte, Indiana

BOND

Bond Number:

Date:

Penal sum _____ \$ _____
(Words) (Figures)

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

BIDDER

SURETY

Bidder's Name and Corporate Seal

Surety's Name and Corporate Seal

By: _____
Signature

By: _____
Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

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

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

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and

assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.

2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.

3. This obligation shall be null and void if:

3.1 Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or

3.2 All Bids are rejected by Owner, or

3.3 Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).

4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.

5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.

6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after the Bid due date.

7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.

8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.

9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.

10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.

11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

LA PORTE COUNTY, IN**LEGAL EMPLOYMENT DECLARATION**

The State of Indiana, in IC §22-5-1.7, requires all state agencies and political subdivisions to seek verification from their contractors that the contractors employees are legally eligible to work in the United States.

This Declaration serves as notice that all Contractors doing business with La Porte County, IN must, as a term of their contract:

1. Enroll in and verify the work eligibility status of newly hired employees of the contractor through the United States government's E-Verify program (but is not required to do so if the E-Verify program no longer exists); and
2. Verify, by signature below, that the Contractor does not knowingly employ unauthorized aliens.

I, _____, a duly authorized agent of _____ (name of Company), declare under penalties of perjury that _____ (name of Company) has verified the work eligibility status of its employees and it does not employ unauthorized aliens to the best of its knowledge and belief.

(Name of Company)

By: _____
(Authorized Representative of Company)

PLEASE SEE <https://e-verify.uscis.gov/enroll/StartPage.aspx?JS=YES> FOR INSTRUCTIONS AND ELECTRONIC REGISTRATION FOR E-VERIFY.

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CONTRACTOR'S BID FOR PUBLIC WORK - FORM 96

State Form 52414 (R2 / 2-13) / Form 96 (Revised 2013)
Prescribed by State Board of Accounts

PART I

(To be completed for all bids. Please type or print)

Date (month, day, year): _____

1. Governmental Unit (Owner): La Porte County Redevelopment Commission

2. County : La Porte

3. Bidder (Firm): _____

Address: _____

City/State/ZIPcode: _____

4. Telephone Number: _____

5. Agent of Bidder (if applicable): _____

Pursuant to notices given, the undersigned offers to furnish labor and/or material necessary to complete the public works project of Utilities Extension to the Intersection of SR 421 and CR 300 North

(Governmental Unit) in accordance with plans and specifications prepared by RQAW Corporation

_____ and dated _____ for the sum of

_____ \$ _____

The undersigned further agrees to furnish a bond or certified check with this bid for an amount specified in the notice of the letting. If alternative bids apply, the undersigned submits a proposal for each in accordance with the notice. Any addendums attached will be specifically referenced at the applicable page.

If additional units of material included in the contract are needed, the cost of units must be the same as that shown in the original contract if accepted by the governmental unit. If the bid is to be awarded on a unit basis, the itemization of the units shall be shown on a separate attachment.

The contractor and his subcontractors, if any, shall not discriminate against or intimidate any employee, or applicant for employment, to be employed in the performance of this contract, with respect to any matter directly or indirectly related to employment because of race, religion, color, sex, national origin or ancestry. Breach of this covenant may be regarded as a material breach of the contract.

CERTIFICATION OF USE OF UNITED STATES STEEL PRODUCTS (If applicable)

I, the undersigned bidder or agent as a contractor on a public works project, understand my statutory obligation to use steel products made in the United States (I.C. 5-16-8-2). I hereby certify that I and all subcontractors employed by me for this project will use U.S. steel products on this project if awarded. I understand that violations hereunder may result in forfeiture of contractual payments.

ACCEPTANCE

The above bid is accepted this _____ day of _____, _____, subject to the following conditions: _____

Contracting Authority Members:

_____	_____
_____	_____
_____	_____

PART II

(For projects of \$150,000 or more – IC 36-1-12-4)

Governmental Unit: _____

Bidder (Firm) _____

Date (month, day, year): _____

These statements to be submitted under oath by each bidder with and as a part of his bid.
Attach additional pages for each section as needed.

SECTION I EXPERIENCE QUESTIONNAIRE

1. What public works projects has your organization completed for the period of one (1) year prior to the date of the current bid?

Contract Amount	Class of Work	Completion Date	Name and Address of Owner

2. What public works projects are now in process of construction by your organization?

Contract Amount	Class of Work	Expected Completion Date	Name and Address of Owner

3. Have you ever failed to complete any work awarded to you? _____ If so, where and why?

4. List references from private firms for which you have performed work.

SECTION II PLAN AND EQUIPMENT QUESTIONNAIRE

1. Explain your plan or layout for performing proposed work. *(Examples could include a narrative of when you could begin work, complete the project, number of workers, etc. and any other information which you believe would enable the governmental unit to consider your bid.)*

2. Please list the names and addresses of all subcontractors *(i.e. persons or firms outside your own firm who have performed part of the work)* that you have used on public works projects during the past five (5) years along with a brief description of the work done by each subcontractor.

3. If you intend to sublet any portion of the work, state the name and address of each subcontractor, equipment to be used by the subcontractor, and whether you will require a bond. However, if you are unable to currently provide a listing, please understand a listing must be provided prior to contract approval. Until the completion of the proposed project, you are under a continuing obligation to immediately notify the governmental unit in the event that you subsequently determine that you will use a subcontractor on the proposed project.

4. What equipment do you have available to use for the proposed project? Any equipment to be used by subcontractors may also be required to be listed by the governmental unit.

5. Have you entered into contracts or received offers for all materials which substantiate the prices used in preparing your proposal? If not, please explain the rationale used which would corroborate the prices listed.

SECTION III CONTRACTOR'S FINANCIAL STATEMENT

Attachment of bidder's financial statement is mandatory. Any bid submitted without said financial statement as required by statute shall thereby be rendered invalid. The financial statement provided hereunder to the governing body awarding the contract must be specific enough in detail so that said governing body can make a proper determination of the bidder's capability for completing the project if awarded.

SECTION IV CONTRACTOR'S NON – COLLUSION AFFIDAVIT

The undersigned bidder or agent, being duly sworn on oath, says that he has not, nor has any other member, representative, or agent of the firm, company, corporation or partnership represented by him, entered into any combination, collusion or agreement with any person relative to the price to be bid by anyone at such letting nor to prevent any person from bidding nor to include anyone to refrain from bidding, and that this bid is made without reference to any other bid and without any agreement, understanding or combination with any other person in reference to such bidding.

He further says that no person or persons, firms, or corporation has, have or will receive directly or indirectly, any rebate, fee, gift, commission or thing of value on account of such sale.

SECTION V OATH AND AFFIRMATION

I HEREBY AFFIRM UNDER THE PENALTIES FOR PERJURY THAT THE FACTS AND INFORMATION CONTAINED IN THE FOREGOING BID FOR PUBLIC WORKS ARE TRUE AND CORRECT.

Dated at _____ this _____ day of _____, _____

(Name of Organization)

By _____

(Title of Person Signing)

ACKNOWLEDGEMENT

STATE OF _____)
COUNTY OF _____) ss

Before me, a Notary Public, personally appeared the above-named _____ and
swore that the statements contained in the foregoing document are true and correct.

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

Notary Public

My Commission Expires: _____

County of Residence: _____

BID OF

(Contractor)

(Address)

FOR
PUBLIC WORKS PROJECTS
OF

Filed _____, _____

Action taken _____

NOTICE OF AWARD

Date of Issuance:

Owner: La Porte County, IN

Owner's Contract No.: N/A

Engineer: RQAW Corporation

Engineer's Project No.: 18-400-024-1

Project: La Porte County Water and Sewer
Extensions (SR 421 & CR 300 North Utility
Extensions)

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 Provider.
2. Deliver with the executed Agreement(s) the Contract security *[e.g., performance and payment bonds]* and insurance documentation as specified in the Request for Qualifications and General Conditions, Articles 2 and 6.
3. Other conditions precedent (if any):

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

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: La Porte County Redevelopment Commission

By: Mitch Bishop

Title: La Porte County Planner

Copy: Engineer

(NO TEXT FOR THIS PAGE)

AGREEMENT BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION CONTRACT

THIS AGREEMENT is by and
between

La Porte County Redevelopment Commission (“Owner”) and
 (“Contractor”).

Owner and Contractor hereby 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:

- A. Furnish all labor, materials, equipment, supplies and services to add approximately 10,600 LF of DIP with polywrap, new water valves and all other associated work as required by the Contract Documents to provide a fully operational water system.
- B. Furnish all labor, materials, equipment, supplies and services to add approximately 4,000 LF of PVC and DIP of sanitary sewer in combination of open trench and jack and bore. In addition to all other associated work as required by the Contract Documents to provide a fully operational sanitary system.
- C. Furnish all labor, materials, equipment, supplies and services to add approximately 5,300 LF of HDPE sanitary force main in addition to a Duplex Pumping Station and all other associated work as required by the Contract Documents to provide a fully operational sanitary force main system.

ARTICLE 2 – THE PROJECT

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: **La Porte County Water and Sewer Extensions (SR 421 & CR 300 North Utility Extensions).**

ARTICLE 3 – ENGINEER

3.01 The part of the Project that pertains to the Work has been designed by RQAW Corporation.

ARTICLE 4 – CONTRACT TIMES**4.01** *Time of the Essence*

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

4.02 *Contract Times: Dates*

- A. The Work will be substantially completed within **240 calendar 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 **270 calendar days** after the date when the Contract Times commence to run.
- B. It is expressly understood and agreed, by and between the Contractor and Owner that the Contract Time for completion of the work described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the Work and excludes the time for unavoidable delays which were beyond the control and without the fault of the Contractor.

4.03 *Liquidated Damages*

- A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with the Contract. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):
 - 1. Substantial Completion: Contractor shall pay Owner \$1,000.00 for each day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 4.02.A above for Substantial Completion until the Work is substantially complete.
 - 2. Completion of Remaining Work: After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner \$750.00 for each day that expires after such time until the Work is completed and ready for final payment.
 - 3. Liquidated damages for failing to timely attain Substantial Completion and Final Completion are not additive and will not be imposed concurrently.

4.04 *Special Damages*

- A. In addition to the amount provided for liquidated damages, Contractor shall reimburse Owner (1) for any fines or penalties imposed on Owner as a direct result of the Contractor's failure to attain Substantial Completion according to the Contract Times, and (2) for the actual costs reasonably incurred by Owner for engineering, construction observation, inspection, and administrative services needed after the time specified in Paragraph 4.02 for

Substantial Completion (as duly adjusted pursuant to the Contract), until the Work is substantially complete.

- B. After Contractor achieves Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times, Contractor shall reimburse Owner for the actual costs reasonably incurred by Owner for engineering, construction observation, inspection, and administrative services needed after the time specified in Paragraph 4.02 for Work to be completed and ready for final payment (as duly adjusted pursuant to the Contract), until the Work is completed and ready for final payment.

ARTICLE 5 – CONTRACT PRICE

- 5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents the amounts that follow, subject to adjustment under the Contract, a fixed rate not to exceed: _____ (\$)
- 5.02 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents the amounts that follow, subject to adjustment under the Contract:
- A. For all Unit Price Work, an amount equal to the sum of the extended prices (established for each separately identified item of Unit Price Work by multiplying the unit price times the actual quantity of that item):

Unit Price Work				
Item No.	Description	Unit	Unit Price	Extended Price
1	Base Bid G-1	1		
2	Base Bid G-2	1		
3	Base Bid G-3	1		
4	Base Bid G-4	1		
5	Base Bid G-5	1		
6	Base Bid F	1		
7	Base Bid A	1		
8	Base Bid B	1		
9	Base Bid B-1	1		
10	Base Bid C	1		
Total of all Extended Prices for Unit Price Work (subject to final adjustment based on actual quantities)				\$

The extended prices for Unit Price Work set forth as of the Effective Date of the Contract 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.

- B. Total of Lump Sum Amount and Unit Price Work (subject to final Unit Price adjustment)
\$_____.

ARTICLE 6 – PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

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

6.02 *Progress Payments; Retainage*

- A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment after the **2nd** Monday of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.
1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract:
 - a. 10 percent of Work completed (with the balance being retainage). If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage.
 2. At Contractor's option, the Contractor may set-up an escrow account and enter into a separate escrow agreement with the Owner and an escrow agent. Anytime retainage is withheld, it shall be placed into the agreed upon escrow account. Set-up escrow account such that once retainage is withheld, it can only be released once written consent is provided by both the Owner and Contractor.
- B. Upon Substantial Completion, Owner may pay an amount sufficient to increase total payments to Contractor to 100 percent of the Work completed, less 200 percent of Engineer's estimate of the value of Work to be completed or corrected attached to the certificate of Substantial Completion and such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions.

6.03 *Final Payment*

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

ARTICLE 7 – 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 paragraphs, 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 – CONTRACT DOCUMENTS**8.01 *Contents***

- A. The Contract Documents consist of the following:
 - 1. This Agreement, identified as Section 00 52 00.
 - 2. Addenda (numbers █ to █, inclusive).
 - 3. Notice of Award, identified as Section 00 51 00.
 - 4. Notice to Proceed, identified as Section 00 55 00.
 - 5. Performance bond, identified as Section 00 61 13.13.
 - 6. Payment bond, identified as Section 00 61 13.16.
 - 7. General Conditions, identified as Section 00 72 00.
 - 8. Supplementary Conditions, identified as Section 00 73 00.
 - 9. Specifications bearing the title as listed in the table of contents of the Project Manual.
 - 10. Drawings (not attached but incorporated by reference) bearing the title La Porte County Water and Sewer Extensions (SR 421 & CR 300 North Utility Extensions)
 - 11. Exhibits to this Agreement (enumerated as follows):
 - a. Contractor's Bid (pages █ to █, inclusive).
 - b. Documentation submitted by Contractor prior to Notice of Award.
 - 12. Governing Order of Contract Documents – In the event that any provision in any of the above component parts of this Agreement conflicts with any provision in any other of the component parts, the provision in the component part first enumerated above shall govern over any other component part which follows it numerically except as may be otherwise specifically stated.
 - 13. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
 - a. Work Change Directives.
 - b. Change Orders.
 - c. Field Orders.
- B. The documents listed in Paragraph 8.01.A are attached to this Agreement (except as expressly noted otherwise above).
- C. There are no Contract Documents other than those listed above in this Article 8.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in the General Conditions.

ARTICLE 9 – MISCELLANEOUS**9.01** *Terms*

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

9.02 *Assignment of Contract*

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

9.03 *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.

9.04 *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.

9.05 *Contractor's Certifications*

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 9.05:
 - 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.

9.06 *Other Provisions*

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

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

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

OWNER:

CONTRACTOR:

La Porte County, IN

By: _____

By: _____

Title: La Porte County Redevelopment Commission

Title: _____

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

Attest: _____

Attest: _____

Title: _____

Title: _____

Address for giving notices:

Address for giving notices:

La Porte County Redevelopment Commission

809 Michigan Ave.

La Porte, IN 46350

License No.: _____
(where applicable)

(NO TEXT FOR THIS PAGE)

NOTICE TO PROCEED

Owner: La Porte County
Redevelopment Commission
Contractor:

Engineer: RQAW Corporation

Project: La Porte County Water and
Sewer Extensions (SR 421 & CR 300
North Utility Extensions)

Owner's Contract No.: N/A

Contractor's Project No.:

Engineer's Project No.: 18-400-024-1

Contract Name: La Porte County Water and Sewer
Extensions (SR 421 & CR 300 North Utility
Extensions)

Effective Date of Contract:

TO PROVIDER:

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on [REDACTED], 20[REDACTED]. [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:

Comply with all requirements as stated in the Contract Documents.

Owner: La Porte County Redevelopment Commission

Authorized Signature

By:

Title:

Date Issued:

Copy: Engineer

(NO TEXT FOR THIS PAGE)

PERFORMANCE BOND

CONTRACTOR *(name and address):*

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

OWNER *(name and address):*

La Porte County Redevelopment Commission
809 Michigan Ave.
La Porte, Indiana 46350

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description *(name and location):*

BOND

Bond Number:

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

Amount:

Modifications to this Bond Form: ☐ None ☐ See Paragraph 16

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

CONTRACTOR AS PRINCIPAL

SURETY

Contractor's Name and Corporate Seal

Surety's Name and Corporate Seal

By: _____
Signature

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

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

14. Definitions

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

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

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

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

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

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

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

16. Modifications to this Bond are as follows:

(NO TEXT FOR THIS PAGE)

PAYMENT BOND

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

CONTRACTOR (*Name and Address*):

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

OWNER (*Name and Address*):

La Porte County Redevelopment Commission

CONTRACT

Effective Date of Agreement:

Amount:

Description (*Name and Location*):

BOND

Bond Number:

Date (*Not earlier than Effective Date of Agreement*):

Amount:

Modifications to this Bond Form:

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

CONTRACTOR AS PRINCIPAL

SURETY

Contractor's Name and Corporate Seal

(Seal)

Surety's Name and Corporate Seal

(Seal)

By:

Signature

Print Name

Title

Attest:

Signature

Title

By:

Signature (Attach Power of Attorney)

Print Name

Title

Attest:

Signature

Title

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

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner to pay for labor, materials, and equipment furnished by Claimants for use in the performance of the Contract, which is incorporated herein by reference.
2. With respect to Owner, this obligation shall be null and void if Contractor:
 - 2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants, and
 - 2.2 Defends, indemnifies, and holds harmless Owner from all claims, demands, liens, or suits alleging non-payment by Contractor by any person or entity who furnished labor, materials, or equipment for use in the performance of the Contract, provided Owner has promptly notified Contractor and Surety (at the addresses described in Paragraph 12) of any claims, demands, liens, or suits and tendered defense of such claims, demands, liens, or suits to Contractor and Surety, and provided there is no Owner Default.
3. With respect to Claimants, this obligation shall be null and void if Contractor promptly makes payment, directly or indirectly, for all sums due.
4. Surety shall have no obligation to Claimants under this Bond until:
 - 4.1 Claimants who are employed by or have a direct contract with Contractor have given notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.
 - 4.2 Claimants who do not have a direct contract with Contractor:
 1. Have furnished written notice to Contractor and sent a copy, or notice thereof, to Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials or equipment were furnished or supplied, or for whom the labor was done or performed; and
 2. Have either received a rejection in whole or in part from Contractor, or not received within 30 days of furnishing the above notice any communication from Contractor by which Contractor had indicated the claim will be paid directly or indirectly; and
 3. Not having been paid within the above 30 days, have sent a written notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to Contractor.
5. If a notice by a Claimant required by Paragraph 4 is provided by Owner to Contractor or to Surety, that is sufficient compliance.
6. Reserved.
7. Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by Surety.
8. Amounts owed by Owner to Contractor under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any performance bond. By Contractor furnishing and Owner accepting this Bond, they agree that all funds earned by Contractor in the performance of the Contract are dedicated to satisfy obligations of Contractor and Surety under this Bond, subject to Owner's priority to use the funds for the completion of the Work.
9. Surety shall not be liable to Owner, Claimants, or others for obligations of Contractor that are unrelated to the Contract. Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

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

11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the Work or part of the Work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Paragraph 4.1 or Paragraph 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the addresses shown on the signature page. Actual receipt of notice by Surety, Owner, or Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

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

14. Upon request of any person or entity appearing to be a potential beneficiary of this Bond, Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

15. Definitions

15.1 Claimant: An individual or entity having a direct contract with Contractor, or with a first-tier subcontractor of Contractor, to furnish labor, materials, or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of Contractor and Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

15.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.

15.3 Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract, or to perform and complete or otherwise comply with the other terms thereof.

FOR INFORMATION ONLY – (*Name, Address, and Telephone*)

Surety Agency or Broker:

Owner's Representative (*Engineer or other*):

(NO TEXT FOR THIS PAGE)

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



Issued and Published Jointly by



Endorsed by



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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

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1801 Alexander Bell Drive, Reston, VA 20191-4400
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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 consider the proposed item as a substitute pursuant to Paragraph 7.05.

7.05 Substitutes

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

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

7.06 *Concerning Subcontractors, Suppliers, and Others*

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

- E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors, Suppliers, or other individuals or entities for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.
- F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.
- H. On a monthly basis Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions.
- J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.
- K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.
- L. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.
- N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.

O. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier, or other individual or entity; nor
2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

7.07 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.08 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

7.09 *Taxes*

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

7.10 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It shall not be Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Owner or Contractor may give notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.11 *Record Documents*

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

7.12 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:
 - 1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.
 - C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
 - D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
 - E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
 - F. Contractor's duties and responsibilities for safety and protection shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).
 - G. Contractor's duties and responsibilities for safety and protection shall resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.13 *Safety Representative*

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

7.14 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or

exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.15 *Emergencies*

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

7.16 *Shop Drawings, Samples, and Other Submittals*

A. *Shop Drawing and Sample Submittal Requirements:*

1. Before submitting a Shop Drawing or Sample, Contractor shall have:
 - a. reviewed and coordinated the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
 - b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
 - c. determined and verified the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
 - d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that submittal, and that Contractor approves the submittal.
3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.

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

1. *Shop Drawings:*

- a. Contractor shall submit the number of copies required in the Specifications.
- b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to

provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.

2. *Samples:*

- a. Contractor shall submit the number of Samples required in the Specifications.
- b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 7.16.D.

3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Other Submittals:* Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.

D. *Engineer's Review:*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto.
3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
4. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order.
5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 7.16.A and B.
6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
7. Neither Engineer's receipt, review, acceptance or approval of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.

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

E. *Resubmittal Procedures:*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.
2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

7.17 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
 1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
 1. observations by Engineer;
 2. recommendation by Engineer or payment by Owner of any progress or final payment;
 3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
 4. use or occupancy of the Work or any part thereof by Owner;
 5. any review and approval of a Shop Drawing or Sample submittal;
 6. the issuance of a notice of acceptability by Engineer;
 7. any inspection, test, or approval by others; or
 8. any correction of defective Work by Owner.

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

7.18 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 7.18.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
 - 1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
 - 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

7.19 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable Laws and Regulations.
- B. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, and other submittals prepared by such professional. Shop

Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this paragraph, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 7.16.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

ARTICLE 8 – OTHER WORK AT THE SITE

8.01 *Other Work*

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.
- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any utility work at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.
- D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

8.02 *Coordination*

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

8.03 *Legal Relationships*

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

- D. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9 – OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

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

9.02 *Replacement of Engineer*

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

9.03 *Furnish Data*

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

9.04 *Pay When Due*

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

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

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

9.06 *Insurance*

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

9.07 *Change Orders*

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

9.08 *Inspections, Tests, and Approvals*

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

9.09 *Limitations on Owner's Responsibilities*

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

9.10 *Undisclosed Hazardous Environmental Condition*

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

9.11 *Evidence of Financial Arrangements*

- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.
- B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

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

10.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.08. Particularly, but without limitation, during

or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Project Representative*

- A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 10.08. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent, or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

10.04 *Rejecting Defective Work*

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

10.05 *Shop Drawings, Change Orders and Payments*

- A. Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.
- B. Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, are set forth in Paragraph 7.19.
- C. Engineer's authority as to Change Orders is set forth in Article 11.
- D. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.06 *Determinations for Unit Price Work*

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

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

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

10.08 *Limitations on Engineer's Authority and Responsibilities*

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

- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 15.06.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 10.08 shall also apply to the Resident Project Representative, if any.

10.09 *Compliance with Safety Program*

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

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

11.01 *Amending and Supplementing Contract Documents*

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

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

3. *Field Orders*: Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.02 *Owner-Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.03 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.

11.04 *Change of Contract Price*

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

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

- C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit shall be determined as follows:
1. a mutually acceptable fixed fee; or
 2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;
 - b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;
 - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.04.C.2.a and 11.04.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of five percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;
 - d. no fee shall be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
 - e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
 - f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04.C.2.a through 11.04.C.2.e, inclusive.

11.05 *Change of Contract Times*

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

11.06 *Change Proposals*

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

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

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

11.07 *Execution of Change Orders*

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

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

11.08 *Notification to Surety*

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

ARTICLE 12 – CLAIMS

12.01 *Claims*

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

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

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

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

13.01 Cost of the Work

- A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
 1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or
 2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:
 1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable

thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.
4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
 - c. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
 - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
 - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
 - f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 6.05), provided such losses and damages have resulted from causes

other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

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

- 1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
- 2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
- 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
- 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
- 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee:* When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.

E. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

13.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

- B. *Cash Allowances*: Contractor agrees that:
 - 1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
 - 2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.
- C. *Contingency Allowance*: Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

13.03 *Unit Price Work*

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of the following paragraph.
- E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price if:
 - 1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement;
 - 2. there is no corresponding adjustment with respect to any other item of Work; and
 - 3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

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

14.02 *Tests, Inspections, and Approvals*

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:
 - 1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
 - 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
 - 3. by manufacturers of equipment furnished under the Contract Documents;
 - 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
 - 5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

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

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to

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

14.03 *Defective Work*

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

14.04 *Acceptance of Defective Work*

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

14.05 *Uncovering Work*

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

- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.
 - 1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
 - 2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, then Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.
- C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will

include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

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

15.01 Progress Payments

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.
- B. *Applications for Payments:*
1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens, and evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
 2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
 3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.
- C. *Review of Applications:*
1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
 2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

- a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
- a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
- a. to supervise, direct, or control the Work, or
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
 - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid on account of the Contract Price, or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.
6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
- a. the Work is defective, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or

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

D. *Payment Becomes Due:*

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

E. *Reductions in Payment by Owner:*

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

remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed shall be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 15.01.C.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

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

15.03 *Substantial Completion*

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

- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.
- F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
 - 1. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through E for that part of the Work.
 - 2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
 - 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
 - 4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.05 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

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

15.06 *Final Payment*

- A. *Application for Payment:*
 - 1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of

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

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

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

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Completion of Work:* The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.

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

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

15.07 *Waiver of Claims*

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

15.08 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents), any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
 - 1. correct the defective repairs to the Site or such other adjacent areas;
 - 2. correct such defective Work;
 - 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
 - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).
- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

- E. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

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

and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

- F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
 - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and
 - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for

expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

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

ARTICLE 18 – MISCELLANEOUS

18.01 *Giving Notice*

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
 - 1. delivered in person, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or
 - 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

18.02 *Computation of Times*

- A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

18.03 *Cumulative Remedies*

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

18.04 *Limitation of Damages*

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

18.05 *No Waiver*

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

18.06 *Survival of Obligations*

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

18.07 *Controlling Law*

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

18.08 *Headings*

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

SECTION 00 73 00 - SUPPLEMENTARY CONDITIONS

GENERAL

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

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

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

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY*SC-1.01.A. Defined Terms*

Add new paragraph 1.01.A.49 and 1.01.A.50 immediately after paragraph 1.01.A.48 of the General Conditions which shall read as follows:

49. “Additional Insureds”, except where otherwise expressly defined, shall mean:

La Porte County Redevelopment Commission
RQAW Corporation
CB&M Surveys
The Department of Water Works, Michigan City

ARTICLE 2 – PRELIMINARY MATTERS*SC-2.02 Copies of Documents*

SC-2.02.A. Amend the first sentence of Paragraph 2.02.A. to read as follows:

Owner shall furnish to Contractor two (2) copies of the Contract Documents (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF).

ARTICLE 3 – DOCUMENT: INTENT, REQUIREMENTS, REUSE*SC-3.01 Intent*

SC-3.01.E. Add new Paragraph 3.01.E.1 immediately after Paragraph 3.01.E:

1. Engineer will issue, within five working days of receipt, such written clarifications or interpretations of the requirement of the Contract Documents (in a form as determined by Engineer) as Engineer may determine necessary, which shall be consistent with the intent of and reasonably inferable from

Contract Documents. If Engineer determines, based upon the nature of the requested clarification or interpretation, that the response cannot be furnished in five working days, Engineer will advise the Contractor giving a schedule for furnishing the information.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

SC-4.01 Commencement of Contract Times; Notice to Proceed

SC-4.01.A Delete Paragraph 4.01.A. in its entirety and insert the following new paragraph in its place:

- A. 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 30 days after the Effective Date of the Agreement.

SC-4.04 Progress Schedule

SC-4.04.C Add new Paragraph 4.04.C. immediately after Paragraph 4.04.B.:

- C. Provide an updated Progress Schedule with each Application for Payment.

SC-4.05 Delay's in Contractor's Progress

SC-4.05.A Delete Paragraph 4.05.A. in its entirety and insert the following new paragraph in its place:

- A. No claim for payment, compensation or adjustment of any kind (other than the extensions of time provided for herein) shall be made or asserted against the Owner or Engineer by the Provider for damages caused by hindrances or delays from any cause, whether such hindrances or delays be avoidable or unavoidable, and the Provider shall make no claim for damages by reason of any such hindrances or delays, and will accept in full satisfaction of such hindrances or delays an extension of time to complete the performance of the Work as specified.

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

SC-5.06 Hazardous Environmental Conditions

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

- A. No reports or drawings related to Hazardous Environmental Conditions at the Site are known to Owner.
- B. Not Used.

ARTICLE 6 – BONDS AND INSURANCE*SC-6.01 Performance, Payment and Other Bonds*

Add new paragraph 6.01.A.1. immediately after paragraph 6.01.A of the General Conditions which shall read as follows:

1. Contractor shall submit the Maintenance Bond within ten (10) days of acceptance of the project by the Owner, for an amount equal to ten percent (10%) of the final contract amount, guaranteeing for a period of three (3) years after the date of acceptance of the project by the Owner.

SC-6.02 Insurance—General Provisions

Add new paragraph 6.02.A.1. immediately after paragraph 6.02.A of the General Conditions which shall read as follows:

1. Contractor may obtain worker's compensation insurance from an insurance company that has not been rated by A.M. Best, provided that such company (a) is domiciled in the state in which the project is located, (b) is certified or authorized as a worker's compensation insurance provider by the appropriate state agency, and (c) has been accepted to provide worker's compensation insurance for similar projects by the state within the last 12 months.

SC-6.03 Contractor's Insurance

Add new paragraph 6.03.J immediately after paragraph 6.03.K of the General Conditions which shall read as follows:

- 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
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Federal, if applicable (e.g., Longshoreman's):	Statutory
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Employer's Liability:	\$1,000,000
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Foreign voluntary worker compensation	Statutory
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2. Contractor's Commercial General Liability under Paragraphs 6.03.B and 6.03.C of the General Conditions which shall include complete operations and product liability coverages and eliminate the exclusion with respect to property under the care, custody and control of Provider:

General Aggregate	\$ 3,000,000
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Products - Completed Operations Aggregate \$ 2,000,000

Each Occurrence (Bodily Injury and Property Damage) \$ 1,000,000

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

Bodily Injury:

Each person \$ 500,000

Each accident \$ 1,000,000

Property Damage:

Each accident \$ 1,000,000

Combined Single Limit of \$ 1,000,000

4. Excess or Umbrella Liability:

Per Occurrence \$ 1,000,000

General Aggregate \$ 3,000,000

5. Contractor's Professional Liability:

Each Claim \$ 1,000,000

Annual Aggregate \$ 3,000,000

SC-6.04 Owner's Liability Insurance

Delete Paragraphs 6.04.A and 6.04.B in their entirety and insert the following:

- A. Contractor shall purchase and maintain until the date of final acceptance, Owner's and Contractor's Protective Liability Insurance to protect Owner, including its employees, officers, and agents against claims which may arise from the operations of the Contractor, or his subcontractors. The coverage shall be for not less than the following amounts or greater where required by law or regulation:

Combination of Primary and Umbrella Coverage \$ 5,000,000

This insurance shall also cover the Engineer, RQAW Corporation, RQAW Corporation's subconsultants or such other engineer or engineers as may act under the Contract, against similar claims.

- B. Not Used.

SC-6.05 Property Insurance

Delete Paragraphs 6.05.A.13 and 6.05.B in their entirety and insert the following:

13. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other loss payee to whom a certificate of insurance has been issued.

B. Not used.

ARTICLE 7 – CONTRACTOR’S RESPONSIBILITIES*SC-7.01 Supervision and Superintendence*

Add new paragraphs 7.01.C and 7.01.D immediately after paragraph 7.01.B of the General Conditions which shall read as follows:

- C. The Superintendent will be Contractor’s representative at the Site and shall have authority to act on behalf of the Contractor. All communications given to or received from the Superintendent shall be binding on Contractor.
- D. Prior to the Acceptance of Contractor’s Bid, the Owner will require Contractor to submit the identity and related experience of the Contractor’s proposed Superintendent and Project Management Personnel to better evaluate the Contractor’s past performance. Submitted information shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such individual. If Owner or Engineer, after due investigation, has objection to any proposed Personnel, Owner may, before the Notice of Award is given, request Contractor to submit a substitute, without an increase in the Bid Price. Any Personnel so listed and against which Owner or Engineer makes no written objection prior to the giving of Notice of Award will be deemed acceptable to Owner and Engineer. The Contractor’s proposed replacement of the Superintendent or Project Management Personnel shall also be subject to these requirements.

SC-7.02 Labor; Working Hours

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

1. Work Hours: Perform work between 7:00 a.m. and 6:00 p.m Mondays through Fridays only. Emergency work may be performed anytime without the Owner’s written consent required in paragraph 7.02.B.
2. Work After Hours: Night work may be established by Contractor as regular procedure with written consent of Owner. Such consent, however, may be revoked at any time by Owner if Contractor fails to maintain adequate equipment and supervision for proper prosecution and control of night work.
3. Owner’s legal holidays are New Years Day, Martin Luther King Day, President’s Day, Good Friday, Memorial Day, Independence Day, Labor Day, Columbus Day, Veteran’s Day, Thanksgiving Day, Day after Thanksgiving, Day before Christmas Eve, Christmas Eve Day, Christmas Day, Day after Christmas Day.

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

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

SC-7.08 Permits

SC 7.08 Add a new paragraph immediately after Paragraph 7.08.A:

- B. Prior to construction beginning, Owner will have obtained the following permits:
 - 1. Indiana Department of Environmental Management - Notice of Intent to Construct a Water Main Extension.
 - 2. Indiana Department of Environmental Management - Construction/Land Disturbance Storm Water (Rule 5) Permit.

SC-7.09 Taxes

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

- B. Owner is exempt from payment of sales and compensating use taxes (Indiana Gross Retail Tax) of the State of Indiana 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-7.10 Laws and Regulations

SC 7.10 Add a new paragraph immediately after Paragraph 7.10.C:

- D. Financing of the project will be through a Community Development Block Grant administered by the Office of Community and Rural Affairs.

SC-7.12 Safety and Protection

SC 7.12 Add the following new paragraphs 4., 5., 6., and 7. immediately after Paragraph 7.12.A.3.:

- 4. No Duty. The duty of the Owner or Engineer to observe Contractor's performance does not include any review of the adequacy of Contractor's safety measures in, on, or near the Work site or sites. Engineer has not been retained or compensated to provide design and construction review services

relating to Contractor's safety precautions required for Contractor to perform the Work.

5. No Liability. Neither the Owner, nor an official or employee of the Owner, nor the Engineer, or any authorized assistant or agent of any of them, shall be responsible for safety precautions and programs in connection with the Work or any liability arising therefrom.
6. Protection of Operations. The Contractor shall take all necessary precautions so as to cause no unauthorized interruption in any essential part of the distribution system operations. Shutdowns for construction Work shall be scheduled in advance (minimum 14 days notice), carefully planned, and shall be carried out in close cooperation with the Owner.
7. Special Requirements for Structural Design. All structures to be provided by the Contractor, that require structural design shall be designed and constructed under the observation of a structural engineer, registered in the State of Indiana, acting for and retained by the Contractor. Drawings and calculations for such structures shall be prepared and sealed by the structural engineer and submitted to the Engineer and Owner for record. A clear outline of the proposed construction procedure shall be shown on the drawings. A statement in writing by the structural engineer attesting that said engineer has visited the Work site or sites, that the design does satisfy the conditions as actually encountered and that the actual construction conforms to the drawings and calculations, as submitted, must be submitted to the Engineer before the Work related to such structures will be considered complete.

All temporary structures, including sheeting and bracing for excavations, that affect the safety of the public, workmen, inspectors, or Owner's or Engineer's personnel shall be regarded as structures that require structural design.

SC-7.16 Shop Drawings, Samples, and Other Submittals

SC 7.16 Delete paragraph 7.16.D.8. in its entirety and insert the following:

8. Furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than two submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawing, sample, or other item requiring approval, and Provider shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Provider to secure reimbursement for such charges.

SC 7.16 Add the following new paragraph 9. immediately after Paragraph 7.16.D.8.:

9. Engineer, generally, will process shop drawings and return them to the Contractor in not more than 10 working days from day of receipt. If the nature of the shop drawings is such that the review cannot be completed in 10 working days, Engineer will advise the Contractor giving a schedule for performing the review.

ARTICLE 8 – OTHER WORK AT THE SITE*SC-8.02 Coordination*

SC-8.02 Add the following new Paragraph 8.02.C. immediately after Paragraph 8.02.B.:

- C. Should Contractor cause damage to the Work or property of any separate contractor at the site, or should any claim arising out of Contractor's performance of the Work at the site be made by any separate contractor against Contractor, Owner, Engineer, Engineer's Consultants, or any other person, Contractor shall promptly attempt to settle with such other contractor by agreement, or to otherwise resolve the dispute by arbitration or at law. Contractor shall, to the fullest extent permitted by Laws and Regulations, indemnify and hold Owner, Engineer, and Engineer's Consultants harmless from and against all claims, damages, losses and expenses (including, but not limited to, fees of engineers, architects, attorneys and other professionals and court and arbitration costs) arising directly, indirectly or consequentially out of any action, legal or equitable, brought by any separate contractor against Owner, Engineer, or Engineer's Consultants to the extent based on a claim arising out of Contractor's performance of the Work. Should a separate contractor cause damage to the Work or property of Contractor or should the performance of Work by any separate contractor at the site give rise to any other claim, Contractor shall not institute any action, legal, or equitable, against Owner, Engineer, or Engineer's Consultants or permit any action against any of them to be maintained and continued in its name or for its benefit in any court or before any arbiter which seeks to impose liability on or to recover damages from Owner, Engineer, or Engineer's Consultants on account of any such damage or claim. If Contractor is delayed at any time in performing or furnishing Work by any act or neglect of a separate contractor and Owner and Contractor are unable to agree as to the extent of any adjustment in Contract Times attributable thereto, Contractor may make a claim for an extension of times in accordance with Article 11. An extension of the Contract Times shall be Contractor's exclusive remedy with respect to Owner, Engineer, and Engineer's Consultants for any delay, disruption, interference, or hindrance caused by any separate contractor. This paragraph does not prevent recovery from Owner, Engineer, or Engineer's Consultants for activities that are their respective responsibilities.

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK*SC-11.07 Execution of Change Orders*

SC 11.07.C Add the following new paragraph immediately after Paragraph 11.07.C.:

- D. After execution of a Change Order, Contractor shall update the Project Schedule and/or Schedule of Values to reflect the agreed upon changes in Contract Price and/or Contract Time.

ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK*SC-13.03 Unit Price Work*

SC 13.03.E Delete Paragraph 13.03.E in its entirety.

ARTICLE 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK*SC-14.02 Tests, Inspections, and Approvals*

SC 14.02.B Delete Paragraph 14.02.B. in its entirety and insert the following in its place:

- B. Contractor shall employ and pay for the services of an independent testing laboratory to perform all inspections, test or approvals required by the Contract Documents except as otherwise specifically provided in the Contract Documents.

ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD*SC-15.01 Progress Payments:*

SC 15.01.B Add the following new subparagraph to Paragraph 15.01.B.1.:

- a. Submit three copies of each application on a form approved by the Owner. Present required information in typewritten form or on electronic media printout.

SC 15.01.B Add the following new Paragraph 15.01.B.4. immediately after Paragraph 15.01.B.3.:

4. Stored Materials - Payment for stored materials will not be provided.

SC 15.01.C Add the following new Paragraph 15.01.C.7. immediately after Paragraph 15.01.C.6.:

7. Keep all record drawings up to date. Engineer's review and recommendation for payment to the Owner is subject to the Contractor maintaining all record drawings are in alignment with the progress of the Work.

SC 15.01.D Delete Paragraph 15.01.D in its entirety and insert the following in its place:

1. Thirty 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.

SC-15.03 Substantial Completion

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

1. If some or all of the Work has been determined not to be at a point of Substantial Completion and will require re-inspection or re-testing by Engineer, the cost of such re-inspection or re-testing, including the cost of time, travel and living expenses, shall be paid by the Contractor to Owner. If Contractor does not pay, or the parties are unable to agree as to the amount

owed, then Owner may impose a reasonable set-off against payments due under Article 15.

ARTICLE 18 – MISCELLANEOUS

SC-18.15 Severability

SC-18.15 Add the following new paragraph immediately after Paragraph 18.14.

18.15 Severability

- A. If any portion of the Contract Documents is invalid or unenforceable pursuant to applicable law, such portion shall be void in the jurisdiction where it is invalid or unenforceable, and the remainder of the Contract Documents shall remain binding upon the parties hereto.

SC-18.16 Compliance with E-Verify Program

SC-18.16 Add the following new paragraph immediately after Paragraph 18.15.

18.16 Compliance with E-Verify Program

- A. Pursuant to IC 22-5-1.7, Contractor shall enroll in and verify the work eligibility status of all newly hired employees of Contractor through the E-Verify Program (“Program”). Contractor is not required to verify the work eligibility status of all newly hired employees through the Program if the Program no longer exists.
- B. Contractor and its subcontractors shall not knowingly employ or contract with an unauthorized alien or retain an employee or contract with a person that Contractor or its subcontractor subsequently learns is an unauthorized alien. If Contractor violates this Section 18.16, Owner shall require Contractor to remedy the violation not later than thirty (30) days after Owner notifies Contractor. If Contractor fails to remedy the violation within the thirty (30) day period, Owner shall terminate the Contract for breach of contract. If Owner terminates the Contract, Contractor shall, in addition to any other contractual remedies, be liable to Owner for actual damages. There is a rebuttable presumption that Contractor did not knowingly employ an unauthorized alien if Contractor verified the work eligibility status of the employee through the Program.
- C. If Contractor employs or contracts with an unauthorized alien but Owner determines that terminating the Contract would be detrimental to the public interest of public property, Owner may allow the Contract to remain in effect until Owner procures a new contractor.
- D. Contractor shall, prior to performing any work, require each subcontractor to certify to Contractor that the subcontractor does not knowingly employ or contract with an unauthorized alien and has enrolled in the Program. Contractor shall maintain on file a certification from each subcontractor throughout the duration of the Project. If Contractor determines that a subcontractor is in violation of this Paragraph 18.16, Contractor may terminate its contract with the subcontractor for such violation. Such termination may not be considered a breach of contract by Contractor or the subcontractor.

- E. With the Agreement, Contractor shall submit executed affidavits stating they will not knowingly employ illegal aliens.
- F. Contractor's subcontractors shall, prior to performing any work, submit executed affidavits which state they will not knowingly employ illegal aliens.

SC-18.17 Engaging in Activities with Iran

SC-18.17 Add the following new paragraph immediately after Paragraph 18.16.

18.17 Engaging in Activities with Iran

Pursuant to IC 5-22-16.5, Contractor shall not engage in investment activities in the country of Iran.

(NO TEXT THIS PAGE)

SECTION 01 10 00 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Project information.
 - 2. Work covered by Contract Documents.
 - 3. Access to site.
 - 4. Work restrictions.
 - 5. Specification and Drawing conventions.
 - 6. Constraints.
 - 7. Work sequence.

- B. Related Requirements:

- 1. Section 01 50 00 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 PROJECT INFORMATION

- A. Project Identification: La Porte County Water and Sewer Extensions (SR 421 & CR 300 North Utility Extensions).

- 1. Project Location: La Porte County, Indiana.

- B. Owner: La Porte County Redevelopment Commission, 801 Michigan Ave., La Porte, IN 46350.

- C. Engineer: RQAW Corporation, 703 Michigan Avenue, Indiana, 46350.

- D. Construction Observation Consultant: H.W. Lochner, 286 W. Johnson Road, La Porte, IN 46350

- E. Engineer's Consultants: Engineer has retained the following design professionals who have prepared designated portions of the Contract Documents:

1. Survey: Antero Group, LLC, 369 Woody Dunes Court, Porter, IN 46304.
2. Geotechnical Engineering: Weaver Consultants Group, 35 E. Wacket Drive, Suite 1250, Chicago, IL 60601
3. It is the responsibility of the Contractor to coordinate with the Engineer on all project related items. Engineer will coordinate with Engineer's Consultants when required.

1.4 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of the Project is defined by the Contract Documents and consists of the following:
 1. The project includes installing new 20-inch ductile iron water main, including all valves, hydrants, and other Work indicated in the Contract Documents.
 2. The project includes the installation of gravity sewer lines, lift station, and forcemain and appurtenances related to sanitary/wastewater conveyance, indicated in the Contract Documents.
- B. The Work includes:
 1. Furnishing of all labor, material, equipment, supplies, services and other means of construction necessary or proper for performing and completing the Work.
 2. Sole responsibility for adequacy of equipment.
 3. Maintaining the Work area and site in a clean and acceptable manner.
 4. Maintaining existing facilities in service at all times except where specifically provided for otherwise herein.
 5. Protection of finished and unfinished Work.
 6. Repair and restoration of Work damaged during construction.
 7. Furnishing as necessary proper equipment and machinery, of a sufficient capacity, to facilitate the Work and to handle all emergencies normally encountered in Work of this character.
- C. Implied and Normally Required Work: It is the intent of these Specifications to provide the Owner with complete operable systems, subsystems and other items of Work. Any part or item of Work which is reasonably implied or normally required to make each installation satisfactorily and completely operable is deemed to be included in the Work and the Contract Amount. All miscellaneous appurtenances

and other items of Work incidental to meeting the intent of these Specifications are included in the Work and the Contract Amount even though these appurtenances may not be specifically called for in these Specifications.

- D. Quality of Work: Regard the apparent silence of the Contract Documents as to any detail, or the apparent omission from them of a detailed description concerning any Work to be done and materials to be furnished as meaning that only the best general practice is to prevail and that only materials and workmanship of the best quality are to be used. Interpretation of these Specifications will be made upon this basis.
- E. Type of Contract:
 - 1. Project will be constructed under a single prime contract.

1.5 ACCESS TO SITE

- A. General: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.
- B. Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
 - 1. Driveways, Walkways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, Residents, and emergency vehicles at all times. Do not use these areas for parking or for storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
 - c. Do not block or prevent entry to driveways and entrances of adjacent property owners throughout the duration of the project.
- C. Condition of Existing Buildings: Maintain portions of existing buildings at or adjacent to the site affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.
- D. Condition of Existing Grounds: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.

1.6 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
 - 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work to normal business working hours as described in the Supplementary Conditions.
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
 - 1. Notify Engineer not less than 48 hours in advance of proposed utility interruptions.
 - 2. Obtain Engineer's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
 - 1. Notify Engineer not less than 48 hours in advance of proposed disruptive operations.
 - 2. Obtain Engineer's written permission before proceeding with disruptive operations.

1.7 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 - 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
- D. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.

1. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and as scheduled on Drawings.

1.8 CONSTRAINTS

- A. The Contract Documents are intended to allow the Contractor flexibility in construction of the Work however the following constraints apply:
 1. When connecting the new water main to the existing distribution system, maintain flow in existing distribution system at all times.
 2. Perform Work in such a manner to prevent damage to portions of the existing distribution system which are to remain in place. Repair or replace any portions of the distribution system which are outside the limits of removal, as shown on the Contract Documents, and which are damaged by the Contractor. Any such repairs or replacements shall be performed at no additional cost to the Owner.
 3. The Engineer is the sole judge of when the Contractor's operations are causing interference with the Owner's daily procedures. The Engineer's orders and instructions on alleviating such interferences will be carried out without delay.
 4. Perform the work in strict accordance within the construction limits shown.
- B. Coordinate in advance with the Owner all interruptions to existing systems and facilities. In the event of a conflict, Contractor will reschedule his operations so that the Work will not conflict with Owner's necessary operations or maintenance.
- C. Perform connections to existing facilities or systems that interfere with the operation of existing facilities or systems as quickly as possible and with as little delay as possible.

1.9 WORK SEQUENCE

- A. Coordinate work of all subcontractors.
- B. Engineer has made an attempt at a proposed sequence of construction. Submit for acceptance a detailed sequence of construction with the construction schedule prior to the Work commencing.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 STARTING WORK

- A. Start Work within 10 days following the date stated in the Notice to Proceed and execute with such progress as may be required to prevent delay to other contractors or to the general completion of the project. Execute Work at such items and in or on such parts of the project and with such forces, material and equipment, as to complete the Work in the time established by the Contract. At all times, schedule and direct the Work so that it provides an orderly progression to completion within the specified time for completion.

END OF SECTION 01 10 00

(NO TEXT FOR THIS PAGE)

SECTION 01 29 00 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

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

1.3 UNIT PRICE PAYMENT

- A. Format and Content: Shall be in accordance with the Bid Form. All tasks associated with this work shall be covered within the available items provided in the BID FORM.

1.4 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Engineer and paid for by Owner.
- B. Payment Application Times: Submit draft Application for Payment to Engineer by the second Tuesday of the month. The period covered by each Application for Payment is one month, ending on the Friday prior to the second Tuesday of each month, or before. Application for Payment must be agreed to and approved at least eight (8) days before the fourth Wednesday of the month for payment at the monthly County Redevelopment Meeting.
- C. Application for Payment Forms: Use EJCDC Document C-620 as form for Applications for Payment
- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Engineer will return incomplete applications without action.
 - 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.

2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
 3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
 4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.
- E. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment for stored materials.
 2. Provide supporting documentation that verifies amount requested, such as paid invoices, photographs of delivered materials, etc. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
 3. Provide summary documentation for stored materials indicating the following:
 - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
 - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
 - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- F. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Engineer by a method ensuring receipt. Include waivers of lien and similar attachments with each copy.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- G. Waivers of Lien: With each Application for Payment, except for the first, submit waivers of lien from entities lawfully entitled to a lien.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
 5. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.

- H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
 - 1. List of subcontractors.
 - 2. Schedule of values: Matching the Unit Price Items in the BID FORM.
 - 3. Contractor's construction schedule (preliminary if not final).
 - 4. Products list (preliminary if not final).
 - 5. Submittal schedule (preliminary if not final).
 - 6. Copies of permits.
 - 7. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 - 8. Initial progress report.
 - 9. Report of preconstruction conference.
- I. Application for Payment at Substantial Completion: After Engineer issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
 - 1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 - 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- J. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
 - 1. Evidence of completion of Project closeout requirements
 - 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 - 3. Updated final statement, accounting for final changes to the Contract Sum.
 - 4. Indiana State Form 34951
 - 5. Evidence that claims have been settled.
 - 6. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
 - 7. Final liquidated damages settlement statement.
- K. Record Drawings: Keep all record drawings current. Recommendation for payment of pay application is subject to Engineer's review and confirmation that all record drawings are up to date.

RQAW Corporation
Extensions

La Porte County Water and Sewer
(SR 421 & CR 300 North Utility Extensions)

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 29 00

SECTION 01 31 19 - PROJECT MEETINGS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Preconstruction Conference.
- B. Project Meetings.

1.2 PRECONSTRUCTION CONFERENCE

- A. The Engineer will schedule meeting after Notice of Award.
- B. Attendance Required: Owner, Engineer, Contractor, and Subcontractors.
- C. Agenda:
 - 1. Execution of Owner-Contractor Agreements.
 - 2. Submission of executed bonds and insurance certificates.
 - 3. Distribution of Contract Documents.
 - 4. Submission of schedule of values and progress schedule.
 - 5. Designation of personnel representing Owner, Engineer, and Contractor.
 - 6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
 - 7. Use of premises by Owner and Contractor.
 - 8. Owner's requirements.
 - 9. Construction facilities and controls.
 - 10. Temporary utilities.
 - 11. Survey.
 - 12. Security and housekeeping procedures.
 - 13. Procedures for testing.
 - 14. Procedures for maintaining record documents.
 - 15. Requirements for start-up of equipment.
 - 16. Inspection and acceptance of equipment put into service during construction period.
- D. The Engineer will record minutes and distribute copies to participants and those affected by decisions made.

1.3 PROGRESS MEETINGS

- A. The Contractor will schedule and administer meetings throughout progress of the Work at maximum monthly intervals.
- B. The Contractor will make arrangements for meetings, prepare agenda with copies for participants, and preside at meetings.
- C. Attendance Required: Job superintendents, major subcontractors and suppliers, Owner, and Engineer, as appropriate to agenda topics for each meeting.
- D. Agenda:
 - 1. Review minutes of previous meetings.
 - 2. Progress to date.
 - 3. Anticipated progress until next progress meeting.
 - 4. Identification of problems impeding planned progress.
 - 5. Review of submittals schedule and status of submittals.
 - 6. Maintenance of progress schedule.
 - 7. Corrective measures to regain projected schedules.
 - 8. Review of Requests for Information (RFI's).
 - 9. Review of Requests for Proposal (RFP's).
 - 10. Review of Change Orders (CO's).
 - 11. Review of Pay Applications.
 - 12. Owner discussions, concerns, and comments.
 - 13. Engineer discussions, concerns, and comments.
 - 14. Other business relating to Work.
- E. The Contractor will record minutes and distribute copies to participants and those affected by decisions made.
 - 1. Distribute meeting notes to attendees within seven calendar days after each meeting and allow three days for review of meeting notes by all parties. After the three-day review period, re-distribute notes as required and prior to the next progress meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 19

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Submittal schedule requirements.
 - 2. Administrative and procedural requirements for submittals.
- B. Related Requirements:
 - 1. Section 01 29 00 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
 - 2. Section 01 40 00 "Quality Requirements" for submitting test and inspection reports, and schedule of tests and inspections.
 - 3. Section 01 77 00 "Closeout Procedures" for submitting closeout submittals and maintenance material submittals.
 - 4. Section 01 78 39 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Engineer's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Engineer's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

1.4 SUBMITTAL SCHEDULE

- A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Engineer and additional time for handling and reviewing submittals required by those corrections.
1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
 2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
 3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
 - a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.
 4. Format: Arrange the following information in a tabular format:
 - a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Submittal Category: Action; informational.
 - d. Name of subcontractor.
 - e. Description of the Work covered.
 - f. Scheduled date for Engineer's final release or approval.
 - g. Scheduled dates for purchasing.
 - h. Scheduled date of fabrication.
 - i. Scheduled dates for installation.
 - j. Activity or event number.

1.5 SUBMITTAL FORMATS

- A. Submittal Information: Include the following information in each submittal:
1. Project name.
 2. Date.
 3. Name of Engineer.
 4. Name of Contractor.
 5. Name of firm or entity that prepared submittal.
 6. Names of subcontractor, manufacturer, and supplier.
 7. Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier; and alphanumeric suffix for resubmittals.
 8. Category and type of submittal.
 9. Submittal purpose and description.

10. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
 11. Drawing number and detail references, as appropriate.
 12. Indication of full or partial submittal.
 13. Location(s) where product is to be installed, as appropriate.
 14. Other necessary identification.
 15. Remarks.
 16. Signature of transmitter.
- B. Options: Identify options requiring selection by Engineer.
- C. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Engineer on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.
- D. Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.
1. Place a permanent label or title block on each submittal item for identification; include name of firm or entity that prepared submittal.
 2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Engineer.
 3. Transmittal for Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using facsimile of sample form included in Project Manual transmittal form.

1.6 SUBMITTAL PROCEDURES

- A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
1. ShareFile/FTP Website: Prepare submittals in PDF form, and upload to a ShareFile or FTP website. Enter required data in web-based software site to fully identify submittal.
 - a. Engineer will review and upload an annotated file to the web-based system.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.

4. Coordinate transmittal of submittals for related parts of the Work specified in different Sections so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as indicated in the General and Supplementary Conditions. Time for review shall commence on Engineer's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
- D. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
 1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked with approval notation from Engineer's action stamp.
- E. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- F. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Engineer's action stamp.

1.7 SUBMITTAL REQUIREMENTS

- A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 1. Mark each copy of each submittal to show which products and options are specific to the project.
 2. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 3. For equipment, include the following in addition to the above, as applicable:

- a. Wiring diagrams that show factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
- B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 2. Paper Sheet Size: Except for templates, patterns, and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 24 by 36 inches.
- C. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other materials.
 1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 2. Identification: Permanently attach label on unexposed side of Samples that includes the following:
 - a. Project name and submittal number.
 - b. Generic description of Sample.
 - c. Product name and name of manufacturer.
 - d. Sample source.
 - e. Number and title of applicable Specification Section.
 - f. Specification paragraph number and generic name of each item.
 3. Paper Transmittal: Include paper transmittal including complete submittal information indicated. Upload a copy of the transmittal to the ShareFile or FTP website for record keeping purposes.
 4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

- a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit three full sets of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Engineer will return submittal with options selected.
6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit three sets of Samples. Engineer will retain two Sample sets; remainder will be returned with Engineer comments.
 - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- D. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
 1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
 2. Manufacturer and product name, and model number if applicable.
 3. Number and name of room or space.
 4. Location within room or space.
- E. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, reference contact information, and other information specified.

- F. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.
- G. Certificates:
1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.
 2. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
 3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
 4. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
 5. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
 6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- H. Test and Research Reports:
1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
 2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
 3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
 4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
6. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - a. Name of evaluation organization.
 - b. Date of evaluation.
 - c. Time period when report is in effect.
 - d. Product and manufacturers' names.
 - e. Description of product.
 - f. Test procedures and results.
 - g. Limitations of use.

1.8 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 1. If criteria indicated are insufficient to perform services or certification required, submit a written request for additional information to Engineer.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF file of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
 2. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

1.9 CONTRACTOR'S REVIEW

- A. Action Submittals and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.
- B. Contractor's Approval: Indicate Contractor's approval for each submittal with a uniform approval stamp. Include name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

1. Engineer will not review submittals received from Contractor that do not have Contractor's review and approval.

1.10 ENGINEER'S REVIEW

- A. Action Submittals: Engineer will review each submittal, indicate corrections or revisions required and return it.
 1. PDF Submittals: Engineer will indicate, via markup on each submittal, the appropriate action as follows:
 - a. No Exceptions Taken:
 - 1) Where submittals are stamped "No Exceptions Taken". Work covered by submittal may proceed PROVIDED THE WORK COMPLIES WITH THE CONTRACT DOCUMENTS. Acceptance of Work will depend upon that compliance
 - b. Make Corrections Noted:
 - 1) When submittals are stamped "Make Corrections Noted". Work covered by submittal may proceed PROVIDED IT COMPLIES WITH ENGINEER'S NOTATIONS AND CORRECTIONS ON SUBMITTAL AND WITH THE CONTRACT DOCUMENTS. Acceptance of Work will depend on that compliance.
 - c. Submit Specified Item:
 - 1) When submittals are stamped "Submit Specified Item" Contractor may proceed with Work covered by the submittal, except for the requested item, PROVIDED THE WORK COMPLIES WITH THE CONTRACT DOCUMENTS. Acceptance of Work will depend upon that compliance.
 - 2) Submit the requested item in accordance with Paragraph 1.7 of this Section.
 - d. Revise and Resubmit:
 - 1) When submittals are stamped "Revise and Resubmit" do not proceed with Work covered by submittal. Do not permit Work covered by submittal to use at Project site or elsewhere where Work is in progress.
 - 2) Revise submittal in accordance with Engineer's notations.
 - e. Rejected:
 - 1) When submittals are stamped "Rejected" do not proceed with Work covered by submittal. Do not permit Work covered by submittal to be used at Project site or elsewhere where Work is in progress.

- 2) Provide a new submittal that meets the intent of the Specifications and in accordance with Engineer's notations.

B. Informational Submittals

1. When Informational Submittals conform to the format requirements in the Contract Documents, Engineer will acknowledge such submittals via a response transmittal.
 2. If an Information Submittal does not conform to the format requirements of the Contract Documents, Engineer will return the submittal with comments or questions. Do not proceed with Work covered by the submittal and do not permit Work covered by the submittal to be used at Project site or elsewhere where Work is in progress. Resubmit the Information Submittal until the Engineer acknowledges that the submittal conforms to the format required.
- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval in writing from Engineer.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Engineer will return without review submittals received from sources other than Contractor.
- F. Submittals not required by the Contract Documents will be returned by Engineer without action.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SUBMITTAL NUMBERING

- A. Number all submittals as follows:

(A) - (B)

Where:

(A) = Specification Section Number

(B) = Consecutive submittal number for the Specification Section Number listed in (A), with an alphabetic suffix indicating the sequential version of the submittal.

Examples: 01 33 00-001A indicates the initial version of submittal number 001 for Specification Section 01 33 00.

01 33 00-001B indicates the second version of submittal number 001 for Specification Section 01 33 00.

01 33 00-002A indicates the initial version of submittal number 002 for Specification Section 01 33 00.

3.2 REPETITIVE REVIEWS

- A. Repetitive Reviews: Submittals will be reviewed no more than twice at the Owner's expense. All subsequent reviews will be performed at times convenient to the Engineer based on the Engineer's then prevailing rates including all direct and indirect costs and fees. Contractor is not entitled to an increase in the Guaranteed Maximum Price for reimbursing Owner for all such costs and fees invoiced for third and subsequent submittals.

3.3 EXAMPLE FORMAT FOR CONTRACTOR'S APPROVAL AND CERTIFICATION STAMP

- A. An example format for the Contractor's approval and certification stamp is as follows:

CONTRACTOR'S NAME
____ Approved and Certified to comply with the Contract Documents
____ Approved and Certified to comply with Contract Documents, except for variations specifically noted on the Submittal Transmittal Form and the associated documents.
PRINTED NAME: _____
TITLE: _____
SIGNATURE: _____
DATE: _____

3.4 CONTRACTOR'S SUBMITTAL TRANSMITTAL FORM

- A. The format for the Contractor's Submittal Transmittal form is as follows:

CONTRACTOR'S NAME
SUBMITTAL TRANSMITTAL FORM
Utilities Extension to the Intersection of SR 421 and CR 300 North

TO: _____ DATE: _____
SITE: _____
ATTN: _____ SPEC. REF. NO.: _____
DWG REF. NO.: _____
FROM: _____ SUBMITTAL NO.: _____

1. The following documents are forwarded for your review:

No. of Copies	Document Originator	Description	Document No.	Date

2. Will item submitted for review fit in space provided in the Contract Document? _____ Yes _____ No _____ Not Applicable
3. Has work indicated in this submittal been coordinated with all trades? _____ Yes _____ No _____ Not Applicable
4. Has the Contractor approved submittal and affixed completed approval and certification stamp? _____ Yes _____ No
5. Contractor's description and justification for variations from the Contract Documents. (Use additional pages, if necessary)

6. Remarks: _____

Printed Name: _____

Signature: _____

3.5 SUBMITTAL REQUIREMENTS

- A. The schedule of submittals below is to be used only as a guide and is not guaranteed as a complete listing. Furnish submittals for any items of material or equipment required by the Technical Specifications.

SECTION	ITEM DESCRIPTION	SHOP DRAWING PRODUCT DATA / LAYOUT DRAWINGS	INSTALLATION INSTRUCTIONS	DESIGN CALCULATIONS AND / OR PE APPROVALS	O&M MANUAL	START-UP REPORT	MANUFACTURERS WARRANTY / CERTIFICATION OF INSTALLATION	SAMPLES & CERTIFIED TEST REPORTS	DAYS DUE AFTER NOTICE TO PROCEED
03 30 00	Cast-in-Place Concrete	X							
09 96 00	High Performance Coatings	X	X						
26 05 19	Low-Voltage Electrical Power Conductors and Cables	X							
26 05 26	Grounding and Bonding for Electrical Systems	X							
26 05 33	Conduit and Boxes for Electrical Systems	X	X						
26 05 53	Identification for Electrical Systems	X							
26 28 16	Disconnect Switches	X	X						
26 33 53	Static Uninterruptible Power Supply	X							
26 56 00	Exterior Lighting	X	X						
31 23 23	Fill							X	
31 25 00	Erosion and Sedimentation Control	X	X					X	
32 12 16	Asphalt Paving	X							
32 16 23	Sidewalks	X							
32 17 23	Pavement Markings	X							
32 92 19	Seeding	X	X						
33 01 10.58	Disinfection of Water Utility Piping Systems							X	
33 01 30.13	Sewer, Force Main and Manhole Testing							X	
33 05 05.31	Hydrostatic Testing							X	
33 05 07.13	Utility Directional Drilling	X							

SECTION	ITEM DESCRIPTION	SHOP DRAWING PRODUCT DATA / LAYOUT DRAWINGS	INSTALLATION INSTRUCTIONS	DESIGN CALCULATIONS AND / OR PE APPROVALS	O&M MANUAL	START-UP REPORT	MANUFACTURERS WARRANTY / CERTIFICATION OF INSTALLATION	SAMPLES & CERTIFIED TEST REPORTS	DAYS DUE AFTER NOTICE TO PROCEED
33 05 13	Precast Concrete Wastewater Utility Structures	X							
33 05 23	Jacking and Augering	X							
33 05 26	Utility Identification	X					X		
33 14 13	Public Water Utility Piping	X	X				X		
33 14 19	Valves and Hydrants for Water Utility Service	X	X				X		
33 31 13	Public Sanitary Sewerage Piping	X	X				X		
33 32 19	Public Utility Wastewater Pumping Stations	X	X	X	X	X	X		
33 34 00	Sanitary Sewer, Force Main	X	X				X		
40 70 05	Remote Terminal Unit	X	X				X		
40 71 79	Flow Switches	X	X				X		
40 72 43	Pressure Type Level Meters	X	X				X		

END OF SECTION 01 33 00

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 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 Document requirements.
 - 1. Specific quality-assurance and quality-control requirements for individual work results are specified in their respective Specification Sections. Requirements in individual Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and quality-control services required by Engineer, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

1.3 DEFINITIONS

- A. Experienced: When used with an entity or individual, "experienced" unless otherwise further described means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- B. Field Quality-Control Tests: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.

Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).

- D. Mock-ups: Full-size physical assemblies that are constructed on-site either as freestanding temporary built elements or as part of permanent construction. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
1. Laboratory Mockups: Full-size physical assemblies constructed and tested at testing facility to verify performance characteristics
 2. Integrated Exterior Mockups: Mockups of the exterior envelope constructed on-site as freestanding temporary built elements or as part of permanent construction, consisting of multiple products, assemblies, and subassemblies.
 3. Room Mockups: Mockups of typical interior spaces complete with wall, floor, and ceiling finishes; doors; windows; millwork; casework; specialties; furnishings and equipment; and lighting.
- E. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.
- F. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- G. Source Quality-Control Tests: Tests and inspections that are performed at the source; for example, plant, mill, factory, or shop.
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- I. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- J. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include contract administration activities performed by Engineer.

1.4 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Engineer.

1.5 CONFLICTING REQUIREMENTS

- A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements are specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Engineer for direction before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Engineer for a decision before proceeding.

1.6 ACTION SUBMITTALS

- A. Shop Drawings: For integrated exterior and laboratory mock-ups
 - 1. Include plans, sections, and elevations, indicating materials and size of mockup construction.
 - 2. Indicate manufacturer and model number of individual components.
 - 3. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.
- B. Delegated-Design Services Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

1.7 INFORMATIONAL SUBMITTALS

- A. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article 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. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Entity responsible for performing tests and inspections.
 - 3. Description of test and inspection.
 - 4. Identification of applicable standards.
 - 5. Identification of test and inspection methods.
 - 6. Number of tests and inspections required.
 - 7. Time schedule or time span for tests and inspections.
 - 8. Requirements for obtaining samples.
 - 9. Unique characteristics of each quality-control service.
- C. Reports: Prepare and submit certified written reports and documents as specified.
- D. Permits, Licenses, and Certificates: For Owner's record, 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.

1.8 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, telephone number, and email address of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.
 - 10. Record of temperature and weather conditions at time of sample taking and testing and inspection.
 - 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 - 12. Name and signature of laboratory inspector.
 - 13. Recommendations on retesting and reinspecting.

- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, telephone number, and email address of technical representative making report.
 2. Statement on condition of substrates and their acceptability for installation of product.
 3. Statement that products at Project site comply with requirements.
 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 6. Statement whether conditions, products, and installation will affect warranty.
 7. Other required items indicated in individual Specification Sections.
- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, telephone number, and email address of factory-authorized service representative making report.
 2. Statement that equipment complies with requirements.
 3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 4. Statement whether conditions, products, and installation will affect warranty.
 5. Other required items indicated in individual Specification Sections.

1.9 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- 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, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, applying, 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.

- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.
- F. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
- G. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- H. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
 - 1. Build mockups of size indicated.
 - 2. Build mockups in location indicated or, if not indicated, as directed by Engineer.
 - 3. Notify Engineer seven days in advance of dates and times when mockups will be constructed.
 - 4. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed to perform same tasks during the construction at Project.
 - 5. Demonstrate the proposed range of aesthetic effects and workmanship.
 - 6. Obtain Engineer's approval of mockups before starting corresponding work, fabrication, or construction.
 - a. Allow seven days for initial review and each re-review of each mockup.
 - 7. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - 8. When not incorporated into the work, demolish and remove mockups when directed unless otherwise indicated.

1.10 QUALITY CONTROL

- A. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.

1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 2. Engage a qualified testing agency to perform quality-control services.
 3. Notify testing agencies at least 48 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. Field and Laboratory Tests: Provide personnel to perform the following periodic observation and associated services:
1. Soils: Observe and test excavations, placement and compaction of soils. Determine suitability of excavated material. Observe subgrade soils and foundations.
 2. Concrete: Observe forms and reinforcement; observe concrete placement; perform and facilitate air entrainment and slump tests, and concrete cylinder preparation. Refer to Specification Section 03 30 00 "Cast-in-Place Concrete" for additional requirements.
 3. Provide at least 24 hours notice prior to when specified testing is required. Provide labor and materials, and necessary facilities at the site as required by the Engineer and the testing laboratory.
- C. Retesting/Reinspecting: Retest and reinspect construction that replaced Work that failed to comply with the Contract Documents. Costs for retesting or reinspecting the Work shall be incurred by the Contractor at no expense to the Owner.
- 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. Determine the locations from which test samples will be taken and in which in-situ tests are conducted.
 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform duties of Contractor.

- E. 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 as specified in Section 01 33 00 "Submittal Procedures."
 - F. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in pre-installation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
 - G. Associated Contractor Services: Cooperate with agencies and representatives 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. Security and protection for samples and for testing and inspection equipment at Project site.
 - H. Coordination: 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.
 - 1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- 1.11 COSTS OF INSPECTION
- A. Contractor's Obligation: Include in the Contract Price, the cost of all shop and field tests of materials and equipment specifically called for in the Contract Documents. The Owner may perform tests on any material furnished under this Contract at any time during the Contract. If tests performed by the Owner result in failure or rejection for noncompliance, reimburse the Owner for expenditures incurred in making such tests. Tests performed by the Owner shall prevail in determining compliance with Contract requirements.
 - B. Reimbursements to Owner:
 - 1. Materials and equipment submitted by the Contractor as the equivalent to those specifically named in the Contract may be tested by the Owner for compliance. Reimburse the Owner for expenditures incurred in making such tests on materials and equipment which are rejected for noncompliance.

1.12 ACCEPTANCE TESTS

- A. Preliminary Field Tests: As soon as conditions permit, furnish all labor and materials and services to perform preliminary field tests of all equipment provided under this Contract. If the preliminary field tests disclose that any equipment furnished and installed under this Contract does not meet the requirements of the Contract Documents, make all changes, adjustments and replacements required prior to the acceptance tests.
- B. Final Field Tests: Upon completion of the Work and prior to final payment, subject all equipment, piping and appliances installed under this Contract to specified acceptance tests to demonstrate compliance with the Contract Documents.
 - 1. Furnish all labor, fuel, energy, water and other materials, equipment, instruments and services necessary for all acceptance tests.
 - 2. Conduct field tests in the presence of the Engineer. Perform the field tests to demonstrate that under all conditions of operation each equipment item:
 - a. Has not been damaged by transportation or installation.
 - b. Has been properly installed.
 - c. Has been properly lubricated.
 - d. Is in proper alignment.
 - e. Has been properly connected.
 - f. Is free of overloading of any parts.
 - g. Operates as intended.
- C. Certificate of Compliance: Submit a notarized Certificate of Compliance for each equipment item. Provide Certificates in the form of a letter stating the following:
 - 1. Manufacturer has performed all required tests.
 - 2. Materials to be supplied meet all test requirements.
 - 3. Tests were performed not more than one year prior to submittal of the certificate.
 - 4. Materials and equipment subjected to the tests are of the same quality, manufacture and make as those specified.
 - 5. Identification of the materials.
- D. Failure of Tests: If the acceptance tests reveal defects in material or equipment, or if the material or equipment in any way fails to comply with the requirements of the Contract Documents, then promptly correct such deficiencies. Failure or refusal to correct the deficiencies, or if the improved materials or equipment, when tested again, fail to meet the guarantees or specified requirements, the Owner, notwithstanding its partial payment for work and materials or equipment, may reject said materials or equipment and may order the Contractor to remove the defective work from the site at no addition to the Contract Price, and replace it with material or equipment which meets the Contract Documents.

1.13 FAILURE TO COMPLY WITH CONTRACT

- A. Unacceptable materials: If it is ascertained by testing or inspection that the material or equipment does not comply with the Contract, do not deliver said material or equipment, or if delivered remove it promptly from the site or from the Work and replace it with acceptable material without additional cost to the Owner. Fulfill all obligations under the terms and conditions of the Contract even if the Owner or the Resident Project Representative fail to ascertain noncompliance or notify the Contractor of noncompliance.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 ACCEPTABLE TESTING AGENCIES

- A. The following list of Testing Agencies are considered to be pre-approved and acceptable to perform the designated tests and inspections:
 - 1. Earth Exploration.
 - 2. Alt & Witzig
 - 3. ATC Group Services
 - 4. CTL Engineering
- B. Contractor may submit the qualifications of an alternate agency for approval by the Engineer.

3.2 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
 - 1. Date test or inspection was conducted.
 - 2. Description of the Work tested or inspected.
 - 3. Date test or inspection results were transmitted to Engineer.
 - 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Engineer's reference during normal working hours.
 - 1. Submit log at Project closeout as part of Project Record Documents.

3.3 REPAIR AND PROTECTION

- A. General: On completion of testing, inspection, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 01 73 00 "Execution."
- 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 OF SECTION 01 40 00

(NO TEXT FOR THIS PAGE)

SECTION 01 42 00 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Engineer's action on Contractor's submittals, applications, and requests, "approved" is limited to Engineer's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Engineer. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
 - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.4 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

- 1. AABC - Associated Air Balance Council; www.aabc.com.
- 2. AAMA - American Architectural Manufacturers Association; www.aamanet.org.
- 3. AAPFCO - Association of American Plant Food Control Officials; www.aapfco.org.
- 4. AASHTO - American Association of State Highway and Transportation Officials; www.transportation.org.
- 5. AATCC - American Association of Textile Chemists and Colorists; www.aatcc.org.
- 6. ABMA - American Bearing Manufacturers Association; www.americanbearings.org.
- 7. ABMA - American Boiler Manufacturers Association; www.abma.com.
- 8. ACI - American Concrete Institute; (Formerly: ACI International); www.concrete.org
- 9. ACPA - American Concrete Pipe Association; www.concrete-pipe.org.
- 10. AEIC - Association of Edison Illuminating Companies, Inc. (The); www.aeic.org.
- 11. AF&PA - American Forest & Paper Association; www.afandpa.org.
- 12. AGA - American Gas Association; www.aga.org.
- 13. AHAM - Association of Home Appliance Manufacturers; www.aham.org.
- 14. AHRI - Air-Conditioning, Heating, and Refrigeration Institute (The); www.ahrinet.org.
- 15. AI - Asphalt Institute; www.asphaltinstitute.org.
- 16. AIA - American Institute of Architects (The); www.aia.org.
- 17. AISC - American Institute of Steel Construction; www.aisc.org.
- 18. AISI - American Iron and Steel Institute; www.steel.org.
- 19. AITC - American Institute of Timber Construction; www.aitc-glulam.org.
- 20. AMCA - Air Movement and Control Association International, Inc.; www.amca.org.
- 21. ANSI - American National Standards Institute; www.ansi.org.
- 22. AOSA - Association of Official Seed Analysts, Inc.; www.aosaseed.com.
- 23. APA - APA - The Engineered Wood Association; www.apawood.org.
- 24. APA - Architectural Precast Association; www.archprecast.org.
- 25. API - American Petroleum Institute; www.api.org.

26. ARI - Air-Conditioning & Refrigeration Institute; (See AHRI).
27. ARI - American Refrigeration Institute; (See AHRI).
28. ARMA - Asphalt Roofing Manufacturers Association; www.asphaltroofing.org.
29. ASCE - American Society of Civil Engineers; www.asce.org.
30. ASCE/SEI - American Society of Civil Engineers/Structural Engineering Institute; (See ASCE).
31. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers; www.ashrae.org.
32. ASME - ASME International; (American Society of Mechanical Engineers); www.asme.org.
33. ASSE - American Society of Safety Engineers (The); www.asse.org.
34. ASSE - American Society of Sanitary Engineering; www.asse-plumbing.org.
35. ASTM - ASTM International; www.astm.org.
36. ATIS - Alliance for Telecommunications Industry Solutions; www.atis.org.
37. AWEA - American Wind Energy Association; www.awea.org.
38. AWI - Architectural Woodwork Institute; www.awinet.org.
39. AWMAC - Architectural Woodwork Manufacturers Association of Canada; www.awmac.com.
40. AWPA - American Wood Protection Association; www.awpa.com.
41. AWS - American Welding Society; www.aws.org.
42. AWWA - American Water Works Association; www.awwa.org.
43. BHMA - Builders Hardware Manufacturers Association; www.buildershardware.com.
44. BIA - Brick Industry Association (The); www.gobrick.com.
45. BICSI - BICSI, Inc.; www.bicsi.org.
46. BIFMA - BIFMA International; (Business and Institutional Furniture Manufacturer's Association); www.bifma.org.
47. BISSC - Baking Industry Sanitation Standards Committee; www.bissc.org.
48. BWF - Badminton World Federation; (Formerly: International Badminton Federation); www.bissc.org.
49. CDA - Copper Development Association; www.copper.org.
50. CE - Conformite Europeenne; <http://ec.europa.eu/growth/single-market/ce-marking/>
51. CEA - Canadian Electricity Association; www.electricity.ca.
52. CEA - Consumer Electronics Association; www.ce.org.
53. CFFA - Chemical Fabrics and Film Association, Inc.; www.chemicalfabricsandfilm.com.
54. CFSEI - Cold-Formed Steel Engineers Institute; www.cfsei.org.
55. CGA - Compressed Gas Association; www.cganet.com.
56. CIMA - Cellulose Insulation Manufacturers Association; www.cellulose.org.
57. CISCA - Ceilings & Interior Systems Construction Association; www.cisca.org.
58. CISPI - Cast Iron Soil Pipe Institute; www.cispi.org.
59. CLFMI - Chain Link Fence Manufacturers Institute; www.chainlinkinfo.org.
60. CPA - Composite Panel Association; www.pbmdf.com.
61. CRI - Carpet and Rug Institute (The); www.carpet-rug.org.
62. CRRC - Cool Roof Rating Council; www.coolroofs.org.
63. CRSI - Concrete Reinforcing Steel Institute; www.crsi.org.
64. CSA - CSA Group; www.csa.ca.
65. CSA - CSA International; (Formerly: IAS - International Approval Services); www.csa-international.org.
66. CSI - Construction Specifications Institute (The); www.csinet.org.

67. CSSB - Cedar Shake & Shingle Bureau; www.cedarbureau.org.
68. CTI - Cooling Technology Institute; (Formerly: Cooling Tower Institute); www.cti.org.
69. CWC - Composite Wood Council; (See CPA).
70. DASMA - Door and Access Systems Manufacturers Association; www.dasma.com.
71. DHI - Door and Hardware Institute; www.dhi.org.
72. ECA - Electronic Components Association; (See ECIA).
73. ECAMA - Electronic Components Assemblies & Materials Association; (See ECIA).
74. ECIA - Electronic Components Industry Association; www.eciaonline.org.
75. EIA - Electronic Industries Alliance; (See TIA).
76. EIMA - EIFS Industry Members Association; www.eima.com.
77. EJMA - Expansion Joint Manufacturers Association, Inc.; www.ejma.org.
78. ESD - ESD Association; (Electrostatic Discharge Association); www.esda.org.
79. ESTA - Entertainment Services and Technology Association; (See PLASA).
80. ETL - Intertek (See Intertek); www.intertek.com.
81. EVO - Efficiency Valuation Organization; www.evo-world.org.
82. FCI - Fluid Controls Institute; www.fluidcontrolsintstitute.org.
83. FIBA - Federation Internationale de Basketball; (The International Basketball Federation); www.fiba.com.
84. FIVB - Federation Internationale de Volleyball; (The International Volleyball Federation); www.fivb.org.
85. FM Approvals - FM Approvals LLC; www.fmglobal.com.
86. FM Global - FM Global; (Formerly: FMG - FM Global); www.fmglobal.com.
87. FRSA - Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.; www.floridarooft.com.
88. FSA - Fluid Sealing Association; www.fluidsealing.com.
89. FSC - Forest Stewardship Council U.S.; www.fscus.org.
90. GA - Gypsum Association; www.gypsum.org.
91. GANA - Glass Association of North America; www.glasswebsite.com.
92. GS - Green Seal; www.greenseal.org.
93. HI - Hydraulic Institute; www.pumps.org.
94. HI/GAMA - Hydronics Institute/Gas Appliance Manufacturers Association; (See AHRI).
95. HMMA - Hollow Metal Manufacturers Association; (See NAAMM).
96. HPVA - Hardwood Plywood & Veneer Association; www.hpva.org.
97. HPW - H. P. White Laboratory, Inc.; www.hpwhite.com.
98. IAPSC - International Association of Professional Security Consultants; www.iapsc.org.
99. IAS - International Accreditation Service; www.iasonline.org.
100. IAS - International Approval Services; (See CSA).
101. ICBO - International Conference of Building Officials; (See ICC).
102. ICC - International Code Council; www.iccsafe.org.
103. ICEA - Insulated Cable Engineers Association, Inc.; www.icea.net.
104. ICPA - International Cast Polymer Alliance; www.icpa-hq.org.
105. ICRI - International Concrete Repair Institute, Inc.; www.icri.org.
106. IDEM - Indiana Department of Environmental Management; www.in.gov/idem/.
107. IEC - International Electrotechnical Commission; www.iec.ch.
108. IEEE - Institute of Electrical and Electronics Engineers, Inc. (The); www.ieee.org.

109. IES - Illuminating Engineering Society; (Formerly: Illuminating Engineering Society of North America); www.ies.org.
110. IESNA - Illuminating Engineering Society of North America; (See IES).
111. IEST - Institute of Environmental Sciences and Technology; www.iest.org.
112. IGMA - Insulating Glass Manufacturers Alliance; www.igmaonline.org.
113. IGSHPA - International Ground Source Heat Pump Association; www.igshpa.okstate.edu.
114. ILI - Indiana Limestone Institute of America, Inc.; www.iliai.com.
115. Intertek - Intertek Group; (Formerly: ETL SEMCO; Intertek Testing Service NA); www.intertek.com.
116. ISA - International Society of Automation (The); (Formerly: Instrumentation, Systems, and Automation Society); www.isa.org.
117. ISAS - Instrumentation, Systems, and Automation Society (The); (See ISA).
118. ISFA - International Surface Fabricators Association; (Formerly: International Solid Surface Fabricators Association); www.isfanow.org.
119. ISO - International Organization for Standardization; www.iso.org.
120. ISSFA - International Solid Surface Fabricators Association; (See ISFA).
121. ITU - International Telecommunication Union; www.itu.int/home.
122. KCMA - Kitchen Cabinet Manufacturers Association; www.kcma.org.
123. LMA - Laminating Materials Association; (See CPA).
124. LPI - Lightning Protection Institute; www.lightning.org.
125. MBMA - Metal Building Manufacturers Association; www.mbma.com.
126. MCA - Metal Construction Association; www.metalconstruction.org.
127. MFMA - Maple Flooring Manufacturers Association, Inc.; www.maplefloor.org.
128. MFMA - Metal Framing Manufacturers Association, Inc.; www.metalframingmfg.org.
129. MHIA - Material Handling Industry of America; www.mhia.org.
130. MIA - Marble Institute of America; www.marble-institute.com.
131. MMPA - Moulding & Millwork Producers Association; www.wmmpa.com.
132. MPI - Master Painters Institute; www.paintinfo.com.
133. MSS - Manufacturers Standardization Society of The Valve and Fittings Industry Inc.; www.mss-hq.org.
134. NAAMM - National Association of Architectural Metal Manufacturers; www.naamm.org.
135. NACE - NACE International; (National Association of Corrosion Engineers International); www.nace.org.
136. NADCA - National Air Duct Cleaners Association; www.nadca.com.
137. NAIMA - North American Insulation Manufacturers Association; www.naima.org.
138. NBGQA - National Building Granite Quarries Association, Inc.; www.nbgqa.com.
139. NBI - New Buildings Institute; www.newbuildings.org.
140. NCAA - National Collegiate Athletic Association (The); www.ncaa.org.
141. NCMA - National Concrete Masonry Association; www.ncma.org.
142. NEBB - National Environmental Balancing Bureau; www.nebb.org.
143. NECA - National Electrical Contractors Association; www.necanet.org.
144. NeLMA - Northeastern Lumber Manufacturers Association; www.nelma.org.
145. NEMA - National Electrical Manufacturers Association; www.nema.org.
146. NETA - InterNational Electrical Testing Association; www.netaworld.org.
147. NFHS - National Federation of State High School Associations; www.nfhs.org.
148. NFPA - National Fire Protection Association; www.nfpa.org.

149. NFPA - NFPA International; (See NFPA).
150. NFRC - National Fenestration Rating Council; www.nfrc.org.
151. NHLA - National Hardwood Lumber Association; www.nhla.com.
152. NLGA - National Lumber Grades Authority; www.nlga.org.
153. NOFMA - National Oak Flooring Manufacturers Association; (See NWFA).
154. NOMMA - National Ornamental & Miscellaneous Metals Association;
www.nomma.org.
155. NRCA - National Roofing Contractors Association; www.nrca.net.
156. NRMCA - National Ready Mixed Concrete Association; www.nrmca.org.
157. NSF - NSF International; www.nsf.org.
158. NSPE - National Society of Professional Engineers; www.nspe.org.
159. NSSGA - National Stone, Sand & Gravel Association; www.nssga.org.
160. NTMA - National Terrazzo & Mosaic Association, Inc. (The); www.ntma.com.
161. NWFA - National Wood Flooring Association; www.nwfa.org.
162. PCI - Precast/Prestressed Concrete Institute; www.pci.org.
163. PDI - Plumbing & Drainage Institute; www.pdionline.org.
164. PLASA - PLASA; (Formerly: ESTA - Entertainment Services and Technology Association); <http://www.plasa.org>.
165. RCSC - Research Council on Structural Connections; www.boltcouncil.org.
166. RFCI - Resilient Floor Covering Institute; www.rfci.com.
167. RIS - Redwood Inspection Service; www.redwoodinspection.com.
168. SAE - SAE International; www.sae.org.
169. SCTE - Society of Cable Telecommunications Engineers; www.scte.org.
170. SDI - Steel Deck Institute; www.sdi.org.
171. SDI - Steel Door Institute; www.steeldoor.org.
172. SEFA - Scientific Equipment and Furniture Association (The);
www.sefalabs.com.
173. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (See ASCE).
174. SIA - Security Industry Association; www.siaonline.org.
175. SJI - Steel Joist Institute; www.steeljoist.org.
176. SMA - Screen Manufacturers Association; www.smainfo.org.
177. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.
178. SMPTE - Society of Motion Picture and Television Engineers; www.smpte.org.
179. SPFA - Spray Polyurethane Foam Alliance; www.sprayfoam.org.
180. SPIB - Southern Pine Inspection Bureau; www.spib.org.
181. SPRI - Single Ply Roofing Industry; www.spri.org.
182. SRCC - Solar Rating & Certification Corporation; www.solar-rating.org.
183. SSINA - Specialty Steel Industry of North America; www.ssina.com.
184. SSPC - SSPC: The Society for Protective Coatings; www.sspc.org.
185. STI - Steel Tank Institute; www.steeltank.com.
186. SWI - Steel Window Institute; www.steelwindows.com.
187. SWPA - Submersible Wastewater Pump Association; www.swpa.org.
188. TCA - Tilt-Up Concrete Association; www.tilt-up.org.
189. TCNA - Tile Council of North America, Inc.; www.tileusa.com.
190. TEMA - Tubular Exchanger Manufacturers Association, Inc.; www.tema.org.
191. TIA - Telecommunications Industry Association (The); (Formerly: TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance);
www.tiaonline.org.

192. TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance; (See TIA).
 193. TMS - The Masonry Society; www.masonrysociety.org.
 194. TPI - Truss Plate Institute; www.tpinst.org.
 195. TPI - Turfgrass Producers International; www.turfgrasssod.org.
 196. TRI - Tile Roofing Institute; www.tilerroofing.org.
 197. UL - Underwriters Laboratories Inc.; <http://www.ul.com>.
 198. UNI - Uni-Bell PVC Pipe Association; www.uni-bell.org.
 199. USAV - USA Volleyball; www.usavolleyball.org.
 200. USGBC - U.S. Green Building Council; www.usgbc.org.
 201. USITT - United States Institute for Theatre Technology, Inc.; www.usitt.org.
 202. WA - Wallcoverings Association; www.wallcoverings.org
 203. **WASTEC - Waste Equipment Technology Association**; www.wastec.org.
 204. WCLIB - West Coast Lumber Inspection Bureau; www.wclib.org.
 205. WCMA - Window Covering Manufacturers Association; www.wcmanet.org.
 206. WDMA - Window & Door Manufacturers Association; www.wdma.com.
 207. WI - Woodwork Institute; www.wicnet.org.
 208. WSRCA - Western States Roofing Contractors Association; www.wsrca.com.
 209. WWPA - Western Wood Products Association; www.wwpa.org.
- B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.
1. DIN - Deutsches Institut fur Normung e.V.; www.din.de.
 2. IAPMO - International Association of Plumbing and Mechanical Officials; www.iapmo.org.
 3. ICC - International Code Council; www.iccsafe.org.
 4. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.
- C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Information is subject to change and is up to date as of the date of the Contract Documents.
1. COE - Army Corps of Engineers; www.usace.army.mil.
 2. CPSC - Consumer Product Safety Commission; www.cpsc.gov.
 3. DOC - Department of Commerce; National Institute of Standards and Technology; www.nist.gov.
 4. DOD - Department of Defense; www.quicksearch.dla.mil.
 5. DOE - Department of Energy; www.energy.gov.
 6. EPA - Environmental Protection Agency; www.epa.gov.
 7. FAA - Federal Aviation Administration; www.faa.gov.
 8. FG - Federal Government Publications; www.gpo.gov/fdsys.
 9. GSA - General Services Administration; www.gsa.gov.
 10. HUD - Department of Housing and Urban Development; www.hud.gov.
 11. LBL - Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; www.eetd.lbl.gov.
 12. OSHA - Occupational Safety & Health Administration; www.osha.gov.
 13. SD - Department of State; www.state.gov.

14. TRB - Transportation Research Board; National Cooperative Highway Research Program; The National Academies; www.trb.org.
15. USDA - Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; www.ars.usda.gov.
16. USDA - Department of Agriculture; Rural Utilities Service; www.usda.gov.
17. USDOJ - Department of Justice; Office of Justice Programs; National Institute of Justice; www.ojp.usdoj.gov.
18. USP - U.S. Pharmacopeial Convention; www.usp.org.
19. USPS - United States Postal Service; www.usps.com.

D. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. CFR - Code of Federal Regulations; Available from Government Printing Office; www.gpo.gov/fdsys.
2. DOD - Department of Defense; Military Specifications and Standards; Available from DLA Document Services; www.quicksearch.dla.mil.
3. DSCC - Defense Supply Center Columbus; (See FS).
4. FED-STD - Federal Standard; (See FS).
5. FS - Federal Specification; Available from DLA Document Services; www.quicksearch.dla.mil.
 - a. Available from Defense Standardization Program; www.dsp.dla.mil.
 - b. Available from General Services Administration; www.gsa.gov.
 - c. Available from National Institute of Building Sciences/Whole Building Design Guide; www.wbdg.org/ccb.
6. MILSPEC - Military Specification and Standards; (See DOD).
7. USAB - United States Access Board; www.access-board.gov.
8. USATBCB - U.S. Architectural & Transportation Barriers Compliance Board; (See USAB).

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 42 00

(NO TEXT FOR THIS PAGE)

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Section 01 10 00 "Summary for work" restrictions and limitations on utility interruptions.
 - 2. Section 31 25 00 "Erosion and Sedimentation Controls" for disposal of ground water at Project site.

1.3 REFERENCES

- A. Codes and standards referred to in this Section are:
 - 1. ASTM E 136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 °C
 - 2. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations
 - 3. NFPA 270 - Standard Test Method for Measurement of Smoke Obscuration Using a Conical Radiant Source in a Single Closed Chamber

1.4 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in the Project to use temporary services and facilities without cost, including, but not limited to, Owner and Owner's staff, Engineer, testing agencies, and authorities having jurisdiction.
- B. Sewer Service: Pay sewer-service use charges for sewer usage by all entities for construction operations.

- C. Water Service: Pay water-service use charges for water used by all entities for construction operations.
- D. Electric Power Service: Pay electric-power-service use charges for electricity used by all entities for construction operations.
- E. Provide water and electric meters for water and electric power services connections. Coordinate with Owner on whether a specific meter type is required for monitoring service.

1.5 INFORMATIONAL SUBMITTALS

- A. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.
- B. Implementation and Termination Schedule: Within 15 days of date established for commencement of the Work, submit schedule indicating implementation and termination dates of each temporary utility.

1.6 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.7 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Portable Chain-Link Fencing: Minimum 2-inch, 0.148-inch thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch OD line posts and 2-7/8-inch OD corner and pull posts, with 1-5/8-inch OD top and bottom rails. Provide galvanized-steel bases for supporting posts.

- B. Dust-Control Adhesive-Surface Walk-Off Mats: Provide mats minimum 36 by 60 inches.

2.2 TEMPORARY FACILITIES

- A. Retain one of two "Field Offices, General" paragraphs below and revise based upon Project requirements.
- B. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- C. Contractor's Office: Erect, furnish, and maintain a field office. Have an authorized agent present at this office at all times while the Work is in progress. Keep readily accessible copies of the Contract Documents, required record documents, and the latest approved shop drawings at this field office.
- D. Coordinate location of field offices, material sheds and temporary structures with Engineer and Owner.
- E. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
- F. Store combustible materials apart from building.

2.3 ENGINEER'S FIELD OFFICE

- A. General: Provide and maintain an Engineer's field office trailer, together with all foundations, steps, landings, handrails, furniture, office equipment, computer equipment, utilities and all other appurtenances required for a complete and functional installation. Provide the Engineer's trailer at the project site for the duration of the construction project. Coordinate the location of the Engineer's trailer with the Owner. Make the completed field office trailer available for occupancy by the Engineer no later than the first day that the Contractor is on-site to begin other construction activities.
- B. Type and Size: Provide a new mobile, tandem-axle field office trailer of not less than 48-feet exterior body length and 12-feet exterior body width.
- C. Arrangement: Arrange trailer's floor plan to provide two offices (one office at each end of the trailer) sized at 11'-0" x 12'-0" and 11'-0" x 10'-0", one washroom, one 4'-0" x 5'-0" storage room and the remainder of the open area in the center of the trailer. Provide a night light over each outside door. Provide privacy locks on the interior door for the washroom and passage locks for all other doors. Provide each window with an operable sash, screen and venetian blinds. Provide an electric furnace with 2-ton air conditioner complete with heating/cooling thermostat. Provide ductwork and regulator type grilles in each room. Provide 100-amp, 120/240-volt electrical service. Provide complete internal connections for single exterior water supply and single exterior sanitary sewer. Provide an electric water heater with 17-gallon minimum capacity. Provide one bottled water cooler with hot and cold taps and refrigerated storage compartment of

approximately one cubic foot capacity. Provide one small refrigerator with freezer. Provide ten gallons of bottled water per week. Provide washroom with lavatory, water closet, cabinet with mirror, toilet tissue holder, paper towel dispenser, wastebasket and an electrical outlet at the lavatory. Provide one fully-equipped standard first-aid cabinet. Provide a stock of paper towels and toilet paper throughout the construction period.

- D. Provide a security alarm system that utilizes motion detection to monitor all windows and doors. Provide a battery back-up for the security alarm system.
- E. Have the field office suitably blocked or otherwise installed in accordance with local ordinances. Enclose the air space beneath the trailer with exterior grade plywood panel siding. Provide hinged access doors at utility connection area.
- F. Utility Connections:
 - 1. Connect the water and sanitary sewer to existing lines. If there are no available sanitary sewers:
 - a. Provide and maintain, throughout the duration of the construction project, portable commodes next to the field office trailer.
 - b. Install Sanitary Holding Tank at project inception and connect the trailer sanitary sewer to the Holding Tank. Pump out tank on not less than a weekly basis.
 - c. Provide a suitable water meter installation in accordance with local ordinances. Pay each monthly water bill cost.
 - d. Arrange for the local power company to provide separate, complete and metered electrical service to the field office. Provide a suitable meter installation as approved. Connect the electrical service to the trailer to provide a complete operating installation. Pay each monthly power cost for the Engineer's field office.
 - e. Arrange with the local internet service Contractor to provide either DSL or cable modem service to the field office. Pay each monthly internet connection charge.

- G. Final Ownership: At the completion of construction, the printer equipment will become the property of the Owner. The trailer and all other furnishings shall remain the property of the Contractor.

- H. Trailer Removal: Subsequent to final completion, remove the field office trailer from the installed location and transport the trailer off-site. Remove all trailer foundations, anchors, supports, and utility connections. Restore site to its original condition or better.

2.4 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
- C. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
- D. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.

PART 3 - EXECUTION

3.1 TEMPORARY FACILITIES, GENERAL

- A. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
- B. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

3.2 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
- B. Locate facilities to limit site disturbance as specified in Section 01 10 00 "Summary."
- C. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.3 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
- B. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.
- D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

1. Prohibit and prevent nuisances on the site of the Work or on adjoining property. Discharge any employee who violates this rule. Abide by all environmental regulations or laws applicable to the Work.
- E. Temporary Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- F. Provide temporary dehumidification systems when required to reduce ambient and substrate moisture levels to level required to allow installation or application of finishes and their proper curing or drying.
- G. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
- H. Install electric power service as noted on the Drawings.
- I. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
- J. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

3.4 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
 1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
 2. Maintain support facilities until Engineer schedules Substantial Completion inspection. Remove after the Substantial Completion walkthrough has been performed. Maintain only the temporary facilities required to achieve Final Completion. Contractor's personnel are not permitted to use the permanent facilities.
- B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas within construction limits indicated on Drawings.
 1. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.
- C. Temporary Use of Planned Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.

1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
 2. Prepare subgrade and install subbase and base for temporary roads and paved areas according to Section 31 25 00 "Erosion and Sedimentation Controls."
 3. Recondition base after temporary use, including removing contaminated material, regrading, proof rolling, compacting, and testing.
 4. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course according to Section 32 12 16 "Asphalt Paving."
- D. Traffic Controls: Comply with requirements of authorities having jurisdiction.
1. Protect existing site improvements to remain including curbs, pavement, and utilities.
 2. Maintain access for fire-fighting equipment and access to fire hydrants.
- E. Parking: Provide temporary parking areas for construction personnel.
- F. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
 2. Remove snow and ice as required to minimize accumulations.
- G. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
1. Identification Signs: Provide Project identification signs as indicated on Drawings.
 2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
 3. Provide temporary, directional signs for construction personnel and visitors.
 4. Maintain and touch up signs so they are legible at all times.
- H. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 01 73 00 "Execution."
- I. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
- J. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate.
- K. Temporary Use of Permanent Stairs: Use of new stairs for construction traffic will be permitted, provided stairs are protected and finishes restored to new condition at time of Substantial Completion.

3.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
- B. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain written permission from adjacent property owner to access property for that purpose.
- C. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
- D. Comply with work restrictions specified in Section 01 10 00 "Summary."
- E. Temporary Erosion and Sedimentation Control: Comply with requirements of the IDEM Rule 5 Permit and requirements specified in Section 31 10 00 "Site Clearing" and the Drawings.
- F. Storm water Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of storm water from heavy rains.
- G. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- H. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people from easily entering site except by entrance gates.
- I. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
- J. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each workday.
- K. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- L. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.

- M. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
- N. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.

3.6 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture-Protection Plan: Describe delivery, handling, storage, installation, and protection provisions for materials subject to water absorption or water damage.
- B. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
 - 1. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
 - 2. Indicate methods to be used to avoid trapping water in finished work.
- C. Exposed Construction Period: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
 - 1. Protect porous materials from water damage.
 - 2. Protect stored and installed material from flowing or standing water.
 - 3. Keep porous and organic materials from coming into prolonged contact with concrete.
 - 4. Remove standing water from decks.
 - 5. Keep deck openings covered or dammed.
- D. Partially Enclosed Construction Period: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
 - 1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
 - 2. Keep interior spaces reasonably clean and protected from water damage.
 - 3. Periodically collect and remove waste containing cellulose or other organic matter.
 - 4. Discard or replace water-damaged material.
 - 5. Do not install material that is wet.
 - 6. Discard and replace stored or installed material that begins to grow mold.
 - 7. Perform work in a sequence that allows wet materials adequate time to dry before enclosing the material in gypsum board or other interior finishes.
- E. Controlled Construction Period: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
 - 1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
 - 2. Use temporary or permanent HVAC system to control humidity within ranges specified for installed and stored materials.

3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
4. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective and require replacing.
 - a. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Engineer.
 - b. Remove and replace materials that cannot be completely restored to their manufactured moisture level within 48 hours.

3.7 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
- C. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- D. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- E. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
- F. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
 1. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
 2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 01 77 00 "Closeout Procedures."

END OF SECTION 01 50 00

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
 - 1. Section 01 42 00 "References" for applicable industry standards for products specified.

1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved by Engineer through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

1.4 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
 - 1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.

2. If a dispute arises between contractors over concurrently selectable but incompatible products, Engineer will determine which products shall be used.
- B. Identification of Products: Except for required labels and operating data, do not attach or imprint manufacturer or product names or trademarks on exposed surfaces of products or equipment that will be exposed to view in occupied spaces or on the exterior.
1. Labels: Locate required product labels and stamps on a concealed surface, or, where required for observation following installation, on a visually accessible surface that is not conspicuous.
 2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on a visually accessible but inconspicuous surface. Include information essential for operation, including the following:
 - a. Name of product and manufacturer.
 - b. Model and serial number.
 - c. Capacity.
 - d. Speed.
 - e. Ratings.
 3. See individual identification sections in Division 33 for additional identification requirements.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.
- C. Storage:
1. Store products to allow for inspection and measurement of quantity or counting of units.
 2. Store materials in a manner that will not endanger Project structure.

3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.
7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.6 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
 3. See other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. All product warranties shall commence at the date of Substantial Completion unless specified otherwise in the individual Specification Sections.
- D. Submittal Time: Comply with requirements in Section 01 77 00 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.

4. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in the General Conditions to obtain approval for use of an unnamed product.

B. Product Selection Procedures:

1. Limited List of Products: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
2. Limited List of Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

2.2 "OR-EQUAL" PRODUCTS

- A. Conditions for Consideration of Or-Equal Products: Engineer will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Contractor may return requests without action, except to record noncompliance with these requirements:
1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant product qualities include attributes such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements
 2. Evidence that proposed product provides specified warranty.
 3. List of similar installations for completed projects with project names and addresses, and contact information for references, if requested.
 4. Samples, if requested.
- B. Submittal Requirements: Approval by the Engineer of Contractor's request for use of comparable product is not intended to satisfy other submittal requirements. Comply with specified submittal requirements.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 60 00

SECTION 01 73 00 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. Installation of the Work.
 - 4. Cutting and patching.
 - 5. Coordination of Owner-installed products.
 - 6. Progress cleaning.
 - 7. Starting and adjusting.
 - 8. Protection of installed construction.
- B. Related Requirements:
 - 1. Section 01 10 00 "Summary" for limits on use of Project site.
 - 2. Section 01 33 00 "Submittal Procedures" for submitting surveys.
 - 3. Section 01 77 00 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, replacing defective work, and final cleaning.
 - 4. Section 02 41 19 "Selective Demolition" for demolition and removal of selected portions of the Work.

1.3 REFERENCES

- A. Codes and standards referred to in this Section are:
 - 1. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations

1.4 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.

- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For land surveyor.
- B. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.
- C. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
 - 1. Include description of provisions for temporary services and systems during interruption of permanent services and systems.
- D. Certified Surveys: Submit two copies signed by land surveyor.
- E. Final Property Survey: Submit two copies showing the Work performed and record survey data.

1.6 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.
 - 1. Provide an experienced survey crew including an instrument operator, competent assistants, and any instruments, tools, stakes, and other materials required to complete the survey, layout, and measurement of work performed by the Contractor.
- B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
 - 1. Structural Elements: When cutting and patching structural elements, notify Engineer of locations and details of cutting and await directions from Engineer before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
 - 2. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.

3. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction 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.
 - C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.
- 1.7 DATUM PLANE
- A. All elevations indicated or specified refer to the HARN/IN Indiana State Planes, West Zone, US Foot, HARN/IN and are expressed in feet and decimal parts thereof, or in feet and inches.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Engineer for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services; and other utilities.
 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 - 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 - 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 - 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 - 1. Description of the Work.
 - 2. List of detrimental conditions, including substrates.
 - 3. List of unacceptable installation tolerances.
 - 4. Recommended corrections.
- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Engineer in accordance with the General Conditions.

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Engineer promptly.

- B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.
 - 1. Establish limits on use of Project site.
 - 2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 - 3. Inform installers of lines and levels to which they must comply.
 - 4. Check the location, level and plumb, of every major element as the Work progresses.
 - 5. Notify Engineer when deviations from required lines and levels exceed allowable tolerances.
 - 6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Control Points: Base horizontal and vertical control points are established in the Drawings and are to be used as the datum for the Work.
- D. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- E. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- F. Protection: Safeguard all points, stakes, grade marks, known property corners, monuments, and benchmarks made or established for the Work. Re-establish them if disturbed, and bear the entire expense of checking re-established marks and rectifying work improperly installed.
- G. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Engineer.

3.4 FIELD ENGINEERING

- A. Identification: Existing benchmarks, control points, and property corners are shown on the Drawings.
- B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
 - 1. Do not change or relocate existing benchmarks or control points. Report lost or destroyed permanent benchmarks or control points promptly.
 - 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

- C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
 - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
 - 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
 - 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
- D. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.
- E. Final Property Survey: Engage a land surveyor to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
 - 1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
 - 2. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
 - 4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Where possible, select tools or equipment that minimize production of excessive noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Engineer.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Repair or remove and replace damaged, defective, or nonconforming Work.
 - 1. Comply with Section 01 77 00 "Closeout Procedures" for repairing or removing and replacing defective Work.

3.6 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.

- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 01 10 00 "Summary."
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
- G. Cutting: Cut in-place 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.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 - 5. 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.
 - 6. Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: 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 practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
 - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.

3. Floors and Walls: Where walls or partitions that are removed extend 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 in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 degrees F.
 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
 4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
1. Remove liquid spills promptly.
 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 01 50 00 "Temporary Facilities and Controls."
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.8 STARTING AND ADJUSTING

- A. Coordinate startup and adjusting of equipment and operating components.
- B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- E. Manufacturer's Field Service: Comply with qualification requirements in Section 01 40 00 "Quality Requirements."

3.9 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

- B. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.
- C. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 01 73 00

(NO TEXT FOR THIS PAGE)

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Repair of the Work.
- B. Related Requirements:
 - 1. Section 01 78 39 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of cleaning agent.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at final completion.

1.4 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.6 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of one week prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
 - 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Engineer. Label with manufacturer's name and model number.
 - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance and material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Engineer's signature for receipt of submittals.
 - 5. Submit testing, adjusting, and balancing records.
 - 6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- C. Procedures prior to Substantial Completion: Complete the following a minimum of one week prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Advise Owner of pending insurance changeover requirements.
 - 2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 - 3. Complete startup and testing of systems and equipment.
 - 4. Perform preventive maintenance on equipment used prior to Substantial Completion.
 - 5. Advise Owner of changeover in utility services.
 - 6. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
 - 7. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 - 8. Complete final cleaning requirements.

9. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of seven days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Engineer, that must be completed or corrected before certificate will be issued.
1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for final completion.

1.7 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
1. Submit a final Application for Payment according to Section 01 29 00 "Payment Procedures."
 2. Certified List of Incomplete Items: Submit certified copy of Engineer's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Engineer. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of one week prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
1. Organize list of spaces in sequential order.

2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Engineer.
 - d. Name of Contractor.
 - e. Page number.
4. Submit list of incomplete items in the following format:
 - a. MS Excel electronic file or PDF electronic file. Engineer will return annotated file.

1.9 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Engineer for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
- C. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

1.10 COMMISSIONING BINDER

- A. Upon completion of training for each equipment item, and prior to Final Completion, provide one (1) commissioning binder. Identify each section based on the equipment using heavy sections dividers with reinforced holes and numbered plastic index tabs. Use 3-ring, slant ring, hard-back binders, Type No. AVE-VS11 as manufactured by Avery Company, or equal. Binder size shall be 3-inch maximum. Punch all loose data for binding. Arrange composition and printing so that punching does not obliterate any data.
- B. At a minimum for each section, i.e. equipment item, provide the following:
 1. Certificate of Installation, Inspection and Start-up Services
 2. Equipment Data Summary
 3. Equipment Preventative Maintenance Summary
 4. Manufacturer's Operating and Maintenance Instructions
 5. Certificate of Instructional Services
 6. Manufacturer's Start-up and Installation Checklists

7. Warranty

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected of a typical municipal water treatment building. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are not planted, mulched, or paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove snow and ice to provide safe access to building.
 - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - h. Sweep concrete floors broom clean in unoccupied spaces.
 - i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.

- j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - k. Remove labels that are not permanent.
 - l. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - o. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
 - p. Clean luminaires, lamps, globes, and reflectors to function with full efficiency.
 - q. Leave Project clean and ready for occupancy.
- C. Construction Waste Disposal: Comply with waste disposal requirements in Section 01 50 00 "Temporary Facilities and Controls."

3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair, or remove and replace, defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
 - 1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
 - 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
 - 3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
 - 4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters to comply with requirements for new fixtures.

END OF SECTION 01 77

SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
 - 4. Miscellaneous record submittals.
- B. Related Requirements:
 - 1. Section 01 73 00 "Execution" for final property survey
 - 2. Section 01 77 00 "Closeout Procedures" for general closeout procedures.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit copies of Record Drawings as follows:
 - a. Initial Submittal:
 - 1) Submit PDF electronic files of scanned record prints.
 - 2) Engineer will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
 - b. Final Submittal:
 - 1) Submit one paper-copy set of marked-up record prints
 - 2) Submit PDF electronic files of scanned record prints.
 - 3) Print each drawing, whether or not changes and additional information were recorded.
- B. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit number of copies of each submittal as defined in the various Specification Sections.

1.4 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding photographic documentation.
 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Depths of foundations.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Locations of concealed internal utilities.
 - i. Changes made by Change Order or Work Change Directive.
 - j. Changes made following Engineer's written orders.
 - k. Details not on the original Contract Drawings.
 - l. Field records for variable and concealed conditions.
 - m. Record information on the Work that is shown only schematically.
 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize record prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Format: Annotated PDF electronic file with comment function enabled.
3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
4. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Engineer.
 - e. Name of Contractor.

1.5 RECORD PRODUCT DATA

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 3. Note related Change Orders and record Drawings where applicable.

1.6 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

1.7 MAINTENANCE OF RECORD DOCUMENTS

- A. Maintenance of Record Documents: Store record documents in the field office 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, protected from deterioration and loss. Provide access to project record documents for Engineer's reference during normal working hours.

RQAW Corporation

La Porte County Water and Sewer Extensions
(SR 421 & CR 300 North Utility Extensions)

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 78 39

SECTION 03 30 00 – REINFORCED CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Providing reinforced cast-in-place concrete as specified herein and as shown on the Plans.

1.2 REFERENCES

- A. Comply with the following codes and standards regarding this Section:
1. ACI 212 - Report on Chemical Admixtures for Concrete
 2. ACI 301 - Specifications for Structural Concrete for Buildings
 3. ACI 303R - Guide to Cast-In-Place Architectural Concrete Practice
 4. ACI 304R - Guide for Measuring, Mixing, Transporting and Placing Concrete
 5. ACI 305R - Guide to Hot Weather Concreting
 6. ACI 306R - Guide to Cold Weather Concreting
 7. ACI 308R - Guide to Curing Concrete
 8. ACI 309R - Guide for Consolidation of Concrete
 9. ACI 318 - Building Code Requirements for Structural Concrete
 10. ACI 347 - Guide to Formwork for Concrete
 11. ACI SP-4 - Formwork for Concrete
 12. ASTM C 31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field
 13. ASTM C 33 - Standard Specifications for Concrete Aggregates
 14. ASTM C 39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
 15. ASTM C 42 - Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
 16. ASTM C 94 - Standard Specification for Ready-Mixed Concrete
 17. ASTM C138 - Standard Test Method for Density (Unit (Weight), Yield, and Air Content (Gravimetric) of Concrete
 18. ASTM C 143 - Standard Test Method for Slump of Hydraulic-Cement Concrete
 19. ASTM C 150 - Standard Specification for Portland Cement
 20. ASTM C 172 - Standard Practice for Sampling Freshly Mixed Concrete
 21. ASTM C 173 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
 22. ASTM C 260 - Standard Specification for Air-Entraining Admixtures for Concrete
 23. ASTM C 309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
 24. ASTM C 494 - Standard Specification for Chemical Admixtures for Concrete
 25. ASTM C 618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
 26. ASTM A 615 - Standard Specification for Deformed and Plain Carbon- Steel Bars for Concrete Reinforcement

27. ASTM C 1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete
28. ASTM E 1155 - Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers
29. ASTM F 593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs
30. CRD C-619 - Corps of Engineers Specification for Grout Fluidifier
31. CRD C-621 - Corps of Engineers Specification for Non-Shrink Grout

1.3 SUBMITTALS

- A. Provide all submittals, including the following, as specified in Division 01.
 1. Concrete mix designs for each type of concrete.
 2. Air content tests in accordance with ASTM C 138 or C 173 with mix design data.
 3. Concrete slump test results.
 4. Concrete strength test results.
 5. Working Drawings for fabrication and placing reinforcing steel conforming to "ACI Detailing Manual - 2004".

1.4 QUALITY ASSURANCE

- A. Meet the requirements of codes and references identified in Article 1.2 - REFERENCES of this Section.
- B. Demonstrate compliance with concrete slump and compressive strength requirements by submitting test reports prepared by an independent testing agency.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Use formwork complying with ACI SP-4 and ACI 303R.
- B. Provide 3/4-inch bevel strips at exposed corners of pads, walls, beams, pilasters, columns, window openings and girders.
- C. Provide new deformed bars meeting the requirements of ASTM A615/A615M Grade 60 for concrete reinforcing steel bars furnished and placed as shown.
- D. Use lapped splices for tension and compression, as shown.
- E. Provide concrete meeting the requirements of ACI 318 and the following:
 1. Minimum 28-day compressive strength of 4000 psi.
 2. Use standard Portland cement meeting the requirements of ASTM C 150 Type I or Type II.

3. If used, fly ash is to meet the requirements of ASTM C 618 Class C or F and not exceed 20 percent by weight of the cement plus fly ash, while maintaining minimum cement content of 450 pounds per cubic yard.
4. Fine aggregate of natural sharp sand meeting the requirements of ASTM C 33 for normal weight concrete.
5. Coarse aggregate consisting of crushed stone, processed from natural rock or stones, meeting the requirements of ASTM C 33 for normal weight concrete, Size No. 57.
6. Limit the use of admixtures to the following:
 - a. Air-entraining admixture conforming to ASTM C 260.
 - b. Water-reducing admixture conforming to ASTM C 494 Type A.
 - c. Water reducing set retarders conforming to ASTM C 494 Type D.
 - d. Do not use admixtures containing calcium chloride, thiocyanates or more than 0.05 percent chloride ion.
7. Air entrainment between 6 ± 1 for concrete exposed to the atmosphere.
8. Maximum water-cementitious material ratio not to exceed 0.45 by weight of the total cementitious constituent.
9. Establish concrete proportions including the water-cementitious material ratio on the bases of field experience or trial mixtures with the materials to be used in accordance with Section 5.3 of ACI 318.
10. For ready-mixed concrete, meet the requirements of ASTM C 94.

2.2 NON-SHRINK GROUT:

A. Non-Shrink Grout:

1. Furnish a flowable, pre-packaged non-shrink grout without dependence on gas expansion forces or enlargement of metal particles for its non-shrinkage characteristics and conforming to CRD C-621.
2. Furnish one of the following:
 - a. Masterflow 928, as manufactured by MasterBuilders, Incorporated.
 - b. Multipurpose, as manufactured by Symons Corporation.
 - c. Sika grout 212, as manufactured by Sika Corporation.
 - d. Or equal.

B. Grout Fluidifier:

1. Furnish grout fluidifier conforming to CRD C-619.

C. Portland Cement, Aggregates, Admixtures:

1. Use air-entraining admixture in all grout exposed to the atmosphere.

2.3 CONCRETE DRILLED ANCHORS

A. General:

1. Stainless steel
2. Current evaluation and acceptance reports by ICC or other similar code organization.

B. Adhesive Anchors

1. Threaded Rod:

- a. ASTM F 593 stainless steel threaded rod, diameter as shown on Drawings.
- b. Length as required, to provide minimum depth of embedment.
- c. Clean and free of grease, oil, or other deleterious material.

2. Adhesive:

- a. Two-component, designed to be used in adverse freeze/thaw environments, with gray color after mixing.
- b. Cure Temperature, Pot Life, and Workability: Compatible for intended use and environmental conditions.
- c. Nonsag, with selected viscosity base on installation temperature and overhead application where applicable.

3. Manufacturers and Products:

- a. Adhesives Technology, Pompano Beach, FL; Ultrabond 1 Epoxy Anchor System.
- b. Hilti, Inc., Tulsa, OK; HY-200 or HIT-RE-500-SD Adhesive Anchor System.
- c. ITW Ramset/Red Head, Elgin, IL; C6 Adhesive Anchor System or A7 Adhesive Anchor System.
- d. Simpson Strong-Tie Co., Inc., Pleasanton, CA; ET-HP Epoxy-Tie Adhesive or Acrylic-Tie Adhesive. (Use Acrylic-Tie Adhesive for temperatures below 40 degrees F.)
- e. Dayton Superior, Miamisburg, OH; Pro-Poxy 300 Fast Epoxy Adhesive Anchors.

PART 3 - EXECUTION

3.1 REINFORCING STEEL PLACEMENT

- A. Clean and bend reinforcement in accordance with ACI 315 and ACI 318. Place all bars in accordance with CRSI "Recommended Practice for Placing Reinforcing Bars" and the following:
 1. Cut bars to required length and bend accurately before placing.
 2. Bend bars in the shop unless written approval for field bending is obtained. If permitted, field bend bars only when the air temperature where the bending operation is performed is above 30 degrees F. Do not field bend bars that have been partially embedded in concrete.
 3. Place bars at the location shown. Tolerance for bar placement is 1/4-inch.
 4. Provide lap splices for reinforcing bars as shown.
 5. Provide 1 1/2-inch of concrete protection (cover) for bars at the top, bottom and ends of the structural components.
- B. Concrete Cover: Place reinforcing steel and hold in position so that the concrete cover, as measured from the surface of the bars to the surface of concrete, is as shown or specified.

3.2 PLACING CONCRETE

- A. Place concrete in accordance with ACI 304R.

3.3 CURING CONCRETE

- A. Follow the recommendations of ACI 308 for curing concrete.
- B. During hot weather, follow ACI 305R.
- C. During cold weather, follow ACI 306R, except that set-accelerators will not be permitted.

3.4 VIBRATING CONCRETE

- A. Consolidate all concrete (by means of standard immersion vibrators) in accordance with the recommendations of ACI 309.

3.5 CONCRETE TESTING

- A. Take concrete samples for slump and strength testing for each day concrete is placed and report test results to the Engineer.
- B. Test slump in accordance with ASTM C 143. Acceptable slump limits: Normal 3- inch to 4-inch and Pumped 4-inch to 6-inch.
- C. Take samples for strength tests consisting of four cylinders from the same batch of concrete. Take samples in accordance with ASTM C 172. Mold and laboratory cure cylinders in accordance with ASTM C 31. Test two cylinders at 7 days and two at 28 days in accordance with ASTM C 39.
- D. Consider the strength level of the concrete mix for each individual class of concrete acceptable when the average of three consecutive 28-day strength tests (average of two cylinders) equal or exceed the 28-day specified compressive strength.
- E. If any individual 28-day concrete strength test result falls below the minimum 28- day compressive strength by more than 500 psi, take test cores from the area in question. Take three cores for each failed strength test in accordance with ASTM C 42. Concrete in the area represented by core tests will be accepted if the average of three cores is equal to or greater than 0.85 of the minimum 28-day compressive strength and no single core is less than 0.75 of the minimum 28-day compressive strength. Remove and replace concrete, which does not meet the core test requirements.
- F. Coordinate inspection of reinforcing and concrete testing with Owner's Authorized Representative a minimum of 48 hours in advance.

3.6 JOINTS AND BONDING

- A. Joints: Make construction joints, where shown, to ensure stability, strength, and watertightness. Build all corners monolithically, and continuously concrete on either side to points shown.
- B. Provide horizontal, continuous, straight, and regular keys in joints, as shown.
- C. When new concrete is placed against existing concrete, roughen existing concrete surface to full amplitude of approximately 1/4 inch, by wire brush or other mechanical means.
- D. Grout Use Between Surfaces: Thoroughly clean and wet concrete surfaces against which the new concrete is to be placed. Just prior to placing new concrete, slush horizontal surfaces and joints with at least 2 inches of cement grout of the same mixtures as the concrete but with coarse aggregate omitted.

3.7 CONCRETE SURFACES

- A. Finish exposed top edges with a 3/4-inch beveled edge.
- B. Provide a trowel finish on top slab or pad surface and top of exposed walls.
- C. For interior working spaces, provide screeded, wood-floated, steel-troweled surface finish.
- D. For exterior working spaces, provide screeded, wood-floated, broom finish.
- E. Immediately after stripping the forms, inspect all concrete surfaces. Remove all fins, offsets, burrs, ridges, or other unsightly marks from the exposed concrete.
- F. Plug tie holes and patch placement joints, voids, stone pockets, or other defective areas before the concrete is thoroughly dry. Chip away defective areas to a depth of not less than 1 inch with all edges perpendicular to the surface. Wet the area to be patched, including at least 5 inches of the adjoining surface, prior to placing the patching mortar. Then scrub onto the surface a grout of equal parts of cement and sand mixed to a brushing consistency followed immediately by the patching mortar. Make the patch of the same material and of approximately the same proportions as used for the concrete, except omit the coarse aggregate. For exposed concrete, substitute white cement for part of the gray cement so that the patch will match the color of the surrounding concrete. Use as little water as consistent with the requirements of handling and placing. Do not retemper mortar. Thoroughly compact and screed off the mortar so as to leave the patch slightly higher than the surrounding surface. Then leave it undisturbed for a period of 1 to 2 hours to permit initial shrinkage before being finally finished. Finish the patch to match the adjoining surface and cure as specified for the original concrete.

3.8 CONCRETE FINISH

- A. Finish concrete surfaces in accordance with ACI 301.
- B. Steel trowel surfaces which are scheduled to be exposed.

- C. Trowel Finish: Apply trowel finish to monolithic slab or pad surfaces to be exposed to view, and surfaces to be covered with other finishes as specified:
 - 1. After floating, begin first trowel finish operation using power driven trowel. For non-sloping level surfaces check and level the surface plane to tolerances as determined by ASTM E 1155. Cut down high spots and fill low spots. For sloping surfaces check the surface planes to a tolerance of $F_f = 20$ as determined by ASTM E 1155. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance with level surface.
 - 2. Procedure for Grout Placement: Allow the grout remaining on the surface to stand undisturbed until it loses some of its plasticity but not its damp appearance. Then rub the surface with clean, dry burlap to remove all excess grout. Provide sufficient materials and workmanship such that all air holes remain filled, with no visible film of grout remaining after the rubbing. Complete any section being finished with grout the same day.
 - 3. Placement Timing: If possible, do the work during cool damp weather. During hot and dry weather, keep the concrete moist with a fine fog spray during the sack finishing. Moist cure the completed surface by keeping the area wet the entire day following the operation. Do not begin the rubber sack finishing until all defects have been repaired.

3.9 GROUT INSTALLATION

- A. Place grout as shown and in accordance with the manufacturer's instructions. Notify the Owner if manufacturer's instructions conflict with the Specifications. Do not proceed with installation until directed by the Owner.
- B. Drypacking will not be permitted.
- C. Have manufacturers of proprietary products make available upon 72 hours notification the services of a qualified, full time employee to aid in assuring proper use of the product under job conditions. The cost of this service, if any, shall be borne by the Contractor.
- D. Equipment Bases:
 - 1. Properly form around the base plates allowing sufficient room around the edges for placing the grout. Adequate depth between the bottom of the base plate and the top of concrete base must be provided to assure that the void is completely filled with the non-shrink grout.

3.10 CONCRETE DRILLED ANCHORS

- A. Begin installation only after concrete to receive anchors has attained design strength.
- B. Install in accordance with manufacturer's instructions.
- C. Provide minimum embedment, edge distance, and spacing as follows, unless indicated otherwise by anchor manufacturer's instructions or shown otherwise on Drawings:

Anchor Type	Min. Embedment (bolt diameters)	Min. Edge Distance (bolt diameters)	Min. Spacing (bolt diameters)
Adhesive	8	9	13.5

- D. Use only drill type and bit type and diameter recommended by anchor manufacturer. Clean hole of debris and dust with brush and compressed air.
- E. When embedded steel or rebar is encountered in the drill path, slant drill to clear obstruction. If drill must be slanted more than 10 degrees to clear obstruction, notify ENGINEER for direction on how to proceed.
- F. Adhesive Anchors:
1. Do not install adhesive anchors when temperature of concrete is below 40 degrees F (25 degrees F for Simpson Strong-Tie Acrylic-Tie Adhesive) or above 100 degrees F.
 2. Remove any standing water from hole with oil-free compressed air. Make inside surface of hole dry where required by manufacturer's instructions.
 3. Do not disturb anchor during recommended curing time.
 4. Do not exceed maximum torque as specified in manufacturer's instructions.

END OF SECTION 03 30 00

SECTION 099656 – EPOXY COATINGS

PART 1 – GENERAL

1.1 SUMMARY

- A. Solvent-free epoxy coating to be applied to specified surfaces and conforms to the requirements set forth below.
- B. This specification covers all labor, materials, equipment, and services necessary to complete the installation of corrosion protection for concrete and masonry structures as herein specified.
- C. Related Sections: Concrete Repair, Environmental, Health and Safety

1.2 REFERENCES

- A. ASTM C109 - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars
- B. ASTM C293 - Standard Test Method for Flexural Strength of Concrete
- C. ASTM C496 - Standard Test Method for Splitting Tensile Strength
- D. ASTM C579 - Standard Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing's, and Polymer Concretes
- E. ASTM C580 - Standard Test Method for Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing's, and Polymer Concretes
- F. ASTM C596 - Standard Test Method for Drying Shrinkage of Mortar Containing Hydraulic Cement
- G. ASTM C666 - Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing
- H. ASTM C882 - Standard Test Method for Bond Strength
- I. ASTM D543 - Resistance of Plastics to Chemical Reagents
- J. ASTM D638 - Tensile Properties of Plastics
- K. ASTM D695 - Compressive Properties of Rigid Plastics
- L. ASTM D790 - Flexural Properties of Unreinforced and Reinforced Plastics
- M. ASTM D2240 - Durometer Hardness, Type D
- N. ASTM D4541 - Pull-off Strength of Coatings Using a Portable Adhesion Tester

- O. ASTM D7234-12 Standard Test Method for Pull-Off Adhesion Strength of Coatings On Concrete Using Portable Pull-Off Adhesion Testers
- P. ASTM - the published standards and test methods of the American Society for Testing and Materials, West Conshohocken, PA.
- Q. NSF/ANSI Standard 61- Drinking Water System Components.
- R. NACE - the published standards of National Association of Corrosion Engineers (NACE International), Houston, TX.
- S. SSPC - the published standards of the Society of Protective Coatings, Pittsburgh, PA.

1.3 SUBMITTALS

- A. The following items shall be submitted:
 - 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. Project specific guidelines and recommendations.
 - 4. Applicator Qualifications:
 - a. Manufacturer certification that the Applicator has been trained 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 approved by the protective coating manufacturer and Applicator personnel have been trained and certified for proper use of the equipment..
 - c. Written document providing three (3) years experience and five (5) recent references of Applicator indicating successful application of a 100% solids high-build solvent-free coating by spray application.
 - d. Applicator must provide written documentation of having installed a minimum of 50,000 square feet of plural component spray applied epoxy coating the same or similar to that specified within the last two (2) years.
 - e. Proof of any necessary federal, state or local permits or licenses necessary for the project.

1.4 QUALITY ASSURANCE

- A. Coating and repair product(s) shall be capable of being installed and curing properly within the specified environment(s)

- B. Coating product(s) shall be resistant to all forms of chemical or bacteriological attack found.
- C. Coating and Repair product(s) shall be fully compatible; including ability to bond effectively (as tested for in Section 3.5 C.) to each other and/or the host substrate, forming a composite system.
- D. Contractor shall utilize equipment for the application of the coating and repair product(s) which has been approved by the product manufacturer; and Contractor shall have received training on the operation and maintenance of said equipment from the product manufacturer. Written certification of such approval(s) and training shall be submitted by the coating and repair product manufacturer(s).
- E. Contractor and contractor personnel shall be certified by, or have their training approved and certified by, the coating and repair product(s) manufacturer(s) for the handling, mixing, application and inspection of the product(s) to be used as specified herein. Written certification of such training shall be submitted by the coating and repair product manufacturer(s) and shall include the individual contractor personnel to be employed on the project.
- F. Inspectors shall be trained in the use of testing or inspection instrumentation and knowledgeable of the proper use, preparation and installation of the product(s) to be used as specified herein.
- G. Contractor shall initiate and enforce quality control procedures consistent with the coating product(s) manufacturer recommendations and applicable NACE, SSPC, ICRI or other standards as referenced herein.
- H. Pre-construction meeting shall take place no less than two weeks prior to Contractor mobilization. All parties to have physical presence on the project during construction shall be present. At this meeting responsibilities and authorities during construction shall be discerned; comments and questions regarding materials and execution of these specifications shall be presented and addressed.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Materials are to be kept dry, protected from weather and stored under cover.
- B. Protective coating materials are to be stored between 50 and 90 deg F. Do not store near flame, heat or strong oxidants.
- C. Protective coating materials are to be handled according to their material safety data sheets.

1.6 SITE CONDITIONS

- A. Contractor shall conform to all local, state, and federal regulations including those set forth by OSHA, RCRA and the EPA and any other applicable authorities.

- B. Confined space entry program and other required safety training certifications shall be submitted by Contractor to Owner as necessary to perform the specified work.
- C. Flow diversion and/or bypass plans shall be submitted by Contractor to Owner as necessary to perform the specified work.

1.7 WARRANTY

- A. Applicator shall warrant all work against defects in materials and workmanship for a period of one (1) year, unless otherwise noted, from the date of final acceptance of the project. Applicator shall, within a reasonable time after receipt of written notice thereof, make good defects in materials or workmanship which may develop during said one (1) year period, and any damage to other work caused by such defects or the repairing of same, at his own expense and without cost to the Owner.

PART 2 – PRODUCTS

2.1 EXISTING PRODUCTS

- A. Standard Portland concrete or new concrete (for quick setting high strength cement see manufacturer's recommendations) must be well cured prior to application of the protective coating. Generally, 28 days is the minimum cure time for standard Portland concrete or when 80% of its designed concrete strength has been achieved (see Raven 1010.2014 CATB for coating green concrete).
- B. Cementitious patching and repair materials must be approved prior to use as being compatible with the epoxy coating. The manufacturer of the cementitious material shall provide information as to its suitability for topcoating with an epoxy coating. Project specific submittals and procedures should be provided to Owner including application, cure time and surface preparation procedures which permit optimum bond strength with the epoxy coating.
- C. Remove existing coatings prior to application of the new protective coating. Applicator is to maintain strict adherence to applicable NACE and SSPC recommendations with regard to proper surface preparation and compatibility with existing coatings.

2.2 MANUFACTURER

- A. Raven Lining Systems, Broken Arrow, Oklahoma 800-324-2810 or 918-615-0020 or FAX 918-615-0140.

2.3 REPAIR MATERIALS

- A. Repair materials shall be used to fill voids, structurally reinforce and/or rebuild surfaces, etc. as determined necessary to produce a relatively smooth surface prior to the application of the epoxy coating. Repair materials must be compatible with the specified epoxy coating and shall be applied in accordance with the manufacturer's recommendations.

1. Repair materials must be supplied by the coating product(s) manufacturer or be an approved equal product.
 2. In order for a product to be considered an approved equal the submitted product must meet or exceed the minimum characteristics as measured by the applicable standards referenced in paragraphs 2.03 and on the Technical Data Sheets of the approved products. Also be approved by the coating product(s) manufacturer in writing for compatibility with the specified coating product(s).
 3. All materials shall be mixed, applied, and cured in accordance with the manufacturer's recommendations.
 4. Repair product physical properties shall be substantiated through submittal of accredited third party testing results and shall be representative of the actual field applied product and cure mechanism(s) to be employed in the field.
- B. 100% solids, solvent-free epoxy grout; specifically the specified coating product(s) (Section 2.4 C or D.)
- C. Factory blended, rapid setting, high-early strength, non-shrink, calcium aluminate repair mortar to be trowel or pneumatically spray applied to the entire surface.
1. Manufacturer: Raven Lining Systems, Broken Arrow, Oklahoma 800-324-2810 or 918-615-0140 fax.
 2. Product: Raven 705CA - Cement Mortar having the following characteristics:
 - a. Product Type: Calcium aluminate mortar
 - b. Tensile Strength, (ASTM C496): >685 psi
 - c. Compressive Strength, (ASTM C109): >9200 psi @ 28 days
 - d. Flexural Strength, (ASTM C293): >1650 psi
 - e. Shrinkage @ 90% R. H. (ASTM C596): 0%
 - f. Adhesion to Concrete, (ASTM C882): >4000 psi
 - g. Freeze/Thaw (ASTM C666): 100 Cycles, no visible damage
 - h. Density of wet mix: 129 – 139 lbs./ft³
 - i. Applied Density: 135 lbs./ft³ (+/- 5 lbs. /ft³)
- D. Factory blended, rapid setting, high-early strength, non-shrink, Portland cementitious repair mortar to be trowel or pneumatically spray applied to the entire surface.
1. Manufacturer: Raven Lining Systems, Broken Arrow, Oklahoma 800-324-2810 or 918-615-0140 fax.
 2. Product: Raven 755 - Cement Mortar having the following characteristics:
 - a. Product Type: Portland cement mortar

- b. Tensile Strength, (ASTM C496): >800 psi
 - c. Compressive Strength, (ASTM C109): >9,000 psi @ 28 days
 - d. Flexural Strength, (ASTM C293): >1500 psi
 - e. Shrinkage @ 90% R. H. (ASTM C596): 0%
 - f. Adhesion to Concrete, (ASTM C882): >2000 psi
 - g. Freeze/Thaw (ASTM C666): 100 Cycles, no visible damage
- E. Factory blended, High Performance Polymer Cement repair mortar to be spray, trowel or otherwise manually applied to the entire surface.
 - 1. Manufacturer: Raven Lining Systems, Broken Arrow, Oklahoma 800-324-2810 or 918-615-0140 fax.
 - 2. Product: Raven 760HPPC – Polymer Cement Mortar having the following characteristics:
 - a. Product Type: Polymer Cement Mortar
 - b. Tensile Strength, (ASTM C496): >700 psi
 - c. Compressive Strength, (ASTM C109): >5120 psi @ 28 days
 - d. Compressive Strength, (ASTM C579): >5210 psi @ 28 days
 - e. Flexural Strength, psi (ASTM C580): >1240 psi
 - f. Shrinkage @ 90% R. H. (ASTM C596): 0%
 - g. Adhesion to Concrete, (ASTM D7234): >200 psi
- F. Factory blended, non-shrink, hydraulic cement to be used for infiltration remediation.
 - 1. Manufacturer: As applicable
 - 2. Product: Hydraulic cement having the following characteristics:
 - a. Product Type: Hydraulic cement
 - b. Compressive Strength, (ASTM C109): >1,000 psi @ 1 hour, >2500 psi @ 24 hours
 - c. Shrinkage @ 90% R. H., % (ASTM C596): 0%
- G. Hydrophobic or Hydrophilic injectable chemical grout to be used for the remediation of high volume infiltration or crack repair and/or soil stabilization and void filling.
 - 1. Manufacturer: As applicable
 - 2. Product: Chemical grout as appropriate for infiltration, crack repair and soil stabilization.
- H. (OPTIONAL) Inlayed into the protective coating material. Fiberglass woven roving cloth using E-Glass, 9 oz/yd² minimum weight; typical of Hexcel or BFG Industries style #7500.

2.4 PROTECTIVE COATING MATERIAL

- A. Coating products shall be applied to all interior surfaces to protect the host substrate and repair materials that are free of structural movement from all forms of chemical attack and to impart a degree of structural enhancement.
- B. Coating product physical properties shall be substantiated through submittal of accredited third party testing results and shall be representative of the actual field applied product and cure mechanism(s) to be employed in the field
- C. Epoxy coating system - 100% solids, solvent-free two-component epoxy, certified to meet the requirements of NSF/ANSI Standard 61 - Drinking Water System Components.
 - 1. Manufacturer: Raven Lining Systems, Broken Arrow, Oklahoma 800-324-2810 or 918-615-0140 fax.
 - 2. Product: AquataPoxy A-6 Thick
 - a. Product type Amine cured epoxy
 - b. Color White
 - c. Solids Content (vol %) 100
 - d. Mix Ratio 1:1
 - e. Hardness, Shore D (ASTM D2240):>87
 - f. Compressive Strength, (ASTM D695):>10,000 psi
 - g. Tensile Strength, (ASTM C638):>6,000 psi
 - h. Flexural Strength, (ASTM D790):>9,400 psi
 - i. Adhesion to Concrete, (ASTM C7234): Substrate Failure
 - j. VOC'S 0.0 lbs/gal
- D. Epoxy coating system - 100% solids, solvent-free two-component epoxy, certified to meet the requirements of NSF/ANSI Standard 61 - Drinking Water System Components.
 - 1. Manufacturer: Raven Lining Systems, Broken Arrow, Oklahoma 800-324-2810 or 918-615-0140 fax.
 - 2. Product: AquataPoxy A-61
 - a. Product type Amine cured epoxy
 - b. Color Aqua, or White
 - c. Solids Content (vol %) 100
 - d. Mix Ratio 3:1
 - e. Hardness, Shore D (ASTM D2240):>88
 - f. Compressive Strength, (ASTM D695):>16,600 psi
 - g. Tensile Strength, (ASTM C638):>7,700 psi
 - h. Flexural Strength, (ASTM D790):>10,600 psi
 - i. Adhesion to Concrete, (ASTM C7234): Substrate Failure
 - j. VOC'S 0.0 lbs/gal
- E. (OPTIONAL) Coating product primer to be applied as recommended by the coating product manufacturer as installation conditions warrant.

1. Manufacturer: Raven Lining Systems, Broken Arrow, Oklahoma 800-324-2810 or 918-615-0140 fax.
2. Product: Raven 171 – 100% solids epoxy primer
 - a. Product Type: amine cured, epoxy primer
3. Product: Raven 171FS – 100% solids epoxy primer
 - a. Product Type: amine cured, epoxy primer
4. Product: Raven 155 – Water borne epoxy primer
 - a. Product Type: amine cured, waterborne epoxy primer

2.5 PROTECTIVE COATING APPLICATION EQUIPMENT

- A. Cementitious repair products may be mixed and applied using hand and/or power tools
- B. Cementitious repair products to be spray applied shall be mixed and applied using manufacturer approved batch mixing and low velocity spray devices.
- C. Coating product primer may be applied using hand tools or other convention/airless spray application device(s).
- D. Coating product to be spray applied shall be mixed and applied using manufacturer approved heated plural component spray equipment.
- E. Coating product application to hard to reach areas or for touch-up may be performed using hand tools.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. All structures to be coated shall be readily accessible to Applicator.
- B. Appropriate actions shall be taken to comply with local, state and federal regulatory and other applicable agencies or client specific policies with regard to environment, health and safety.
- C. Any active flows shall be locked-out, plugged or diverted as required to ensure that the liquid flow is maintained below the surfaces to be coated. Any equipment shall be locked-out according to site safety and OSHA requirements.
- D. Infiltration shall be stopped by using a material which is compatible with repair materials and is suitable for topcoating with the specified epoxy coating. Infiltration areas that require crack injection shall not be covered in this scope of work.

- E. Installation of the protective coating shall not commence until the concrete substrate has properly cured and been prepared in accordance with these specifications.
- F. Temperature of the surface to be coated should be maintained between 50 deg F and 120 deg F during application. Prior to and during application, care should be taken to avoid exposure of direct sunlight or other intense heat source to the structure being coated. Where varying surface temperatures do exist, care should be taken to apply the coating when the surface temperature is falling versus rising.

3.2 REPAIRS AND SURFACE PREPARATION

- A. Excessive debris, sediment, root intrusion or other foreign materials which may impact the effectiveness of the surface preparation process shall be removed prior to the commencement thereof.
- B. Offset structural components, lids, covers, frames, etc. shall be repaired, replaced, or reset prior to the commencement of surface preparation.
- C. External soil/fill voids shall be remediated and/or stabilized by replacement or injection of stabilizing grout as determined appropriate by the engineer.
- D. Oils, grease, incompatible existing coatings, waxes, form release, curing compounds, efflorescence, sealers, salts, or other contaminants which may affect the performance and adhesion of the coating to the substrate shall be removed in accordance with SSPC-SP 1 – Solvent Cleaning.
- E. Choice of surface preparation method(s) should be based upon the condition of the structure and concrete or masonry surface, potential contaminants present, access to perform work, and the required cleanliness and profile of the prepared surface to receive the repair and/or coating product(s).
- F. Surface preparation method, or combination of methods, that may be used include high-pressure water cleaning, water jetting, abrasive blasting, shot blasting, grinding, scarifying, detergent water cleaning, hot water cleaning and others as referenced in industry accepted standards such as:
 - 1. SSPC SP-13/NACE No. 6 Surface Preparation of Concrete,
 - 2. ASTM D4258 Standard Practice for Surface Cleaning Concrete for Coating and ASTM-D4259 Standard Practice for Abrading Concrete,
 - 3. ICRI Technical Guideline No. 03732 Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays.
 - 4. NACE/SSPC Standards for the surface preparation of steel.
- G. Whichever method(s) are used, they shall be performed in a manner that provides a uniform, sound, clean, and neutralized surface suitable for the specified coating product(s).

1. Resulting surface profile of the prepared concrete substrate shall be (as described in ICRI Technical Guideline No. 03732):
 - a. For application of cementitious materials; at least a CSP5
 - b. For application of coating products: at least a CSP4.
2. Concrete and/or mortar damaged by corrosion, chemical attack or other means of degradation shall be removed so that sound substrate remains,
 - a. In conditions where severe chemical attack is present the prepared substrate shall exhibit a pH of 8-12. Additional cleaning and/or contaminated substrate removal may be required to achieve the specified pH level.
3. Steel surfaces to be coated shall be abrasive blast cleaned.
 - a. Blast air shall be free of oil and water.
 - b. Abrasive shall be as required to produce the specified level of cleanliness and profile in an efficient and uniform manner. Abrasive shall not be recycled.
 - c. Abrasive blasting shall not be performed when the air or steel temperature is below 40 °F, when the relative humidity exceeds 80%, or when the steel is less than 5 °F warmer than the dew point. The Contractor will provide dehumidification, and/or temperature control as necessary to meet these conditions.
 - d. Blast cleaning shall be in accordance with SSPC-SP 5, White Metal Blast Cleaning for immersion service of the coated areas. Blast cleaning for other surfaces shall be in accordance with SSPC-SP 10, Near White Blast Cleaning. Anchor profile shall be 2.5-5.0 mils and relative to the coating thickness specified.
 - e. Alternatively, surfaces to be recoated may be cleaned according to SSPC-SP 12/NACE No. 5 Surface Preparation and Cleaning of Metals by Water jetting prior to Recoating.
 - i. Preparation shall be to SSPC-SP 12, WJ-1, and Clean to Bare Substrate using a minimum of High-Pressure Water Jetting (10,000-30,000 psi).
 - ii. Water jetting does not produce a profile of the magnitude currently recognized by the coatings industry. Rather, it exposes the original abrasive-blasted surface profile if one exists. An anchor profile of at least 2.5 mils is required to be exposed. If sufficient profile does not exist, abrasive blasting shall be performed as specified in section 3.2 D.
 - iii. At the time of the recoating, the amount of flash rust shall be no greater than "No Flash Rust" as defined in SSPC-SP 12.
 - iv. If inhibitors are to be used with the standard jetting water, the coatings manufacturer shall be consulted to ensure the compatibility of inhibitors with the coatings.

- H. Prior to the application of the coating product repairs shall be completed to ensure the following:
1. All inflow and infiltration shall be eliminated by use of appropriate repair material(s), such as hydraulic cements and/or chemical grouts as described in Section 2.2.
 2. All repairs to joints, pipe seals, steps, mechanical penetrations, benches, inverts, pipes or other appurtenances to be coated shall be completed and repaired surfaces prepared according to this section.
 - a. Inverts or flow channels shall be smooth without lips, rough edges and contoured to minimize turbulent flow; and be sloped to promote adequate flow from the inlet(s) to the outlet pipe.
 - b. All joints, pipe seals, steps or other penetrations shall be sealed against inflow, infiltration and exfiltration and be adequately filled, smoothed and contoured to promote monolithic coating application.
- I. Areas where reinforcing steel has been exposed shall be repaired in accordance with the Project Engineer's recommendations or at the minimum all exposed steel shall be prepared in accordance with Section 3.2 prior to coating with the coating product specified or other approved primer as specified by the coating product manufacturer.

3.2 APPLICATION OF REPAIR AND RESURFACING PRODUCTS

- A. Repair products as per section 2.3 C, D, shall be used to repair, smooth or rebuild surfaces with rough profiles to provide a concrete or masonry substrate suitable for the coating product(s) to be applied. These products shall be installed to 1/2" minimum thickness or as recommended within manufacturers published guidelines. Should structural rebuild be necessary, these products shall be installed to a thickness as specified by the Project Engineer
- B. Repair products as per section 2.3 E shall be used to fill voids, bug holes, and other surface defects which may affect the performance or adhesion of the coating product(s). These products shall be installed to 1/16" minimum thickness to 1/4" or as recommended within manufacturers published guidelines.
- C. Repair products as per section 2.3 F and/or G shall be used to remediate all active inflow, infiltration, and/or external soil/fill voids.
- D. All Repair products shall be handled, mixed, installed, and cured in accordance with manufacturer guidelines.
- E. All repaired or resurfaced substrates shall be inspected for cleanliness and suitability to receive the coating product(s). Additional surface preparation may be required prior to coating application as per section 3.2.
- F. (OPTIONAL) Fiberglass woven roving cloth may be rolled into the coating for added tensile and flexural strength where desired and/or required.

- i. A tack coat of a minimum of 20-30 mils shall be applied and allowed to cure to a tack free state, followed by an additional coat of 20-30 mils of coating into which the fiberglass matte shall be inlaid and rolled while wet, an additional 50-60 mil coat minimum shall be applied over the fiberglass inlay as part of the overall coating application.
- ii. Fiberglass matte shall be woven roving cloth with an approximate weight of 9 oz/yd². Fiberglass matte shall be rolled into the epoxy tack coat(s) using a notched roller fully relieving trapped air and wrinkles. The final topcoat shall encapsulate all fiberglass strands. Care should be taken to ensure adequate cure time between applications above 100 mils to relieve exothermic heat in order to avoid thermal degradation of the coating.

3.4 APPLICATION OF PROTECTIVE COATING

- A. Application procedures shall conform to the recommendations of the protective coating manufacturer, including material handling, mixing, environmental controls during application, safety, and spray equipment.
- B. Before spraying all surfaces with the epoxy coating, grooves, rough areas, difficult-to-spray areas, and repair areas as specified shall be striped with the specified epoxy coating to a nominal 10 mil thickness or greater as necessary to provide proper topcoating and protective coverage. Striping can be accomplished by spray application in accessible areas; and, hand-mixing product or spray followed by scrub-striping with a good-quality bristle brush in difficult-to-spray areas.
- C. The spray equipment shall be specifically designed to accurately ratio and apply the specified protective coating materials in accordance with coating manufacturer's requirements and shall be regularly maintained and in proper working order.
- D. The protective coating material must be spray applied by a Certified Applicator of the protective coating manufacturer.
- E. Specified surfaces shall be coated with AquataPoxy A-6 Thick or Aquatapoxy A-61 epoxy to achieve a minimum dry film thickness of 60-80mils for new concrete with surface profiles of CSP4 to CSP5, 80-120mils for new or rehabilitated concrete with surface profiles of CSP6 or greater.
 - a. Each coat of the A-6 Thick protective coating should occur as soon as the basecoat becomes tack free, but no later than the recoat window. Additional surface preparation procedures will be required if this recoat window is exceeded.
 - b. A-61 protective coating should be applied to the desired mil thickness in one coat. Additional surface preparation procedures will be required if additional applications are required.
- F. See coating manufacture for mil thickness recommendations to ground water head pressure.

- G. (Pipeline only) Coating product(s) shall interface with adjoining construction materials throughout the pipeline to effectively seal and protect concrete or masonry substrates from infiltration and attack by corrosive elements. Procedures and materials necessary to effect this interface shall be as recommended by the coating product(s) manufacturer.
- H. (Pipeline only) Termination points of the coating product(s) shall be made at each manhole joint, 1" below normal flow levels (when less than 360° coating application is being specified), and a minimum of 1" interfacing with each pipe penetration. When less than 360° of the pipe is to be coated, the coating shall be terminated at a saw cut key-in within the pipe.
- I. Surfaces not to receive the coating shall be masked or otherwise protected to prevent overspray or feathering of the coating termination.
- I. Disinfect water contact surfaces in accordance with AWWA C 652 or as directed by the Project Engineer after the coating has cured for 3 days and field inspection and testing has been completed.

3.5 TESTING AND INSPECTION OF PROTECTIVE COATING

- A. During application a wet film thickness gauge 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.
- B. After the protective coating has set hard to the touch it shall be inspected with high-voltage holiday detection equipment. The spark tester shall be initially set at 100 volts per 1 mil (25 microns) of film thickness applied but may be adjusted as necessary to detect the induced holiday (refer to NACE RPO188-99). All detected holidays shall be marked and repaired by abrading the coating surface with abrasive paper or brush blast. After abrading, additional protective coating material can be hand applied to the repair area, but should not be applied beyond the abraded area. All touch-up/repair procedures shall follow the protective coating manufacturer's recommendations.
- C. A final visual inspection shall be made by the Inspector and Applicator. Any deficiencies in the finished coating shall be marked and repaired according to the procedures set forth herein by Applicator.
- D. *Include when required for potable water storage or distribution structures.* The coated surfaces shall be thoroughly washed and disinfected in accordance with the current AWWA Standard C652. The owner shall approve the method of disinfecting. The Applicator shall provide all disinfectant and labor to satisfactorily place the structure in service. The Applicator shall make all arrangements with the Owner to coordinate the furnishing of water for sterilization. The Owner will collect and run tests on representative water samples. The tank shall not be placed in service until satisfactory bacteriological tests have been provided.
- E. If AquataPoxy A-6/A-6 Thick epoxy was the product used the system may be put back into service in 3 days at 77F in accordance with NSF/ANSI Standard 61 Certification.

- G. If AquataPoxy A-61 epoxy was the product used the system may be put back into service in 5 hours at 72F in accordance with NSF/ANSI Standard 61 Certification

END OF SECTION

SECTION 26 05 19 -LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 -GENERAL

1.1 SUMMARY

- A. Section includes building wire and cable; nonmetallic-sheathed cable; service entrance cable; armored cable; metal clad cable; and wiring connectors and connections.
- B. Related Sections:
 - 1. Division 26 -Identification for Electrical Systems: Product requirements for wire identification.

1.2 REFERENCES

- A. International Electrical Testing Association:
 - 1. NETA ATS -Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

1.3 SYSTEM DESCRIPTION

- A. Product Requirements: Provide products as follows:
 - 1. Solid conductor for feeders and branch circuits 10 AWG and smaller.
 - 2. Stranded conductors for control circuits.
 - 3. Conductor not smaller than 12 AWG for power and lighting circuits.
 - 4. Conductor not smaller than 18 AWG for control circuits.
 - 5. 10 AWG conductors for 20 ampere, 120 volt branch circuits longer than 75 feet
- B. Wiring Methods: Provide the following wiring methods:
 - 1. Wet or Damp Interior Locations: Use only THWN or XHHW in raceway.
 - 2. Exterior Locations: Use only THWN or XHHW insulation, in raceway.
 - 3. Underground Locations: Use only THWN or XHHW insulation, in raceway.

1.4 DESIGN REQUIREMENTS

- A. Conductor sizes are based on copper unless indicated as aluminum or "AL".
- B. When aluminum conductor is substituted for copper conductor, size to match circuit requirements for conductor ampacity and voltage drop.

1.5 SUBMITTALS

- A. Division 01 -Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit for building wire and each cable assembly type.

1.6 CLOSEOUT SUBMITTALS

A. Division 01

B. Project Record Documents: Record actual locations of components and circuits.

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.8 FIELD MEASUREMENTS

- A. Verify field measurements are as indicated on Drawings.

1.9 COORDINATION

- A. Division 01
- B. Where wire and cable destination is indicated and routing is not shown, determine routing and lengths required.

PART 2 -PRODUCTS

2.1 BUILDING WIRE

- A. Manufacturers:
 - 1. American
 - 2. Essex Group Inc.
 - 3. General Cable Co.
 - 4. Southwire
 - 5. Pirelli
 - 6. Cerro
 - 7. Encore
- B. Product Description: Single conductor insulated wire.
- C. Conductor: Copper for sizes smaller than # 1/0 AWG; copper or aluminum for sizes # 1/0 AWG and larger.
- D. Insulation: 600 volt rating; thermoplastic material rated 60,75, 90 degrees C. applied per NEC. Conductors installed within 12" of roof decks shall be 90 degrees C.

2.2 WIRING CONNECTORS

- A. No Split Bolt Connectors shall be permitted.
- B. Solderless Pressure Connectors: 3M, Ideal, Wing-nut, T&B or equal.
- C. Compression Connectors: OZ-Gedney, Burndy, Penn-Union, T&B or equal.

PART 3 -EXECUTION

3.1 EXAMINATION

- A. Division 01 – Project Management and Coordination.

- B. Verify mechanical work likely to damage wire and cable has been completed.
- C. Verify raceway installation is complete and supported.

3.2 PREPARATION

- A. Completely and thoroughly swab raceway before installing wire.

3.3 INSTALLATION

- A. Route wire and cable to meet Project conditions.
- B. Neatly train and lace wiring inside boxes, equipment, and panelboards.
- C. Identify and color code wire and cable under provisions of Section 26 05 53. Identify each conductor with its circuit number or other designation indicated.
- D. Special Techniques--Building Wire in Raceway:
 - 1. Pull conductors into raceway at same time.
 - 2. Install building wire 4 AWG and larger with pulling equipment.
- E. Special Techniques -Cable:
 - 1. Protect exposed cable from damage.
 - 2. Support cables above accessible ceiling, using spring metal clips or plastic cable ties to support cables from structure. Do not rest cable on ceiling panels.
 - 3. Use suitable cable fittings and connectors.
- F. Special Techniques -Wiring Connections:
 - 1. Clean conductor surfaces before installing lugs and connectors.
 - 2. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
 - 3. Tape uninsulated conductors and connectors with electrical tape to 150 percent of insulation rating of conductor.
 - 4. Install solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller.
 - 5. Install insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.
 - 6. Terminate aluminum conductors with tin-plated, aluminum-bodied compression connectors only. Fill with anti-oxidant compound before installing conductor.
 - 7. Install suitable reducing connectors or mechanical connector adaptors for connecting aluminum conductors to copper conductors.
- G. Install solid conductor for feeders and branch circuits 10 AWG and smaller.

3.4 WIRE COLOR

- A. General
 - 1. For wire sizes 10 AWG and smaller, install wire colors in accordance with the following:
 - Black and red for single phase circuits at 120/240 volts.
 - Black, red, and blue for circuits at 120/208 volts single or three phase.

Orange, brown, and yellow for circuits at 277/480 volts single or three phase.

2. For wire sizes 8 AWG and larger, identify wire with colored tape at terminals, splices and boxes. Colors are as follows:

- a. Black and red for single phase circuits at 120/240 volts.
- b. Black, red, and blue for circuits at 120/208 volts single or three phase.

B. Neutral Conductors: White. When two or more neutrals are located in one conduit, individually identify each with proper circuit number.

C. Branch Circuit Conductors: Install three or four wire home runs with each phase uniquely color coded.

D. Feeder Circuit Conductors: Uniquely color code each phase.

E. Ground Conductors:

1. For 6 AWG and smaller: Green.
2. For 4 AWG and larger: Identify with green tape at both ends and visible points including junction boxes.

3.5 FIELD QUALITY CONTROL

A. Division 01 -Quality Requirements, Division 01

B. Inspect and test in accordance with NETA ATS, except Section 4.

C. Perform inspections and tests listed in NETA ATS, Section 7.3.1.

END OF SECTION 26 05 19

SECTION 26 05 26 -GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 -GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Wire.
 - 2. Mechanical connectors.
 - 3. Exothermic connections.

1.2 REFERENCES

- A. Institute of Electrical and Electronics Engineers:
 - 1. IEEE 142 -Recommended Practice for Grounding of Industrial and Commercial Power Systems.
 - 2. IEEE 1100 -Recommended Practice for Powering and Grounding Electronic Equipment.
- B. International Electrical Testing Association:
 - 1. NETA ATS -Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- C. National Fire Protection Association:
 - 1. NFPA 70 -National Electrical Code.

1.3 SYSTEM DESCRIPTION

- A. Grounding systems use the following elements as grounding electrodes:
 - 1. Grounding on sandy soil, see plans for details.

1.4 DESIGN REQUIREMENTS

- A. Test Reports: Indicate overall resistance to ground and resistance of each electrode.

1.5 CLOSEOUT SUBMITTALS

- A. Division 01
- B. Project Record Documents: Record actual locations of components and grounding electrodes.

1.6 QUALITY ASSURANCE

- A. Provide grounding materials conforming to requirements of NEC, IEEE 142, and UL labeled.

1.7 COORDINATION

- A. Division 0

PART 2 -PRODUCTS

2.1 WIRE

- A. Material: Stranded copper.
- B. LYNCOLE “XIT” grounding per plans
- C. Bonding Conductor: Copper conductor

PART 3 -EXECUTION

3.1 EXAMINATION

- A. Division 01 – Project Management and Coordination.

3.2 INSTALLATION

- A. Install in accordance with IEEE., and NEC.
- B. Install grounding and bonding conductors concealed from view.

3.3 FIELD QUALITY CONTROL

- A. Division 01 -Quality Requirements, Division 01.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Grounding and Bonding: Perform inspections and tests listed in NETA ATS, Section 7.13.
- D. Perform ground resistance testing in accordance with IEEE 142.
- E. Perform leakage current tests in accordance with NFPA 99.
- F. Perform continuity testing in accordance with IEEE 142.
- G. When improper grounding is found on receptacles, check receptacles in entire project and correct. Perform retest.

END OF SECTION 26 05 26

SECTION 26 05 33 -RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 -GENERAL

1.1 SUMMARY

- A. Section includes conduit and tubing, surface raceways, wireways, outlet boxes, pull and junction boxes, and handholes.
- B. Related Sections:
 - 1. Division 26 -Equipment Wiring Connections.
 - 2. Division 26 -Grounding and Bonding for Electrical Systems.
 - 3. Division 26 -Identification for Electrical Systems.
 - 4. Division 26 -Wiring Devices.

1.2 REFERENCES

- A. American National Standards Institute:
 - 1. ANSI C80.1 -Rigid Steel Conduit, Zinc Coated.
 - 2. ANSI C80.3 -Specification for Electrical Metallic Tubing, Zinc Coated.
 - 3. ANSI C80.5 -Aluminum Rigid Conduit -(ARC).
- B. National Electrical Manufacturers Association:
 - 1. NEMA 250 -Enclosures for Electrical Equipment (1000 Volts Maximum).
 - 2. NEMA FB 1 -Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
 - 3. NEMA OS 1 -Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
 - 4. NEMA OS 2 -Nonmetallic Outlet Boxes, Device Boxes, Covers, and Box Supports.
 - 5. NEMA RN 1 -Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
 - 6. NEMA TC 2 -Electrical Polyvinyl Chloride (PVC) Tubing and Conduit.
 - 7. NEMA TC 3 -PVC Fittings for Use with Rigid PVC Conduit and Tubing.

1.3 SYSTEM DESCRIPTION

- A. Raceway and boxes located as indicated on Drawings, and at other locations required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements. Raceway and boxes are shown in approximate locations unless dimensioned. Provide raceway to complete wiring system.
- B. Concealed Dry Locations: Provide rigid steel conduit, intermediate metal conduit, electrical metallic tubing. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes.
- C. Exposed Dry Locations: Provide rigid steel , intermediate metal conduit, electrical metallic tubing. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes.

- D. MC cable will NOT be permitted.

1.4 SUBMITTALS

- A. Division 01-Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit for the following:
 - 1. Flexible metal conduit.
 - 2. Liquidtight flexible metal conduit.
 - 3. Nonmetallic conduit.
 - 4. Flexible nonmetallic conduit.
 - 5. Nonmetallic tubing.
 - 6. Raceway fittings.
 - 7. Conduit bodies.
 - 8. Surface raceway.
 - 9. Wireway.
 - 10. Pull and junction boxes.
- C. Manufacturer's Installation Instructions: Submit application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

1.5 CLOSEOUT SUBMITTALS

- A. Division 01
- B. Project Record Documents:
 - 1. Record actual routing of all conduits.
 - 2. Record actual locations and mounting heights of outlet, pull, and junction boxes.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Division 01
- B. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
- C. Protect PVC conduit from sunlight.

1.7 COORDINATION

- A. Division 01
- B. Coordinate installation of outlet boxes for equipment connected under Section 26 05 03.
- C. Coordinate mounting heights, orientation and locations of outlets mounted above counters, benches, and backsplashes.

- 1.8 Unless otherwise additional requirements are stipulated, provide a minimum of not less than two (2) 1" spare and two (2) spare 3/4" EMT conduits for each flush mounted branch distribution panelboard with conduits elbowed out above ceiling and suitably capped.

PART 2 -PRODUCTS

2.1 Heavy Wall (Rigid) Conduits "RMC"

- A. Heavy wall conduit shall be galvanized, having UL approved mark, meeting Federal Specification WC 581A, and ANSIC80.
- B. Conduit shall be standard weight, free from burrs and scale. Conduit shall not crack or split, nor shall galvanizing crack or flake when bent to smallest radius allowed by NEC.
- C. All conduit threads shall be standard conduit taper cut. Threads shall be galvanized. Field cut threads shall be coated with "Kopr-Shield" before coupling.
- D. Conduit shall meet all requirements of NEC-ART 344.
- E. Conduit shall be manufactured by Allied, Wheatland or LTV.

2.2 Intermediate Metal Conduit "IMC"

- A. Intermediate metal conduit shall be galvanized on the exterior and coated with a corrosion resistant lubricating coating on the interior.
- B. Conduit shall be UL approved, meeting all requirements of UL 1242 (UL listing #DYBY).
- C. Conduit shall be manufactured from high-strength low-alloy ASTM-A568 steel. It shall be further strengthened by the work hardening forming process to achieve a tensile strength of approximately 67,000 psi.
- D. Threads shall be standard conduit taper cut to fit standard coupling threads. Threads shall be galvanized. Field cut threads shall be coated with "Kopr-Shield" before coupling.
- E. Conduit shall meet all requirements of NEC-ART 342, Federal specification WC 581, and ANSI-C80.
- F. Conduit shall be manufactured by Allied Tube, Conduit Corporation, LTV Steel and Wheatland Tube.

2.3 Rigid Non-Metallic Conduits "RNC"

- A. Rigid non-metallic conduit shall be UL approved schedule 40 heavy wall PVC polyvinylchloride plastic type or fiberglass reinforced epoxy, properly supported and anchored. Conduit shall be terminated in end-bells, bushings, etc. Provide bonding or grounding conductors in accordance with NEC. Conduit shall meet all requirements of NEC-ART 352.

2.4 Thin Wall Conduits -"EMT"

- A. Thin wall conduit shall be 4" and under, UL approved electrical metallic tubing (EMT) with approved steel threadless compression type (OZ 60005) or set screw type (OZ 4000) concrete tight fittings. EMT shall meet Federal Specifications WW806, latest edition, and NEC-ART 358. EMT shall be mild steel electrically welded galvanized in which to provide a magnetic shield and a completely grounded electrical raceway system.
- B. Conduit shall be manufactured by Allied Tube, Conduit corporation, LTV Steel and Wheatland Tube.

2.5 Flexible Metal Conduit

- A. Galvanized steel, made with a single continuous strip of interlocked, double wrapped steel galvanized inside and outside forming a smooth internal wiring channel.
- B. Federal Specification WWC-566, UL listed, and in accordance with NEC-ART 348.

2.6 Liquid-Tight Flexible Metal Conduit

- A. Galvanized steel, made with a single continuous strip of interlocked, double wrapped steel galvanized inside and outside forming a smooth internal wiring channel.
- B. Conduit to have continuous liquid-tight jacket of flexible PVC.
- C. Federal Specification WWC-566, UL listed and in accordance with NEC-ART 350.

2.7 PVC Coated Galvanized Rigid Conduit

- A. Must be UL listed and have been investigated by UL as providing the primary corrosion protection for the rigid metal conduit.
- B. Must be ETL verified to the Intertek ETL SEMKO High Temperature H2O PVC Coating Adhesion Test Procedure for 200 hours.
- C. Must include the ETL Verified PVC001 label.
- D. Ferrous fittings must be UL listed with PVC as the primary corrosion protection.
- E. Hazardous location fittings, prior to plastic coating must be UL listed.
- F. Applicable UL standards may include: UL6 and UL514B.
- G. Certified test reports shall be evaluated by an independent recognized third party.
- H. Acceptable manufacturer: Perma-Cote, Gilmer, Texas.

2.8 Conduit Fittings

- A. Fittings shall be UL listed, constructed of formed material, electrically conductive of

same size and finish as conduit on which installed.

B. All conduit 1" and larger in size shall be provided with color coded grounding and insulated bushing similar and equal to OZ/Gedney Electrical Products Company's type "BL". Insulating bushings and double locknuts (that is, one inside and one outside) shall be provided at all junction boxes, Outlet boxes, pull boxes and cabinet entrances.

C. Fittings for flexible metal conduit and liquid-tight flexible conduit shall be specifically designed for material and application. Fittings shall provide for the termination of an external bare copper bonding jumper to adequately ground the equipment served by the flexible conduit. Connectors shall be like OZ type 4QL. They shall meet requirements of Federal Specification WF406 and shall be UL listed.

D. Bonded galvanized expansion joints shall provide for a minimum of 4" movement and shall have a tinned copper flexible braided jumper around the joint, OZ type EX or TX as required, with type BJ jumper.

E. Provide UL seal-off fittings for conduits penetrating walls/floors/roofs where high temperature changes occur such as walk-in coolers, exterior, etc., and for hazardous applications such as paint storage, storm water or sewage water lift stations, etc.

F. Fill seal-off as recommended by Crouse Hinds Co. for explosion-proof applications. Product must be listed for this application. See plans for locations. No hazardous fumes shall reach energized equipment unless it is hazardous rated.

2.9 OUTLET BOXES

A. Manufacturers:

1. Carlon Electrical Products
2. Hubbell Wiring Devices
3. Thomas & Betts Corp
4. Walker Systems Inc.
5. The Wiremold Co

B. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.

1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; furnish 1/2 inch male fixture studs where required.
2. Concrete Ceiling Boxes: Concrete type.

C. Nonmetallic Outlet Boxes: NEMA OS 2.

D. Cast Boxes: NEMA FB 1, Type FD, cast ferrous alloy. Furnish gasketed cover by box manufacturer. Furnish threaded hubs.

E. Wall Plates for Finished Areas: As specified in Section 26 07 26. Wall Plates for Unfinished Areas: Furnish gasketed cover.

Part 3 -EXECUTION

3.1 Provide color-coded end caps on all exposed threads of threaded metal conduit.

3.2 Conduit/tubing shall be handled carefully to prevent any bending or damage to ends of conduit, or scratching of the conduit finish.

3.3 Conduit shall be stored inside in a protected area. If conduit must be stored outdoors, provide blocking to elevate conduit above grade and properly protect from damage.

3.4 Provide conduits from distribution centers through pull and/or junction boxes, panelboards, etc., to outlets, and bond throughout to make continuous circuit.

3.5 Make field bends properly and in accordance with NEC: wherever possible use factory 90° and 45° bends.

3.6 Leave 14 gauge fish or drag wire in all empty conduits. Cap each end of all unused conduits.

3.7 Minimum size concealed conduit permitted is 3/4" unless otherwise noted on drawings except switch legs may be 1/2". All home run conduits to be 3/4" minimum. Conduit open above accessible ceiling tile is not considered concealed.

3.8 Conduit shall be cut square, carefully reamed, coupled watertight and fastened securely to structure. Terminate in metal enclosures, such as outlet boxes, pull boxes, cabinets, switches, other types of raceways, or as indicated. Equip with double locknuts and approved bushings to protect wire from abrasion, except where equipment affords equal protection. Use of single locknuts is not permitted. Conduit sizes of 1" and larger shall be equipped with insulating type bushings and with locknuts inside and outside the enclosure.

3.9 Conduit larger than 1" in size shall not be installed in concrete slabs or through wood members, unless otherwise directed by Architect/Engineer. Conduit and raceways within floors shall be encased in concrete and shall not be installed until structural and reinforcing steel is fabricated and in place. Conduit shall not be installed horizontally in masonry walls, unless denoted on drawings, nor shall walls be channeled or cut to install conduits, unless approved by Architect/Engineer.

3.10 Connect motors and other equipment or appliances subject to movement, using shore length of UL approved liquid tight flexible conduit (36" maximum length).

3.11 Conduit shall be sealed where entering or leaving refrigerated and/or hazardous spaces and/or spaces having ambient temperature differentials of 10°F or greater.

3.12 Minimum size of flexible conduit shall be 3/8" trade size, max. length 6 ft.

3.13 EMT is NOT approved for installation in concrete slabs, below slabs on grade, underground, wet locations, exterior locations, in concrete walls, for feeders to panels/switchboards/transformers, or exposed below a height of 6 ft. No cast type/pot metal type fittings are permitted. Size of conduits must meet NEC.

3.14 Conduit below floor line of concrete slabs on fill (or grade) shall be installed below wire mesh and below membrane waterproofing in an underground manner.

3.15 All wiring shall be installed in conduit unless otherwise specified.

3.16 All conduits shall be installed concealed in walls, slabs or above ceilings except as noted. Conduit may be run exposed in electrical rooms, mechanical rooms, equipment rooms, tunnels, attics, penthouses or like unfinished spaces.

3.17 Underground Conduits

A. For interior underground wiring, conduit shall be RMC or IMC under concrete floors. Where conduits are laid in the same trench with others, they shall be separated not less than 2", one from the other. All threads of conduit for underground wiring shall be coated with "Kopr-Shield" before coupling and then torqued.

B. RNC conduit may be used in lieu of RMC or IMC for interior underground feeders and same shall be installed similar to steel conduit. All bends, sweeps shall be made with GRC or IMC. Provide ground conductor per 250-95. Encase with 3" concrete where shown.

C. RNC conduit shall be used for all exterior underground installation of feeders and branch circuits. Service entrance RNC shall be encased in 3" concrete minimum.

D. Underground conduits shall be installed level or pitched slightly down to drain to eliminate collection of moisture and/or condensation. Low points shall have suitable drain provisions.

E. Installation of conduits, etc., shall be performed in manner that will obviate sinking, breaking up and damage.

3.18 RNC Conduit

A. Proper care shall be taken when field bending is employed, to maintain the internal diameter and wall thickness. A conduit heating box, as approved by the conduit manufacturers, shall be used to preheat the conduit with infra-red power. Conduits 2" and larger shall use an interior support to prevent crimping or deforming of the conduit. Use factory bends wherever possible.

B. Care shall be taken when joining sections to carefully make a square cut using a fine tooth saw. Debur the edges of the ends. Clean all mating surfaces of any dirt, oil, moisture, etc., using approved cleaning agents. Apply a uniform coating of approved cement on one surface and immediately insert into connecting surface rotating 1/4 turn. Allow proper time to set before moving.

3.19 RNC conduit shall not be used in any location except underground unless noted.

END SECTION 26 05 33

SECTION 26 05 53 -IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 -GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Nameplates.
 - 2. Labels.
 - 3. Wire markers.
 - 4. Conduit markers.
 - 5. Stencils.
 - 6. Underground Warning Tape.
 - 7. Lockout Devices.

1.2 SUBMITTALS

- A. Division 01 -Submittal Procedures: Requirements for submittals.
- B. Product Data:
 - 1. Submit manufacturer's catalog literature for each product required.
 - 2. Submit electrical identification schedule including list of wording, symbols, letter size, color coding, tag number, location, and function.
- C. Manufacturer's Installation Instructions: Indicate installation instructions, special procedures, and installation.

1.3 CLOSEOUT SUBMITTALS

- A. Division 01
- B. Project Record Documents: Record actual locations of tagged devices; include tag numbers.

1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Division 01 – Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Accept identification products on site in original containers. Inspect for damage.
- C. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.

D. Protect labels from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Division 01

B. Install labels and nameplates only when ambient temperature and humidity conditions for adhesive are within range recommended by manufacturer.

PART 2 -PRODUCTS

2.1 Engraved nameplates to identify electrical equipment shall be one of the following, but all plates on the project will be of same general design.

A. Aluminum, approximately 2-1/2" x 3/4" with black enamel background and engraved lettering.

B. Melamine plastic laminate, black with white core punched for mechanical fastening with self tapping stainless steel screws, engraved with mfg. standard lettering.

2.2 Conduit identification shall be snap-on semi-rigid plastic, Seton "Setmark".

A. Marker backgrounds shall be color-coded with clearly printed legend to identify the equipment. Size of markers, size of lettering and color scheme shall conform with the ANSI A13.1-1975 "Scheme for Identification of Piping Systems".

B. Products shall be as manufactured by Seton Name Plate Corp., 592 Boulevard, New Haven, Connecticut 06505, 213-772-2520.

2.3 Exterior buried cable and conduit shall be identified by a continuous brightly colored plastic tape approximately 6" wide x 4 mils thick. Tape shall be printed to most accurately describe type of service. Allen "Detect/Tape", Reef "Terra Tape", Thomas & Betts "Protect-A-Line", or approved equal.

PART 3 -EXECUTION

3.1 Conduits and Raceways

A. All electrical conduit which is accessible for maintenance operations including conduits in equipment rooms, , , and all unoccupied and/or unfinished spaces accessible without demolition, will be identified with semi-rigid plastic identification markers equal to "Setmark" pipe markers or approved equal.

B. "Setmark" type SNA snap-around electrical markers to be used on diameters 3/4" thru 5".

C. Markers shall be located adjacent to each junction box, pull box, controller, panelboard, transformer, relay and like.

3.2 Equipment Identification

- A. Provide engraved nameplates on all equipment such as panelboards, access panels, motor starters, safety switches, control devices, and like. Include voltage/phase.
- B. Lettering shall include name of equipment, specific unit number and any reference to on/off or other instructions that are applicable.
- C. All electrical equipment shall also have identification indicating the source of its power supply, voltage and phase, and circuit number.
- F. Appliances, motors, heaters and like which are served by separately mounted disconnect switch, motor starter and/or combination type motor starter shall be labeled on outside accordingly for easy identification. Identify voltage/phase.
- G. Field identification of any equipment with factory installed permanent identification is not required.

3.4 Operational Identification

- A. Wherever reasonably required to ensure safe and efficient operation and maintenance of the electrical systems, including prevention of misuse of electrical facilities by unauthorized personnel, install signs with proper identification, instruction or warnings on switches, outlets and other controls, devices and covers or electrical enclosures. Where detailed instructions or explanations are needed, provide plasticized tags with clearly written messages adequate for the intended purposes.

3.5 Danger Signs

- A. Provide "DANGER" signs at all locations as required by OSHA or any other government regulating authority.

3.7 Outlet Box and Junction Box Labels

- A. In finish areas, indicate circuit numbers in box on back (box) side of flush cover (plate) using heavy line laundry marker pen. This includes all convenience outlets!
- B. All outlet boxes, pull boxes and junction boxes above finish ceilings or exposed in equipment rooms shall be labeled with a pressure sensitive vinyl label approximately 2" x 3" with the warning "DANGER" and the voltage, i.e., "120/208 volts" "277/480 volts" exposed on the face of the box. Identify source of power (panel mark) and circuit number with black laundry marker.

3.9 Fasteners

- A. All labels shall be permanently and mechanically fastened to the equipment. The use of pressure sensitive back adhesive is not acceptable.

END OF SECTION 26 05 53

SECTION 26 56 00 - EXTERIOR LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes exterior luminaires, poles, and accessories.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. Exterior Luminaire:
 - 1. Basis of Measurement: Each.
 - 2. Basis of Payment: Includes concrete base, luminaire pole, and luminaire with lamps and accessories. connection to power source.

1.3 REFERENCES

- A. American National Standards Institute:
 - 1. ANSI C82.1 - American National Standard for Lamp Ballast-Line Frequency Fluorescent Lamp Ballast.
 - 2. ANSI C82.4 - American National Standard for Ballasts-for High-Intensity-Discharge and Low-Pressure Sodium Lamps (Multiple-Supply Type).
 - 3. ANSI O5.1 - Wood Poles, Specifications and Dimensions.

1.4 SUBMITTALS

- A. Shop Drawings: Indicate dimensions and components for each luminaire not standard Product of manufacturer.
- B. Product Data: Submit dimensions, ratings, and performance data.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store and handle solid wood poles in accordance with ANSI O5.1.

1.7 COORDINATION

- A. Furnish bolt templates and pole mounting accessories to installer of pole foundations.

1.8 MAINTENANCE MATERIALS

- A. Section 017000 - Execution and Closeout Requirements: Spare parts and maintenance products.
- B. Furnish 2 of each lamp installed.
- C. Furnish 2 gallons of touch-up paint for each different painted finish and color.
- D. Furnish 2 ballasts of each lamp type installed.

PART 2 - PRODUCTS

2.1 HIGH PRESSURE SODIUM LAMP

- A. Product Description: 70 watt HP sodium lamp, vandal-proof acrylic prismatic refractory, cast aluminum housing, and integral plug-in photoelectric cell for automatic dusk to dawn operation.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify foundations are ready to receive fixtures.

3.2 INSTALLATION

- A. Install lamps in each luminaire.
- B. Bond and ground luminaires ,metal accessories and metal poles in accordance with Section 260526.

3.3 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements and 017000 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Operate each luminaire after installation and connection. Inspect for improper connections and operation.
- C. Measure illumination levels to verify conformance with performance requirements.

- D. Take measurements during night sky, without moon or with heavy overcast clouds effectively obscuring moon.

3.4 CLEANING

- A. Section 017000 - Execution and Closeout Requirements: Final cleaning.
- B. Clean photometric control surfaces as recommended by manufacturer.
- C. Clean finishes and touch up damage.

3.5 PROTECTION OF FINISHED WORK

- A. Section 017000 - Execution and Closeout Requirements: Protecting finished work.
- B. Relamp luminaries having failed lamps at Substantial Completion.

END OF SECTION 26 56 00

SECTION 31 10 00 - SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Removing surface debris.
2. Removing designated paving, curbs, and walkways.
3. Removing designated trees, shrubs, and other plant life.
4. Removing abandoned utilities.
5. Excavating topsoil.

1.2 QUALITY ASSURANCE

- A. Perform Work in accordance with local, State and Federal standards.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Herbicide: As approved by authority having jurisdiction.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify existing plant life designated to remain is tagged or identified.

3.2 PREPARATION

- A. Call Local Utility Line Information service at not less than three working days before performing Work.
1. Request underground utilities to be located and marked within and surrounding construction areas.

3.3 PROTECTION

- A. Locate, identify, and protect utilities indicated to remain, from damage.

- B. Protect trees, plant growth, and features designated to remain, as final landscaping.
- C. Protect bench marks, survey control points, and existing structures from damage or displacement.

3.4 CLEARING

- A. Clear areas required for access to site and execution of Work.
- B. Remove trees and shrubs within marked areas. Remove stumps, main root ball, surface rock, and other obstructions to performing the Work.
- C. Clear undergrowth and deadwood, without disturbing subsoil.
- D. Apply herbicide to remaining stumps to inhibit growth.

3.5 REMOVAL

- A. Remove debris, rock, and extracted plant life from site.
- B. Partially remove paving, curbs, and walkways as indicated on Drawings. Neatly saw cut edges at right angle to surface.
- C. Remove abandoned utilities. Indicated removal termination point for underground utilities on Record Documents.
- D. Continuously clean-up and remove waste materials from site. Do not allow materials to accumulate on site.
- E. Do not burn or bury materials on site. Leave site in clean condition.

3.6 TOPSOIL EXCAVATION

- A. Excavate topsoil from areas to be further excavated, relandscaped, or regraded, without mixing with foreign materials for use in finish grading.
- B. Do not excavate wet topsoil.
- C. Stockpile in area designated on site to depth not exceeding 8 feet and protect from erosion. Stockpile material on impervious material, until disposal.
- D. Remove excess topsoil not intended for reuse, from site.

END OF SECTION 31 10 00

SECTION 31 23 16 - EXCAVATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Excavating for site structures.

B. Related Sections:

1. Section 31 23 17 "Trenching"
2. Section 31 23 23 "Fill"

1.2 REFERENCES

A. Local utility standards when working within 24 inches of utility lines.

B. Codes and standards referred to in this Section are:

1. All Federal, State and local laws and regulations applying to the design and construction of shoring, sheeting, underpinning and bracing.
2. National Bureau of Standards Building Science Series 127 "Recommended Technical Provisions for Construction Practice in Shoring and Sloping Trenches and Excavations."

1.3 SUBMITTALS

A. Refer to Section 01 33 00 "Submittal Procedures"

B. Excavation Protection Plan: Describe sheeting, shoring, and bracing materials and installation required to protect excavations and adjacent structures and property; include structural calculations to support plan.

1. Contractor's Submittals: Submit a Certification, signed and sealed by a Licensed Structural/Professional Engineer qualified to perform structural engineering of this nature and registered in the State where the construction will be performed, that certifies that the Licensed Structural/Professional Engineer has evaluated and approved the Contractor's excavation plan and has prepared, signed and sealed complete design calculations and working drawings for the shoring, sheeting and bracing, not specifically shown or shown on the Contract Drawing, which will be used for excavation support. Provide a separate certification, identifying the applicable excavation, for each excavation before starting the excavation. Where commercially manufactured trench boxes are to be used, provide a Certification from the Contractor's Licensed Structural/Professional Engineer stating the conditions under which the trench boxes will be used.

- C. Dewatering Excavation Plan: Develop an excavation dewatering plan that considers site ground and groundwater conditions, the type and arrangement of the equipment to be used and the proper method of groundwater dispersed. Prepare the dewatering plan before beginning excavations below groundwater. Maintain one copy of the dewatering plan at the project site to be available for inspection while all dewatering options are underway.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with local, State and Federal standards.

1.5 QUALIFICATIONS

- A. Prepare excavation protection plan under direct supervision of Professional Engineer experienced in design of this Work and licensed in the State of Indiana.

PART 2 - PRODUCTS

- 2.1 Not Used.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Call Local Utility Line Information service not less than three working days before performing Work.
 - 1. Request underground utilities to be located and marked within and surrounding construction areas.
- B. Identify required lines, levels, contours, and datum.
- C. Protect utilities indicated to remain from damage.
- D. Protect plant life, lawns, and other features remaining as portion of final landscaping.
- E. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.
- F. Hazardous materials: If hazardous materials not specifically shown or noted are encountered, proceed in accordance with General Conditions Article 4 Hazardous Environmental Condition at site.

3.2 EXCAVATION

- A. Excavate subsoil to accommodate site structures, construction operations, and utility connections.
- B. Compact disturbed load bearing soil in direct contact with foundations to original bearing capacity; perform compaction in accordance with Section 31 23 23 and Section 31 23 17. Dewatering Excavation Plan: Develop an excavation dewatering plan that considers site ground and groundwater conditions, the type and arrangement of the equipment to be used and the proper method of groundwater dispersed. Prepare the dewatering plan before beginning excavations below groundwater. Maintain one copy of the dewatering plan at the project site to be available for inspection while all dewatering options are underway.
- C. Slope banks with machine to angle of repose or less until shored.
- D. Do not interfere with 45 degree bearing splay of foundations.
- E. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- F. Trim excavation. Remove loose matter.
- G. Remove lumped subsoil, boulders, and rock.
- H. Notify Engineer of unexpected subsurface conditions.
- I. Correct areas over excavated as specified in Section 31 23 23.
- J. Stockpile excavated material meeting requirements for subsoil materials and topsoil materials in area designated on site to a depth not exceeding 6 feet and protect from erosion.
- K. Remove excess excavated materials not intended for reuse, from site.
- L. Remove excess excavated materials not meeting requirements for subsoil materials and topsoil materials from site.
- M. Repair or replace items indicated to remain damaged by excavation.

3.3 STOCKPILING

- A. Stockpile materials on site at locations approved by Owner.
- B. Stockpile in sufficient quantities to meet Project schedule and requirements.
- C. Separate differing materials with dividers or stockpile apart to prevent mixing.
- D. Stockpile 6 feet high maximum.
- E. Prevent intermixing of soil types or contamination.
- F. Direct surface water away from stockpile to prevent erosion or deterioration of materials.

- G. Stockpile Cleanup: Remove stockpile, leave area in clean and neat condition. Grade site surface to prevent free standing surface water.

3.4 FIELD QUALITY CONTROL

- A. Refer to Section 01 40 00 "Quality Requirements"
- B. Request inspection of excavation and controlled fill operations in accordance with applicable code.
- C. Request visual inspection of bearing surfaces before installing subsequent work.

3.5 PROTECTION

- A. Prevent displacement or loose soil from falling into excavation; maintain soil stability.
- B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.
- C. Protect structures, utilities and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth operations.

END OF SECTION 31 23 16

SECTION 31 23 17 - TRENCHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Excavating trenches for utilities.
2. Compacted fill from top of utility bedding to subgrade elevations under pavement and to surface elevations under unpaved areas.
3. Backfilling and compaction.

B. Related Sections:

1. Section 31 23 16 "Excavation"
2. Section 31 23 23 "Fill"
3. Section 33 31 13 "Public Sanitary Utility Sewerage Piping"

1.2 DEFINITIONS

- A. Utility: Any buried pipe, duct, conduit, or cable.

1.3 SUBMITTALS

- A. Section 01 33 00 "Submittal Procedures"

- B. Excavation Protection Plan: Describe sheeting, shoring, and bracing materials and installation required to protect excavations and adjacent structures and property; include structural calculations to support plan.

1. Refer to Section 31 23 16 for detailed requirements regarding, The Sheeting and Shoring Plan.

- C. Product Data: Submit gradation data for imported fill materials.

- D. Materials Source: Submit name of imported fill materials suppliers.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with local, State, and Federal standards.

1.5 QUALIFICATIONS

- A. Prepare excavation protection plan under direct supervision of Professional Engineer experienced in design of this Work and licensed in State of Indiana.

1.6 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.7 COORDINATION

- A. Verify Work associated with lower elevation utilities is complete before placing higher elevation utilities.

PART 2 - PRODUCTS

2.1 FILL MATERIALS

- A. Subsoil Fill: As specified in Section 31 23 23.
- B. Granular Fill: As specified in Section 31 23 23.

PART 3 - EXECUTION

3.1 LINES AND GRADES

- A. Lay pipes to lines and grades indicated on Drawings.
 - 1. Engineer reserves right to make changes in lines, grades, and depths of utilities when changes are required for Project conditions.
- B. Use laser-beam instrument with qualified operator to establish lines and grades.

3.2 PREPARATION

- A. Call Local Utility Line Information service not less than three working days before performing Work.
 - 1. Request underground utilities to be located and marked within and surrounding construction areas.
- B. Identify required lines, levels, contours, and datum locations.
- C. Protect plant life, lawns, and other features remaining as portion of final landscaping.

- D. Protect bench marks, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.
- E. Maintain and protect above and below grade utilities indicated to remain.
- F. Establish temporary traffic control and detours when trenching is performed in public right-of-way. Relocate controls and reroute traffic as required during progress of Work.

3.3 TRENCHING

- A. Excavate subsoil required for utilities to utility service.
- B. Remove lumped subsoil, boulders, and rock.
- C. Perform excavation within 24 inches of existing utility service in accordance with utility's requirements.
- D. Do not advance open trench more than 200 feet ahead of installed pipe.
- E. Cut trenches sufficiently wide, within established construction limits and/or temporary construction easements, to enable installation and allow inspection. Remove water or materials that interfere with Work.
- F. Excavate bottom of trenches maximum 2 feet wider than outside diameter of pipe.
- G. Excavate trenches to depth indicated on Drawings. Provide uniform and continuous bearing and support for bedding material and pipe.
- H. Do not interfere with 45 degree bearing splay of foundations.
- I. When Project conditions permit, slope side walls of excavation starting 2 feet above top of pipe. When side walls cannot be sloped, provide sheeting and shoring to protect excavation as specified in this section.
- J. When subsurface materials at bottom of trench are loose or soft, excavate to greater depth as directed by Engineer until suitable material is encountered.
- K. Cut out soft areas of subgrade not capable of compaction in place. Backfill with subsoil fill and compact to density equal to or greater than requirements for subsequent backfill material.
- L. Trim excavation. Hand trim for bell and spigot pipe joints. Remove loose matter.
- M. Correct areas over excavated areas with compacted backfill as specified for authorized excavation or replace with fill concrete as directed by Engineer.
- N. Remove excess subsoil not intended for reuse, from site.
- O. Provide means of ingress and egress from the trenches as required by applicable safety and health regulations.

3.4 SHEETING AND SHORING

- A. General: Provide safe working conditions, prevent shifting of material, prevent damage to structures or other work, and avoid delay to the work, all in accordance with applicable laws and regulations. Properly shore, sheet, underpin and brace all excavations that are not cut back to the proper slope, as determined by the Contractor's Licensed Professional Engineer.
 - 1. Take sole responsibility for the design and adequacy of shoring, sheeting, and bracing not shown or shown on the Contract Drawings.
 - 2. Take sole responsibility for the methods of installation of the shoring, sheeting and bracing.
- B. Arrange shoring, sheeting, underpinning and bracing so as not to place any strain on portions of completed work until the general construction has proceeded far enough to provide ample strength.
- C. Sheet, shore, and brace excavations to prevent danger to persons, structures and adjacent properties and to prevent caving, erosion, and loss of surrounding subsoil.
- D. Support trenches more than 5 feet deep excavated through unstable, loose, or soft material. Provide sheeting, shoring, bracing, or other protection to maintain stability of excavation.
- E. Design sheeting and shoring to be removed at completion of excavation work.
- F. Repair damage caused by failure of the sheeting, shoring, or bracing and for settlement of filled excavations or adjacent soil.
- G. Repair damage to new and existing Work from settlement, water or earth pressure or other causes resulting from inadequate sheeting, shoring, or bracing.
- H. If the Contractor or its Licensed Professional Engineer is of the opinion that at any time the Contractor's excavation plan, shoring, sheeting, underpinning or bracing is inadequate or unsuited for the purpose, take immediate and appropriate action. Provide a new Certificate if the Contractor's excavation plans, shoring, sheeting, underpinning or bracing require modifications.
- I. Monitoring: Periodically monitor horizontal and vertical deflections of sheeting, shoring, bracing and underpinning.
- J. Remove shoring, sheeting and bracing as the excavation is refilled in a manner to avoid the caving in of the bank or disturbance to adjacent areas or structures or pipe bedding.
 - 1. Carefully fill voids left by the withdrawal of the shore, sheeting and bracing. No separate payment will be made for the filling of such voids.
 - 2. If pipe bedding is disturbed, re-compact it to meet specified density requirements.
- K. Permission for removal: Obtain permission from the Contractor's Licensed Professional Engineer before the removal of any shoring, sheeting or bracing. Retain the responsibility for injury to structures or to other property or persons for failure to leave such shoring, sheeting and bracing in place even though permission for removal has been obtained.

3.5 DEWATERING

- A. Where groundwater is encountered, make every practical effort necessary to secure a dry trench bottom prior to laying pipe and/or the installation of the sanitary sewer facility.
- B. Provide, install and operate sufficient trenches, sumps, pumps, hoses, piping, wellpoints or other means necessary to depress and maintain groundwater level below base of the excavation.
- C. Dewatering shall be sufficient to stop weeping and running water from displacing soil and entering trench through trench walls.
- D. If unable to remove standing water in the trench, over-excavate the proposed bottom grade of the sewer bedding and place not less than six (6) inches of No. 2 or No. 8 crushed stone in the over-excavated area, at no additional cost to the Owner.
- E. Divert or remove surface runoff and other accumulations of surface water from excavations in compliance with all applicable rules and regulations.
- F. The Owner reserves the right to cease installation activities when trench conditions are not in conformance with the requirements provided by this Section.
- G. Dispose of excavation water to location other than sanitary and storm sewer in accordance with State and Federal laws and regulations. Under no circumstances shall surface water and/or groundwater be discharged to, disposed of, or allowed to flow into the sanitary and storm sewer systems except as directed by the Owner.
- H. Provide adequate protection for water discharged onto streets. Protect the street surface at the point of discharge.
- I. Allow no water to rise in the trench excavation until sufficient backfill has been placed to prevent pipe or duct flotation.

3.6 BACKFILLING

- A. Backfill trenches to contours and elevations with unfrozen fill materials.
- B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.
- C. Place fill material in continuous layers and compact in accordance with Section 31 23 23.
- D. Employ placement method that does not disturb or damage utilities in trench, and existing subsurface structures.
- E. Maintain optimum moisture content of fill materials to attain required compaction density.
- F. Do not leave more than 50 feet of trench open at end of working day.
- G. Protect open trench to prevent danger to the public.

3.7 TOLERANCES

- A. Refer to Section 01 40 00 “Quality Requirements”
- B. Top Surface of Backfilling Under Paved Areas: Plus or minus 0.5 inch from required elevations.
- C. Top Surface of General Backfilling: Plus or minus 1 inch from required elevations.

3.8 FIELD QUALITY CONTROL

- A. Refer to Section 01 40 00 “Quality Requirements”
- B. Perform laboratory material tests in accordance with Section 31 23 23.
- C. Perform in place compaction tests in accordance with Section 31 23 23.
- D. When tests indicate Work does not meet specified requirements, remove Work, replace, compact, and retest.

3.9 PROTECTION OF FINISHED WORK

- A. Refer to Section 01 73 00 “Execution”
- B. Refer to Section 01 77 00 “Closeout Procedures”
- C. Reshape and re-compact fills subjected to vehicular traffic during construction.

END OF SECTION 31 23 17

SECTION 31 23 19 - DEWATERING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes construction dewatering.

1.3 ALLOWANCES

- A. Dewatering observation wells are part of dewatering allowance.

1.4 PREINSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at Project Site.
 - 1. Verify availability of Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 2. Review dewatering excavation plan submitted in accordance with Section 31 23 16 "Excavation".
 - 3. Review condition of site to be dewatered including coordination with temporary erosion-control measures and temporary controls and protections.
 - 4. Review geotechnical report.
 - 5. Review proposed site clearing and excavations.
 - 6. Review existing utilities and subsurface conditions.
 - 7. Review observation and monitoring of dewatering system.

1.5 FIELD CONDITIONS

- A. Project-Site Information: A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of a geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by a geotechnical engineer. Owner is not responsible for interpretations or conclusions drawn from this data.
 - 1. Make additional test borings and conduct other exploratory operations necessary for dewatering according to the performance requirements.
 - 2. The geotechnical report is included as an Appendix to the Contract Documents.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by dewatering operations.
 - 1. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding site or surrounding area.
 - 2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.
- B. Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
- C. Provide temporary grading to facilitate dewatering and control of surface water.
- D. Protect and maintain temporary erosion and sedimentation controls, which are specified in Section 31 25 00 "Erosion and Sedimentation Controls", during dewatering operations.

3.2 INSTALLATION

- A. Install dewatering system utilizing wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material gradation, valves, appurtenances, water disposal, and surface-water controls.
 - 1. Space well points or wells at intervals required to provide sufficient dewatering.
 - 2. Use filters or other means to prevent pumping of fine sands or silts from the subsurface.
- B. Place dewatering system into operation to lower water to specified levels before excavating below ground-water level.
- C. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.
- D. Provide standby equipment on-site, installed and available for immediate operation, to maintain dewatering on continuous basis if any part of system becomes inadequate or fails.

3.3 OPERATION

- A. Operate system continuously until drains, sewers, and structures have been constructed and fill materials have been placed or until dewatering is no longer required.
- B. Operate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry subgrades. Drain water-bearing strata above and below bottom of foundations, drains, sewers, and other excavations.
 - 1. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.
 - 2. Reduce hydrostatic head in water-bearing strata below subgrade elevations of foundations, drains, sewers, and other excavations.
 - 3. Maintain piezometric water level a minimum of 24 inches below bottom of excavation.
- C. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water and sediment in a manner that avoids inconvenience to others.
- D. Remove dewatering system from Project site on completion of dewatering. Plug or fill well holes with bentonite grout or cut off and cap wells a minimum of 36 inches below overlying construction.

3.4 PROTECTION

- A. Protect and maintain dewatering system during dewatering operations.
- B. Promptly repair damages to adjacent facilities caused by dewatering.

END OF SECTION 31 23 19

(NO TEXT FOR THIS PAGE)

SECTION 31 23 23 - FILL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Subsoil fill materials.
2. Coarse aggregate materials.
3. Fine aggregate materials.
4. Backfilling site structures to subgrade elevations.
5. Fill for over-excavation.

B. Related Sections:

1. Section 31 23 16 - Excavation.
2. Section 31 23 17 - Trenching.

1.2 REFERENCES

A. Indiana Department of Transportation (INDOT) Standard Specifications (latest edition).

B. ASTM International:

1. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
2. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
3. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
4. ASTM D6938 - Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (shallow depth).
5. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).

1.3 SUBMITTALS

A. Section 01 33 00 "Submittal Procedures"

B. Materials Source: Submit name of imported fill materials suppliers.

C. Material Data: Submit gradation charts, sieve analysis for imported aggregate testing results.

D. Test Reports: Submit certified laboratory reports of all proposed backfill material. Test reports are to be dated within 6 months of backfill operation.

1.4 QUALITY ASSURANCE

- A. Furnish each imported material from single source throughout the Work.

PART 2 - PRODUCTS

2.1 FILL MATERIALS

- A. Subsoil Fill: Excavated and reused material; graded and free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.
- B. Structural Fill: Coarse No. 8 aggregate conforming to INDOT Standard Specifications.
- C. Granular Fill: No. 53 aggregate conforming to INDOT Standard Specifications.
- D. Concrete: Lean concrete.
- E. Select Fill: No. 53 aggregate conforming to INDOT Standard Specifications.
- F. Borrow Material: No. 30 sand. Conform to subsoil INDOT Standard Specifications.
- G. Drainage Fill: No. 8 pea gravel conforming to INDOT Standard Specifications.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify subdrainage, dampproofing, or waterproofing installation has been inspected.
- B. Verify structural stability of unsupported walls to support loads imposed by fill.

3.2 STOCKPILING

- A. Stockpile materials on site at locations approved by Owner.
- B. Stockpile in sufficient quantities to meet Project schedule and requirements.
- C. Separate different aggregate materials with dividers or stockpile individually to prevent mixing.
- D. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.
- E. Stockpile Cleanup: Remove stockpile, leave area in clean and neat condition. Grade site surface to prevent free standing surface water.

3.3 PREPARATION

- A. Compact subgrade to density requirements for subsequent backfill materials.
- B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with subsoil fill and compact to density equal to or greater than requirements for subsequent fill material.

3.4 BACKFILLING

- A. Backfill areas to contours and elevations with unfrozen materials.
- B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen or spongy subgrade surfaces.
- C. Place fill material in continuous layers and compact in accordance with schedule at end of this section.
- D. Employ placement method that does not disturb or damage other work.
- E. Maintain optimum moisture content of backfill materials to attain required compaction density.
- F. Make gradual grade changes. Blend slope into level areas.
- G. Remove surplus backfill materials from site.
- H. Leave fill material stockpile areas free of excess fill materials.

3.5 TOLERANCES

- A. Section 01 40 00 "Quality Requirements"
- B. Top Surface of Backfilling Under Paved Areas: Plus or minus 0.5 inch from required elevations.
- C. Top Surface of General Backfilling: Plus or minus 1 inch from required elevations.

3.6 FIELD QUALITY CONTROL

- A. Section 01 40 00 "Quality Requirements"
- B. Perform laboratory material tests in accordance with ASTM D698.
- C. Perform in place compaction tests in accordance with the following:
 - 1. Density Tests: ASTM D1556, ASTM D2167, or ASTM D6938.
 - 2. Moisture Tests: ASTM D6938.
- D. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

- E. Frequency of Tests: 250 feet for horizontal trenches. Every 12 inches for vertical layers.
- F. Proof roll compacted fill surfaces under slabs-on-grade and paving.

3.7 PROTECTION OF FINISHED WORK

- A. Refer to Section 01 73 00 "Execution"
- B. Refer to Section 01 77 00 "Closeout Procedures"
- C. Reshape and re-compact fills subjected to vehicular traffic.
 - 1. Select Fill compacted uniformly to 95 percent of maximum dry density or lean concrete.

3.8 SCHEDULE

- A. Fill Under Grass Areas:
 - 1. Subsoil fill, to 6 inches below finish grade, compact uniformly to 95 percent of maximum density.
- B. Fill Under Paving:
 - 1. Compact subsoil to 95 percent of its maximum dry density.
 - 2. Structural fill, to subbase elevation, compact uniformly to adhere a consistent subgrade.
- C. Fill to Correct Over-excavation:
 - 1. Select fill or lean concrete, flush to required elevation, compact uniformly to 95 percent of maximum density. Sand fill is required for watermain over-excavation and a minimum of 6-inches of sand placed between the layer of #53 stone and the pipe to prevent damage to the polywrap.
- D. Fill Beneath Sanitary and Storm Structures
 - 1. Select fill, compact uniformly to 95 percent of its maximum dry density.
- E. Fill Around Sanitary and Storm Structures
 - 1. Granular fill, compact uniformly to not less than 95 percent of the maximum dry density.
- F. Precast Manhole Bedding
 - 1. Bedding Compaction: Bed all precast manholes in well graded, compacted, select fill conforming to the requirements except as otherwise shown, specified, or required. Compact bedding thickness no less than 6 inches for precast concrete manhole bases.
 - 2. Concrete Work Mats: Cast cast-in-place manhole bases and other foundations for structures against a Class D concrete work mat in clean and dry excavations, unless otherwise shown, specified or required.

3. Bedding Placement: Place select fill used for bedding beneath precast manhole bases, in uniform layers not greater than 8 inches in loose thickness. Thoroughly compact in place with suitable mechanical or pneumatic tools to not less than 95 percent of the maximum dry density.
4. Use of Select Fill: Bed existing underground structures, tunnels, conduits, and pipes crossing the excavation with compacted select fill material. Place bedding material under and around each existing underground structure, tunnel, conduit or pipe and extend underneath and on each side to a distance equal to the depth of the trench below the structure, tunnel, conduit or pipe.

G. Pipe Bedding

1. Hand Placement: Place select fill pipe bedding by hand from the bottom of the excavation to 1 foot over the top of the pipe in uniform layers not greater than 6 inches in loose thickness. Tamp under pipe haunches and thoroughly compact pipe bedding in place with suitable mechanical or pneumatic tools to not less than 95 percent of the maximum dry density unless otherwise specified.
2. Stone Placement: Do not place large stone fragments in the pipe bedding or backfill to 1 foot over the top of pipes, nor nearer than 2 feet at any point from any pipe, conduit or concrete wall.
3. Unallowed Materials: Sanitary Pipe bedding containing very fine sand, uniformly graded sands and gravels, or other materials that have a tendency to flow under pressure when wet is unacceptable unless otherwise specified.

3.9 COMPACTION EQUIPMENT

- A. Equipment and Methods: Carry out all compaction with suitable approved equipment and methods.
1. Compact clay and other cohesive material with sheep's-foot rollers or similar equipment where practicable. Use hand held pneumatic tampers elsewhere for compaction of cohesive fill material.
 2. Compact low cohesive soils with pneumatic-tire rollers or large vibratory equipment where practicable. Use small vibratory equipment elsewhere for compaction of cohesionless fill material.
 3. Do not use heavy compaction equipment over pipelines or other structures unless the depth of fill is sufficient to adequately distribute the load.

3.10 FINISH GRADING

- A. Final Contours: Perform finish grading and blend into conformation with remaining natural ground surfaces.
1. Leave all finished grading surfaces smooth and firm to drain.
 2. Bring finish grades to elevations within plus or minus 0.10 foot of existing or contours shown.

- B. Surface Drainage: Perform grading outside of building or structure lines in a manner to prevent accumulation of water within the area. Where necessary or where shown, extend finish grading to ensure that water will be carried to drainage ditches, and the site area left smooth and free from depressions holding water

3.11 RESPONSIBILITY FOR AFTERSETTLEMENT

- A. Aftersettlement Responsibility: Take responsibility for correcting any depression which may develop in backfilled areas from settlement within one year after the work is fully completed. Provide as needed, backfill material, pavement base replacement, permanent pavement, sidewalk, curb and driveway repair or replacement, and lawn replacement, and perform the necessary reconditioning and restoration work to bring such depressed areas to proper grade as approved.

3.12 INSPECTION AND TESTING OF BACKFILLING

- A. Sampling and Testing: Sampling and testing of all in-place backfill will be provided by the Contractor as specified in Division 01. If initial testing reveals non-compliance with Contract requirements, all additional testing will be made at the Contractor's request.
- B. Correction of Work: Correct any areas of unsatisfactory compaction by removal and replacement, or by scarifying, aerating or sprinkling as needed and recompaction in place prior to placement of a new lift.

END OF SECTION 31 23 23

SECTION 31 25 00 - EROSION AND SEDIMENTATION CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Erosion and sediment controls.
2. Erosion and sediment control plan.
3. Erosion and sediment control inspection logs.

B. Related Sections:

1. Section 31 10 00 "Site Clearing"
2. Section 31 23 16 "Excavation"
3. Section 31 23 19 "Dewatering"
4. Section 31 23 17 "Trenching"
5. Section 31 23 23 "Fill"

1.2 REFERENCES

- A. Indiana Department of Transportation Standard Specifications (latest edition).
- B. Indiana Department of Transportation Standard Drawings (latest edition).
- C. Indiana Storm Water Quality Manual (latest edition).

1.3 SUBMITTALS

A. Refer to Section 01 33 00 "Submittal Procedures"

B. Erosion and Sediment Control Plan

1. For the Contractor's convenience, the Owner has prepared an Erosion and Sediment Control Plan to meet the requirements of the Rule 5 General Storm Water Runoff Permit. The Contractor may develop a separate Plan for approval by the La Porte County Soil and Water Conservation District. Contractor's Plan must include the following:
 - a. Submit plan for construction staging and maintenance of the Site relative to erosion and sediment controls. For areas not indicated in the Contract Documents as being disturbed and that the Contractor proposes to disturb, indicate proposed erosion and sediment control measures for the additional areas on a site plan. Where Contractor proposes to deviate from erosion and sediment control measures as shown on the Contract Documents, submit proposed changes on a site plan.
 - b. Submit location and details of temporary concrete washout areas.

- c. Submit location and details of temporary construction entrances.
- 2. Availability: Keep the Erosion and Sediment Control Plan at the construction site at all times available for inspection for the entire construction period.
- C. Product Data: Submit manufacturer product data, installation instructions and maintenance instructions, for all erosion and sedimentation control products proposed for use.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with requirements of Section 31 10 00 "Site Clearing", Section 31 23 16 "Excavation", Section 31 23 23 "Fill", and Section 32 92 19 "Seeding".
- B. Perform Work according to design and construction requirements of INDOT Standard Specifications Section 205 and the Indiana State Water Quality Manual standards.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Refer to Section 01 60 00 "Product Requirements"
- B. Do not place grout when air temperature is below freezing.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Provide erosion and sedimentation control devices meeting the standards provided by INDOT Standards Specifications and Drawings, the Indiana Storm Water Quality Manual, and the Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify compacted stabilized soil is acceptable and ready to support devices and imposed loads.
- B. Verify gradients and elevations of base or foundation for other work are correct.

3.2 GENERAL

- A. Provide methods to control storm water runoff and water from excavations to prevent damage to the work. Provide, operate, and maintain equipment and facilities of adequate size to control storm water runoff.

- B. Provide and maintain means and devices to properly remove and dispose of all storm water runoff entering excavations and keep excavations dry until pipelines to be placed therein are completed.
- C. Water used for working or processing, resulting from dewatering operations, or containing oils or sediments that will reduce the quality of the water downstream of the point of discharge, shall not be directly discharged. Such waters shall be diverted through a settling basin, filter or other approved method, before being discharged.
- D. Install and maintain erosion and sediment control around stockpiles of granular material using gravel filled bags or other approved method.
- E. Install and maintain erosion and sediment control around inlets downstream from construction activity.
- F. Furnish, install and maintain erosion and sediment control measures such as perimeter control and temporary seeding on disturbed areas.
- G. Minimize granular deposits on street and sidewalk surfaces open to traffic. Excess material shall be removed at the end of each work day by approved methods, such as street sweeper or brooming and returned to the point of likely origin or other suitable location. Material shall not be removed by flushing with water.

3.3 SITE STABILIZATION

- A. Incorporate erosion control devices indicated on the Drawings into the Project at the earliest practicable time.
- B. Construct, stabilize and activate erosion controls before site disturbance within tributary areas of those controls.
- C. Stockpile and waste pile heights shall not exceed 10 feet. Slope stockpile sides at 2:1 or flatter.
- D. Stabilize any disturbed area of affected erosion control devices on which activity has ceased and which will remain exposed for more than 14 days.
 - 1. During non-germinating periods, apply mulch at recommended rates.
 - 2. Stabilize disturbed areas which are not at finished grade and which will be disturbed within one year with temporary seeding.
 - 3. Stabilize disturbed areas which are either at finished grade or will not be disturbed within one year in accordance with Section 32 92 19 permanent seeding specifications.
- E. Stabilize diversion channels, sediment traps, and stockpiles immediately.

3.4 INSTALLATION

- A. Install erosion and sedimentation control devices in accordance with manufacturer's recommendations, in addition to INDOT Standard Specifications and Drawings, the Indiana Storm Water Quality Manual, and the Drawings.

3.5 FIELD QUALITY CONTROL

- A. Inspect erosion control devices on a weekly basis and after each runoff event. Make necessary repairs to ensure erosion and sediment controls are in good working order.
- B. During the period of construction activity all erosion control measures shall be maintained by the Contractor. At the completion of construction the Contractor shall coordinate the transfer of required maintenance responsibilities to the Owner.
- C. The Engineer, Owner, and IDEM have the authority to conduct inspections of site activities as needed, to ensure compliance with the above specifications and the stormwater pollution prevention plan.
- D. Potential sanctions for Contractor violations may include, but are not limited to:
 - 1. Contract payment withholding, liquidated damages, setoff, or equitable adjustment;
 - 2. Indemnification of Government costs due to administrative enforcement and litigation;
 - 3. Contract termination;
 - 4. Consideration in past performance evaluations in award of future contracts;
 - 5. Suspension or debarment from bidding or working on future contracts; and/or
 - 6. Stop-work orders may be issued for the entire project until violations have been rectified to the satisfaction of the U.S. Government.

3.6 CLEANING

- A. When sediment accumulation in sedimentation structures has reached a point one-third depth of sediment structure or device, remove and dispose of sediment.
- B. Do not damage structure or device during cleaning operations.
- C. Do not permit sediment to erode into construction or site areas or natural waterways.

END OF SECTION 31 25 00

SECTION 32 12 16 - ASPHALT PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Aggregate subbase.
 - 2. Aggregate base course.
 - 3. Cold milling of existing asphalt pavement.
 - 4. Hot-mix asphalt patching.
 - 5. Hot-mix asphalt paving.
 - 6. Hot-mix asphalt overlay.
 - 7. Asphalt surface treatments.

1.3 REFERENCES

- A. AI MS-2 - Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types
- B. AI MS-22 - Construction of Hot Mix Asphalt Pavements
- C. ASTM D 3910 - Standard Practices for Design, Testing, and Construction of Slurry Seal
- D. ASTM D 6927 - Standard Test Method for Marshall Stability and Flow of Asphalt Mixtures
- E. Indiana Department of Transportation (INDOT) Publication: Standard Specifications latest edition.

1.4 FIELD CONDITIONS

- A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:
 - 1. Prime Coat: Minimum surface temperature of 60 deg F.
 - 2. Tack Coat: Minimum surface temperature of 60 deg F.
 - 3. Slurry Coat: Comply with weather limitations in ASTM D 3910.

4. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.
5. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.

1.5 SUBMITTALS

- A. Section 01 33 00 "Submittal Procedures"
- B. Product Data:
 1. Submit data for geotextile fabric.
 2. Submit product information for asphalt and aggregate materials.
 3. Submit mix design with laboratory test results supporting design.
- C. Materials Source: Submit name of aggregate materials suppliers.
- D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.6 QUALITY ASSURANCE

- A. Furnish each aggregate material from single source throughout the Work.
- B. Perform work in accordance with INDOT and local standards.
- C. Mixing Plant: Conform to INDOT Standards.

PART 2 - PRODUCTS

2.1 AGGREGATE MATERIALS

- A. No. 2 subbase materials shall meet the gradation as set forth in Subsection 903.02, Course Aggregates, INDOT Standard Specifications latest edition.
- B. No. 53 "Type O" subbase materials shall meet the gradation as set forth in the INDOT Standard Specifications latest edition.

2.2 ASPHALT MATERIALS

- A. Asphalt Cement: INDOT AC20.
- B. Aggregate for Base Course Mix: In accordance with State Department of Transportation standards.
- C. Aggregate for Binder Mix: In accordance with State Department of Transportation standards.

- D. Aggregate for Topping Mix: In accordance with State Department of Transportation standards.
- E. Fine Aggregate: Manufactured sand.
- F. Mineral Filler: Finely ground particles of limestone, hydrated lime or other mineral dust, free of foreign matter.
- G. Tack coat: Asphalt Emulsion AE-T.

2.3 MIXES

- A. Use dry material to avoid foaming. Mix uniformly.
- B. Asphalt Paving Mixtures:
 - 1. Base Course: 4.5 to 6 percent of asphalt cement by weight in mixture.
 - 2. Binder Course: 4.5 to 6 percent of asphalt cement by weight in mixture in accordance with AI MS-2.
 - 3. Wearing Course: 5 to 7 percent of asphalt cement by weight in mixture. Topping course shall contain a minimum of 10 percent fine aggregate.

2.4 SOURCE QUALITY CONTROL

- A. Section 01 40 00 "Quality Requirements"

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify utilities indicated under paving are installed with excavations and trenches backfilled and compacted.
- B. Verify compacted substrate is dry and in suitable condition to support paving and imposed loads.
- C. Verify substrate has been inspected, gradients and elevations are correct.
- D. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Protection: Provide protective materials, procedures, and worker training to prevent asphalt materials from spilling, coating, or building up on curbs, driveway aprons, manholes, and other surfaces adjacent to the Work.
- B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph.
 2. Proof roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
 3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Engineer, and replace with compacted backfill or fill as directed.
- C. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.
- D. Do not place fill on soft, muddy, or frozen surfaces.

3.3 AGGREGATE PLACEMENT

- A. Spread aggregate over prepared substrate to total compacted thickness indicated on Drawings.
- B. Place aggregate in maximum 6-inch layers and compact.
- C. Level and contour surfaces to elevations, profiles, and gradients indicated.
- D. Add small quantities of fine aggregate to course aggregate when required to assist compaction.
- E. Maintain optimum moisture content of fill materials to attain specified compaction density.
- F. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.4 TACK COAT

- A. Coat surfaces of manhole and catch basin frames with oil to prevent bond with asphalt paving. Do not tack coat these surfaces.

3.5 ASPHALT PAVING

- A. Install Work in accordance with INDOT standards.
- B. Place each course to compacted thickness identified on Drawings.
- C. Place tack coat at a rate of 0.05 gallons per square yard where new paving will cover existing paving. Tack Coat to be applied between all layers of asphalt and allowed enough time for Tack Coat Break before Asphalt is laid.
- D. Place binder course.
- E. Place topping course within twenty-four hours of placing and compacting binder course.

- F. Compact paving by rolling to specified density. Do not displace or extrude paving from position. Hand compact in areas inaccessible to rolling equipment.
- G. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

3.6 PATCHING

- A. Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches into perimeter of adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.
- B. Placing Patch Material: Partially fill excavated pavements with hot-mix asphalt base mix and, while still hot, compact. Cover asphalt base course with compacted, hot-mix surface layer finished flush with adjacent surfaces.

3.7 REPAIRS

- A. Leveling Course: Install and compact leveling course consisting of hot-mix asphalt surface course to level sags and fill depressions deeper than 1 inch in existing pavements.
 - 1. Install leveling wedges in compacted lifts not exceeding 3 inches thick.
- B. Crack and Joint Filling: Remove existing joint filler material from cracks or joints to a depth of 1/4 inch.
 - 1. Clean cracks and joints in existing hot-mix asphalt pavement.
 - 2. Use emulsified-asphalt slurry to seal cracks and joints less than 1/4 inch wide. Fill flush with surface of existing pavement and remove excess.
 - 3. Use hot-applied joint sealant to seal cracks and joints more than 1/4 inch wide. Fill flush with surface of existing pavement and remove excess.

3.8 COMPACTION

- A. Minimum Asphalt Density: 92% Contractor to provide testing to verify density is achieved.
- B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.
- C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:

1. Average Density: 96 percent of reference laboratory density according to ASTM D 6927 of AASHTO T 245, but not less than 94 percent or greater than 100 percent.
- D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
- E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.
- F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.
- G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.9 INSTALLATION TOLERANCES

- A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:
 1. Base Course: Plus or minus 1/4 inch.
 - a. Maximum Variation from Elevation: 1/2 inch.
 2. Surface Course: Plus 1/4 inch, no minus.
 - a. Maximum Variation from Elevation: 1/2 inch.
- B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:
 1. Base Course: 1/4 inch.
 2. Surface Course: 1/4 inch.
 3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.

3.10 SURFACE TREATMENTS

- A. Slurry Seals: Apply slurry coat in a uniform thickness according to ASTM D 3910 and allow to cure.
 1. Roll slurry seal to remove ridges and provide a uniform, smooth surface.

3.11 WASTE HANDLING

3.12 FIELD QUALITY CONTROL

- A. Section 01 40 00 "Quality Requirements"
- B. Asphalt Paving Mix Temperature: Measure temperature at time of placement.
- C. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

3.13 PROTECTION OF FINISHED WORK

- A. Section 01 73 00 "Execution"
- B. Immediately after placement, protect paving from mechanical injury for 15 days or until surface temperature is less than 140 degrees F.

END OF SECTION 32 12 16

(NO TEXT FOR THIS PAGE)

SECTION 32 16 23 – SIDEWALKS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes requirements for concrete sidewalks.

1.2 REFERENCES

- A. American Concrete Institute:

1. ACI 301 – Specifications for Structural Concrete.
2. ACI 305 – Hot Weather Concreting.
3. ACI 306 – Cold Weather Concreting.

- B. ASTM International:

1. ASTM A185/A185M - Standard Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
2. ASTM A605/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
3. ASTM C33 - Standard Specification for Concrete Aggregates.
4. ASTM C150 - Standard Specification for Portland Cement.
5. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
6. ASTM C1116 - Standard Specification for Fiber-Reinforced Concrete and Shotcrete.
7. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).

1.3 SUBMITTALS

- A. Section 01 33 00 “Submittal Procedures”.
- B. Product Data:
 1. Submit data on concrete materials, joint filler, admixtures, and curing compounds.
- C. Concrete Mix: Submit proposed concrete mix design for each strength, slump, and combination of admixtures required for the Project.
- D. Test Reports:

1. Submit chloride ion test or total chloride tests (with generally accepted method to relate total chloride to chloride ion) to show compliance with maximum ion concentrations.
 - a. Tests may be from another job, utilizing the same proportions of aggregates, cements, and admixtures.
2. Submit slump, air-entrainment, compressive strength, and flatness and levelness test reports to the Engineer.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301.
- B. Obtain cementitious materials from same source throughout.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Do not place concrete when base surface temperature is less than 40 degrees F, or surface is wet or frozen.

PART 2 - PRODUCTS

2.1 FORM MATERIALS

- A. Form Materials: conform to ACI 301.
- B. Joint Filler: ASTM D1751.

2.2 REINFORCING

- A. Reinforcing Steel: ASTM A615; 40 ksi yield grade; deformed billet steel bars.
- B. Welded Steel Wire Fabric: Plain type, ASTM A185; in flat sheets or coiled rolls; galvanized finish.
- C. Dowels: ASTM A615; 40 ksi yield grade, plain steel, galvanized finish.
- D. Concrete used in sidewalk construction shall be reinforced with fiber reinforcement.
 1. Reinforcement shall be added at the time of mixing at a rate of one pound per cubic yard.
 2. Fiber shall be $\frac{3}{4}$ " length.
 3. Fibers shall conform to ASTM C1116 except that nylon fibers conforming to all other requirements of the standard may be used.

2.3 CONCRETE MATERIALS

- A. Cement: ASTM C150 Normal – Type 1 Portland type, gray color.
- B. Fine and Coarse Aggregates: ASTM C33.
- C. Water: Potable, not detrimental to concrete.
- D. Air Entrainment: Add air-entraining agent as indicated in ACI 301 Table 3.4.1. Air entrainment shall be $6\% \pm 1\%$.

2.4 ACCESSORIES

- A. Weight: Normal Weight.
- B. Strength for concrete/sidewalk: 4000 psi, 28- day compressive strength; minimum cement requirements in accordance with ACI 301, Table 3.8.5 except not less than 520 pounds of cement per cubic yard.
- C. Strength for Concrete Curbs, Gutters, and Walks: 4000 psi, 28-day compressive strength; minimum 520 pounds of cement per cubic yard.
- D. Slump: In accordance with ACI 301; 3-inch maximum slump for concrete curb; 4.5-inch maximum slump for concrete sidewalk.
- E. Proportions: Selection in accordance with ACI 301 Method 1, trial batches or Method 2, field test data.

2.5 SOURCE QUALITY CONTROL AND TESTS

- A. Refer to Section 01 40 00 “Quality Requirements”

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify compacted granular subbase is dry and ready to support sidewalk and imposed loads.
- B. Verify gradients and elevations of base are correct.

3.2 PREPARATION

- A. Moisten substrate to minimize absorption of water from fresh concrete.
- B. Notify Engineer minimum 24 hours prior to commencement on concreting operations.

3.3 FORMING

- A. Place and secure forms and screeds to correct location, dimension, profile, and gradient.
- B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
- C. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

3.4 REINFORCING

- A. Place reinforcing as indicated on Drawings.
- B. Interrupt reinforcing at expansion joints.
- C. Place dowels to achieve paving and curb alignment as detailed.

3.5 PLACING CONCRETE

- A. Place concrete in accordance with ACI 301, 305, and 306.
- B. Ensure reinforcing, inserts, embedded parts, and formed joints are not disturbed during concrete placement.
- C. Place concrete continuously over the full width of the panel and between predetermined construction joints. Do not break or interrupt successive pours that cold joints occur.
- D. Place concrete to pattern indicated.

3.6 JOINTS

- A. Place expansion joints at 50-foot intervals. Align sidewalk joints.
- B. Place joint filler between paving components and building or other appurtenances. Recess top of filler ¼ inch for sealant installation.
- C. Provide scored or sawn joints at 5 feet intervals between sidewalks and curbs and between curbs and paving.
- D. Saw cut contraction joints 3/16-inch wide at an optimum time after finishing. Cut 1/3 into depth of slab. Concrete pavement joints shall be constructed in accordance with the type dimensions and at the locations required by the Drawings unless directed otherwise by the Engineer. Concrete pavement joints shall comply with all applicable provisions of Section 501.14 of the INDOT Standard Specifications.
 - 1. The backer rod shown in the expansion joint detail shall be “Cera-rod” as manufactured by W.R. Meadows or-equal.

2. The joint sealer shall be “Pourthane” as manufactured by W.R. Meadows or-equal.

3.7 FINISHING

- A. Sidewalk Paving: Light broom and trowel joint edges.
- B. Curbs and Gutters: Light broom.
- C. Direction of Texturing: Transverse to paving direction.
- D. Place curing compound sealer on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer’s instructions.

3.8 JOINT SEALING

- A. Separate pavement from vertical surfaces with ½-inch thick joint filler.
- B. Place joint filler in pavement pattern placement sequence. Set top to required elevations. Secure to resist movement from wet concrete.
- C. Extend joint filler from bottom of pavement to within ¼ inch of finished surface.

3.9 ERECTION TOLERANCES

- A. Section 01 40 00 “Quality Requirements”
- B. Maximum Variation of Surface Flatness: ¼ inch in 10 ft.
- C. Maximum Variation From True Position: ¼ inch.

3.10 FIELD QUALITY CONTROL

- A. Section 01 40 00 “Quality requirements”: Field inspecting, testing, adjusting, and balancing.
- B. Inspect remaining placement for size, spacing, location, support.

3.11 PROTECTION

- A. Immediately after placement, protect paving from premature drying, excessive hot or cold temperatures, and mechanical injury.
- B. Do not permit vehicular traffic over paver for 7 days minimum after finishing or until 75 percent design strength of concrete has been achieved.

END OF SECTION 32 16 23

SECTION 32 17 23 - PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes painted markings applied to asphalt and concrete pavement.

1.2 FIELD CONDITIONS

- A. Environmental Limitations: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F for alkyd materials, 55 deg F for water-based materials, and not exceeding 95 deg F.

1.3 REFERENCES

- A. International Code Council
 - 1. ICC A117.1 - Accessible and Usable Buildings and Facilities

PART 2 - PRODUCTS

2.1 PAINT

- A. White Traffic Paint: DuPont #LF32M30P, Hawkins-Hawkins Co. #V10-31, or equal.
- B. Yellow Traffic Paint: DuPont #112-8049, Hawkins-Hawkins Co. #V10-32, or equal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that pavement is dry and in suitable condition to begin pavement marking according to manufacturer's written instructions.
- B. Proceed with pavement marking only after unsatisfactory conditions have been corrected.

3.2 PAVEMENT MARKING

- A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with the Owner/Engineer.

- B. Allow paving to age for a minimum of 30 days before starting pavement marking.
- C. Sweep and clean surface to eliminate loose material and dust.
- D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated on Drawings, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.
 - 1. Apply graphic symbols and lettering with paint-resistant, die-cut stencils, firmly secured to pavement. Mask an extended area beyond edges of each stencil to prevent paint application beyond stencil. Apply paint so that it cannot run beneath stencil.
 - 2. Broadcast glass beads uniformly into wet markings at a rate of 6 lb/gal..

3.3 PROTECTING AND CLEANING

- A. Protect pavement markings from damage and wear during remainder of construction period.
- B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 32 17 23

SECTION 32 92 19 - SEEDING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Preparation of subsoil.
2. Topsoil materials.
3. Placing topsoil.
4. Fertilizing.
5. Seeding.
6. Mulching.
7. Maintenance.

1.2 REFERENCES

- A. Indiana Storm Water Quality Manual
- B. Indiana Department of Transportation (INDOT) Standard Specifications.

1.3 DEFINITIONS

- A. Weeds: Vegetative species other than specified species to be established in given area.

1.4 SUBMITTALS

- A. Section 01 33 00 "Submittal Procedures"
- B. Materials Source: Submit name of imported materials source.
- C. Product Data: Submit data for seed mix, fertilizer, mulch, imported topsoil, soil amendments and other accessories.

1.5 QUALITY ASSURANCE

- A. Furnish imported topsoil material from single source throughout the Work.
- B. Furnish seed from single source throughout the Work.
- C. Tab each seed sack in accordance with the agricultural seed laws of the United States and the State of Indiana. Provide seed mixture in containers showing percentage of seed mix, germination percentage, inert matter percentage, weed percentage, year of production, net weight, date of packaging, location of packaging, and the tests by which the percentages were

determined. Provide seed for this project having a test date within 6 months of the date of sowing.

- D. Perform Work according to Indiana Storm Water Quality Manual Standards and INDOT Standard Specifications.

1.6 QUALIFICATIONS

- A. Seed Supplier: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing work of this section with minimum 3-years of experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 "Product Requirements"
- B. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable.
- C. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

1.8 PROJECT CONDITIONS

- A. Environmental Requirements:
 - 1. Proceed with and complete lawn and grass planting as rapidly as portions of the Site become available, working within the seasonal limitations for each type of lawn and grass planting required.
 - 2. Proceed with planting only when current and forecasted weather conditions are favorable to successful planting and establishment of lawns and grasses.
 - a. Do not spread seed when wind velocity exceeds five miles per hour.
 - b. Do not plant when drought, or excessive moisture, or other unsatisfactory conditions prevail.
 - c. Sow grass seed between August 15th and October 15th or between March 15th and June 1st.
 - 3. Begin maintenance immediately after each area is planted and continue until acceptable growth is established.
 - 4. Due to the project proximity to adjacent waterways, herbicides, chemicals and insecticides shall not be used.

1.9 MAINTENANCE SERVICE

- A. Refer to Section 01 73 00 "Execution"
- B. Refer to Section 01 77 00 "Closeout Procedures"
- C. Maintain seeded areas immediately after placement until grass is well established and exhibits vigorous growing condition.
- D. Special Warranties: The Contractor shall guarantee a good stand of grass in seeded areas by watering, regrading and reseeding eroded areas and otherwise maintaining all seeded areas until final acceptance. Any areas which do not show a uniform stand or have bare spots shall be reseeded and remulched at the Contractor's expense with the same seed mixture and mulch as originally used thereon and such reseeding and remulching shall be repeated until all affected areas are covered with grass.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. Topsoil: Fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, taken from drained site; free of subsoil, clay or impurities, plants, weeds and roots; pH value of minimum 5.4 and maximum 7.0.
 - 1. May be excavated from site. Must be free from weeds.
- B. Provide topsoil with a mechanical analysis as follows:

<u>Sieve</u>	<u>Percentage Passing</u>
1 inch	100
¼ inch	97-100
No. 100	40-60

2.2 SEED MIXTURE

- A. Within riparian corridor:
 - 1. To the extent practicable, revegetation must restore species native to the site.
 - 2. If revegetation with native species is not practicable, revegetation shall be performed by the planting of a mixture of red clover, orchard grass, timothy and/or perennial rye grass.
 - 3. In no case shall Tall Fescue be used to revegetate disturbed areas.
- B. Outside riparian corridor:

1. Provide fresh, clean, new-crop seed complying with the tolerance for purity and germination established by INDOT 621. Provide seed of the grass species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed, as specified. Apply lawn grass seed at proportioned by weight as follows:
 - a. 50 percent Premium Grade Kentucky Bluegrass (2 types).
 - b. 50 percent perennial ryegrass (2 types).
 - c. 0 percent noxious weeds.

2.3 ACCESSORIES

- A. Mulching Material: Dry, clean, mildew free and certified seed-free and weed-free and free from other foreign matter detrimental to plant life. Mulch may consist of straw, wood cellulose fiber, or biodegradable erosion control blanket.
- B. Fertilizer: Commercial grade; recommended for grass; of proportion necessary to eliminate deficiencies of topsoil, and meeting standard of the Indiana State Seed Commissioner.
- C. Water: Clean, fresh and free of substances or matter capable of inhibiting vigorous growth of grass.
- D. Stakes: Softwood lumber, chisel pointed.
- E. String: Inorganic fiber.

2.4 SOURCE QUALITY CONTROL

- A. Section 01 40 00 "Quality Requirements"
- B. Analyze topsoil to ascertain percentage of nitrogen, phosphorus, potash, soluble salt content, organic matter content, and pH value.
- C. Provide recommendation for fertilizer and lime application rates for specified seed mix as a result of topsoil testing.
- D. Testing is not required when recent tests and certificates are available for imported topsoil. Submit these test results to testing laboratory. Indicate, by test results, information necessary to determine suitability.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify trench backfilling has been inspected.
- B. Verify prepared soil base is ready to receive the Work of this section.

3.2 STOCKPILING

- A. Stockpile topsoil materials on site at locations approved by Owner in sufficient quantities to meet Project schedule and requirements.
- B. Separate differing materials with dividers or stockpile apart to prevent mixing. Prevent intermixing of soil types or contamination.
- C. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.
- D. Stockpile Cleanup: Remove stockpile, leave area in clean and neat condition. Grade site to prevent free standing surface water.

3.3 PREPARATION OF SUBSOIL

- A. Prepare sub-soil to eliminate uneven areas and low spots. Maintain lines, levels, profiles and contours. Make changes in grade gradual. Blend slopes into level areas.
- B. Remove foreign materials, weeds and undesirable plants and their roots. Remove contaminated sub-soil.
- C. Scarify subsoil to depth of 3 inches where topsoil is to be placed. Repeat cultivation in areas where equipment, used for hauling and spreading topsoil, has compacted sub-soil.

3.4 PLACING TOPSOIL

- A. Disking: Before the application of topsoil or seeding, disk the area to be seeded with groundcover to a depth of 6 inches. Continue the disking until the subsoil surface is sufficiently broken to provide a good bond between subsoil and topsoil.
- B. Spread topsoil to minimum depth of 6 inches over area to be seeded. Rake until smooth.
- C. Place topsoil during dry weather and on dry unfrozen subgrade.
- D. Remove vegetable matter and foreign non-organic material from topsoil while spreading.
- E. Grade topsoil to eliminate rough, low or soft areas, and to ensure positive drainage.
- F. Remove surplus subsoil and topsoil from site.
- G. Prohibit construction traffic over topsoil.

3.5 FERTILIZING

- A. Apply lime at application rate recommended by soil analysis. Work lime into top 6 inches of soil.
- B. Apply fertilizer at application rate recommended by soil analysis.

- C. Apply after smooth raking of topsoil.
- D. Do not apply fertilizer at same time or with same machine used to apply seed.
- E. Mix fertilizer thoroughly into upper 2 inches of topsoil.
- F. Lightly water soil to aid dissipation of fertilizer. Irrigate top level of soil uniformly.

3.6 SEEDING

- A. Maintain grade stakes until removal is mutually agreed upon by all parties concerned.
- B. Rake or harrow all seedbeds immediately prior to seeding to produce a rough, grooved surface, no deeper than 1 inch. Seed only when seedbed is in a friable condition and not muddy or hard.
- C. Sow seed using a spreader or seeding machine. Distribute seed evenly over entire area by sowing equal quantity in two directions at right angles to each other.
- D. Sow lawn grass seed mixture at the rate of not less than 5 pounds for every 1,000 square feet.
- E. Do not sow immediately following rain, when ground is too dry, or when winds are over 12 mph.
- F. All seeded areas shall be thoroughly mulched by a method approved by the Engineer. Mulching material shall be applied uniformly in a continuous blanket at a rate of 92 pounds per 1,000 square feet. Mulch shall be punched into the soil so that it is partially covered. The punching operation shall be performed longitudinally with a mulch tiller. Care shall be exercised to obtain a reasonably even distribution of mulch incorporated into the soil.
- G. Do not seed areas in excess of that which can be mulched on same day.
- H. Reseed areas that remain without mulch for longer than 3 days.
- I. Using a uniform fine spray, irrigate lawn and grass plantings as required to obtain adequate establishment of lawns and grasses.
- J. Pesticide use is strictly prohibited.
- K. Prevent foot or vehicular traffic, or the movement of equipment, over the mulched areas. Reseed areas damaged as a result of such activity.

3.7 ACCEPTANCE

- A. Work will be considered acceptable when a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 square feet and bare spots not exceeding 5 inches by 5 inches.
- B. Where seeding areas do not comply with specified acceptance criteria, reestablish lawns and grasses and continue extended service period until lawns and grasses comply with criteria for acceptance.

3.8 CLEANUP AND PROTECTION

- A. Promptly remove soil and debris, created by lawn and grass Work, from paved areas. Clean wheels of vehicles before leaving Site to avoid tracking soil and topsoil onto roads, walks, or other paved areas.
- B. Erect barricades and warning signs as required protecting newly planted areas from traffic. Maintain barricades throughout extended service period and remove when service period ends. Treat, repair or replace damaged lawns and meadows.

END OF SECTION 32 92 19

(NO TEXT FOR THIS PAGE)

SECTION 33 01 10.58 - DISINFECTION OF WATER UTILITY PIPING SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following: Disinfection of all pipelines, tanks, structures, conduits and equipment which are to store, handle or carry potable water. Furnish all labor, water, chemicals and equipment, including taps, corporation stops, temporary pumps and other items necessary to perform the Work, except as otherwise specified.

1.3 REFERENCES

- A. Codes and standards referred to in this Section are:
 - 1. AWWA C651 - Disinfecting Water Mains
 - 2. AWWA C655 – Field Dechlorination

1.4 QUALITY ASSURANCE

- A. Disinfection Standards: Disinfect in accordance with AWWA C651 for water mains.
 - 1. Prior to disinfecting contact Michigan City Department of Water Works (MCDWW) to determine disinfection requirements and then compare them to AWWA C651. Disinfect in accordance with whatever standard is more stringent.
- B. Chlorinated Water Disposal: Dispose of old highly chlorinated water in accordance with applicable regulations.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 APPLICATION

- A. Flushing: Flush water mains and fire hydrants prior to disinfection. Flush water mains with a flushing velocity of at least 2.5 feet per second. The following are flows required to provide a flushing velocity of 2.5 feet per second. Flush water mains and hydrants until the water discharged is clear.

<u>Pipe Size</u>	<u>Inside Diameter</u>	<u>Flow at a Velocity of 2.5 Feet per Second</u>
½"	0.622"	2.4 gpm
¾"	0.824"	4.2 gpm
1"	1.05"	6.8 gpm
1¼"	1.38"	12 gpm
1½"	1.61"	16 gpm
2"	2.07"	27 gpm
2½"	2.47"	38 gpm
3"	3.07"	58 gpm
4"	4"	98 gpm
6"	6"	220 gpm

- 3.2 Disinfection Procedures for Piping shall meet the requirements of AWWA C651. The specific method for disinfection will be presented to the Michigan City Department of Water Works (MCDWW) for approval prior to construction. The approved disinfection process will then be coordinated with MCDWW. MCDWW will verify adequate levels of disinfectant. Dechlorination processes will be coordinated with MCDWW.

3.3 VERIFICATION OF DISINFECTION

- A. Final Samples: Bacteriological samples will be collected and analyzed by MCDWW.
1. The contractor will assume the expense of subsequent disinfection or disinfection method changes and follow-up testing if satisfactory sample results cannot be obtained.
 2. The contractor shall install 1-inch taps at requested intervals and piping sufficient to allow MCDWW personnel to sample without entering an excavation. Sampling will be done in a minimum of five segments.
 3. Samples will be considered satisfactory when samples on two consecutive days for a segment pass.

4. Additional pipe shall not be installed until a segment has satisfactory results unless the flushing and sampling locations for the segment in testing can remain in service.

END OF SECTION 33 01 10.58

(NO TEXT FOR THIS PAGE)

SECTION 33 01 30.13 – SEWER, FORCE MAIN AND MANHOLE TESTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Testing of Gravity Sewer Piping:
 - a. Infiltration testing.
 - b. Deflection testing.
2. Testing of Force Main
 - a. Pressure Testing
3. Testing of Manholes:
 - a. Vacuum testing.
4. Testing of Valves

B. Related Requirements:

1. Section 33 05 13 “Precast Concrete Wastewater Utility Structures”
2. Section 33 31 13 “Sanitary Utility Sewerage Piping”
3. Section 33 32 19 “Public Utility Wastewater Pumping Stations”
4. Section 33 34 00 “Sanitary Sewer, Force Main”
5. Appendix D - Michigan City Sanitary District Sanitary Sewer Specifications

1.2 REFERENCE STANDARDS

A. ASTM International:

1. ASTM C1244 - Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill.
2. ASTM D2122 - Standard Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings.
3. ASTM F1417 – Standard Practice for Installation Acceptance of Plastic Non-Pressure Sewer Lines Using Low-Pressure Air

B. American Water Works Association:

1. AWWA C600 - Installation of Ductile Iron Mains and Their Appurtenances.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures
- B. Submit following items prior to start of testing:
 - 1. Testing procedures.
 - 2. List of test equipment.
 - 3. Testing sequence schedule.
 - 4. Provisions for disposal of flushing and test water.
 - 5. Certification of test gage calibration.
 - 6. Deflection mandrel drawings and calculations.
- C. Test and Evaluation Reports: Indicate results of manhole and piping tests.

PART 2 - PRODUCTS

2.1 VACUUM TESTING

- A. Equipment:
 - 1. Vacuum pump.
 - 2. Vacuum line.
 - 3. Vacuum Tester Base:
 - a. Compression band seal.
 - b. Outlet port.
 - 4. Shutoff valve.
 - 5. Stopwatch.
 - 6. Plugs.
 - 7. Vacuum Gage: Calibrated to 0.1 in. Hg.

2.2 INFILTRATION TESTING

- A. Equipment: Weirs.

2.3 DEFLECTION TESTING

- A. Equipment:
 - 1. "Go, no go" mandrels.
 - 2. Pull/retrieval ropes.

2.4 LOW PRESSURES AIR TEST

A. Equipment:

1. Plugs.
2. Compressor.
3. Piping for air lines.
4. Pressure gauge.

2.5 HYDROSTATIC TESTING

A. Equipment:

1. Hydrostatic water pump.
2. Pneumatic or mechanical plugs.
3. Hoses.
4. Pressure gauge.

2.6 VALVE TESTING

A. Equipment:

1. Hydrostatic water pump.
2. Pneumatic or mechanical plugs.
3. Hoses.
4. Tools for opening/closing valves.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Refer to Section 01 73 00 "Execution" and Section 01 77 00 "Closeout Requirements"
- B. Verify that manholes and piping are ready for testing.
- C. Verify that trenches are backfilled.
- D. Verify that pressure piping thrust restraint system is installed.

3.2 PREPARATION

- A. Refer to Section 01 73 00 "Execution" and Section 01 77 00 "Closeout Requirements"
- B. Lamping:
 1. Lamp gravity piping after flushing and cleaning.

2. Perform lamping operation by shining light at one end of each pipe section between manholes.
3. Observe light at other end.
4. Pipe not installed with uniform line and grade will be rejected.
5. Remove and reinstall rejected pipe sections.
6. Reclean and lamp until pipe section is installed to uniform line and grade.

C. Plugs:

1. Plug outlets, wye branches, and laterals.
2. Brace plugs to resist test pressures.

3.3 FIELD QUALITY CONTROL

A. Refer to Section 01 73 00 "Execution" and Section 01 77 00 "Closeout Requirements"

B. Coordination with Owner Requirements

1. Prior to performing tests, review requirements of this section with those outlined in Appendix D. Use more stringent requirement.

C. Infiltration Testing:

1. Maximum Allowable Infiltration: 100 gal./in. of pipe diameter for each mile per day for reach of piping undergoing testing.
2. Include allowances for leakage from manholes.
3. Perform testing with minimum positive head of 2 feet.

D. Deflection Testing of Plastic Sewer Piping:

1. Perform vertical ring deflection testing on PVC sewer piping after backfilling has been in place for at least 30 days but not longer than 12 months.
2. Allowable maximum deflection for installed plastic sewer pipe is no greater than five percent of original vertical internal diameter.
3. Perform deflection testing using properly sized rigid ball or "go, no go" mandrel.
4. Furnish rigid ball or mandrel with diameter not less than 95 percent of base or average inside diameter of pipe, as determined by ASTM standard to which pipe is manufactured; measure pipe diameter in compliance with ASTM D2122.
5. Perform testing without mechanical pulling devices.
6. Locate, excavate, replace, and retest piping that exceeds allowable deflection.

E. Low Pressure Air Test – Gravity Sewers

1. Testing Procedure: Test gravity sewers using low-pressure air in accordance with ASTM F 1417
 - a. Isolate the section of sewer under test using pneumatic plugs that have a sealing length greater than the diameter of the pipe and are capable of resisting test

- pressure without external bracing or blocking. It is advisable to plug the upstream end of the line first to prevent any upstream water from collecting in the test line.
- b. Introduce low pressure air slowly into the sealed line until the internal air pressure reaches the “starting air pressure” of 4.0 psig greater than the average back pressure of any groundwater above the pipe, but not greater than 6.0 psig.
 - c. After the starting air pressure is reached, throttle the air supply to maintain that internal pressure for at least two minutes. This time permits the temperature of the entering air to equalize with the temperature of the pipe wall.
 - d. When temperatures have been equalized and the starting pressure stabilized, disconnect the air supply and allow pressure to drop. Observe the continuous monitoring pressure gauge while the pressure is decreased to no more than 0.5 psig from the starting air pressure. The time in minutes required for the pressure to drop 0.5 psig must not be less than as calculated using the following formula.

$$T = \frac{0.085 \times (D) \times (D)}{60 \times Q \times 2}$$

Where:

T = Shortest time, in minutes, allowed for the air pressure to drop 0.5 psig

K = 0.000419 x (D) x (L), but NOT less than 1.0

Q = Leak rate, 0.0015 cubic feet per minute per square feet of internal surface

D = Inside pipe diameter, in inches

L = Length of pipe being tested, in feet

F. Pressure (Hydrostatic) Tests of Exposed or Buried Force Mains

1. Perform testing of both the existing force mains and new force main constructed. Perform test of existing force main prior to beginning lift station work to determine suitability for re-use.
2. Testing: Completely backfill all harnessed sections of buried piping before such sections are tested.
 - a. Pressure test buried or concealed pipelines for leakage by maintaining the fluid in the pipe at the specified pressure for a minimum period of 4 hours.
 - b. Pressure test the piping for leakage as a whole or in sections, valved or bulkheaded at the ends. Apply the specified pressure to the piping through a tap in the pipe by means of a hand pump or other approved method. Do not use air for testing.
3. Test Pressures: Test the piping at a minimum of 100 psi.
4. Allowable Leakage: Stop all visible leakage. Do not allow leakage for any piping, as determined by the above test, to exceed the allowable leakage of whichever guideline is more stringent of the following:
 - a. As given by the following formula in Section 5.2 of AWWA C600:

$$L = \frac{S \times D \times (P)^{1/2}}{148,000}$$

in which L is the allowable leakage in gallons per hour, S is the length of water main tested in feet, D is nominal diameter of the pipe in inches and P is the average test pressure in psi gauge.

OR

- b. Ten (10) gallons per inch diameter per mile per day as defined by Appendix B.

G. Manhole Testing:

1. If air testing, test whenever possible prior to backfilling in order to more easily locate leaks.
2. Repair both outside and inside of joint to ensure permanent seal.
3. Test manholes with manhole frame set in place.
4. Vacuum Testing:
 - a. Comply with ASTM C1244.
 - b. Plug pipe openings; securely brace plugs and pipe.
 - c. Inflate compression band to 40 psi. Create seal between vacuum base and structure.
 - d. Connect vacuum pump to outlet port with valve open, then draw vacuum to 10 in. Hg.
 - e. Close valve.
 - f. Manhole Test Duration in Seconds:
 - 1) Diameter 4 Feet: 60.
 - 2) Diameter 5 Feet: 75.
 - 3) Diameter 6 Feet: 90.
 - g. Record vacuum drop during test period.
 - h. If vacuum drop is greater than 1 in. Hg during testing period, repair and retest manhole.
 - i. If vacuum drop of 1 in. Hg does not occur during test period, manhole is acceptable; discontinue testing.
 - j. If vacuum test fails to meet 1 in. Hg drop in specified time after repair, repair and retest manhole.
5. If unsatisfactory testing results are achieved, repair manhole and retest until result meets criteria.
6. Repair visible leaks regardless of quantity of leakage.

H. Valve Testing

1. Testing: Operate valves in the section under test through several complete cycles of closing and opening. In addition, have the test pressure for each valve, when in the closed position, applied to one side of the valve only. Test each end of the valve in this manner.
2. Test Pressure: Test each valve at the same test pressure as that specified for the pipe in which the valve is installed.
3. Leakage: Stop all external and internal leakage through the valves.
4. Movement: Stop all valve movement or structural distress.

END OF SECTION 33 01 30.13

SECTION 33 05 05.31 - HYDROSTATIC TESTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawing and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following: Hydrostatic testing of all raw water transmission and finished water mains installed. Furnish all items necessary to perform the Work, except as otherwise specified.

1.3 REFERENCES

- A. AWWA C600-17 – Installation of Ductile Iron Water Mains and Their Appurtenances
- B. AWWA C504-15 – Rubber Seated Butterfly Valves
- C. AWWA C502 - Dry-Barrel Fire Hydrants
- D. AWWA C509 - Resilient-Seated Gate Valves for Water Supply Service

1.4 QUALITY ASSURANCE

- A. Test procedures should be performed to meet the requirements of AWWA Standard C605-13.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TESTING

- A. Hydrostatic tests shall be performed on all water mains installed. Make arrangements with the Michigan City Department of Water Works and Owner's representative for scheduling each test. Each test shall be performed on the day mutually agreed upon and in the presence of the Michigan City Department of Water Works and Owner's Representative.

- B. Furnish equipment, temporary piping, pumps, fittings, gauges, and operating personnel necessary to conduct the tests. Water for testing may be obtained from the Michigan City Department of Water Works.
- C. The water mains may be tested in sections between valves when there is one or more intermediary valves in a water main, as coordinated and approved by the Michigan City Department of Water Works. At a minimum, the Michigan City Department of Water Works anticipates pressure testing the main in eleven (11) segments:
1. From connection to existing system through pipe under I-94,
 2. On 950W, half-way between I-94 and 300N,
 3. On 950W at 300N,
 4. On 300N, half-way between 950W and US421,
 5. On 300N, East of US421
 6. On 300N, immediately West of US421,
 7. On 300N, immediately East of pipeline crossing,
 8. On 300N, immediately West of pipeline crossing,
 9. On 300N, West end of pipe,
 10. West Side pipe US421,
 11. East Side pipe US421.
- D. Expel all air from the water main test section during the filling of the main and prior to the application of test pressure. Tap the water main at high points, if necessary, to release all air from the water main. Plug taps after the test is successfully completed. Plugs shall be watertight.
- E. Test water mains at a static pressure of 150 pounds per square inch over a period of two consecutive hours.
1. Do not allow leakage for water mains to exceed the pound per square inch specified by the following formula in Section 5.2 of AWWA C600.

$$L = \frac{SxDx(P)^{1/2}}{148,000}$$

in which L is the allowable leakage in gallons per hour, S is the length of water main tested in feet, D is the nominal diameter of the pipe in inches, and P is the average test pressure in psi gauge.

2. The test will be considered successful when the pressure drop over the test period is the determined value or less.

END OF SECTION 33 05 05.31

SECTION 33 05 07.13 - UTILITY DIRECTIONAL DRILLING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This Section includes requirements for the installation of the sanitary force mains and finished water mains using the horizontal directional drilling method.

1.2 RELATED DOCUMENTS

- A. Section 01 33 00 "Submittal Procedures"
- B. Section 33 05 05.31 "Hydrostatic Testing"
- C. Section 33 14 13 "Public Water Utility Piping"
- D. Section 33 34 00 "Sanitary Sewer, Force Main"

1.3 GENERAL

- A. The minimum depth of soil cover above the crown of the pipe shall be 5 feet.

1.4 REFERENCES

- A. Codes and Standards referred to in this Section are:
 - 1. ANSI/AWWA C150/A21.50 - Thickness Design of Ductile-Iron Pipe
 - 2. ANSI/AWWA C111/A21.11 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
 - 3. ASTM D3261 – Butt Fusion High Density Polyethylene Pipe and Fittings
 - 4. ANSI/AWWA C906 - Sewer Pipe and Fittings for High Density Polyethylene Pipe

1.5 QUALITY ASSURANCE

- A. The project superintendent on the horizontal directional drilling (HDD) portion of the work shall furnish satisfactory evidence that he has a minimum of five (5) years of HDD experience and shall have worked on at least two (2) HDD projects in similar ground conditions using similar equipment as required on this project. The machine operator shall have attended training sessions on the equipment to be utilized and shall have at least three (3) years of HDD experience and shall have operated similar machinery on at least one (1) HDD project using similar equipment.

- B. The Contractor shall establish and maintain quality control for operations under this Section to assure conformance with contract requirements and shall maintain records of his quality control for materials, equipment, and construction operations including, but not limited to, the following:
 - 1. Check selected pipe material for conformance to contract specifications and to certification tests.
 - 2. Check manufacturer's requirements for proper pipe handling and storage.
 - 3. Review pipe installation procedure with the Engineer.
- C. Perform hydrostatic tests as specified in Section 33 05 05.31.

1.6 SUBMITTALS

- A. Submittals shall be as specified in the General Conditions and Section 01 33 00 "Submittal Procedures".
- B. Submit the following:
 - 1. Detailed description of the procedures including construction techniques.
 - 2. Literature describing in detail the drilling system to be used.
 - 3. Working drawings:
 - a. Approximate layout of boring and receiving locations, and associated equipment at each location.
 - b. Electrical system.
 - c. Grade and alignment control system details.
 - d. Groundwater control provision of drilling equipment, if required.
 - 4. Certification from the pipe manufacturer that the pipe and pipe joints are manufactured for drilling installation and conform to current specifications.
 - 5. Qualifications and experience record of the drilling superintendent, and machine operators.
 - 6. As-built drawings showing actual location of installed pipe.

PART 2 - PRODUCTS

2.1 DUCTILE IRON PIPE

- A. Ductile Iron pipe shall conform to the requirements listed in Section 33 14 13.
- B. Joining Systems
 - 1. Pipes shall be jointed to one another by restrained flexible joints suitable for directional drilling as specified in Section 33 14 13.
 - 2. The tensile strength at yield of the joints shall not be less than the pipe.

C. Tests

1. General - Tests for compliance with this Specification shall be made as specified herein and according to the applicable ASTM specifications. A certificate of compliance with these specifications, along with a report of each test, shall be furnished by the manufacturer for all material furnished under this specification. In addition, the purchaser may, at his own expense, witness inspection and test of the materials.
2. Tensile Properties - The tensile strength, yield strength, elongation, and elastic modulus of the material shall be determined as specified in ANSI/AWWA C150/A21.50 Section 33 14 13.

D. Rejection

1. Ductile iron pipe and fittings may be rejected for failure to meet any of the requirements of this specification.

2.2 HIGH DENSITY POLYETHYLENE PIPE

- A. High Density Polyethylene pipe shall conform to the requirements listed in Section 33 34 00.

B. Joining Systems

1. Pipes shall be joined to one another by restrained flexible joints suitable for Section 33 34 00.

C. Tests

1. General - Tests for compliance with this Specification shall be made as specified herein and according to the applicable ASTM specifications. A certificate of compliance with these specifications, along with a report of each test, shall be furnished by the manufacturer for all material furnished under this specification. In addition, the purchaser may, at his own expense, witness inspection and test of the materials.
2. Tensile Properties - The tensile strength, yield strength, elongation, and elastic modulus of the material shall be determined as specified in ANSI/AWWA C906 Section 33 34 00.

E. Rejection

1. High Density Polyethylene pipe and fittings may be rejected for failure to meet any of the requirements of this specification.

PART 3 - EXECUTION

3.1 GENERAL

- A. The ductile iron piping and fittings shall be installed in accordance with ANSI/AWWA C111/A21.11, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings, and with the guidelines and recommendations of the manufacturer.
- B. The high density polyethylene piping and fittings shall be installed in accordance with ANSI/AWWA C906, Butt Fusion Joints for High Density Polyethylene Pipe and Fittings, and with the guidelines and recommendations of the manufacturer.
- C. The pipe shall be installed in the location to the line and grade as shown in the Drawings.
- D. All materials delivered to the project for work on the project shall be neatly piled. Excavated materials which are not removed from the immediate site of the work shall be kept trimmed up so as to cause as little inconvenience to the owners of neighboring property and to the public, as possible. Gutters, driveways, and street crossings shall be kept clear except when the latter are unavoidably obstructed by open trench.
- E. Excavated material, including but not limited to, pipe, pavement, concrete, and concrete rubble, and masonry units, which is unsuitable for backfill and all excavated material which has not been used for backfill shall, upon completion of the project, be removed from the site of the work by the Contractor at his own expense.
- F. Pipe crossing alignment shall be laid out by the Surveyor confirming accurate horizontal distances, either physically measured or shot by Electronic Distance Measurement. Entry and exit points shall be located and marked with survey hubs or markers.
- G. The drill and pipe staging areas shall be kept neat and orderly and disturb as little area as possible.
- H. A drilling fluid shall be used in connection with the installation of the proposed pipe into the hole. Prior to installation of the pipe into the hole, the Contractor should determine whether a cement or bentonite slurry shall be used as a supplement. If sub-surface conditions contain predominantly clayey soils, then the bentonite slurry should be used. Polymers can be used, if appropriate. Drilling fluid, when used for the installation of potable watermain shall be NSF certified for use with potable watermain.
- I. Mud and slurry material displaced by the pipe during installation and during drilling operations shall be deposited in watertight containers and hauled off by a vacuum truck to a certified receiving site.

3.2 TESTS AND INSPECTIONS

- A. All installed pipe shall be subjected to a water tightness test as provided in Section 33 05 05.31, Hydrostatic Testing.

END OF SECTION 33 05 07.13

SECTION 33 05 13 – PRECAST CONCRETE WASTEWATER UTILITY STRUCTURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Modular precast concrete manhole structures with tongue-and-groove joints and transition to cover frame, covers, anchorage, and accessories.
2. Bedding and cover materials.

B. Related Requirements:

1. Section 31 23 16 “Excavation”
2. Section 31 23 23 “Fill”
3. Section 33 01 30.13 “Sewer and Manhole Testing”
4. Section 33 31 13 “Public Sanitary Utility Sewerage Piping”

1.2 REFERENCE STANDARDS

A. ASTM International:

1. ASTM C478 - Standard Specification for Precast Reinforced Concrete Manhole Sections.
2. ASTM C913 - Standard Specification for Precast Concrete Water and Wastewater Structures.

1.3 SUBMITTALS

A. Refer to Section 01 33 00 “Submittal Procedures”.

B. Product Data: Submit data for manhole covers, component construction, features, configuration, dimensions, and all accessories. Provide evidence of compliance with the noted ASTM Standards.

C. Shop Drawings:

1. Indicate structure locations and elevations, sections, riser rings.
2. Indicate sizes and elevations of piping, conduit, penetrations, and accessories.

D. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

1.4 QUALITY ASSURANCE

A. Refer to Section 01 40 00 “Quality Requirements”.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum five years' experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 "Product Requirements".
- B. Comply with precast concrete manufacturer's instructions and ASTM C913 for unloading, storing, and moving precast structures.
- C. Storage:
 - 1. Store precast concrete structures to prevent damage to Owner's property or other public or private property.
 - 2. Repair property damaged from materials storage.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cover and Bedding:
 - 1. As specified in Section 31 23 23 "Fill".

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Refer to Section 01 73 00 "Execution" and Section 01 77 00 "Closeout Requirements".
- B. Verify that items provided by other Sections of Work are properly sized and located.
- C. Verify that piping connections, sizes, locations, and inverts are as indicated on Drawings.
- D. Verify that built-in items are in proper location and are ready for roughing into Work.
- E. Verify correct size of structure excavation.

3.2 PREPARATION

- A. Refer to Section 01 73 00 "Execution" and Section 01 77 00 "Closeout Requirements".

- B. Mark each precast structure by indentation or waterproof paint showing date of manufacture, manufacturer, and identifying symbols and numbers as indicated on Drawings to indicate its intended use.
- C. Coordinate placement of inlet and outlet pipe required by other Sections.
- D. Do not install structures where Site conditions induce loads exceeding structural capacity of manholes or structures.
- E. Inspect precast structures immediately prior to placement in excavation to verify that they are internally clean and free from damage; remove and replace damaged units.

3.3 INSTALLATION

- A. Excavation and Backfill:
 - 1. Excavate for structures as specified in Section 31 23 16 "Excavation" and in indicated locations and depths.
 - 2. Provide clearance around sidewalls structure for construction operations.
 - 3. If groundwater is encountered, prevent accumulation of water in excavations; place structure in dry trench.
 - 4. Where possibility exists of structure becoming buoyant in flooded excavation, anchor structure to avoid flotation, as approved by Engineer.
- B. Install structures supported at proper grade and alignment on crushed stone bedding as indicated on Drawings.
- C. Backfill excavations for manholes and structures as specified in Section 31 23 23 "Fill".
- D. Cut and fit for pipe.
- E. Grout base of shaft sections to achieve slope to exit piping, trowel smooth, and contour to form continuous drainage channel. See Section 03 30 00 "Cast-In-Place Concrete" for information on grouting.
- F. Paint interior with two coats of bituminous interior coating at direction of the Owner.
- G. Set manhole cover frames and covers level to correct elevations without tipping.
- H. Precast Concrete Manholes and Structures:
 - 1. Lift precast components at lifting points designated by manufacturer.
 - 2. When lowering manholes and structures into excavations and joining pipe to units, take precautions to ensure that interior of pipeline and structure remains clean.
 - 3. Set precast structures, bearing firmly and fully on crushed stone bedding, compacted as specified in Section 31 23 23 "Fill" or on other support system as indicated on Drawings.
 - 4. Assembly:
 - a. Assemble multi-section manholes and structures by lowering each section into excavation.

- b. Install rubber gasket joints between precast sections according to manufacturer's recommendations.
 - c. Lower, set level, and firmly position base section before placing additional sections.
 - 5. Remove foreign materials from joint surfaces and verify sealing materials are placed properly.
 - 6. Maintain alignment between sections by using guide devices affixed to lower section.
 - 7. Joint sealing materials may be installed on Site or at manufacturer's plant.
 - 8. Verify that installed manholes and structures meet required alignment and grade.
 - 9. Remove knockouts or cut structure to receive piping without creating openings larger than required to receive pipe; fill annular spaces with mortar.
 - 10. Cut pipe flush with interior of structure.
 - 11. Shape inverts through manhole and structures as indicated on Drawings.
 - I. Sanitary Manhole Drop Connections:
 - 1. Construct drop connections into sanitary manholes as indicated on Drawings.
 - J. Castings:
 - 1. Set frame and cover 2 inches above finished grade for manholes and other structures with covers located within unpaved areas to allow area to be graded away from cover beginning 1 inch below top surface of frame. Embed frames in mortar. Provide wedges or shims for accurate and level placing of the frames.
 - K. Connections to Riser Section: Manufacture riser sections with openings properly located for making connections to sewers. Unless otherwise shown or permitted, provide 6 inches minimum distance between a joint in a manhole section and the nearest edge of an opening for a connecting sewer. Make the diameter of such openings to be not more than 4 inches larger than the outside diameter of the pipe to be connected.
 - L. Lift Holes: Provide lift holes that are formed, tapered, or drilled. Repair lift holes in a clean, workmanlike manner using a conical shaped pre-cast plug, properly sealed in place using non-shrink cement grout or an expanding Portland Cement mixture such as Octocrete as manufactured by IPA Systems, Inc. in accordance with manufacturer's application instruction.
 - M. Adjusting Rings and External Chimney Seal: Provide a soiltight seal between the precast manhole and adjusting ring, and each adjoining adjusting ring, and between the adjusting ring and casting by the use of mortar. Seal joints both internally and externally.
- 3.4 SOURCE QUALITY CONTROL
- A. Accept that the finished precast manhole or structure is subject to inspection and approval by the Engineer. The Owner or Engineer may make such inspection on the work after delivery. The Owner or Engineer may reject any precast manhole or structure at any time on account of failure to meet any of the specifications' requirements even though sample manhole sections may have been accepted as satisfactory at the place of manufacture.

- B. Prior to being installed, each precast manhole or structure shall be carefully inspected. Reject those not meeting the specifications and replace at the Contractor's expense.
- C. Acceptance: Base acceptance of manholes passing a proof-of-design test in accordance with ASTM C 478 with joints meeting the requirements of ASTM C 443.

3.5 FIELD QUALITY CONTROL

- A. Refer to Section 01 40 00 "Quality Requirements".
- B. Test concrete manhole and structure sections as specified in Section 33 01 30.13 "Sewer and Manhole Testing".

END OF SECTION 33 05 13

(NO TEXT FOR THIS PAGE)

SECTION 33 05 23 – JACKING AND AUGERING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Pipeline installation in casing pipe beneath roadways and other structures may be installed by jacking and augering.
- B. Related Work specified in other sections includes, but is not limited to, the following:
 - 1. Section 31 23 16 “Excavation”
 - 2. Section 31 23 17 “Trenching”

1.2 REFERENCES

- A. Codes and standards referred to in this Section are:
 - 1. ASTM A 139 - Specification for Electric-Fusion (Arc) -Welded Steel Pipe (NPS in 4 in. and Over)
 - 2. OSHA PL-91-596 - Occupational Safety Health Act of 1970 Public Law 91-596

1.3 SUBMITTALS

- A. Provide all submittals, including the following, as specified in Division 01.
 - 1. Shop drawings of the jacking pipe, jacking frame, jacking head, reaction blocks, sheeting, including design calculations and the complete jacking installation.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle all products and materials as specified in Division 01.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Welded steel pipe, minimum 3/8-inch wall thickness, meeting the requirements of ASTM A 139, Grade B.
- B. Fill Material: Use fill material consisting of 1-1/4 pounds of Bentonite per gallon of water during jacking to fill any voids between pipe and the earth.

- C. Casing Seals: Pull-on End Seal, Model AC, by APS or approved equivalent, sized to permit placement of seal over polywrapped pipe.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install all piping in accordance with the manufacturer's recommendations and approved shop drawings and as specified in Division 01.
- B. Casing Spacers:
 - 1. Secure casing spacers to the carrier pipe at 5-foot intervals inside the casing pipe. Arrange the spacers to provide support for and to prevent floatation or shifting of the carrier pipe.
 - 2. Provide high density polyethylene (HDPE) casing spacers that are projection type non-metallic as manufactured by Raci Spacers or-equal.
- C. Conform all operations and materials to the regulations of the highway department or other agency having jurisdiction over the crossing. Obtain the approval of all materials and methods from the agency having jurisdiction over the crossing prior to construction.
- D. Augering: Conduct augering with the proper equipment and procedure such that the carrier pipe and the casing pipe can be installed to the grades specified without disturbing the adjacent earth. Submit all equipment and procedures for prior approval.
- E. Hand Mining: Conduct hand mining only in casings that are sufficiently large enough to permit such operation. Provide adequate fresh air supply within the casing pipe and conduct all operations in accordance with the requirements of the U.S. Department of Labor Safety and Health Regulations for Construction promulgated under the Occupational Safety and Health Act 7 1970 (PL-91-596).
- F. Jacking Pit: Make the jacking pit of adequate length to provide room for the jacking frame, the jacking head, the reaction blocks, the jacks, auger rig, and the jacking pipe. Make the pit sufficiently wide to allow ample working space on each side of the jacking frame. Make the depth of the pit such that the invert of the pipe, when placed on the guide frame, is at the elevation desired for the completed line. Provide excavation in conformance with Section 31 23 16 "Excavation".
- G. Sheet piling: Sheet the jacking pit tightly and keep it dry at all times. Conform sheet piling to Section 31 23 17 "Trenching".
- H. Jacking Frame: Use a jacking frame that applies a uniform pressure over the entire pipe wall area of the pipe to be jacked.
- I. Reaction Blocks: Use reaction blocks designed to carry the thrust of the jacks to the soil without excessive soil deflection and in such a manner as to avoid any disturbance of adjacent structures or utilities.

- J. Casing ends are to remain exposed and end seals are not to be pulled into position until after main has passed pressure testing.
- K. Operation: Use hydraulic jacks in the jacking operation. Use extreme care to hold the pipe to exact line and grade. Advance the excavation at the heading manually or with an auger. Do not allow the advance to exceed one foot ahead of the casing pipe. Make every effort to avoid loss of earth outside the casing.
- L. Safety Railing: Provide a safety railing all around the top of the pit at all times.

END OF SECTION 33 05 23

(NO TEXT FOR THIS PAGE)

SECTION 33 05 26 – SANITARY UTILITY IDENTIFICATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Pipeline marker posts.
2. Detectable underground warning tape for placement 3 feet below sanitary sewer.

B. Related Requirements:

1. Section 31 23 17 “Trenching”
2. Section 31 23 23 “Fill”

1.2 SUBMITTALS

A. Section 01 33 00 “Submittal Procedures”

B. Product Data: Submit manufacturer's catalog information for each product required.

C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.3 CLOSEOUT SUBMITTALS

A. Section 01 73 00 “Execution”

B. Section 01 77 00 “Closeout Procedures”

1.4 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.

PART 2 - PRODUCTS

2.1 PIPELINE MARKER POSTS

A. Approved Manufacturers:

1. Bernsten.
2. Tapco.
3. Approved Equal.

B. Description:

1. Flexible utility marking post with blue “Caution Water Pipeline” decal, constructed with durable, UV-resistant material capable of resisting displacement from wind and vehicular impact forces, and at least 84 inches in height.
2. Shall include testing station for tracer wire connection with removable, locking protective cap to protect terminals from the elements and prevent vandalism.

2.2 TRACE WIRE

A. Manufacturers:

1. Tracer wire connections shall be made using part number 3WB-O 1
 - a. Manufactured by Copperhead Industries, LLC.
2. All PVC pipe for pressure sanitary sewer shall be installed with tracing wire.
3. Tracing wire shall be 12 AWG –
 - a. Solid core RHW
 - b. RHH underground copper cable.
4. It shall be polyethylene insulated for underground service, solid copper or copper clad steel.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Pipeline Marker Posts:

1. Install as recommended by manufacturer.
2. Install every 500-feet on straight runs, every 100-feet on curves, and at every significant change in direction or when otherwise limited by sight distance.
3. Install at all INDOT right-of-way boundaries at ends of casing pipes where pipe crossings will occur at said boundaries as shown in the Drawings.
4. Tracer wire shall be brought up inside marking post and attached at the top to connection points for cable tracing.

B. Tracer Wire:

1. Install in such a manner as to be able to trace all mains without loss or deterioration of signal or without the transmitted signal migrating off the tracer wire.
2. Install in same trench with pipe during pipe installation in the same orientation to the installed pipe.
3. Tape tracer wire to pipe every 10 feet in the 3-o’clock position.
4. Securely bond all wire joints with an approved watertight connector to provide electrical continuity.

5. Except for approved spliced-in connections, tracer wire shall be continuous and without splices from each tracer wire access point. Where any approved spliced-in connections occur, use a watertight connector to provide electrical continuity.
6. At the point of connection between ductile iron mains with any non-iron main, connect tracer wire to the iron pipe with a cad weld or approved equivalent. Tracer wire welds shall be completely sealed with the use of an approved mastic type sealer specifically manufactured for underground use. Mastic shall be applied in a thick coat a minimum of 2 inches thick and shall be protected from contamination by the backfill material with the use of a plastic membrane.
7. Wire insulation shall be highly resistant to alkalis, acid and other destructive agents found in soil.
8. Locating tracer wire shall be brought to service no less than every 800 L.F. on PVC riser and cap.
9. A solid 12-gauge plastic coated copper tracer wire shall be installed with all PVC force main. Access to the wire must be provided at 1,000-foot intervals along the length of the main.

3.2 FIELD QUALITY CONTROL

- A. Section 01 40 00 "Quality Requirements"
- B. Perform continuity test on all tracer wire in the presence of the Owner or the Owner's representative. If tracer wire is found to be not continuous after testing, repair or replace failed segment of the wire at no additional cost to Owner.

3.3 PROTECTION OF FINISHED WORK

- A. Section 01 73 00 "Execution"
- B. Section 01 77 00 "Closeout Procedures"
- C. Protect tracer wire from damage or displacement during installation of pipe and aggregate cover.

END OF SECTION 33 05 26

(NO TEXT FOR THIS PAGE)

SECTION 33 14 13 – PUBLIC WATER UTILITY PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This section includes requirements for the installation and furnishing of all pipe, fittings, and appurtenances necessary to complete work shown or specified.
- B. Related Requirements
 - 1. Section 31 23 23 “Fill”
 - 2. Section 31 23 16 “Excavation”
 - 3. Section 31 23 16.13 “Trenching”
 - 4. Section 33 01 10.58 “Disinfection of Water Utility Piping Systems”
 - 5. Section 33 05 05.31 “Hydrostatic Testing”
 - 6. Section 33 14 19 “Valves and Hydrants for Water Utility Service”

1.3 REFERENCES

- A. American Association of State Highway and Transportation Officials:
 - 1. AASHTO T 180 - Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.
- B. ASTM International:
 - 1. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³).
 - 2. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³).
 - 3. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
- C. American Water Works Association:
 - 1. AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings.
 - 2. AWWA C105/A21.5-18 – Polyethylene Encasement for Ductile Iron Pipe Systems
 - 3. AWWA C110 - Ductile-Iron and Gray-Iron Fittings.
 - 4. AWWA C111 - Rubber Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.

5. AWWA C151 - Ductile-Iron Pipe, Centrifugally Cast.
6. AWWA C504 - Rubber-Seated Butterfly Valves, 3 In. (75 mm) through 72 In. (1,800 mm)
7. AWWA C509 – Resilient Seated Gate Valves for Water Supply Service
8. AWWA C600 - Installation of Ductile-Iron Mains and Their Appurtenances.

D. National Fire Protection Association:

1. NFPA 24 – Standard for the installation of Private Fire Service Mains and Their Appurtenances.

1.4 SUBMITTALS

- A. Refer to Section 01 33 00 “Submittal Procedures”: Requirements for submittals.
- B. Product Data: Submit data on pipe materials, pipe fittings, and accessories.
- C. Shop Drawings: Indicate piping layout, including piping specialties. Indicate dimensions, method of field assembly, and components, sizes of appurtenances provided, appropriate fittings, and all options required by the Work.
- D. Manufacturer’s Certificate: Certify that the products meet or exceed the specified requirements.
- E. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

1.5 CLOSEOUT SUBMITTALS

- A. Section 01 77 00 “Closeout Procedures”: Requirements for submittals.
- B. Project Record Documents: Record actual locations of piping mains, valves, connections, thrust restraints, and invert elevations.
- C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.6 QUALITY ASSURANCE

- A. Mark pipe, fittings, valves and hydrants according to the applicable specification or standard.
- B. The Contractor shall test and disinfect water mains constructed under this Contract, as specified in Section 33 01 10.58 and 33 05 05.31.

- C. A performance test may be required by the Owner, at any time, for each crew installing water mains. Perform these tests at no additional cost to the Owner. When required, test a given section of water main installed by a given crew. The section shall be a continuous section of water main which can be isolated by valves shown on the Drawings. Do not install water mains in other sections until the first section has been successfully tested.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 "Product Requirements": Requirements for transporting, handling, storing, and protecting products.
- B. Block individual and stockpiled pipe lengths to prevent moving.
- C. Do not place pipe or pipe materials on private property or in areas obstructing pedestrian or vehicle traffic.
- D. Pipe and pipe materials are to be stored in a manner that limits debris collecting in the materials and that debris shall be removed prior to using a material.

1.8 EXISTING CONDITIONS

- A. Field Measurements
 - 1. Verify field measurements prior to fabrication.
 - 2. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 GENERAL

- 1. All pipe, fittings, valves, hydrants, and appurtenances shall be as shown on the Drawings or as required by the manufacturer's and AWWA specifications. All pipe, fittings, valves, hydrants and appurtenances shall be new and unused.

2.2 BURIED WATER MAIN PIPE AND FITTINGS

- A. Approved Manufacturers
 - 1. Clow
 - 2. American
 - 3. U.S. Pipe
- B. Ductile Iron Water Mains (3" and Larger)
 - 1. Pipe

- a. Ductile iron pipe shall meet the requirements of AWWA C151. Design and manufacture pipe for the pressure class listed plus 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 AWWA specifications, shall be included. Minimum pressure class shall be as follows:

<u>Size Range</u>	<u>Pressure Class</u>	<u>Thickness Class</u>
4" - 12"		52
16" - 20"	350	

2. Joints

- a. Pipe joints shall be push-on type during excavation and through casings. Joints shall meet the requirements of AWWA C111. Restrained joints shall be Megalug or approved equal. Restrained pipe joints shall be restrained by Field lock gaskets or mechanical bell restraints.
- b. Pipes shall be jointed to one another by TR flex or Ball and Socket when directional drilling method is used.

3. Fittings

- a. Fittings shall be ductile iron. Fittings for standard size pipe shall meet the requirements of AWWA C110. Compact or short body fittings 3 inches through 24 inches shall meet the requirements of AWWA C153. Design and manufacture fittings for a pressure rating of at least 350 psi.
- b. Fitting joints shall be restrained mechanical joints using Megalug or approved equal. Joints shall meet the requirements of AWWA C111. Thrust block all non-restrained joints and fittings as indicated on the Drawings or as required by the manufacturer's and AWWA specifications. Pipe joints restrained upstream and downstream of restrained fittings shall be restrained as indicated on the Drawings or as required by the manufacturer's and AWWA specifications.

4. Adapters

- a. Adapters from ductile iron water mains to flange joint valves or fittings shall be ductile iron. Adapters shall meet the requirements of AWWA C110. Design and manufacture adapters for a pressure class rating of 350 psi.
- b. Adapter ends connecting to ductile iron water mains shall be one of the following: push-on joint, mechanical joint or restrained push-on joint. Adapters with push-on joints or mechanical joints may be used where restrained joints are not required. Adapters shall have restrained push-on joints where restrained joint piping is required, as indicated on the Drawings. Mechanical joints and restrained push-on joints shall meet the requirements of AWWA C111. Restrained joints shall be Megalug or approved equal.
- c. Adapter ends connecting to flange joint valves or fittings shall have joints complying with the specifications for the applicable valves or fittings.

5. Line the inside surfaces of all pipe, fittings and adapters with a single layer cement mortar lining. Cement mortar lining and seal coating shall meet the requirements of AWWA C104. Coat the outside surfaces of all pipe, fittings and adapters with a bituminous coating, complying with AWWA C151 and NSF 61.
6. Gaskets for mechanical joints and push-on joints shall meet the requirements of AWWA C111.
 - a. Nuts and Bolts - Nuts and bolts for mechanical joints shall be high strength, heat treated, alloy steel. Nuts shall be hexagonal nuts, bolts shall be tee head bolts. Nuts and bolts shall meet the requirements of AWWA C111.
 - b. Nuts and bolts for restrained push-on joints shall meet the requirements of the joint manufacturer.
7. Polyethylene Wrap – All ductile iron pipe, valves and fittings are to be wrapped with polyethylene encasement tubing and sheet polyethylene.
 - a. The minimum thickness shall be 4 mil and shall be blue in color.
 - b. The wrap for main installation shall be cut two feet longer than the length of the pipe and slipped over the pipe so that one foot overhangs both ends of the pipe. After the lap is made with the next pipe, the slack in the tubing is to be taken up for a snug fit and the overlay shall be secured with polyethylene tape.
 - c. Odd shaped appurtenances, such as fittings and valves shall be wrapped using sheet polyethylene. Wrapped shall be done by placing the sheet under the appurtenance and bringing it up around the time to be wrapped. Seams shall be made by fringing the edges together, folding and taping down using polyethylene tape. The shaft and operating nut for valves shall not be wrapped to allow operation.
 - d. Care must be taken to prevent damage to the wrap when backfilling, and no pipe, fittings or valves are to be backfilled prior to wrap being installed.

2.3 VALVES

- A. Refer to Section 33 14 19 for valve requirements.

2.4 FIRE HYDRANTS

- A. Refer to Section 33 14 19 for fire hydrant requirements.

2.5 WATER SERVICES

- A. Initiation of water services shall be coordinated by the customer with the Michigan City, Indiana Department of Water Works per their General Policy Manual.

2.6 WATER METERS

- A. All water meters shall be furnished and installed by the Michigan City, Indiana Department of Water Works as part of the tap-in process per their General Policy Manual.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that existing utility water main size, location, and inverts are as indicated on Drawings.
- B. Inspect water main pipe, fittings, and appurtenances prior to installation. Promptly remove damaged or unsuitable products from the job site. Replace damaged or unsuitable products with undamaged and suitable products.

3.2 PREPARATION

- A. Preconstruction Site Video:
 - 1. Take digital video along centerline of proposed pipe trench.
 - 2. Show mailboxes, curbing, lawns, driveways, signs, culverts, and other existing Site features.
 - 3. Include Project description, date taken, and sequential number in file of each video.
- B. Pipe Cutting:
 - 1. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, and remove burrs.
 - 2. Use only equipment specifically designed for pipe cutting; use of chisels or hand saws is not permitted.
 - 3. Grind edges smooth with beveled end for push-on connections.
- C. Remove scale and dirt on side and outside before assembly.
- D. Prepare pipe connections to equipment with flanges or unions.

3.3 EXCAVATION

- A. Excavate pipe trench as specified in Section 31 23 16.13 "Trenching" for Work in this Section.
- B. Dewater excavations to maintain dry conditions to preserve final grades at bottom of excavation as specified in Section 31 23 19 "Dewatering".

- C. Provide sheeting and shoring as specified in Section 31 23 16.13 “trenching”.
- D. Place bedding material as specified in Section 31 23 23 “Fill”.

3.4 LAYING OF WATER MAINS

- A. Proper tools and facilities shall be provided and used by contractor for safe working conditions.
- B. Lay and maintain pipe to the lines and grades shown on the Drawings or to the minimum depth specified in this Paragraph. Install fittings, valves and hydrants in the locations shown on the Drawings.
- C. 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.
- D. Water mains shall be laid at least 10 feet horizontally from any existing sanitary or storm sewer or sewage force main. The distance shall be measured from edge to edge of the pipe. Water mains crossing sanitary sewer or sewage force mains shall be laid to provide a minimum vertical distance of 18 inches between the outside of the water main and the outside of the sewer or force main. The 18-inch separation shall apply whether the water main is over or under the sewer or force main. Lay water mains at crossings of sewers and force mains so a full length of water main pipe is centered on the sewer or force main whenever possible. No water main shall pass through or come in contact with any part of a sanitary sewer manhole and must maintain a separation of a minimum of 8 feet.
- E. All piping shall be laid at a depth that provides at least 5 feet of cover. Cover shall be measured as the vertical distance from the top of the pipe to the finish grade elevation.
- F. B-borrow must be used around the outside of the water main pipe to protect the polywrap. #53 or #8 stone should not come in contact with the water main. Pea gravel shall only be in contact with drinking water appurtenances near the fire hydrant drains.
- G. Laying of water mains shall meet the requirements of AWWA C600, unless otherwise specified in this Section
- H. Shape the bottom of the trench to give uniform circumferential support of the lower quarter of each pipe.
- I. Do not lay pipe in water or when the trench or weather conditions are unsuitable for proper installation.
- J. As each length of pipe is placed in a trench, joint the pipe being laid to the previously laid pipe. Bring the pipe to correct line and grade. Secure the pipe in place with bedding tamped under the pipe. Tamp bedding up to the centerline of the pipe.

- K. Deflection from a straight line or grade shall not exceed the limits specified by the pipe manufacturer. 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.
- L. Provide thrust restraint at horizontal and vertical deflection fittings and at tees, plugs, tapping sleeves and tapping saddles. Restraint shall be mechanical joint piping.
- M. Block the open end of the pipe at the close of each day's work to prevent contamination from dirt or rain water and entry of any animal or foreign material.
- N. Lower pipe, fittings, valves and hydrants into the trench by hand, hoists or ropes or other suitable tools or equipment that will not damage products, coatings or linings. Do not drop or dump pipe, fittings, valves, or hydrants into the trench.
- O. As the water main system is installed, water lines shall be marked with a 2"x4" or other acceptable stake, with a height allowing a minimum of 6'-0" above grade. Stake shall have the uppermost section painted blue and marked with the letter "W" to indicate water line placement.

3.5 CONNECTING TO EXISTING MAINS

- A. Locate and verify exact size of all existing mains, both horizontally and vertically. Additionally, allow adequate time, after location and prior to making new connections, for changes in the connection location and size. Backfill excavation immediately after main is located and measured.
- B. Make each dry connection with fittings and valves indicated on the Drawings. Furnish and install sleeves or tees required to complete connections. All required pipe, fittings, valves, tools, and equipment shall be at the connection site prior to starting connection. Wash interior of new pipe, fittings, and valves with a solution containing 50 mg/L of chlorine prior to making connection. Make connections at night and on weekends when required. The Owner will operate existing valves. Install sufficient water main and restrained joints so existing water mains can be up in service immediately after connection is completed. Inspect joints and eliminate leaks immediately after connection is completed and existing mains are put in service. Install watertight plugs on open ends of pipe and valves and backfill excavation if new water main is not connected to dry connection within 48 hours after completing dry connection.

3.6 JOINTING

- A. Ductile Iron Push-on Joints
 - 1. Pipe must be cleaned and installed as specified by the manufacturer and 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. For restrained push-on joints, move the loose retainer ring into position against the retainer bar on the spigot end of the pipe being installed. Loosely assemble the joint bolts and nuts.

3. Deflect pipe after jointing, if deflection is required. The amount of deflection shall not exceed the limits shown in the following table or the pipe manufacturer's specifications, whichever is smaller:

<u>Pipe Size</u>	<u>Maximum Deflection Angle</u>	<u>Maximum Deflection Based Upon 18-Foot Pipe Length</u>
4"	5°	18-1/2"
6"	5°	18-1/2"
8"	5°	18-1/2"
10"	5°	18-1/2"
12"	5°	18-1/2"
18"	3°	18-1/2"
20"	3°	18-1/2"

B. Ductile Iron Restrained Push-on Joints

1. Ductile Iron Restrained Push-on Joints will have the same requirements as listed in this Section for Ductile Iron Push-on Joints.
2. Ductile iron restrained push-on joints shall either be accomplished using Field Lock Gaskets or consist of an iron pipe bell restraint with a wedge action restraint ring on the spigot joined to a split ductile iron ring behind the bell. The product shall be the Megalug restraint harness or approved equal.
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.

C. Ductile Iron Mechanical Joint Restraints

1. Mechanical Joint Restraint shall be in the Megalug Series or approved equal.
2. Mechanical joint restraint shall require conventional tools and installation procedures per AWWA C600, while retaining full mechanical joint deflection during assembly as well as allowing joint deflection after assembly.
3. Proper actuation of the gripping wedges shall be ensured with torque limiting twist off nuts.

D. 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:

<u>Pipe Size</u>	<u>Bolt Size</u>	<u>Torque Range</u>
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:

<u>Pipe Size</u>	<u>Maximum Deflection Angle</u>	<u>Maximum Deflection Based Upon 18-Foot Pipe Length</u>
4"	8° - 18'	31"
6"	7° - 7'	27"
8"	5° - 21'	20"
10"	5° - 21'	20"
12"	5° - 21'	20"
14"	3° - 35'	13-1/2"
16"	3° - 35'	13-1/2"
18"	3° - 0'	11"
20"	3° - 0'	11"
24"	2° - 23'	9"

E. Flange Joints

- Pipe must be cleaned and installed as specified by the manufacturer and 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.
- Do not over torque nuts and bolts.

3.7 RESTRAINING AND SUPPORTS

- A. Restrained joint piping shall be as specified in this Section. Distance from fitting to end of restraint shall not be less than that indicated on the Drawings.
- B. Mechanical Joint Rod Restraint
- Mechanical joint rod restraint shall be from fitting to fitting.
 - The number of rods shall conform to the follow table.
 - Mechanical joint connections shall be made using Field Lock gaskets and shall be a boltless, integral restraining system and shall be rated in accordance to ANSI/AWWA C11/A21.11.

<u>Pipe Size</u>	<u>Rod Size</u>	<u>Minimum No. of Rods</u>
4"	3/4"	2
6"	3/4"	2
8"	3/4"	4
10"	3/4"	4
12"	3/4"	6
14"	3/4"	6
16"	3/4"	8
18"	3/4"	8
20"	3/4"	10

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, at least 8 feet on center.

3.8 TESTING

- A. Testing should be completed as specified in Section 33 05 05.31 "Hydrostatic Testing".

3.9 FLUSHING

- A. Flush water mains and fire hydrants prior to disinfection. Flush water mains as specified in Section 33 01 10.58 "Disinfection of Water Utility Piping Systems".

3.10 DISINFECTION

- A. Disinfect all new and repaired water mains prior to placing them in service. Refer to Section 33 01 10.58 "Disinfection of Water Utility Piping Systems" for disinfection requirements.

3.11 COMPLETION SCHEDULING

- A. Complete water mains as they are installed. Test, flush, sterilize, and place in service each part of the water main which is complete and can be placed in service without preventing work to continue on uncompleted parts of the new water mains.

END OF SECTION 33 14 13

SECTION 33 14 19 - VALVES AND HYDRANTS FOR WATER UTILITY SERVICE

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes requirements for the installation and furnishing of valves, hydrants, and accessories necessary to complete the Work shown or specified.

1.2 DEFINITIONS

- 1. Abbreviations
 - a. ANSI - American National Standards Institute
 - b. ASTM - American Society for Testing & Materials
 - c. AWWA - American Water Works Association
 - d. MSS - Manufacturers Standardization Society of the Valve and Fittings Industry
- 2. Note: All valve sizes on the Drawings or in the Specifications are intended to be nominal size and shall be interpreted as such.

1.3 REFERENCES

- A. American Water Works Association:
 - 1. AWWA C111 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
 - 2. AWWA C502 - Dry-Barrel Fire Hydrants
 - 3. AWWA C504 - Rubber-Seated Butterfly Valves, 3 In. (75 mm) through 72 In. (1,800 mm)
 - 4. AWWA C509 - Resilient-Seated Gate Valves for Water Supply Service
 - 5. AWWA C550 - Protecting Interior Coatings for Valves and Hydrants
 - 6. AWWA C600 - Installation of Ductile-Iron Mains and Their Appurtenances
 - 7. AWWA C800 - Underground Service Line Valves and Fittings
- B. American National Standards Institute:
 - 1. ANSI B16.1 - Cast Iron Pipe Flanges and Flanged Fittings
- C. ASTM International:
 - 1. ASTM B62 - Standard Specification for Composition Bronze or Ounce Metal Castings

1.4 SUBMITTALS

- A. Section 01 33 00 "Submittal Procedures".
- B. Product Data: Submit data for valves, hydrants, and all accessories. Provide evidence of compliance with the noted AWWA Standards.
- C. Shop Drawings: Indicate dimensions, method of field assembly and components, sizes of appurtenances provided, and any additional options required to complete the Work.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- F. O&M Manuals: Provide Operation and Maintenance Manuals for the following items.
 - 1. Butterfly Valves.
 - 2. Gate Valves.
 - 3. Fire Hydrants.

1.5 QUALITY ASSURANCE

- A. Mark pipe, fittings, valves and hydrants according to the applicable specification or standard.
- B. Perform Work according to all applicable local, State and Federal standards.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 "Product Requirements": Requirements for transporting, handling, storing, and protecting products.
- B. Prepare valves, hydrants, and accessories for shipment according to the applicable AWWA standards.
- C. Seal valve and hydrant ends to prevent entry of foreign matter.
- D. Inspection: Accept materials on site in manufacturer's original packaging and inspect for damage.
- E. Storage:
 - 1. Store materials in areas protected from weather, moisture, or potential damage.
 - 2. Do not store materials directly on ground.

- F. Handle materials in a way that prevents damage to interior and exterior surfaces.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Valves and hydrants shall be as shown on the Drawings or as required by the manufacturer's and AWWA specifications. All valves and hydrants shall be new and unused.

2.2 VALVES

A. Resilient- Seated Gate Valves

1. Approved Manufacturers:
 - a. Clow
 - b. Kennedy
 - c. Mueller
2. Buried gate valves 4-inches through 10-inches shall be full ductile iron body, epoxy coated and NSF 61 rated, resilient-seated for underground installations, non-rising stem gate valves. Valves shall meet the requirements of AWWA C509 and have mechanical joint ends. Mechanical joints and joint accessories shall comply with AWWA C111.
3. All valves bodies and bonnets shall be equipped with properly sized stainless-steel bolts and nuts to meet mechanical strength, excluding joint accessories.
4. Valves are to open left (counter-clockwise) and be equipped with a 2-inch square operating nut.

B. Rubber Seated Butterfly Valves

1. Approved Manufacturers:
 - a. Clow
 - b. Kennedy
 - c. Mueller
2. Butterfly valves and operators 12-inches and larger shall meet the requirements of AWWA Standard C504. Valves and operators shall be Class 150B.
3. All valves shall be properly coated with an Epoxy that complies with the Standard and Federal Drinking Water Standards, latest revision.
4. All valves bodies and gear boxes shall be equipped with properly sized stainless-steel bolt and nuts to meet mechanical strength, excluding joint accessories.

5. Buried butterfly valves shall have mechanical joints. Mechanical joints shall meet the requirements of AWWA C111.
6. Valves are to open left (counter-clockwise) and be equipped with a 2-inch square operating nut.

2.3 VALVE BOXES

- A. Valve boxes for gate valves shall be cast iron. Valve boxes shall be three-piece type consisting of: Bottom Section, Top Section, and Lid.
 1. The Valve Box Bottom section shall be equipped with a base flange of not less than 10 inches in diameter, and an inside shell diameter of 5-1/4-inch diameter, with outside threads. The bottom height can vary.
 2. The Valve Box Top section shall be equipped with an inside shell diameter of 6-3/4-inch diameter, with inside threads to match bottom section outside threads. The top shall be capable of accepting a standard drop lid, with an inside diameter of 7-3/8 inches, and an outside diameter of not less than 9 inches in diameter. The bottom height can vary.
 3. The Valve Box lid shall be the drop type with an outside diameter of 7-5/16 inches, and total height of 3-1/2 inches. The lid should bear the word "WATER" located in the center of the lid.

2.4 FIRE HYDRANTS

- A. Approved Manufacturers:
 1. Clow Medallion
 2. Mueller Super Centurion
 3. East Jordan CD 250
- B. Fire hydrants shall meet minimum working pressures of 150 pounds per square inch (psi), and hydrostatic test of not less than 300 psi. They shall also comply with AWWA C502.
- C. Fire hydrant sizes to be furnished shall be of the following two sizes:
 1. 6-inch mechanical joint pipe inlet, with 5-1/4-inch valve
- D. The fire hydrant shall have a bury line of not less than 5 feet. This is to be determined by actual water main size and depth of cover.
- E. The fire hydrant shall be equipped with ductile-iron barrels, body and bonnet with break a-way traffic flange at ground level.
- F. The fire hydrant shall be configured with one (1) 4-inch pumper nozzle, and two (2) 2-1/2-inch hose connections, with national standard threads.

- G. The fire hydrant caps shall be equipped with a 1-inch square nut and no chains. If Chains are ordered, Contractor shall remove the chains.
- H. The fire hydrant operating caps shall be equipped with a 1-inch square nut.
- I. The fire hydrant valve and mechanical joint inlets shall be properly coated with an approved fusion-bonded epoxy coating that complies with the Standard and Federal Drinking Water Standards, latest revision.
- J. The fire hydrant barrel shall have an exterior coating and consisting of a nominal one-mil thick of asphaltic material applied to the outside of the barrel as described in AWWA C151 Standard, latest revision. The fire hydrant body, bonnet and caps, shall be painted "Aluminum". The fire hydrant shall be furnished without any cap chains.
- K. The fire hydrant shall be equipped with properly sized stainless-steel bolts and nuts to meet mechanical strength (below grade level), excluding joint accessories.
- L. The fire hydrant shall have mechanical joint ends, conforming to the ANSI/AWWA C111/A21.11 standard latest revision.
- M. The fire hydrant is to open left (counter-clockwise) against the flow of water.
- N. Fire Hydrant Placement - Fire Hydrants shall be placed as shown in the Drawings. For residential uses with densities less than three dwelling units per gross acre, the requirements as established in Table No. III-B-A of the Uniform Fire Code shall apply. Where there is any ambiguity or dispute concerning the interpretation of this requirement, the decision of the Chief of the local fire department shall prevail subject to appeal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Refer to Section 01 73 00 "Execution" and Section 01 77 00 "Closeout Procedures": Requirements for installation examination.
- B. Determine exact location and size of valves and hydrants from Drawings.
- C. Verify that invert elevations are as indicated on Drawings prior to excavation and installation.

3.2 INSTALLATION

- A. Perform trench excavation, backfilling, and compaction as specified in Section 31 23 16.13 "Trenching".

- B. Clean the interiors of valves and hydrants of foreign matter before installation. Tighten stuffing boxes. Inspect valves and hydrants in opened and closed positions to ensure all parts are in working condition.
- C. Valves
 - 1. Install valves in conjunction with pipe laying using Mega Lugs or approved equal.
 - 2. Set 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.
 - 3. Wrap valve with polywrap as described in Section 33 14 13.
 - 4. Provide buried valves with valve boxes installed flush with finished grade.
 - 5. 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.
- D. Hydrants
 - 1. Provide support blocking and drainage gravel while installing fire hydrants; do not block drain hole. Notify the MCDWW if the soil conditions at the hydrant are such that the shoe will be sitting in groundwater. The MCDWW may require modification to the drain holes.”
 - 2. Set fire hydrants plumb with pumper nozzle facing roadway. The centerline of the outlet nozzles shall be at least 18 inches or at most 30 inches above finished grade at a hydrant. Install hydrant extensions where required to bring hydrant to proper elevation and attach using Mega Lug or approved equal.
 - 3. Set each hydrant upon a slab of stone or concrete not less than 4 inches thick and 15 inches square. Wedge the side of each hydrant opposite the pipe connection against undisturbed trench face to prevent the hydrant from blowing off the branch connection.
 - 4. Install pea gravel as identified in Section 31 23 23 to an elevation 12-inches above the hydrant barrel to shoe flange
 - 5. Compact the backfill around each hydrant to finish grade.
 - 6. Furnish and install a gate valve and valve box in each hydrant branch connection. MCDWW staff will provide the final field painting/coating, when the work is complete.

3.3 FIELD QUALITY CONTROL

- A. Section 01 40 00 “Quality Requirements”: Requirements for inspecting and testing.

- B. Pressure test the system according to AWWA C600 and Section 33 05 05.31.

END OF SECTION 33 14 19

SECTION 33 31 13 - PUBLIC SANITARY UTILITY SEWERAGE PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Sanitary sewerage pipe and fittings (gravity sewers).
2. Pipe markers.
3. Connection to existing manholes.
4. Manholes.
5. Wye branches and tees.
6. Bedding and cover materials.

B. Related Requirements:

1. Section 31 23 16 "Excavation".
2. Section 31 23 17 "Trenching".
3. Section 31 23 23 "Fill".
4. Section 33 01 30.13 "Sewer and Manhole Testing".
5. Section 33 05 13 "Precast Concrete Wastewater Utility Structures".
6. Section 33 05 26 "Utility Identification".

1.2 REFERENCE STANDARDS

A. ASTM International:

1. ASTM C923 - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals.
2. ASTM D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.

1.3 COORDINATION

- A. Coordinate Work of this Section with local authorities having jurisdiction.
- B. Notify affected utility companies at least 72 hours prior to construction.

1.4 SUBMITTALS

- A. Section 01 33 00 "Submittal Procedures".
- B. Product Data: Submit manufacturer information indicating details and construction information.

- C. Test and Evaluation Reports: Submit reports indicating field tests made and results obtained.

1.5 CLOSEOUT SUBMITTALS

- A. Refer to Section 01 73 00 “Execution” and Section 01 77 00 “Closeout Requirements”.
- B. Project Record Documents: Record invert elevations and actual locations of pipe runs, connections, manholes, and cleanouts. Use Indiana State Plane West coordinate system for all record Drawings.
- C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.6 QUALITY ASSURANCE

- A. Perform Work according to local, State and Federal standards.

1.7 QUALIFICATIONS

- A. Installer: Company specializing in performing Work of this Section with minimum three years' documented experience.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 “Product Requirements”.
- B. Storage:
 - 1. Store materials according to manufacturer instructions.
 - 2. Store valves in shipping containers with labeling in place.
- C. Protection:
 - 1. Block individual and stockpiled pipe lengths to prevent moving.
 - 2. Provide additional protection according to manufacturer instructions.
- D. Deliver and store valves in shipping containers with labeling in place.

1.9 EXISTING CONDITIONS

- A. Field Measurements:
 - 1. Verify field measurements prior to fabrication.
 - 2. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Sanitary Sewer Piping

1. Refer to Exhibit D “Michigan City Sanitary District Sanitary Sewer Specifications”.

B. Bedding and Cover:

1. Bedding: As specified in Section 31 23 23 “Fill”.
2. Cover: As specified in Section 31 23 23 “Fill”.
3. Soil Backfill from Above Pipe to Finish Grade:
 - a. As specified in Section 31 23 23 “Fill”.
 - b. Subsoil with no rocks over 6 inches in diameter, frozen earth, or foreign matter.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Refer to Section 01 73 00 “Execution” and Section 01 77 00 “Closeout Requirements”.
- B. Verify that trench cut is ready to receive Work.
- C. Verify that excavations, dimensions, and elevations are as indicated on Drawings.

3.2 PREPARATION

- A. Refer to Section 01 73 00 “Execution” and Section 01 77 00 “Closeout Requirements”.
- B. Correct over-excavation as specified in Section 31 23 23 “Fill”.
- C. Remove large stones or other hard materials that could damage pipe or impede consistent backfilling or compaction.
- D. Protect and support existing sewer lines, utilities, and appurtenances.
- E. Utilities:
 1. Maintain profiles of utilities.
 2. Coordinate with other utilities to eliminate interference.
 3. Notify Engineer if crossing conflicts occur.

3.3 INSTALLATION

- A. Bedding:

1. Excavate pipe trench as specified in Section 31 23 17 "Trenching".
2. Excavate to lines and grades as indicated on Drawings, or as required to accommodate installation of encasement.
3. Dewater excavations to maintain dry conditions and to preserve final grades at bottom of excavation.
4. Provide sheeting and shoring as specified in Section 31 23 17 "Trenching".

B. Piping:

1. Install pipe, fittings, and accessories according to ASTM D2321, and seal joints watertight.
2. Lay pipe to slope gradients as indicated on Drawings.
3. Maximum Variation from Indicated Slope: 1/8 inch in 10 feet.
4. Begin at downstream end and progress upstream.
5. Assemble and handle pipe according to manufacturer's instructions, except as may be modified on Drawings or by Engineer.
6. Keep pipe and fittings clean until Work has been completed and accepted by Engineer.
7. Cap open ends during periods of Work stoppage.
8. Lay bell and spigot pipe with bells upstream.
9. Backfill and compact as specified in Section 31 23 17 "Trenching".
10. Do not displace or damage pipe when compacting.
11. Connect pipe to existing sewer system as shown on Drawings.
12. Pipe Markers: As specified in Section 33 05 26 "Utility Identification".

C. Connection to Existing Manholes:

1. Drilling:
 - a. Core drill existing manhole to clean opening.
 - b. Use of pneumatic hammers, chipping guns, and sledge hammers are not permitted.
2. Install watertight Kor-n Seal boot with non-shrink concrete grout.
3. Prevent construction debris from entering existing sewer line when making connection.

D. Manholes:

1. Install manholes as specified in Section 33 05 13 "Precast Concrete Wastewater Utility Structures".

E. Backfilling:

1. Backfill around sides and to top of pipe as specified in Section 31 23 23 "Fill" and in construction details located in the Drawings.
2. Maintain optimum moisture content of bedding material as required to attain specified compaction density.

3.4 FIELD QUALITY CONTROL

A. Section 01 40 00 "Quality Requirements".

- B. Request inspection by Owner or Owner's Representative prior to and immediately after placing bedding.
- C. Testing:
 - 1. If tests indicate that Work does not meet specified requirements, remove Work, replace, and retest.
 - 2. Pipe Testing:
 - a. Pressure Test, Infiltration Test, Deflection Test, Leakage Test: As specified in Section 33 01 30.13 "Sewer and Manhole Testing".
 - 3. Compaction Testing:
 - a. In accordance with Section 31 23 23 "Fill".

3.5 PROTECTION

- A. Refer to Section 01 73 00 "Execution" and Section 01 77 00 "Closeout Requirements".
- B. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.

END OF SECTION 33 31 13

(NO TEXT FOR THIS PAGE)

SECTION 33 32 00 – WASTEWATER PUMPING STATION

PART 1 - GENERAL

1.1 SCOPE

- A. Furnish, install, and place into operation one complete wastewater pumping station. The pumping station shall include electric service, electrical controls, pump controls, telemetry monitoring system, two (2) submersible pumps, wet-well, valve vault, and associated piping, valves, and appurtenances.
- B. Coordinate with utilities and perform all work in accordance with the National Electric Code, all local electric codes and the requirements of the electric utility, NIPSCO.
- C. Provide submittals for each component included in this specification including wiring diagrams.

PART 2 – PRODUCTS

2.1 SUBMERSIBLE PUMPS

- A. The pumps shall pump 251 gpm @ 64 feet TDH.
- B. Pumps shall be XFP 100E CB1.4 PE90/4 from ABS, with no exceptions.
- C. Each pump with its appurtenances and cable shall be capable of continuous submergence without loss of watertight integrity. Pumps shall be designed for automatic connection to the discharge connection elbow, guided by a single guide bar extending from the top of the structure to the discharge elbow. Sealing of the pump discharge flange elbow interface shall be by metal to metal contact. No portion of the pump or guidance system shall bear on the floor of the sump pump except the discharge connection elbow.
- D. Shaft shall be stainless steel with heavy duct ball bearings, permanently lubricated with double tandem mechanical seals.
- E. Impeller shall be of the non-clog type designed to pass 3" solids and unscreened liquids. Impeller shall be close grained cast iron or bronze and keyed to the motor shaft.
- F. Pump Tests: The pump manufacturer shall perform the following inspections and tests on each pump before shipment from the factory:
 - a. Impeller, motor rating, and electrical connections shall first be checked for compliance with the customer's purchase order.
 - b. A motor and cable insulation test for moisture content or insulation defects shall be made.
 - c. Prior to submergences, the pump shall be run dry to establish correct rotation and mechanical integrity.
 - d. The pump shall run in water to a minimum depth of 6 feet.
 - e. After operational test (d), the insulation test (b) shall be performed again.

2.2 MOTORS

- A. The submersible pump shall be driven by a completely sealed electrical submersible motor of 4.7 horsepower, 1.3 service factor, 1,180 rpm nominal speed, for operation on 230V, 60 hertz, and three phase power. The motor nameplate horsepower rating shall not be exceeded by the brake horsepower requirements of the pumps for the specified head and GPM conditions.
- B. The submersible pump shall be designed for a Class I, Group D, and Divisions 1 hazardous location as designed by the National Electric Code. The unit shall be listed with Underwriters Laboratories as Class I, Group D, and Division 1 for installation in water or sewage. All electrical parts shall be housed in an air filled cast iron, water tight enclosure. The enclosure shall be sealed by the use of "O" rings and shall have rabbet joints with a large overlap. Cable leads shall be epoxy sealed. The motor shaft extension shall be stainless steel, impervious to the liquid waste and materials being handled. All external hardware including the motor nameplate shall also be made of stainless steel.
- C. There shall be tandem seals, one inside an oil chamber and one outside, providing double protection to the electrical parts. Two moisture sensing probes shall be used to detect an influx of conductive liquid past the outer seal and provide ample warning of first seal failure. These sensors shall be wired to the control panel for use in conjunction with the external overload protection.
- D. Bearings shall be pre-lubricated at the factory and designed for a minimum L-10 life of 17,500 hours. Shaft extension bearings shall be locked to prevent shift movements and to take thrust loads.
- E. Motor winding shall have a special Class F insulation system providing 1.15 service factor and extended life. Automatic reset, normally closed thermal overloads shall be installed in adjacent phases of the motor winding to provide the overheating protection.
- F. Lifting eyes shall be provided and be of adequate strength to lift the entire pump assembly.
- G. Contractor shall wire from pumps to junction box directly below the panel, then wire from the junction box to the control panel. There should be no junction box located on or in the wet well.

2.3 LIFT STATION ACCESSORIES

- A. Permanent stainless steel chains for the installation and removal of each pump on its guide rail system shall be provided. Each chain shall have sufficient strength and length to reach from each pump to at least four (4) feet above the top of the lift station wet well. Each chain shall be secured on a stainless steel hook bolt, anchored to the top slab of the wet well, in the pump access opening.
- B. Two (2) mercury-free float switches, each with 50 feet of cable to extend to the electronic unit with no splicing of cables allowed, shall be provided. The floats shall be utilized to start and stop the "lead" and "lag" pumps in the event of a failure of the level transmitter

or controller and to alarm the failure at elevations indicated on the drawings. The pump controls shall prevent the simultaneous start of both pumps under this situation.

- C. The pump level control floats shall have sufficient weight to hang freely, without intermediate support, from stainless steel supports that are secured to the wet well wall, just below the top slab of the wet well.
- D. The aluminum hatches with fall protection grating for the tops of the lift station wet well and valve vault structures shall be series SIS, as manufactured by Halliday Products or approved equal. The hatches shall be the size indicated, or larger if required, for easy removal of the wet well pumps or the valve vault valves. Each hatch shall have a recessed slam-lock and 90 degree open holding latch.
- E. Pump removal stainless steel (schedule 40) guide rails with anchoring hardware shall be provided by the pump manufacturer.

2.4 PUMP LEVEL CONTROL AND CONTROL TRANSMISSION SYSTEM

- A. The pump level control and control transmission system shall include a pressure transducer in the wet well. The transducer shall be Siemens Mag 6000, with no exception and shall be provided with 50 feet of cable to extend to the electronic unit without splicing. The electronic unit shall be located in the pumping station control panel.
- B. The transducer shall be attached to a 1/8" 316 stainless steel cable and 316 stainless steel clamps. A weight shall be attached at the bottom of the cable and transducer and shall be attached just above the weight near the bottom of the wet well.
- C. The transducer shall be provided with battery backup to send water level data to the plant in the event of a power failure.

2.5 LIFT STATION CONTROL PANEL

- A. The lift station pump control panel enclosure shall be Type 4x, stainless steel, flange mounted disconnect with swing out panel. The enclosure shall be Hoffman or Saginaw Controls, or approved equal. The lift station control panel enclosure shall be separate from the operator interface panel.
- B. The operators (lights, selector switch) shall be 22mm and installed on the swing out panel. The operators shall be Allen Bradley or Square D, or approved equal.
- C. Circuit breakers shall be provided for each pump and accessible through the swing out door. The circuit breakers shall be Allen Bradley or Square D.
- D. The miscellaneous control components such as relays, terminal blocks, and wire way shall be provided as required.
- E. The level transmitter and floats shall be provided and wired into intrinsically safe area of the control panel. A submersible level transmitter shall be installed and wired to the operator interface controller.

- F. The backup float circuit shall be hardwired to operate the controller in case of level transmitter failure.
- G. A UPS, power fail relay, 24 VDC power supply, and lightening arrestor, condensation heater with thermostat, terminal blocks, circuit breaker, receptacle, and GFI shall be provided in the enclosure.
- H. The electrician shall properly seal all conduits from gases entering the control panel.
- I. The control panel shall be constructed by an Industrial UL Listed control panel shop and shall be 698A listed.
- J. The pump controls shall be provided by the pump manufacturer and shall include the following:
 - 1. A NEMA 3R stainless steel enclosure with outside solid door and an inside door with instrumentation mounting. The control panel shall be designed to conveniently hold the outside door in a 180 degree fully open position and the inside instrument door in a 120 degree open position.
 - 2. The following starting and overload protection facilities for each pump.
 - a. A combination NEMA rated motor starter and circuit protector to provide short circuit protection per NEC Code.
 - b. A manual reset for dual protection against current overloads and short circuits.
 - c. An overload relay to be pre-calibrated to match motor characteristics.
 - d. A hand/off/auto selector switch mounted on the inside door of the control enclosure.
 - 3. Thermal overload protection shutoff switches, restart buttons and warning lights for each pump.
 - 4. A 20 amp 115 volt GFI receptacle in the pump control system enclosure.
 - 5. Run and moisture sensor warning lights for each pump mounted on the inside door of the control enclosure.
 - 6. A separate circuit breaker for the pump control system.
 - 7. Lighting/surge protection for the entire pump control system.

- 8.A 100 watt heater with thermostat and over-temperature control for moisture control inside the pump control enclosure.
- 9. Dry contacts for pump thermal failure.
- 10. Either a 3-phase electrical supply monitor-or a low electrical voltage monitor, if an electrical phase converter is used for lift station power supply. This monitor shall interrupt power to the pump controls in an electrical supply problem condition.
- 11. Circuit breakers shall be provided in the pump control panel for the following accessories:
 - a. Area Light
 - b. GFI receptacle
 - c. 100 watt heater
 - d. Controls

2.6 OPERATOR INTERFACE PANEL

- A. The operator interface panel enclosure shall be Type 4x stainless steel with swing out panel. The enclosure shall be Hoffman or Saginaw Controls, or approved equal. The operator interface panel enclosure shall be separate from the lift station control panel.
- B. The operator interface controller shall be the Station Controller SC2000-11 by MPE Electronics with no exceptions and shall be mounted on the swing out panel.
- C. A Mission RTU shall be installed in the control panel for real-time monitoring and alarming. The Mission RTU shall be M-800 by Mission Communications, no exceptions.
- D. The Mission RTU shall monitor wet well level and flow rate. The wet well level shall be retransmitted from the operator interface controller.
- E. The Mission RTU shall have the following digital and/or analog inputs:
 - a. Wet well level
 - b. Pump 1 run/off
 - c. Pump 2 run/off
 - d. Pump 1 fail/normal
 - e. Pump 2 fail/normal
 - f. Low wet well level/normal
 - g. High wet well level/normal
 - h. Power fail
 - i. Float control
 - j. Motor high temperatures
- F. The Mission RTU shall be provided with battery backup to send water level data to the plant in the event of a power failure.

- G. A UPS, power fail relay, 24 VDC power supply, lightning arrestor, condensation heater with thermostat, terminal blocks, circuit breaker, receptacle, and GFI shall be provided in the enclosure.
- H. The lift station control panel and the operator interface panel shall be provided as a single source to avoid any incompatibility. The control panel shall be constructed by an Industrial UL Listed control panel shop and shall be 508A listed.

2.7 FLOW METER

- A. Operating principle: Utilizing Faraday's Law of Electromagnetic Induction, the flow of liquid through the sensor induces an electrical voltage that is proportional to the velocity of the flow.
- B. Construction: (choose based on sensor size)
- C. (2" – 10") The sensor flow tube and liner material shall be constructed of a composite elastomer (hard and soft rubber) surrounded by two integral coils. Measurement and grounding electrodes shall be 316 stainless steel. Connecting flanges shall be carbon steel.
- D. (1", 1-1/2", and 12" – 48") The sensor flow tube shall be 304 stainless steel surrounded by two coils. Liner material shall be hard rubber. Measurement and grounding electrodes shall be 316 stainless steel. Connecting flanges shall be carbon steel
- E. Installation: A minimum of 5 pipe diameters up stream and 3 pipe diameters down stream are recommended (Consult the factory for any variations).
- F. Operating Temp: -20 to +160° F.
- G. Size: 1" to 48" diameter
- H. Submergence: The sensor shall be pedestal sealed against accidental submersion to 3 feet for 30 minutes standard, or permanently submerged to 30 feet when the terminal box is backfilled with a non-setting, transparent potting material.
- I. Signal converter: Type MAG 6000.
- J. Enclosure: NEMA 4X enclosure
- K. Display: Background illumination with alphanumeric 3-line, 20-character display to indicate flow rate, totalized values, settings, and faults (a blind version of the MAG 6000 signal converter is available).
- L. Power supply: 115/230 VAC or 11-24VDC.
- M. Operating temperature: -5 to +120 degrees F.

- N. Outputs: 0-20 mA or 4-20 mA into 800 ohms max. One relay rated at 42 VAC/2 A, 24 DC/1 A. Digital (frequency or pulse) for external display of flow rate or totalizer.
- O. Communications; Optional Plug-in Modules – Profibus (PA or DP), HART, Modbus RTU/RS485, CAN Open Device Net

2.8 LIFT STATION PIPING, FITTINGS, AND VALVES

- A. The sizes of the pipe, fittings, and valves for the submersible pump discharge and the emergency pump suction and discharge connections shall be specifically determined for the pump station design capacity.
- B. All interior or buried piping shall be class 50 or pressure class 250 ductile iron with flanged joints.
- C. Pump discharge check valves shall be swing-check type with outside weighted arm and manufactured in accordance with AWWA specification C508. The check valves shall be ductile iron and have flanged ends as per ANSI B.16.1 Class 125. The valves shall have an access flange for internal valve maintenance, without removing the valve from the pipeline.
- D. Pump discharge plug valves shall have eccentric action such that the valve plug rises off the seat during operation. The valve plug shall be neoprene or BUNA-N faced. The plug valves shall be iron or semi-steel and have flanged ends as per ANSI B.16.1 Class 125. Plug valve operators shall be as indicated on the drawing details. Plug valves shall be DeZurick series 100, or approved equal.
- E. All piping connections to fittings and valves can be with field flanges, Uni-flange, or approved equal.
- F. Pump discharge check, plug, and bypass valves shall be located in a separate structure with aluminum hatch. This structure shall have a drain that returns to the wet well with an appropriate trap, as indicated on the drawings.
- G. Two valve operating T-wrenches shall be provided, one eight (8) feet long and one three (3) feet long, for opening the plug valves in the valve vault from the top of the vault.
- H. All cables and conductors shall be in conduit; schedule 80 PVC for buried and rigid galvanized steel for exposed. All conduit sizes shall be oversized for easy future removal of the cables and conductors and their replacement with the next larger size.

PART 3 - EXECUTION

- 3.1 Complete installation and test pumps for conformance with specifications and manufacturer's recommendations.

- 3.2 The location of all buried electrical conduit shall be marked with continuous plastic tape, a minimum of 6 inches wide and 4 mils thick and buried directly above the conduit, approximately 8 inches below finished grade.
- 3.3 Meet with District officials and Engineer at the following lift station construction stages: (1) prior to beginning, (2) at 50% completion, (3) at substantial completion start-up, and (4) at 100% completion of the lift station. Prior to scheduling the substantial completion start-up with District officials, the contractor shall fully start-up all lift station equipment. District officials will issue a letter of acceptance at 100% completion upon compliance with any “punch list” of items to be completed, which was generated at the substantial completion start-up of all lift station equipment, or thereafter.
- 3.4 The contractor shall furnish the District with one (1) digital and four (4) hard copies of the following documents: (a) lift station operation and maintenance manual, with complete detailed information on all lift station equipment and components and a first page summary sheet or index which clearly indicates the contents of the manual all referenced and marked by numbered tabs; (b) as-built construction drawings of the lift station including a site plan with state plane coordinates and NGVD88 elevation data for rims and inverts of the wet well, other manholes and connecting sewers; (c) lift station start-up procedure and results check list; and (d) parts list.
- 3.5 Suppliers of the pump station control system shall provide one day of supervisory startup service to ensure proper operation of the system.

PART 4 – MEASUREMENT AND PAYMENT

- 4.1 Wastewater Pumping Station will be paid for at the contract unit price for “Wastewater Pumping Station...LS” as indicated on the bid form. The price shall include the wet well, valve vault, electrical service, controls, control panel, operator interface panel, electrical wiring, yard lighting, electrical panel supports, concrete slab, covers, hatches, all piping, valves, fittings and other appurtenances within the footprint of the wall enclosure.

END OF SECTION 33 32 00

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SECTION 33 34 00 – DUCTILE IRON PIPE SANITARY SEWER, FORCE MAIN

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Excavation and Backfill
2. Pipe Bedding
3. Site Restoration

B. Related Requirements:

1. Section 31 23 16 “Excavation”
2. Section 31 23 17 “Trenching”
3. Section 31 23 23 “Fill”
4. Section 33 01 30.13 “Sewer, Force Main and Manhole Testing”
5. Section 33 05 26 “Utility Identification”

1.2 REFERENCE STANDARDS

A. American National Standards Institute / American Water Works Association:

1. AWWA C104/ANSI A21.4-16 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings.
2. AWWA C110/ANSI A21.10 - Ductile-Iron and Gray-Iron Fittings.
3. AWWA C111/ANSI A21.11 – Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
4. AWWA C151/ANSI A21.51 - Ductile Iron Pipe, Centrifugally Cast.

B. ASTM International:

1. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 Kn-M/M³)).

C. Ductile Iron Pipe Research Association (DIPRA):

1. Thrust Restraint Design for Ductile Iron Pipe.

1.3 SUBMITTALS

A. Section 01 33 00 “Submittal Procedures”.

- B. Product Data: Submit manufacturer information indicating pipe material used, pipe accessories, sizing, restrained joint details and materials. Annotate product data clearly to delineate what is being supplied.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Provide shop fabrication drawings with piping layouts for how the piping will be installed in the field.
 - 1. Indicate piping piece numbers and locations
 - 2. Indicate restrained joint locations.
- E. Test and Evaluation Reports: Submit reports indicating field tests made and results obtained.
- F. Manufacturer Instructions:
 - 1. Indicate special procedures required to install specified products.
- G. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections. Submit certificate of compliance for pipe, fittings, gaskets, coatings, etc. in accordance with this section.

1.4 CLOSEOUT SUBMITTALS

- A. Refer to Section 01 73 00 "Execution" and Section 01 77 00 "Closeout Requirements".
- B. Project Record Documents: Record invert elevations and actual locations of pipe runs, connections, manholes, and cleanouts.
- C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.5 QUALITY ASSURANCE

- A. Perform Work according to local, State and Federal standards.

1.6 FIELD MEASUREMENTS

- A. Verify that field measurements and elevations are as indicated.

1.7 SAFETY

- A. For the security and safety of persons in and adjacent to trenches or construction operations, the "Manual of Accident Prevention in Construction" published by the Associated General Contractors of America and the safety regulations of the appropriate state or local agency shall be followed when specifically applicable or by similarity of operation or as necessary for adequate protection.

1.8 DELIVERY, STORAGE & HANDLING

- A. Refer to Section 01 60 00 "Product Requirements".
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Delivery:
 - 1. Pipe fittings, manhole sections, and accessories shall be loaded and unloaded by lifting with hoists or skidding so as to avoid shock or damage. Under no circumstances shall such materials be dropped. Pipe handled on skidways shall not be skidded or rolled against other pipe.
 - 2. Provide each pipe segment, fitting and accessory with a date stamp indicating date of manufacture.
- D. Storage:
 - 1. Store materials according to manufacturer instructions.
 - 2. Do not place materials on private property without written permission of property owner.
 - 3. Do not stack pipe higher than recommended by pipe manufacturer.
- E. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Store gaskets for mechanical and push-on joints in cool and dry location, out of direct sunlight, and not in contact with petroleum products.

1.9 DEWATERING

- A. Should water be encountered, furnish and operate suitable pumping equipment of such capacity adequate to dewater the trench. The trench shall be sufficiently dewatered so that the laying and joining of the pipe is made in the dry. Convey all trench water to a natural drainage channel or storm sewer without causing any property damage. Any dewatering well, temporary or permanent, shall be constructed in a manner to comply with local and state guidelines. Should dewatering operations affect any existing water wells, provide temporary water service to the affected parties.

1.10 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.
- B. Installer: Company specializing in performing Work of this Section with minimum three years' documented experience.

1.11 EXISTING CONDITIONS

A. Field Measurements:

1. Verify field measurements prior to fabrication.
2. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 SEWER / FORCE MAIN PIPE MATERIALS

A. Polyethylene Pipe

1. All pipe and fittings to be incorporated into the work shall be made from virgin polyethylene pipe compound material. The pipe shall possess a minimum dimension ratio (DR) of 11 with an Ductile Iron Pipe Size (DIPS) outside diameter.
2. The polyethylene resin compound shall contain antioxidants and be stabilized with carbon black against ultra-violet degradation to provide protection during processing and subsequent weather exposure. Pipe shall have permanently extruded green stripe on four (4) sides.
3. Pipe and fittings shall be made of a high density polyethylene pipe resin, PE3408, possessing a minimum cell classification of 345434C as defined in the latest revision of ASTM D3350 for high density polyethylene pipe and manufactured to the standards of ASTM F-714. Unless otherwise shown on the plans.
4. Pressure Class: Unless otherwise shown on the plans, the required pressure class shall be 200 psi.
5. Pipe made from polyethylene resins shall be homogeneous throughout and be free of visible cracks, holes, foreign material, blisters or deleterious faults.
6. The pipe shall be jointed together by conventional fusion methods or by using electrofusion couplings or connectors with tensile strength equivalent to that of the pipe being joined.

PART 3 - EXECUTION

3.1 GENERAL

- #### A.
- Pipe and accessories shall be handled in such a manner as to ensure that pipe is installed in sound, undamaged condition. Particular care shall be taken not to injure the pipe coating and lining.

- B. Any pipe showing a distinct crack with no evidence of incipient fracture beyond the limits of the visible crack, if approved, may have the cracked portion cut off by, and at the expense of, the Contractor before the pipe is laid so 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.
- C. Cutting of the pipe shall be done in a neat and workmanlike manner without damage to the pipe lining. Unless otherwise authorized by the Engineer, all pipe cutting shall be done by means of an approved type of power cutter. The use of hammer and chisel, or any other method with results in rough edges, chipped or damaged pipe, is prohibited.
- D. Each pipe section shall be placed into position in the trench in such a manner and by such means required to cause no injury to the pipe, persons, or to any property.
- E. Furnish slings, straps, and/or approved devices to provide satisfactory support of the pipe when it is lifted. Transportation from storage areas to the trench shall be restricted to operations which can cause no damage to the pipe or lining.
- F. The pipe shall not be dropped from trucks onto the ground or into the trench.
- G. Provide all the proper tools to handle and cut the pipe on the job site with each pipe laying crew,
- H. Damaged pipe coating and/or lining shall be restored and approved by the Engineer before installation.
- I. Polyethylene Wrap: Wrap all ductile iron pipe in polyethylene wrap conforming to the requirements of ANSI A21.5

3.2 PREPARATION OF BED

- A. As soon as excavation has been completed to the required depth, place and compact bedding materials as shown on the Contract Drawings and specified in Section 31 23 23 "Fill", to the elevation necessary to bring the pipe to grade.
- B. The compacted bedding material shall be placed so that the pipe shall rest firmly on the bedding for the full length of the barrel. Suitable holes for bells or couplings shall be dug around the pipe joints to provide ample space for making tight joints.

3.3 LAYING PIPE

- A. Each pipe length shall be inspected for cracks, defects in coating or lining, and any other evidences of unsuitability.
- B. Pipe shall be laid in the dry and at no time shall water in the trench be permitted to flow into the pipe.
- C. The pipe shall then be laid on the trench bedding, and the pipe pushed home. Jointing and laying shall be in accordance with the manufacturer's instructions and appropriate ASTM Standards, and the Contractor shall have on hand for each pipe laying crew, the necessary tools,

gauges, pipe cutters, etc., necessary to install the pipe in a workmanlike manner. Pipe laying shall proceed upgrade with spigot ends pointing in the direction of the flow.

- D. Blocking under the pipe will not be permitted except where a concrete cradle is proposed, in which case precast concrete blocks shall be used. Provide thrust restraints at all bends and connections.

E. Ductile Iron Pipe Mechanical Joints:

1. Assembly: In making up mechanical joints, center the spigot in the bell.
 - a. Thoroughly brush the surfaces with which the rubber gasket comes in contact with a wire brush just prior to assembly of the joint.
 - b. Brush lubricant over the gasket just prior to installation.
 - c. Place the gasket and gland in position, bolts inserted, and the nuts tightened finger tight.
 - d. Tighten the nuts with a torque wrench so that the gland is brought up toward the pipe evenly.
 - e. Prime all bolts by dipping with a bituminous coating, except the threads. Coat threads immediately prior to installation of nuts.

2. Torques: Apply the following range of bolt torques:

<u>Inches</u>	<u>Torque – ft. lbs</u>
5/8	45 - 60
3/4	75 - 90
1	85 – 100
1-1/4	105 - 120

3. Remaking of Joints: If effective sealing is not obtained at the maximum torque listed above, disassemble and reassemble the joint after thorough cleaning.

F. Ductile Iron Pipe Gasket Joints

1. Assembly: In making up the rubber gasket joint, brush the gasket seat in the socket thoroughly with a wire brush and wipe the gasket with a cloth.
 - a. Place the gasket in the socket with the large round end entering first so that the groove fits over the bead in the seat.
 - b. Apply a thin film of lubricant to the inside surface of the gasket that will come in contact with the entering pipe.
 - c. Brush the plain end of the pipe to be entered thoroughly with a wire brush and place it in alignment with the bell of the pipe to which it is to be joined.
 - d. Exert sufficient force on the entering pipe so that its plain end is moved past the gasket until it makes contact with the base of the socket to make the joint.
2. Positioning: Before proceeding with backfilling, feel completely around the joint using a feeler gauge to confirm that the gasket is in its proper position.

- a. If the gasket can be felt out of position, withdraw the pipe and examine the gasket for cuts or breaks.
 - b. If the gasket has been damaged, replace it with a new one before reinstalling the pipe.
 3. Sealing/Repairing Field Cut Pipe: Cut pipe square. Remove any damaged lining caused by field cutting operations or handling and clean any exposed metal by sanding or scraping. After area has been cleaned and roughened, apply a coat of Protecto Joint Compound (used to repair Protecto 401 Ceramic Epoxy Lining) in accordance with lining manufacturer recommendations. Additionally, coat the exposed metal surface of the cut pipe end. To ensure proper sealing, overlap at least one inch of the lining with this repair material. Apply Protecto Joint Compound in accordance with lining manufacturer recommendations.
 - G. After placement of the haunching material, the pipe shall be checked for line depth and any debris, tools, etc., shall be removed.
 - H. If inspection of the pipe indicates that the pipe has been properly installed as determined by the Owner's Representative, backfill may proceed in accordance with Section 31 23 23 "Fill" and/or the typical trench detail shown on the Drawings.
 - I. At any time that work is not in progress, the end of the pipe shall be suitably closed to prevent the entry of animals, earth, water, etc.
 - J. At the end of each day's work or at intervals of length at the option of the Owner and Owner's Representative, the Owner's Representative with the Contractor, will inspect the pipe for adherence to the slopes and elevations shown on the plans. Unsatisfactory work shall be dug up and reinstalled to the satisfaction of the Owner's Representative.
- 3.4 TESTING
- A. Refer to Specification 33 01 30.13 "Sewer, Force Main and Manhole Testing".
- 3.5 PROXIMITY TO WATER MAINS
- A. Whenever possible, sewers shall be laid with a minimum of 10 feet horizontal separation between the sewer and potable water lines (outside of the pipe). Should lateral separation of 10 feet not be possible, pressure rated pipe shall be utilized and the following methods of protection must be employed:
 1. Lay sewer and water main in separate trench.
 2. Lay the sewer and water main in same trench with the water main at one side on a bench of undisturbed earth.
 3. In both cases, the water main invert shall be 18 inches above the sewer crown and the pipe shall be located as far apart as possible. (There shall be a minimum of 3+ feet or horizontal separation between the pipe outside diameters.)

- B. Whenever sewers must cross under water mains, the sewer shall be laid at such an elevation that the top of the sewer is at least 18 inches below the bottom of the water main. One full length of water main should be centered over the sewer so that both joints will be as far from the sewer as possible. The sewer shall not be located above the water main.
- C. When it is impossible to obtain horizontal and/or vertical separation as stipulated above, both the water main and sewer shall be constructed of pressure pipe. Both pipes shall be pressure tested at 50 psi for a minimum of 15 minutes with no leakage to assure water tightness.

3.6 FIELD QUALITY CONTROL

- A. Section 01 40 00 "Quality Requirements".
- B. Request inspection by Owner or Owner's Representative prior to and immediately after placing bedding.
- C. Testing:
 - 1. If tests indicate that Work does not meet specified requirements, remove Work, replace, and retest.
 - 2. Pipe Testing:
 - a. Pressure Test, Infiltration Test, Deflection Test, Leakage Test: As specified in Section 33 01 30.13 "Sewer and Manhole Testing".
 - 3. Compaction Testing:
 - a. In accordance with Section 31 23 23 "Fill".

3.7 PROTECTION

- A. Refer to Section 01 73 00 "Execution" and Section 01 77 00 "Closeout Requirements".
- B. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.

END OF SECTION 33 34 00

SECTION 40 71 13 - MAGNETIC FLOW METERS

PART 1 - GENERAL

1.1 SCOPE

- A. This section describes the requirements for an electromagnetic flow meter and microprocessor-based signal converter. Under this item, the contractor shall furnish and install the magmeter equipment and accessories as indicated on the plans and as herein specified.

1.2 SUBMITTALS

- A. Data sheets and catalog literature for the magmeter and the microprocessor-based signal converter.
- B. Connection diagrams for equipment wiring.
- C. List of spare parts and optional equipment.

PART 2 - PRODUCTS

2.1 MAGNETIC FLOW METERS

- A. SIEMENS:
 - 1. The electromagnetic flow meter shall consist of a flow sensor based on Faraday's Law of Electromagnetic Induction and microprocessor-based signal converter, type MAG 6000.
- B. Sensor:
 - 1. Operating principle: Utilizing Faraday's Law of Electromagnetic Induction, the flow of liquid through the sensor induces an electrical voltage that is proportional to the velocity of the flow.
 - 2. Construction: (choose based on sensor size)
 - 3. (2'-10') The sensor flow tube and liner material shall be constructed of a composite elastomer (hard and soft rubber) surrounded by two integral coils. Measurement and grounding electrodes shall be 316 stainless steel. Connecting flanges shall be carbon steel.
 - 4. (1', 1-1/2", and 12" – 48") The sensor flow tube shall be 304 stainless steel surrounded by two coils. Liner material shall be hard rubber. Measurement and grounding electrodes shall be 316 stainless steel. Connecting flanges shall be carbon steel.
 - 5. Installation: : A minimum of 5 pipe diameters up stream and 3 pipe diameters down stream are recommended (Consult the factory for any variations).
 - 6. Operating Temp: -20 to +160° F.
 - 7. Size: 1" to 48" diameter (see instrument schedule).

8. Submergence: The sensor shall be pedestal sealed against accidental submersion to 3 feet for 30 minutes standard, or permanently submerged to 30 feet when the terminal box is backfilled with a non-setting, transparent potting material.
 9. Signal Converter: Type MAG 6000.
 10. Enclosure: NEMA 4X Enclosure.
 11. Display: Background illumination with alphanumeric 3-line, 20-character display to indicate flow rate, totalized values, settings, and faults (a blind version of the MAG 6000 signal converter is available).
 12. Power Supply: 115/230 VAC or 11-24VDC.
 13. Operating temperature: -5 to +120 degrees F.
 14. Outputs: 0-20 mA or 4-20 mA into 800 ohms max. One relay rated at 42 VAC/2 A, 24 DC/1 A. Digital (frequency or pulse) for external display of flow rate or totalizer.
 15. Communications: Optional Plug-in Modules - Profibus (PA or DP), HART, Modbus RTU/RS485, CAN Open, Device Net.
- C. Performance:
1. Flow Range: 1.5 fps to 33 fps for accuracies stated below.
 2. Accuracy: 0.25% of actual flow.
 3. Separation: Maximum distance of 900 feet between signal converter and sensor without the use of any additional equipment.
 4. Bi-directional flow capabilities shall be standard.
 5. Totalizer: Two eight-digit counters for forward, net, or reverse flow.
 6. The electromagnetic flow meter shall be a Siemens Model MAG 5100 W flow sensor with a Siemens Model MAG 6000 signal converter. Insertion type flow meters will not be accepted.
- D. Spare Parts:
1. Spare parts for the equipment shall include the following, unless otherwise noted:
 - a. One set of manufacturers recommended spare parts.
 - b. Extra operation manuals as required
- E. Operator Functions:
1. Calibration:
 - a. Each flow sensor shall be wet calibrated and all of the calibration information and factory settings matching the sensor shall be stored in an integrally mounted SENSORPROM® memory unit. The SENSORPROM® shall store sensor calibration data and signal converter settings for the lifetime of the product. At initial commissioning, the flowmeter commences measurement without any initial programming. Any customer specified settings are downloaded to the SENSORPROM®. Should the signal converter need to be replaced, the new signal converter will upload all previous settings and resume measurement without any need for reprogramming or rewiring.
 - b. A certificate of calibration shall accompany each flow sensor.
 2. Converter Function Details:
 - a. All programming shall be accomplished through an integral keypad and all programming shall be protected by a user-defined password.
 - b. The signal converter shall be integrally mounted or remotely mounted using a remote-mount kit provided by the manufacturer.
 - c. The signal converter shall provide a 0/4-20 mA DC signal proportional to flow rate into 800 ohms max. Output selectable as unidirectional or bi-directional.

- d. The relay shall be programmable as error indicator, limit alarm or pulsed output.
 - e. The signal converter system shall be equipped with an error and status log with 4 groups of information:
 - 1) Information without a functional error involved.
 - 2) Warnings which may cause malfunction in the application.
 - 3) Permanent errors, which may cause malfunction in the application.
 - 4) Fatal error, which is essential for the operation of the flowmeter.
 - f. A system error shall be indicated by a flashing icon on the display or activation of the relay when set as an error alarm.
 - g. The first nine standing errors shall be stored in the error pending log. A corrected error is removed from the error pending log. A status log shall be provided to store the last 9 error messages received for 180 days regardless of correction.
- F. Reverification:
- 1. Verification:
 - a. Verification using a stand-alone Siemens MAGFLO Vericator to measure a number of selected parameters in the flow sensor and signal converter, which affects the integrity of the flow measurement, shall be available through a factory verification service.
 - 2. Parameters:
 - a. Verification of the Flowmeter shall consist of the following test routines:
 - 1) Insulation test of the entire flowmeter system and cables.
 - 2) Test of sensor magnetic properties.
 - 3) Signal converter gain, linearity, and zero point tests.
 - 4) Digital output test.
 - 5) Analog output test.
- G. Certificate:
- 1. A certificate of verification shall be issued if the flowmeter passes all of the tests with-in 1% of the original factory test parameters.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Follow manufacturer's recommendation for the minimum upstream and downstream installation requirements for the flow sensor.
- B. Wiring between flow sensors and remote mounted signal converters shall use cable type and procedures as per the manufacturers' recommendations.

3.2 MANUFACTURER'S ASSISTANCE

- A. Warranty:

1. The manufacturer of the electromagnetic flow meter shall guarantee for one year of operation that the equipment shall be free from defects in design, workmanship, or materials
2. In the event a component fails to perform as specified, or is proven defective in service during the guarantee period, the manufacturer shall promptly repair or replace the defective part at no cost to the owner.

END OF SECTION 40 71 13

September 11, 2018
Project # 3628-302-19-01

GEOTECHNICAL EXPLORATION

**LIFT STATION AND JACK AND BORE PITS
MICHIGAN CITY, INDIANA**

**Prepared For:
LaPorte County
555 Michigan Avenue
Suite 202
LaPorte, IN 46350**

PREPARED BY





September 11, 2018

Project # 3628-302-19-01

Attn: Mr. Mitch Bishop
La Porte County
555 Michigan Avenue, Suite 202
La Porte, Indiana 46350

**Re: Geotechnical Exploration
Lift Station and Jack and Bore Pits
Michigan City, Indiana**

Dear Mr. Bishop,

In compliance with your request, **Weaver Consultants Group** has completed the geotechnical exploration at the site of the above-referenced project. This work was completed in general accordance with our Proposal dated March 20, 2018 and subsequent authorization by your office. The purpose of this study was to explore the stratification and engineering properties of subsurface soils along the proposed new sewer and water main lines along county roads 300N and 950W in Michigan City, Indiana. In the body of this report, we present a summary of our findings, an interpretation of the subsurface conditions, our design recommendations, and construction considerations. The boring location plan is presented in the **Figures Appendix**. The soil boring logs are presented in the **Boring Logs Appendix**. The methods for field and laboratory operations are presented in the **Field Exploration Appendix**. General Qualifications and Contractual Considerations are presented in the **Qualifications Appendix**.

Thank you for selecting our firm to assist in this phase of the project. Please call us if there are any questions concerning this report.

We would be pleased to review the project design and specifications and to provide observation and testing services during the project construction.

Sincerely,

Weaver Consultants Group

A handwritten signature in blue ink, appearing to read 'Scott A. Stelter'.

Scott A. Stelter, EI
Geotechnical Engineer

A handwritten signature in blue ink, appearing to read 'Steve Schubert'.

Steve Schubert, PE
Geotechnical Engineering Manager

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Figures

Figure 1: Boring Location Plan

Boring Logs

Boring Logs: B-1 through B-9

Field Exploration Appendix

Log of Soil Boring General Notes

Unified Soil Classification System

Field Exploration Procedures

Boring Log Preparation & Laboratory Testing Procedures

Qualifications Appendix

Previously Answered Questions

Weaver Consultants Group

1 EXECUTIVE SUMMARY

LaPorte County is planning to construct new sanitary sewer lines and water main alongside county roads 300N and 950W in Michigan City, IN. The utility improvement project will include the construction of a lift station at the southeast corner of Rt. 421 and 300N. Weaver Consultants Group (WCG) was retained to evaluate subsurface conditions at proposed locations of the lift station and jack and bore pits. For the design and construction of the lift station and pit shoring, a geotechnical study consisting of 9 soil borings was performed. Borings were not performed at regular intervals along the proposed alignment.

In summary, the soil borings indicate that the subsurface soil profile generally consists of stiff to hard cohesive soils interspersed with granular layers. Groundwater was generally observed to be at depths of between 3 and 19 feet below the existing ground surface.

In our opinion, the proposed lift station may be supported by a shallow foundation system bearing at a depth of about 12 feet below surface. We recommend that the foundations be designed for a maximum net allowable soil bearing pressure of 3,000 psf. Jack and bore sending and receiving pits may be used as a means to advance the sewer beneath road, utility, and stream conflicts. Shoring design parameters are provided in Table 1 in Section 4.4.

A more detailed discussion of design parameters and construction considerations is included in subsequent sections of this report.

Weaver Consultants Group

2 PROJECT INFORMATION

We understand LaPorte County plans to construct new sewer and water mains beneath and alongside existing county roads 300N and 950W in Michigan City, Indiana. The newly constructed water lines will extend west from the intersection of 300N and Rt. 421 for approximately 2,700 feet. The water line will also extend south from the intersection 300N and Rt. 421 along Rt. 421 for approximately 1,200 feet. A branch of the proposed sewer line will extend approximately 2,800 feet east of the intersection of 300N and Rt. 421 along 300N, while another branch will extend approximately 3,100 feet north on 950W from the intersection of 300N and continue under Interstate-94. Jack and bore methods of construction are expected to be used to advance the pipes underneath road, stream and utility crossings.

A lift station will be constructed on the southeast corner of the intersection of 300N and Rt. 421. The lift station will consist of an 8-foot diameter round manhole and have a total depth of approximately 12 feet. The approximate elevations of the sewer and waterlines were not known at the time this report was written.

Weaver Consultants Group

3 SITE AND SUBSURFACE CONDITIONS

3.1 Site Conditions

The proposed lift station and jack and bore pits are located along county roadways 300N and 950W in LaPorte County, Indiana (Site). The sewer and water main will be constructed underneath and alongside the existing roadways. The site is generally flat with little relief across the area. Ground cover generally consists of grass and aggregate fill along the shoulders and asphalt pavement in roadway areas. The roads in the project area grade towards ditches adjacent to the roadways. Overhead electric lines and various underground utilities are present along much of the proposed sewer and water main route.

3.2 Subsurface Conditions

Our interpretation of the subsurface conditions is based upon nine soil borings advanced at the approximate locations shown on **Figure 1** in the **Figures Appendix**. The borings were located in the field by WCG considering the proposed working locations and safe access for the drilling equipment. The following discussion is general; for more specific information, refer to the boring logs presented in the **Boring Logs** portion of the appendices.

The borings drilled along the proposed alignment utility improvements and locations of the lift station and jack and bore pits extended to depths of 15-35 feet below ground surface (bgs).

Surface Conditions:

Topsoil or asphalt was encountered at the surface of boring locations. The topsoil (encountered at borings B-2 and B-3) had an approximate thickness of 12 to 14 inches and consisted of dark brown silty sand. At the other boring locations, 1 to 10 inches of asphalt pavement was encountered at the surface. The asphalt pavement was underlain by aggregate base course and granular fill that extended to depths between 0.6 and 3.0 feet bgs. Granular fill was encountered beneath the base course in borings B-8 and B-9.

The majority of the actual project construction will take place outside of existing roadway areas. However, most borings were offset into the roadway due to utility conflicts at the original boring locations.

Weaver Consultants Group

Subsurface Conditions:

Beneath the surficial materials, in general, the subsurface profile primarily consists of fine-grained soils with intermittent layers of granular soils to the maximum exploratory depths of the borings. These deposits are described in more detail below.

- **Fine Grained Soils (CL-ML, CL, ML)** – The fine-grained soil layers were typically encountered beneath the surficial material and generally extended beyond the terminal depth of the boring. In borings B-3 and B-5, the layer extended to depths of 26.5 and 17.5 feet, respectively. The soils were classified as silty clay (CL-ML), lean clay (CL), or plastic silt (ML). Consistency of these soils varied from stiff to hard based on hand penetrometer tests estimating unconfined compressive strengths ranging from 1.0 to 6.0 tons per square foot (tsf).
- **Upper Granular Layer (SM, SC, ML)** – Granular soils with significant fines were encountered near the surface or interspersed in the upper portions of the fine-grained layer. The upper granular layer was observed in borings B-1 and B-4 through B-7. The layer had typical thicknesses around 5 - 6 feet, except in B-6 which had an observed thickness around 12 feet. The top of the upper granular layer ranged from depths of 0.6 to 5.5 feet bgs. The granular soils classified as silty sand (SM), clayey sand (SC), and sandy silt (ML). SPT “N” values recorded in the granular soils varied from 4 to 24 blows/foot, indicating a loose to medium dense relative density.
- **Lower Granular Layer (SM, GM, ML)** – A layer of silty granular soils was observed in borings B-3 and B-5 at lower depths than the upper granular layer. The top of the lower granular layer was observed to be at depths of 26.5 and 17.5 in B-3 and B-5, respectively. This layer extended beyond the terminal depths of the borings. The granular soils classified as silty sand (SM), silty gravel (GM), and sandy silt (ML). SPT “N” values recorded in the granular soils varied from 10 to 19 blows/foot, indicating a medium dense relative density.

3.3 Groundwater Observations

Groundwater level observations were made during and shortly after completion of the drilling operations. The depths at which ground water was encountered are shown in the upper left-hand corner of the boring logs. Based on these observations,

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groundwater was encountered at depths ranging from approximately 3.0 to 19.3 feet below the existing surface. Low-permeability soils extended from the surface to termination depths allowing for a wide variance in the ground water observations. We estimate that some shallow groundwater observations were due to perched water above low-permeability layers. Based on groundwater observations during the exploration, soil color changes, and moisture content measurements, we estimate the static water table at the time of our exploration was between 10 and 15 feet bgs. However, fluctuations in the water table should be anticipated throughout the year with variations in precipitation and other environmental or physical factors.

4 DESIGN RECOMMENDATIONS

4.1 Basis

Our recommendations are based on data presented in this report, which includes nine soil borings. Subsurface variations can exist along the project route which may not be indicated by a limited exploratory program. If such variations or unexpected conditions are encountered during construction, or if the project information is incorrect or changed, we should be informed immediately since the validity of our recommendations may be affected. Refer to the **Qualifications Appendix** for additional qualifications and contractual considerations.

4.2 Lift Station Foundation

The lift station is planned to be founded on precast concrete sections, bearing on native soil and an approximate 6 inch aggregate lift at a depth of about 12 feet bgs.

In our opinion, the proposed lift station can be supported on existing site soils provided they are evaluated and prepared in accordance with the recommendations given in **Section 5.2** of this report. The precast lift station bearing a 6-inch structural fill layer over native clayey soils is capable of providing a net allowable bearing pressure of 3,000 psf. The bearing pressure value is that pressure which may be transmitted to the foundation soil in excess of the final minimum surrounding overburden pressure and may be increased by one-third when considering seismic loading conditions.

Provided the foundation subgrade is prepared as discussed in **Section 5.2**, we estimate that the total foundation settlement should not exceed approximately one inch. Careful field control during construction may reduce the actual settlement which occurs.

4.3 Buoyancy Considerations

The precast lift station will be buried underground to a depth of approximately 12 feet bgs. Especially during times when the groundwater is seasonally high, the lift station may be subject to buoyant uplift force if the groundwater rises above the bottom of the lift station elevation. Since we did not perform long-term monitoring of the groundwater level at the lift station location, the seasonal high ground water table elevation will need to be estimated. At the time of our exploration, we estimated that

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the groundwater table was at a depth of 10-15 feet bgs. However, the seasonal groundwater level may be considerably higher.

We recommend resisting uplift forces by considering the dead weight of the lift station. Additionally, side friction along the sides of the lift station may be considered. Side friction can be calculated using the following equation:

$$f_s = \sigma_v \times K_o \times 0.3$$

where f_s is side friction, σ_v is overburden pressure, K_o is the appropriate value from Table 1, and 0.3 is the coefficient of friction. We recommend that the lift station have a factor of safety of 1.5 against uplift.

If additional resistance is required, a toe can be constructed off the lift station base slab that extends into the surrounding soil. Thus, all the overburden pressure of the soil located above the toe will resist upward movement. Alternatively, a deadman anchor may be constructed to resist uplift, if needed.

If uplift of the lift station is a concern, we recommend consulting with WCG to further evaluate the conditions.

4.4 Jack and Bore Pit Shoring and Lift Station Wall Design

We understand that the proposed sewer pipe will cross beneath roads and other near surface features by using jack and bore methods. Each crossing will require a receiving pit and a sending pit requiring shoring design. The subsurface conditions near the following crossings were evaluated: gas main crossing at 300N (west), Rte. 421, stream crossing at 300N, Marathon pipeline at 300N (east), Marathon pipeline at 950W, stream crossing at 950W, Interstate-94. Table 1 summarizes the soil parameters to be used for the design of the shoring at each location. We suggest designing shoring to resist active earth pressures. The design of the lift station walls should consider soil parameters K_o value based on Boring B-3 and presented in Table 1.

Table 1 – Shoring Design Soil Parameters

Soil Description	Depth (feet)	Unit Weight (pcf)	Friction Angle (ϕ')	K_o	K_a	K_p
<i>Gas Main Crossing at 300 N (B-1)</i>						
Clay (CL)	0 - 5	115	24	0.59	0.42	2.37
Granular (SM/SC)	5 - 10	110	31	0.48	0.32	3.12
Clay (CL/CL-ML)	10 -20	115	24	0.59	0.42	2.37
<i>Rte. 421 & Lift Station (B-2 and B-3)</i>						
Clay (CL)	0 - 26	115	24	0.59	0.42	2.37
Granular (SM/GM)	26 - 35	110	30	0.50	0.33	3.00
<i>Stream Crossing at 300 N (B-4)</i>						
Clay (CL)	0 - 3	115	26	0.56	0.39	2.56
Granular (SM)	3 - 8	110	29	0.52	0.35	2.88
Clay (CL)	8 -15	115	24	0.59	0.42	2.37
<i>Marathon Pipeline at 300 N (B-5)</i>						
Silt (ML)	0 - 8	110	27	0.55	0.38	2.66
Clay (CL)	8 - 18	115	26	0.56	0.39	2.56
Granular (SM)	18 -20	110	29	0.52	0.35	2.88
<i>Marathon Pipeline at 950 W (B-6)</i>						
Granular (SM/ML)	0 - 14	110	29	0.52	0.35	2.88
Clay (CL)	14 -20	115	24	0.59	0.42	2.37

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Soil Description	Depth (feet)	Unit Weight (pcf)	Friction Angle (ϕ')	K_o	K_a	K_p
<i>Stream Crossing at 950 W (B-7)</i>						
Granular (SM/SC)	0 - 5	110	29	0.52	0.35	2.88
Clay (CL)	5 -15	115	24	0.59	0.42	2.37
<i>Interstate-94, North and South (B-8 and B-9)</i>						
Clay (CL)	0 - 20	115	24	0.59	0.42	2.37

In addition to lateral earth pressure, surcharges from temporary loads during construction (if any) and any adjacent surcharge or live loads, located within a zone defined by a 45-degree slope from the base of the walls, should be taken into account in the design of below-grade shoring.

5 CONSTRUCTION CONSIDERATIONS

5.1 Existing Utilities and Site Preparation

The potential effect of ground movements upon nearby utilities should be considered during construction. The contractor should ensure there are no utility conflicts with the final design and construction program.

Care should be exercised during the grading and construction operations for this project. The clayey nature of the near-surface soils and soils near the pipe elevations are subject to deterioration from excess precipitation or runoff. We recommend that their exposure be kept to a minimum and that the excavations be kept relatively “dry” and well-drained at all times.

5.2 Lift Station Foundation Excavation

Once the lift station foundation subgrade level is reached, the exposed clayey subgrade soils should be checked by the Geotechnical Engineer or his representative to confirm that subgrade soils of adequate strength have been reached before placing the 6-inch aggregate pad. Any localized soft soil zones encountered at the bearing elevations should be further excavated to adequate support soils and replaced with structural fill. Structural fill installed under foundations should extend beyond all edges of the footings at least 6 inches per foot of undercut depth below the foundation bottom grade.

5.3 Pipe Support

At this time the material type of the sewer pipes are not known. The material composition of the pipes should be durable enough such that they will not deform or collapse beneath the weight of the backfilled material.

Based on the boring information and anticipated subgrade levels of underground pipes, the new lines are expected to be supported mostly by stiff to hard clays. However, depending on elevation, loose to medium dense silts and granular soil layers were also located within the clays. Therefore, it is possible that granular soils may be exposed in some excavations and allow infiltration of perched groundwater or precipitation, which will require dewatering.

In our opinion, the firm (stiff to hard) natural clay soils and the natural granular soils should provide adequate support of the pipes, provided the recommendations for site

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preparation, fill placement, and inspection, as discussed in this report, are followed. Some undercutting and replacement of isolated soft clay soils with structural fill could become necessary in some isolated areas. If granular soils are exposed at the subgrade level, a program of soil compaction is recommended to densify any naturally-occurring loose soils and those sandy soils that may become loosened/disturbed by the excavator, as well as to identify any soft or yielding areas and provide a more uniform bearing surface prior to construction.

Where clayey soils are exposed at the base of the sewer excavation, we recommend that the clay subgrade be further undercut by about 6 to 12 inches to allow for placement of a granular bedding layer to provide uniform support and contact pressure beneath the pipes and structures. Granular soils should be used around the haunches of pipes to assure adequate soil contact and compaction around the pipes. Should saturated granular soils or soft clayey soils be encountered, it may become necessary to install a mat of clean crushed aggregate (e.g., INDOT No. 5 or No. 8 stone) to provide a stable working platform, reduce disturbance of the subgrade, and aid in the dewatering.

If sandy soils are exposed at the base of the excavation, no special granular bedding layer will be necessary. However, prior to placement of the sewer, we recommend that the exposed sandy subgrade soils be compacted with vibratory compaction equipment to achieve a minimum of 95 percent of the standard Proctor density (ASTM D698), or a medium dense condition as determined by the Static Cone Penetration (SCP) test in the upper 12 inches of the subgrade. Any loose or soft areas of the subgrade delineated during the compaction process and any areas judged by the engineer to pump or deflect excessively should first be compacted in-place or, if necessary, undercut and replaced with granular structural fill.

5.4 Backfill Placement and Control

We recommend that granular backfill be placed around the pipes and against the lift station structure in uniform layers and mechanically compacted to achieve the required minimum density. It is important that the backfill above the pipes be properly compacted to allow some arching effects and help reduce the overhead soil loads on the pipes. Therefore, it is recommended that the backfill be placed and compacted with hand-held compactors simultaneously on each side of the pipe and up to two to three pipe diameters above the pipe. Similarly, hand-guided equipment is recommended to

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accomplish compaction of the backfill adjacent to the below-grade walls of the lift station to avoid over-stressing the walls.

It should be recognized that over-compaction may cause movement of the pipe prior to being seated. Therefore, we recommend that caution be exercised during the initial phase of pipe placement and backfilling. The manufacturer may provide backfill requirements pertaining to their particular pipe/structure, and if this is the case, their specifications should be followed.

We recommend that the backfill of the pipes be placed in a structural manner. The compactive effort during backfill placement will depend on future use of the easement. In structural areas (e.g., below roadways, driveways, sidewalks, etc.), it is recommended that the backfill be placed in relatively thin lifts (i.e., not exceeding about 6 to 8 in. loose lift thickness, depending on the type of lightweight equipment used) and compacted to at least 95 percent of the standard Proctor dry density (ASTM D698), or a medium dense condition as determined by the SCP test, to within 2 feet of the pavement base subgrade and then to at least 98 percent of the same above that. The aggregate base material should be similarly compacted to at least 98 percent of the standard Proctor dry density. In non-structural areas (e.g., lawns), we recommend the backfill be placed in layers and compacted to at least 90 percent of the standard Proctor dry density.

To monitor compliance with the recommended density standards, we recommend that in-place density tests be performed.

5.5 Structural Fill

Structural fill, defined as any fill which will support structural loads, should be free of organic material, have a plasticity index of less than 25 percent, a maximum particle size of no more than 3 inches, and a maximum dry density in excess of 100 pcf, as determined by the standard Proctor compaction test (ASTM D698). In addition, structural fill should not be frost susceptible if placed within 3½ feet from the surface.

The topsoil and silt observed at the site should not be used as structural fill. The remainder of the soils observed during the exploration appears suitable for use as structural fill. The clay soils at the site may require extensive preparation and drying before being reused as structural fill. Importing structural fill should be considered in lieu of trying to reuse on-site materials.

5.6 Groundwater Concerns

Some dewatering may be required when excavating for lift station/jack and bore sending and receiving pits, depending on the groundwater table elevation, perched water conditions, bottom of foundation elevation, precipitation, and runoff. We expect that the clayey soils at the Site will allow dewatering to be accomplished conventionally by pumping from sumps installed in the bottom of the excavations. However, if the excavations extend into saturated granular material, a more extensive dewatering effort may be required, e.g. well points.

5.7 Excavation Slope Stability

Our exploration did not include a detailed analysis of slope stability for any temporary excavation condition. Based on the soil conditions encountered at the boring locations, temporary, open cut construction excavations are expected to expose either clayey or granular soils, depending on the locations. In our opinion, based on site variability, shallow temporary excavations in such soil conditions can be cut with side slopes of 1½ horizontal:1 vertical (1½H:1V). However, current OSHA standards must be met and may be more restrictive. Hence, if safe side slopes cannot be maintained, the excavation sides should be flattened, shielded or shored in accordance with current OSHA standards.

5.8 Limitations

WCG has prepared this report in accordance with generally accepted geotechnical engineering practices to aid in the evaluation of the site subsurface soils. No other warranty, expressed or implied, is made.

The scope of this report is limited to the specific project, project phase, and location described herein, and our description of this project represents our understanding of the project. The geotechnical engineering analysis and foundation recommendations presented herein were developed based on the information obtained during the subsurface exploration. It should be noted that the borehole data reflects the subsurface conditions only at the specific locations designated on the borehole logs, and that soil and groundwater conditions could vary widely throughout the site. If variations do appear during future activities, it may become necessary to re-evaluate the recommendations of this report.

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We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we may be of any additional service, please do not hesitate to contact us.

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FIGURES APPENDIX



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Group**

Scale: **NTS**



Drawn by:
SS

Checked by:
SAS

Date: **09/6/2018**

FIGURE 1
BORING LOCATION PLAN
Sewer and Water Main Project
CR W300N & CR N950W
MICHIGAN CITY, INDIANA 46360

BORING LOGS APPENDIX

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7121 Grape Road, Granger, IN 46530
574-271-3447(PHONE)/574-271-3343(FAX)

LOG OF SOIL BORING NO.: B-1

Location: See Boring Location Plan

File No.: 3628-302-19-01

Sheet 1 of 1

WATER LEVEL DATA NE = Not Encountered










6.5 ft While Drilling ▼
NE ft At Completion**
ft At Hrs. A.D.*
ft At Days A.D.***

Started: 8/16/2018
Completed: 8/16/2018
Engineer: S. Schubert
Driller: D&T Drilling Inc.
Drilling Equip.: IR A300
Drilling Method: HSA (4 1/4" I.D.)

PROJECT: County Road 300 & County Road 950

Michigan City
Indiana

CLIENT: LaPorte County
LaPorte Indiana

Depth (ft)	DATUM: SURFACE ELEVATION (ft):		Strata Depth (ft)	Type	Recovery	Number	Standard Penetration Test-Blows/6" (#) = "N" Value	LOI (%)	Qp (tsf)	Moisture Content %	BORING AND SAMPLING NOTES	Elevations (ft)
	Symbol	SOIL DESCRIPTION, CLASSIFICATION and USCS or AASHTO GROUP SYMBOL										
		ASPHALT PAVEMENT	0.8									
		Aggregate base course	1.1									
		Hard, brown & gray, LEAN CLAY, trace sand (CL)				1	3/6/8 (14)		5.4	18.4		
5		Medium dense, light brown, fine to medium SILTY SAND (SM)	5.5			2	8/9/11 (20)		5.6	15.7		
		Medium dense, brown, fine to medium CLAYEY SAND (SC)	8.0			3	5/5/8 (13)			17.7	P200=46%	
10		Very stiff, dark brown & gray, LEAN CLAY, trace sand (CL)	10.5			4	7/10/14 (24)			11.8		
		Very stiff, dark brown & gray, LEAN CLAY, trace sand (CL)	13.5			5	6/11/16 (27)		4.0	17.5		
15		Stiff to very stiff, gray, SILTY CLAY, trace gravel (CL-ML)				6	7/10/12 (22)		2.5	17.9		
20		Boring Terminated at 20 ft	20.0			7	6/8/7 (15)		2.0	19.5		

NOTES:

- Weather: Cloudy, 81°F
- Used rotary auger
- Backfilled with auger cuttings

LEGEND



= Auger



= Geoprobe



= Grab Sample



= No Recovery



= Core Sample



= Shelby Tube



= Split-Spoon Sample



= Vane Shear Test

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7121 Grape Road, Granger, IN 46530
574-271-3447(PHONE)/574-271-3343(FAX)

LOG OF SOIL BORING NO.: B-2

Location: See Boring Location Plan

File No.: 3628-302-19-01

Sheet 1 of 1

WATER LEVEL DATA NE = Not Encountered

NE ft While Drilling
NE ft At Completion**
ft At Hrs. A.D.*
ft At Days A.D.***

Started: 8/16/2018
Completed: 8/16/2018
Engineer: S. Schubert
Driller: D&T Drilling Inc.
Drilling Equip.: IR A300
Drilling Method: HSA (4 1/4" I.D.)

PROJECT: County Road 300 & County Road 950
Michigan City
Indiana
CLIENT: LaPorte County
LaPorte Indiana

Depth (ft)	DATUM: SURFACE ELEVATION (ft):		Strata Depth (ft)	Type	Recovery	Number	Standard Penetration Test-Blows/6" (#) = "N" Value	LOI (%)	Qp (tsf)	Moisture Content %	BORING AND SAMPLING NOTES	Elevations (ft)
	Symbol	SOIL DESCRIPTION, CLASSIFICATION and USCS or AASHTO GROUP SYMBOL										
		Dark brown, SILTY SAND, with clay TOPSOIL	1.0			1	1/2/6 (8)		5.0	19.8		
5		Hard, light brown & gray, LEAN CLAY, trace sand (CL)	5.5			2	5/8/10 (18)		5.5	19.1		
		Hard, light gray, LEAN CLAY (CL)				3	5/7/13 (20)		6.0	16.5		
10						4	6/9/10 (19)		6.0	16.9		
						5	4/6/7 (13)		5.5	19.8		
15		Hard, gray & brown, LEAN CLAY (CL)	13.0			6	8/10/14 (24)		4.5	20.5	PL=19 LL=48 PI=29	
20						7	7/8/10 (18)		5.25	16.8		
		Boring Terminated at 20 ft	20.0									
25												
30												
35												

NOTES:

- Weather: Cloudy, 81°F
- Used rotary auger
- Backfilled with auger cuttings

LEGEND

- | | | |
|---------------|---------------|----------------------|
| = Auger | = No Recovery | = Split-Spoon Sample |
| = Geoprobe | = Core Sample | = Vane Shear Test |
| = Grab Sample | = Shelby Tube | |

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7121 Grape Road, Granger, IN 46530
574-271-3447(PHONE)/574-271-3343(FAX)

LOG OF SOIL BORING NO.: B-3

Location: See Boring Location Plan

File No.: 3628-302-19-01

Sheet 1 of 1

WATER LEVEL DATA NE = Not Encountered

19.25 ft While Drilling ▼
16 ft At Completion** ∇
ft At Hrs. A.D.*
ft At Days A.D.***

Started: 8/16/2018
Completed: 8/16/2018
Engineer: S. Schubert
Driller: D&T Drilling Inc.
Drilling Equip.: IR A300
Drilling Method: HSA (4 1/4" I.D.)

PROJECT: County Road 300 & County Road 950

Michigan City
Indiana









CLIENT: LaPorte County
LaPorte Indiana

Depth (ft)	DATUM: SURFACE ELEVATION (ft):		Strata Depth (ft)	Type	Recovery	Number	Standard Penetration Test-Blows/6" (#) = "N" Value	LOI (%)	Qp (tsf)	Moisture Content %	BORING AND SAMPLING NOTES	Elevations (ft)
	Symbol	SOIL DESCRIPTION, CLASSIFICATION and USCS or AASHTO GROUP SYMBOL										
		Dark brown, SILTY SAND, with CLAY, TOPSOIL	1.2			1	3/4/6 (10)		3.0	21.0		
		Hard to very stiff, light gray & brown, SILTY CLAY, trace gravel (CL-ML)				2	5/7/8 (15)		6.0	14.3		
5						3	7/8/11 (19)		5.0	16.8		
						4	6/6/8 (14)		6.0	17.8		
10		Very stiff, gray & brown, LEAN CLAY (CL)	10.5			5	5/8/10 (18)		3.75	17.6	PL=16 LL=37 PI=21	
						6	5/7/10 (17)		3.0	19.7		
15		Very stiff, gray, LEAN CLAY (CL)	16.5			7	7/7/6 (13)		2.0	18.6	PL=16 LL=36 PI=20	
20						8	11/7/7 (14)		3.0	18.7		
25						9	8/9/10 (19)		1.5	18.7		
		Medium dense, light gray, SANDY SILT (ML)	26.5			10	5/7/8 (15)					
30												
		Medium dense, brown, fine to medium SILTY GRAVEL, with sand (GM)	31.5									
35		Boring Terminated at 35 ft	35.0									

NOTES:

- Weather: Cloudy, 81°F
- Used rotary auger
- Backfilled with auger cuttings

LEGEND

-  = Auger
-  = Geoprobe
-  = Grab Sample
-  = No Recovery
-  = Core Sample
-  = Shelby Tube
-  = Split-Spoon Sample
-  = Vane Shear Test

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7121 Grape Road, Granger, IN 46530
574-271-3447(PHONE)/574-271-3343(FAX)

LOG OF SOIL BORING NO.: B-4

Location: See Boring Location Plan

File No.: 3628-302-19-01

Sheet 1 of 1

WATER LEVEL DATA NE = Not Encountered

NE ft While Drilling
NE ft At Completion**
ft At Hrs. A.D.*
ft At Days A.D.***

Started: 8/16/2018
Completed: 8/16/2018
Engineer: S. Schubert
Driller: D&T Drilling Inc.
Drilling Equip.: IR A300
Drilling Method: HSA (4 1/4" I.D.)

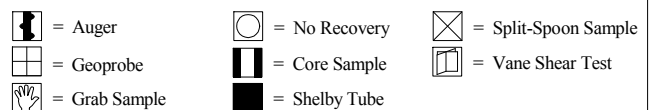
PROJECT: County Road 300 & County Road 950
Michigan City
Indiana
CLIENT: LaPorte County
LaPorte Indiana

Depth (ft)	DATUM: SURFACE ELEVATION (ft):		Strata Depth (ft)	Type	Recovery	Number	Standard Penetration Test-Blows/6" (#) = "N" Value	LOI (%)	Qp (tsf)	Moisture Content %	BORING AND SAMPLING NOTES	Elevations (ft)
	Symbol	SOIL DESCRIPTION, CLASSIFICATION and USCS or AASHTO GROUP SYMBOL										
		ASPHALT PAVEMENT	0.8									
		Aggregate base course	1.8			1	3/4/5 (9)		2.0	21.5		
		Very stiff, gray, LEAN CLAY, with sand, trace silt (CL)	3.0			2	6/4/4 (8)					
5		Loose to medium dense, gray to light brown, fine to medium SILTY SAND, moist (SM)	8.0			3	2/3/7 (10)					
		Hard to very stiff, gray, LEAN CLAY (CL)	10.0			4	4/6/11 (17)	4.25	20.6			
10			12.0			5	5/6/9 (15)	4.0	18.0			
15			14.0			6	3/3/6 (9)	3.0	20.2			
		Boring Terminated at 15 ft	15.0									
20												
25												
30												
35												

NOTES:

- Weather: Cloudy, 81°F
- Used rotary auger
- Backfilled with auger cuttings

LEGEND



= Vane Shear Test

Weaver Consultants Group

7121 Grape Road, Granger, IN 46530
574-271-3447(PHONE)/574-271-3343(FAX)



LOG OF SOIL BORING NO.: B-6

Location: See Boring Location Plan

File No.: 3628-302-19-01

Sheet 1 of 1

WATER LEVEL DATA NE = Not Encountered

12.5 ft While Drilling 
10 ft At Completion** 
ft At Hrs. A.D.*
ft At Days A.D.***

Started: 8/16/2018
Completed: 8/16/2018
Engineer: S. Schubert
Driller: D&T Drilling Inc.
Drilling Equip.: IR A300
Drilling Method: HSA (4 1/4" I.D.)

























PROJECT: County Road 300 & County Road 950

Michigan City

Indiana

CLIENT: LaPorte County

LaPorte Indiana

Depth (ft)	DATUM:		SURFACE ELEVATION (ft):	Strata Depth (ft)	Type	Recovery	Number	Standard Penetration Test-Blows/6" (#) = "N" Value	LOI (%)	Qp (tsf)	Moisture Content %	BORING AND SAMPLING NOTES	Elevations (ft)
	Symbol												
		ASPHALT PAVEMENT		0.1									
		Aggregate base course		0.8									
		Loose, gray, fine to medium SILTY SAND, moist (SM)					1	1/2/2 (4)			14.7		
5		Loose, gray, SANDY SILT, moist (ML)		5.5			2	3/6/6 (12)			22.4		
		Loose, gray, SANDY SILT, moist (ML)					3	2/2/3 (5)	2.0	18.6			
10		Loose, gray, fine to medium SILTY SAND (SM)		11.5			4	3/3/4 (7)	2.25	22.3			
		Loose, gray, fine to medium SILTY SAND (SM)		13.5			5	3/3/3 (6)		23.3			
15		Stiff to very stiff, gray, SILTY CLAY, trace gravel (CL-ML)		17.0			6	2/3/3 (6)	2.25				
		Stiff, gray, SILT (ML)											
20		Boring Terminated at 20 ft		20.0			7	3/3/3 (6)	2.5	25.8			
25													
30													
35													

NOTES:

- Weather: Cloudy, 81°F
- Used rotary auger
- Backfilled with auger cuttings

LEGEND



= Auger



= Geoprobe



= Grab Sample



= No Recovery



= Core Sample



= Shelby Tube



= Split-Spoon Sample



= Vane Shear Test

Weaver Consultants Group

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LOG OF SOIL BORING NO.: B-7

Location: See Boring Location Plan

File No.: 3628-302-19-01

Sheet 1 of 1

WATER LEVEL DATA NE = Not Encountered

NE ft While Drilling
NE ft At Completion**
ft At Hrs. A.D.*
ft At Days A.D.***

Started: 8/16/2018
Completed: 8/16/2018
Engineer: S. Schubert
Driller: D&T Drilling Inc.
Drilling Equip.: IR A300
Drilling Method: HSA (4 1/4" I.D.)

PROJECT: County Road 300 & County Road 950
Michigan City
Indiana
CLIENT: LaPorte County
LaPorte Indiana

Depth (ft)	DATUM: SURFACE ELEVATION (ft):		Strata Depth (ft)	Type	Recovery	Number	Standard Penetration Test-Blows/6" (#) = "N" Value	LOI (%)	Qp (tsf)	Moisture Content %	BORING AND SAMPLING NOTES	Elevations (ft)
	Symbol	SOIL DESCRIPTION, CLASSIFICATION and USCS or AASHTO GROUP SYMBOL										
		ASPHALT PAVEMENT	0.3									
		Aggregate base course	0.6									
		Loose, dark brown, fine to medium, SILTY SAND, with clay, moist (SC-SM)	3.0			1	2/2/4 (6)		1.5	17.7		
		Loose, light brown, fine SILTY SAND, moist (SM)	5.5			2	3/3/3 (6)					
		Very stiff to stiff, gray, LEAN CLAY (CL)	15.0			3	4/5/10 (15)		4.0	18.2		
						4	2/2/3 (5)		4.75	18.0		
						5	7/6/7 (13)		4.0	21.0		
						6	5/5/7 (12)		1.75	22.5		
		Boring Terminated at 15 ft										

NOTES:

- Weather: Cloudy, 81°F
- Used rotary auger
- Backfilled with auger cuttings

LEGEND

- | | | |
|---------------|---------------|----------------------|
| = Auger | = No Recovery | = Split-Spoon Sample |
| = Geoprobe | = Core Sample | = Vane Shear Test |
| = Grab Sample | = Shelby Tube | |

Weaver Consultants Group

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LOG OF SOIL BORING NO.: B-9

Location: See Boring Location Plan

File No.: 3628-302-19-01

Sheet 1 of 1

WATER LEVEL DATA NE = Not Encountered

NE ft While Drilling
NE ft At Completion**
ft At Hrs. A.D.*
ft At Days A.D.***

Started: 8/16/2018
Completed: 8/16/2018
Engineer: S. Schubert
Driller: D&T Drilling Inc.
Drilling Equip.: IR A300
Drilling Method: HSA (4 1/4" I.D.)

PROJECT: County Road 300 & County Road 950

Michigan City

Indiana

CLIENT: LaPorte County

LaPorte Indiana

Depth (ft)	DATUM: SURFACE ELEVATION (ft):		Strata Depth (ft)	Type	Recovery	Number	Standard Penetration Test-Blows/6" (#) = "N" Value	LOI (%)	Qp (tsf)	Moisture Content %	BORING AND SAMPLING NOTES	Elevations (ft)
	Symbol	SOIL DESCRIPTION, CLASSIFICATION and USCS or AASHTO GROUP SYMBOL										
		ASPHALT PAVEMENT	0.1									
		Aggregate base course	0.7									
		Medium dense, brown, fine to medium SILTY SAND, with clay, moist (FILL)	3.0			1	8/12/15 (27)					
5		Hard, brown & gray, LEAN CLAY (CL)				2	3/5/8 (13)	5.0	16.5			
						3	7/8/16 (24)	5.0	16.4			
10						4	5/7/14 (21)	6.0	18.1			
						5	4/6/11 (17)	4.25	20.8			
15		Stiff, light gray, LEAN CLAY (CL)	13.0			6	4/7/8 (15)	1.75	23.3			
20						7	4/4/6 (10)	1.75	23.7			
		Boring Terminated at 20 ft	20.0									
25												
30												
35												

NOTES:

- Weather: Cloudy, 81°F
- Used rotary auger
- Backfilled with auger cuttings

LEGEND



= Auger



= Geoprobe



= Grab Sample



= No Recovery



= Core Sample



= Shelby Tube



= Split-Spoon Sample



= Vane Shear Test

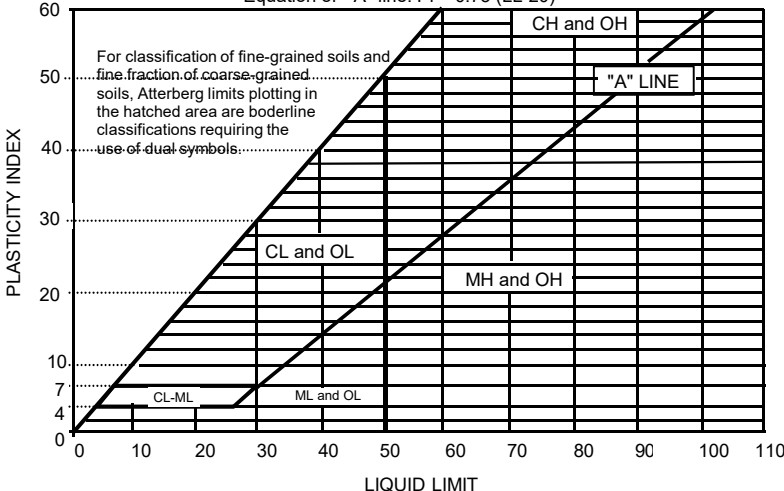
FIELD EXPLORATION APPENDIX

WEAVER CONSULTANTS GROUP

- 35 East Wacker Drive, Suite 1250, Chicago, IL 60601
- 6420 Southwest Boulevard, Suite 206, Fort Worth, TX 76109
- ☒ 7121 Grape Road, Granger, IN 46530

- (312) 922-0201
- (817) 735-9770
- (574) 271-3447

UNIFIED SOIL CLASSIFICATION SYSTEM

Major Divisions			Group Symbol	Typical Names	Classification on basis of percentage of fines by dry wt.	Laboratory Classification Criteria	
COARSE-GRAINED SOILS	GRAVELS	Clean Gravels	GW	Well-graded gravels and gravel-sand mixtures, little or no fines	< 5% passing #200 sieve= GW, GP, SW, SP	$C_u = D_{60}/D_{10}$ Greater Than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
			GP	Poorly-graded gravels and gravel-sand mixtures, little or no fines		Not meeting both criteria for GW	
		Gravels w/fines	GM	Silty gravels, gravel-sand-silt mixtures		Atterberg limits plot below "A" line or plasticity index less than 4	Atterberg limits plotting in hatched area are borderline classification requiring use of dual symbols
			GC	Clayey gravels and gravel-sand-clay mixtures		Atterberg limits plot above "A" line and plasticity index greater than 7	
	SANDS	Clean Sands	SW	Well-graded sands and gravelly sands, little or no fines	5% to 12% passing #200 sieve= Borderline Classifications requiring use of dual symbols	$C_u = D_{60}/D_{10}$ Greater Than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
			SP	Poorly-graded sands and gravelly sands, little or no fines		Not meeting both criteria for SW	
		Sands w/fines	SM	Silty sands and sand-silt mixtures		Atterberg limits plot below "A" line and plasticity index less than 4	Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols
			SC	Clayey sands and sand-clay mixtures		Atterberg limits plot above "A" line and plasticity index greater than 7	
FINE-GRAINED SOILS	SILTS & CLAYS	Liquid Limit 50% or less	ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands			
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays			
			OL	Organic silts and organic silty clays of low plasticity			
	SILTS & CLAYS	Liquid Limit greater than 50%	MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts			
			CH	Inorganic clays of high plasticity Fat clays			
			OH	Organic clays of medium to high plasticity			
	HIGHLY ORGANIC SOILS		PT	Peat, Muck and other highly organic soils			

Plasticity Chart

FIELD EXPLORATION PROCEDURES

Standard Penetration Test Soil Borings

General

We wish to point out that the soils actually recovered from our borings for observation and testing represent a very small percentage of the site soils. Our records depict subsurface conditions only at specific locations and at the particular time when drilling. Soil conditions at other locations may differ from conditions occurring at these boring locations. The passage of time may result in a change in the subsurface soil and groundwater conditions at the boring locations. The interface between differing subsurface materials on the logs and profiles represent approximate boundaries. The transition between materials may be gradual. Also, thin strata that occur between sample depths may be present, but remain undetected by routine sampling procedures.

Drilling Procedures

Soil borings were performed at the approximate locations shown on the attached boring plan. The soil borings were advanced by mechanically twisting a continuous steel-flight, hollow-stem auger into the soil. The inside diameter (I.D.) of the hollow-stem auger is typically 3-¼ in. (sometimes a 6-in. I.D. auger is used, particularly when installing 4-in. diameter monitoring wells).

The auger is turned into the ground, which displaces the soil upwards as it advances. Once the desired sample depth is achieved, the advancement of the hollow-stem auger is stopped. The hollow-stem is then cleaned of any soil and the sampling tools are inserted, and the sampling is performed. When drilling below the water table in pervious soils, a head of water is maintained in the hollow-stem, to prevent a "quick" condition at the auger tip.

Penetration Testing and Split-Barrel Sampling

Standard Penetration Testing and split-barrel sampling are normally conducted in the borings to provide relative density information and soil samples for visual classification and laboratory testing. The standard split-barrel (commonly called split-spoon) sampler is a 2-in. O.D., 1.375-in. I.D., typically 18 to 24 in. long and is connected to an AW or N size drilling rod. The sampler is then driven into the soil with a force of a 140 lb. hammer free-falling a distance of 30 in. The number of hammer blows required to drive the sampler into the soil is recorded for each 6-in. interval. The sampler is typically driven a total of 18 in., and the last two 6-in.

interval blow counts are added together and commonly referred to as the "N" value, blow count or penetration resistance. Representative samples are placed in airtight glass jars and returned to our laboratory for further observation and testing. Descriptions of the split-barrel samples and the penetration resistances are shown on the boring logs.

Shelby Tube Sampling Procedure

In the Shelby tube sampling procedure, a thin-walled steel seamless tube with a sharp cutting edge is pushed hydraulically into the soil and a relatively undisturbed sample is obtained. This procedure is generally employed in cohesive soils. The tubes are carefully handled in the field to avoid excessive disturbance and are returned to the laboratory for extrusion and further analysis and testing.

Calibrated Pocket Penetrometer Testing

The strength of cohesive soils does not correlate as well as granular materials with the Standard Penetration Testing described above. Typically, we test split-barrel samples of cohesive soils with a calibrated pocket penetrometer in the field. This test involves pushing a spring-loaded piston, 0.25-in. in diameter, into the sample and measuring the spring deflection, which has been correlated to shear strength. This test is used as a rough approximation method only. More refined results require undisturbed Shelby tube sampling and laboratory unconfined compressive strength testing.

Water Level Readings

When the drilling crew notices groundwater or significant variations in soil moisture, they are recorded on the boring logs. Generally, the level of water at the time of drilling is measured and recorded. The readings may indicate the approximate level of the hydrostatic water table at the time of our drilling activities.

Where low permeability soils are encountered, the water seeps into the borings at a slow rate, and it is generally not possible to establish accurate groundwater level readings in an open borehole during the drilling operations. If water-drilling methods are used, a local groundwater "mound" could be created, taking several days to dissipate. Also, the groundwater level typically fluctuates on a long-term or seasonal basis, due to variations in precipitation, surface run-off, evaporation, etc. When these long-term readings are required, piezometers or monitoring wells are necessary to maintain an open hole.

Boring Log Preparation

The subsurface conditions encountered during drilling are reported on a field log recorded by the chief driller. The driller's field record contains information concerning the boring method, samples attempted and recovered, indications of the presence of various materials such as coarse gravel, cobbles, etc., and observations between samples. Therefore, these records contain both factual and interpretive information. The field logs are on file in our office.

The soil samples, plus the field logs, are reviewed by a geotechnical engineer, geologist, or geotechnician. The engineer/geologist/geotechnician then classifies the soil in general accordance with the Unified Soil Classification System and prepares the final boring logs, which are the basis for our evaluations and recommendations. The group symbol for each soil type is indicated in parentheses following the soil descriptions on the boring logs. The final boring logs represent our interpretation of the contents of the field logs based on the results of the engineering review and laboratory testing of the field samples. The final boring logs are included in this section.

LABORATORY TESTING PROCEDURES

Representative soil samples were selected and tested in our laboratory in order to check field classifications and to evaluate pertinent engineering properties. The laboratory testing program included visual classification of all samples and hand penetrometer tests on all cohesive samples. In the hand penetrometer test, the unconfined compressive strength of a cohesive soil is estimated by measuring the resistance of the soil sample to penetration by a small spring calibrated cylinder. Any additional tests are described below or on the following sheet(s). Appropriate data obtained from laboratory tests are also included on the respective boring logs.

A geotechnical engineer classified each soil sample on the basis of texture and plasticity in accordance with the Unified Soil Classification System (ASTM D 2487 and/or ASTM D 2488). The group symbol for each soil type is indicated in parentheses following the soil descriptions on the boring logs. A brief explanation of the Unified System is included with this report.

Data obtained from the field logs and appropriate laboratory tests have been shown on the boring logs. The procedures used in preparing the final boring logs are described on the sheet entitled "Field Exploration Procedures."

It should be noted that the geotechnical engineer grouped the various soil types into the major zones noted on the boring logs. The stratification lines designating the interfaces between earthen materials shown on the boring logs and profiles are approximate; in-situ, the transitions may be gradual.

All samples will be retained in our Granger, Indiana laboratory for a period of thirty (30) days after which they will be discarded unless other instructions as to their disposition are received.

Calibrated Pocket (Hand) Penetrometer Testing

This test involves pushing a spring-loaded piston, 0.25-in. in diameter, into the sample and measuring the spring deflection, which has been correlated to shear strength. This test is used as a rough approximation method only. More refined results require undisturbed Shelby tube sampling and laboratory unconfined compressive strength testing.

Moisture Content

Moisture content tests were performed on selected soil samples. The moisture content has a significant effect on the strength, compressibility and general behavior of the soil.

Atterberg Limits

To provide a quantitative appraisal of the soil and define the plastic characteristics, Atterberg limits are determined. The liquid limit is defined as the moisture content above which the soil

would tend to act as a liquid, and below which the soil would tend to act as a solid. The difference between the liquid and the plastic limits is the plasticity index, which provides a measure of the plasticity of the soil.

Past experience and research studies indicate that if the natural moisture content of the soil is close to the liquid limit, the soil is likely normally consolidated and could be expected to settle under any increase in effective stress. However, if the moisture content is close to the plastic limit, the soil is likely over-consolidated and would not readily settle under a small increase in effective stress.

Unconfined Compressive Strength (Q_u)

Unconfined compressive strength tests were performed on selected cohesive samples. A hydraulically-operated testing machine is used to provide a controlled rate of strain. This information is used in evaluating the shear strength of cohesive soil, which is useful in bearing capacity and slope stability calculations.

QUALIFICATIONS APPENDIX

GENERAL QUALIFICATIONS

This report has been prepared at the request of our client for his use on this project. The work, including the field work, laboratory testing, and engineering analysis, was performed in accordance with generally accepted Geotechnical Engineering practices. For this study, we were not retained to address environmental or land use restriction concerns. This warranty is in lieu of all other warranties either expressed or implied.

This report may not contain sufficient information for purposes of other parties or other uses. Should there be any sufficient differences in structural arrangement, loading or location of the structure, our analysis should be reviewed.

The analysis, conclusions, and recommendations contained in our report are based on site conditions as they existed at the time of our exploration and further assume that the borings are representative of the subsurface conditions throughout the site.

If during construction, different subsurface conditions from those encountered during our exploration are observed or appear to be present beneath excavations, we must be advised promptly so that we can review these conditions and reconsider our recommendations where necessary.

If there is a substantial lapse of time between the submission of our report and the start of work at the site, or if conditions have changed due to natural causes or construction operations at or adjacent to the site, we urge that our report be reviewed to determine the applicability of the conclusions and recommendations considering the changed conditions and time lapse.

We urge that we be retained to review those portions of the plans and specifications that pertain to earthwork and foundations to determine whether they are consistent with our recommendations. In addition, we are available to observe construction, particularly the compaction of structural backfill and preparation of the foundations, and such other field observations as may be necessary.

In order to fairly consider changed or unexpected conditions that might arise during construction, we recommend the following verbiage to be included in the project contract.

STANDARD CLAUSE FOR UNANTICIPATED SUBSURFACE CONDITIONS

The owner has had a subsurface exploration performed by a Geotechnical consultant, the results of which are contained in the consultant's report. The consultant's report presents his conclusions on the subsurface conditions based on his interpretation of the data obtained in the exploration. The contractor acknowledges that he has reviewed the consultant's report and any addenda thereto, and that his bid for earthwork operations is based on the subsurface conditions as described in that report. It is recognized that a subsurface exploration may not disclose all conditions as they actually exist and further, conditions may change, particularly groundwater conditions, between the time of a subsurface exploration and the time of earthwork operations. In recognition of these facts, this clause is entered in the contract to provide a means of equitable additional compensation for the contractor if adverse unanticipated conditions are encountered and to provide a means of rebate to the owner if the conditions are more favorable than anticipated.

Should the contractor encounter conditions that are different than those anticipated by the Geotechnical consultant's report at any time during construction operations, he shall immediately (within 24 hours) bring this fact to the owner's attention. If the owner's representative on the construction site observes subsurface conditions which are different than those anticipated by the consultant's report, he shall immediately (within 24 hours) bring this fact to the contractor's attention. Once a fact of unanticipated conditions has been brought to the attention of either the owner or the contractor, and the consultant has concurred, immediate negotiations will be undertaken between the owner and the contractor to arrive at a change in contract price for additional work or reduction in work. The contractor agrees that the following unit prices would apply for additional or reduced work under the contract. For changed conditions in which unit prices are not provided, the additional work shall be paid for on a time and material basis.

PREVIOUSLY ANSWERED QUESTIONS APPENDIX

Appendix Answers to Previous Bid Questions

1. Are all of the attachments listed on page 31 of the specs (Article 7) required? I am not finding the exhibits in the specs.

Certificates for:

Responsible Bidder Requirements-2013-009

D-2556-Iron and Steel

Form_9_Wage-Fringe_Benefit_Certification

E-Verify Affidavit Form I-9

I will supply them in the Additional Information Section as Exhibits.

Also, there are no DBE requirements.

3. The sanitary sewer specifications are telling me that I need to reference MSD Exhibit D. I cannot find this exhibit in either the plans or specifications provided.

MC Sanitary Sewer Specifications are included in the Additional Information Section as Exhibits.

4. Can you tell me if there will be a group site visit? Or will it be on an individual basis? We will be bidding this project for the electrical scope of work.

There will not be an official on-site meeting.

5. Can you please provide your measurements for the HMA in each section for the Laporte County Water and Sewer Extension project? I am having a tough time trying to figure out how the quantities were determined.

The engineer estimated the total HMA base at 715 tons and the HMA binder at 141 tons.

There are 7 asphalt drive repairs.

One road crossing.

A col de sac repair.

An estimated 15 boring pits along 300 N and 950 W.

There may also be some intersection repair/reconstruction at 300 N and 950 W.

1. Can you clarify the contractor expectation for the electrical service and phone service needed for the project? I have read that NIPSCO will maybe provide service to the meter set. It would be our responsibility from there. The phone service seems to be a little more gray.

Electric service will need to be supplied at the pumping station (3 PH 230V) and at the flow meter vault (1 Ph 110 V) location.

No phone line will be required.

2. Does the MCSD have a preferred contractor for SCADA/communications?

Mission Controllers and they are handled/serviced for MCSD by Flow Techniques.

3. Are there inspection or observation costs that the contractor is responsible for pipeline crossings?

The owner will have a representative on site. INDOT or the Toll Road may require on site inspection.

That would be a contractor cost.

4. What level of Subsurface Utility Engineering took place at time of design?

Geotechnical information is supplied in the Borings Log Appendix on page 422 of the specifications.

The design engineer has shown identifiable utilities on the plans. The Contractor will be responsible for locating all utilities prior to construction.

Appendix Answers to Previous Bid Questions

5. Is the contract being paid for under unit prices?

Yes

6. Please clarify if service laterals and water services are required for the project? There were none shown on the drawings.

All water and sewer service laterals will be installed by the home owner.

7. Are we going to be required to provide force main markers in the road or will the air releases along the route serve as those?

The Air Release Valve Pits will be adequate.

The Directional Drilled HDPE Pipe needs to include a tracer wire.

8. Who is responsible for obtaining water and sewer permits from the MCSD? Are there any other permits the contractor is responsible for?

The owner has obtained all MCSD, IDEM, Drinking Water NOI, Legal Drain and Rule 5.

The Contractor will be responsible for the INDOT US 421 and I-94 Jack and Boring permits.

9. Do we need to provide jack and bore monitoring with a survey crew for bores under US 421 and I-94?

Only as required by the construction permits obtained from INDOT and the Toll Road.

10. Will pre-cast drops be allowed in lieu of the field built drops? The detail on the prints show flowable fill to encapsulate and the MCSD drawings show concrete. Please clarify which detail we are to follow.

Pre-Cast man holes and vaults are acceptable. I think the detail you are referring to is for sanitary sewer separation with any other pipe fluid carrier.

11. How is the erosion control being paid for? Is the quantity in the bid form for lineal feet of silt fence installed?

The line items will be for the contractors estimates for all erosion control measures needed for each construction area.

Specifications line item S18 page 18, S5 page 21, S9 page 22, F15 page 25, W19 page 27, W4 page 28, W9 page 29, W10 page 30,

12. Can you please clarify easements and acquisitions?

All Easements and acquisitions will be obtained by the owner.

The contractor will be responsible for a staging area and job site trailer location, utility supply etc..

The lift station site should be adequate for the above.

13. There are line items for Water Meter pit for lines B1 and C. I do not see these located on the prints. Please clarify.

Water lateral valves and meters will be installed by the home owner.

14. Will TR Flex pipe be allowed for Jack and Bore carrier pipes?

This will need to be asked of INDOT and the Toll Road when getting the permit.

15. Can you clarify what needs to be included in the F13 – Lift Station line item?

A complete operational lift station with Mission/SCADA system is required.

This would include electrical service installation and a constructed site plan to print.

Appendix Answers to Previous Bid Questions

16. Lift Station access drive. What pay item will this be covered under?

F10, F11 and F12 on specifications page 23.

17. On Sheet C201 – 12” CMP is a remove and replace? Install?

The 12” culvert is existing.

18. Will asphalt restoration be paid for on a neat line measurement or by actual installed?

Actual installed and as determined by the owners on-site representative.

19. To clarify, #53 limestone is the granular backfill required for backfill. Will this be paid for on a neat line or actual used?

The neat line is the engineers estimate, actually quantities used will be paid for.

20. Is the lump sum item for the lift station all inclusive of line items LS1-LS19? Are we to combine the total prices for LS1-19 for the lift station total bid price or list them out as separate line items?

F13 Bid item would include items LS1-LS19.

23. Are we going to be required to have a contractor trailer on site? Fenced in with the security measures?

A job site trailer is required. Security measures are up to the contractor.

24. Section 01 40 00 – Quality Requirements lists testing agencies. Is this going to be required? If so, what items or tasks will this be required for?

Testing agencies will be required for items listed in Section 03 30 00.

For Concrete mix strength, slump and strength.

All MH and pipe testing will be done by the contractor and witnessed by the owner’s representative.

LS start up and meter testing will be paid for by the contractor and witnessed by the owner’s representative.

25. Are we required to hold builders risk and a 3 year maintenance bond?

Yes 10%, See ARTICLE 6 sc-6.01 on page 141 of the specifications.

26. SC 7.02C – Are we required to pay RPR overtime if the contractor decides to work over 40 hours a week? If so, what is the hourly rate which we need to factor into our bid?

Reference the addendum form 2013-009 Section E.

27. SC 7.12 #7 – What items or tasks will this be required on?

There are no requirements for this provision in this contract.

28. Section 099656 – Will this epoxy coating be required? If so, which items or tasks?

All DIP within the lift station, valve vault and flow meter pit.

For the wet well coating see plan sheet C200.

29. Section 31 23 16 – Is the contractor going to be required to hire a structural engineer for item 1.3 A & B? If so, can more detail be given as to what needs to be signed and stamped?

There are no requirements for this provision in this contract.

Appendix Answers to Previous Bid Questions

30. Can you confirm that all ductile iron pipe utilized for gravity sanitary sewer is to be PC350?
The outer casing pipe can be class 300 the inner DIP pipe shall be PC350.

31. Does ductile iron pipe utilized for sanitary sewer require polywrap, if so can you provide a color and thickness for the polywrap?
No.

32. Does ductile iron pipe utilized as a carrier pipe need to be field locked together or are standard tyton joint gaskets sufficient?
For Gravity Sewer Pipe gaskets are sufficient.
For all other DIP connections see MC Sanitary Sewer Specifications Section 9, pages 5-6.

34. Does the water main require a tracer wire?
No, the water line is DIP.

35. Does either the gravity sewer or water line require a warning tape?
NO, only the FM HDPE pipe.
Yes The correct answer is warning tape per Part 3 3.01 item 6. Yes warning tape for gravity sewer will read
“CAUTION SEWER LINE BURIED BELOW” For Trenched Water Line “CAUTION WATER LINE BURIED BELOW”

36. Who is responsible for performing the compaction testing, taking concrete cylinders and asphalt testing?
The contractor will be responsible for obtaining a certified testing company.

37. Is the removal and replacement of fencing along the north side of CR 300 incidental to construction or will a line item be added to the bid form?
Use line item S17 for any fence removal. There will not be fence replacement in the project costs.

38. Are any coatings required for the casing pipes?
No coating is required for the casing pipe

39. What does the line item “Easements/Land Acquisitions” mean, please provide a description of what this entails?
The Contractor will only be responsible for acquiring any temporary easements for a staging area and location for the job site trailer.

40. The bid form refers to a water meter pit complete for a total of 5 for the entire job, can you clarify the location and size for these pits as we cannot find any?
Water lateral valves and meters will be installed by the home owner.

41. A detail for an Air Relief Assembly has been provided on sheet C523, is this what you are referring to as a meter pit, if not will a bid item be added?
No, the meter pit location C312 & C301, Details C313 is a separate item.

Appendix Answers to Previous Bid Questions

42. What is the make and model of the air relieve valve shown on sheet C523?

The ASR is an APCO Series 400.

43. Items W17 of bid category A1 and A2 has a quantity of 37 and a unit of Lump Sum? Please clarify?

Use a lump sum amount for tree clearing for Water Line A1 and A2.

44. The bid form has line items for contractors trailers, is this what is referred to as Engineers Trailer in the Temporary Facilities and Control section of the spec book?

Yes.

45. Will we need to submit our subs & suppliers with the bid or can they be turned in after the bids are read?

Sub-contractors can be turned in after award of bid but before their work begins.

1. Sanitary detail for bedding the sanitary sewer lists #8 crushed stone for Class 1 material. Can sand be used to bed and initial backfill the pipe?

Yes, Class I Structural Backfill may be used for initial pipe backfill for the Gravity PVC pipe.

The fill should be a minimum of 4" below the pipe invert and 12" above the top off the pipe.

4. What is the County's thinking about 950 asphalt? Looking at the project, it appears that the county road is not in the best of shape and I am not sure that the road will hold up to construction traffic for installation of the water main. Please clarify.

The County has no plans to resurface the 950W or 300N prior to project completion.

The County is anticipating road damage.

5. The existing manhole that the force main will connect to was full of water and appears to be larger than 4' in diameter. Why does the structure have water in it? Note that the downstream manhole was dry at time of site visit. What specific coating is required in the manhole?

The inlet pipe for the MH's Water, FM will need to be grout sealed. No MH coating is required.

6. As stated in the pre-bid meeting on October 15th, the fence on 300 North from US 421 to end of project will be removed and NOT replaced. Do we need to provide temporary fence after pipe installation is complete?

No temporary fence will be required with this contract.

7. There is a ditch line that is basically in the same path of the 20" water main along 950. Will there be an item added for sod of the ditch line? If not will there be an item added for erosion control blanket?

The erosion control costs should be included in the erosion control line item for the water line along 950W.

8. At or about STA 17+60 on Line C there is a box of some sort in the ROW where the water is being installed. What is the box and how are we to account for in the bid?

The box referenced, if identified correctly is an electrical junction box. Utility conflicts, unless they can be proven extreme, are incidental to the cost of the waterline installation and will be paid for by LF of water line installed.

Appendix Answers to Previous Bid Questions

9. Will "Field Locking Gaskets" or TR Flex be allowed for carrier pipe installation for the water main Jack and Bores?

The pipe will need to be one piece or welded.. The ends will need to be sealed. See detail sheet C523

10. How will culvert removal and replacement be paid for at drive crossings along 950 for the water main installation?

The culverts were not anticipated as needing replaced. If replacement is determined necessary by the owners on site Rep than a CO will be issued.

11. Will the County be providing allowances for US 421 and I-94 permitting and requirements?

Will the US 421 and I-94 borings have to be monitored for settlement?

Contact information is Mike Hurt 219-851-1426.

There will be a \$10,000 bond required for each casing. There will be a \$55.00 permit application fee for each casing. These costs should be included in the Jack and Bore line items.

12. How will the inspection and observation fees be paid for US 421 and I-94 borings, if 24-HR operations are required under the permit?

There are no INSDOT inspection fees required. See question 11 above for more information.

13. If during Jack and Bore large rocks are encountered, how will those be paid for?

Large Rocks were not anticipated. If jack and bore obstacles are encountered and determined necessary to be removed, INDOT will need contacted, the owner's rep will need to be contacted and if all parties agree, a CO will be issued.

15. Will the annular space in the casings be required to be grouted?

No, the drawing calls out a flexible APS end seal or equivalent.

16. Where is the future Love's going to be located along the project?

At the open space just North of 300 N., West of 421 and East of the land fill.

17. The prints show the jack and bore pits up to the ROW along I-94. How will the guardrail be paid for that will likely be removed for bore pit installation? Or will the bores need to be lengthened to avoid impact to the existing guardrail?

The removal and replacement of the guard rail is incident to the I-94 Jack and Bore costs.

18. Where will we be allowed to discharge dewatering efforts on the project?

Dewatering discharge can be sent to the pond on the Loves sight. The discharge will need to be netted for sediment control.

22. Does the interior of the wet well need to have a protective coating?

No, exterior walls only. See Drawing sheet C203.

23. In regards to the compaction testing, where will we be required to perform the compaction testing? (road crossing, pipe trench off the road, etc). To what %? How often / frequency?

Compaction tests will be required where open trenching across roadways or as required by the owners Rep. Include 10 total compaction tests for bidding purposes. See Bid Tab, Incidentals.

Appendix Answers to Previous Bid Questions

24. Is the carrier pipe to be included in these line items along with the spacers and end seals or is the carrier pipe included in other line items?

The Steel Casing Pipe line items include all incidental seals spacers and joints necessary to accomplish the task.

27. The bid form for Bid G1 has a line item for 18" SDR-26 pipe and a quantity of 325', please clarify this as the following pipe runs are all listed as SDR-26?

- a. Lift Station to Manhole #1 = 14'
- b. Manhole #2 to Manhole #3 = 324.09'
- c. Manhole #3 to Manhole #4 = 287.04'

28. The sanitary sewer manholes shown on the profile that have ductile iron pipe leading up to them show PVC for the inverts, are we to convert over to PVC before the manhole?

Continue using DIP after leaving the casing to the MH.

30. When we jack and bore under 94 can we tie directly into the existing valve or do we need to stop short and install a blow off for testing? Please let us know as we may need to add another valve for testing so the entire line doesn't need to be drained for final connection to the existing main.

Follow Detail #3 drawing C524.

31. When taking off the waterline and sewer line for the job I noticed it seems that you are paying for the carrier pipe for sanitary sewer with the casing pipe yet you are not doing this for the water. Is this how you intended to quantify the items on the bid form?

36" Steel casing pipe for the 20" water line is called out for segments A1 and A2.

32. For lines A1 & A2 it appears that the total lineal footage of pipe for the directional drill, open cut and carrier pipe in a casing is all included with bid item W1, is that correct, please check your quantities since the quantity of pipe listed in W1 is for all of the pipe shown on lines A1 & A2.

All the 20" DIP quantities are included in W1 line A1 and A2.

All 20" DIP pipe for Gas/Stream crossings is included in line item W4.

33. Bid item W4 of A1 and A2, is this just the labor cost of directional drilling and the material is paid for in line item W1? Please check your quantities since the quantity of pipe listed in W1 is for all of the pipe shown on lines A1 & A2.

The pipe will be paid for by LF installed. The HDD pipe should include all costs associated with the installation of the pipe on a LF basis.

34. Bid items W5, W6 & W7 of lines A1 and A2, is this just the labor to perform the jack and bore and material to install the casing pipe, spacers and end seals only and the carrier pipe material will be paid for under line item W1? Please check your quantities since the quantity of pipe listed in W1 is for all of the pipe shown on lines A1 & A2.

The lineal foot of water main pipe used will be paid for on a LF installed basis.

The Jack and Bore line items shall include all necessary costs to install the carrier pipe for the main water line.

35. Are aligners required for the water line valve boxes as none are shown on the drawings?

See detail 3 and 4 Sheet C522.

Appendix Answers to Previous Bid Questions

36. The specification manual references stainless steel hardware for hydrants but doesn't say stainless steel hardware is required for the valves and fittings of the water line. Are fire hydrants the only component required to have stainless steel hardware?

All hardware shall be Stainless Steel.

37. Is any compaction testing required for backfill of yard areas? If so, please provide us with a frequency.

Compaction tests will be required where open trenching across roadways or as required by the owners Rep. Include 10 total compaction tests for bidding purposes. See Bid Tab, Incidentals.

39. Will an allowance line item be added for permits, inspector, inspection fees etc. for the jack and bore under pipelines and highways as we don't know these costs?

Contact information is Mike Hurt 219-851-1426.

There will be a \$10,000 bond required for each casing. There will be a \$55.00 permit application fee for each casing. These costs should be included in the Jack and Bore line items.

41. There are 15 hydrants shown on the drawings and 14 on the bid form for lines A1 and A2, please clarify?

There 14 new hydrants and 1 existing.

42. Is coal tar epoxy coating required in the interior of the existing manhole the forcemain is to be tied into or is this to be ravens coating?

NO interior coatings are required for the man holes, wet wells or vaults.

43. Does the existing forcemain discharge manhole need to be coated.

All DIP within the lift station, valve vault and flow meter pit need coated.

For the wet well coating see plan sheet C200.

44. Are standard tyton joint gaskets sufficient or do they need to be "locking" field lock gaskets for ductile iron pipe in a casing for sanitary sewer?

Tyton Joint gaskets can be used for inside the casing pipe only. The ends will need to be sealed. See detail sheet C413.

48. Do we use detail 5 on plan sheet C523 for the construction of the drinking water air release valve and pit?

Yes.

49. How are we to be paid for the asphalt patching of CR300 where line B crosses the road?

Use pay item W9, W10 and W11 from Water line A1 and A2.

50. Water main line C crosses CR 300 which is asphalt and both entrances to the Speedway truck stop which are also asphalt but you only include bid item W7 which is commercial concrete drive

Use pay item W9, W10 and W11 from Water line A1 and A2.

51. Line B for the water line bid item W4 has a quantity of 818 LF and the plans show approximately 350 lineal feet, please clarify?

Pay Item W4 for Water Line B is for erosion control measures.

Appendix Answers to Previous Bid Questions

52. Line B1 for the water line bid item W9 has a quantity of 50 LF and the plans show about 590 LF, please clarify?

Pay Item W9 for Water Line B1 is for erosion control measures.

53. Line C for the water line bid item W10 has a quantity of 100 LF and the plans show about 1,925 LF, please clarify?

Pay Item W10 for Water Line C is for erosion control measures.

54. Please confirm that a good faith efforts worksheet is not required to be turned in?

There are no DBE or DBVE requirements for this project.

56. Is a separate trailer required for the engineer as well as the contractor? Please clarify if one or two trailers are required?

Only one trailer is required. The trailer does not have to be new, the trailer size of 48 feet is optional, a porta potty is sufficient, no restroom no permanent potable water service is required, the printer equipment will not be retained by the owner.

57. Question 35 of addendum #2 was answer that warning tape is not required for gravity sewer but page 8 of the Michigan City sewer specifications indicates a tape is required, which is correct?

The correct answer is warning tape per Part 3 3.01 item 6. Yes warning tape for gravity sewer will read "CAUTION SEWER LINE BURIED BELOW" For Trenched Water Line "CAUTION WATER LINE BURIED BELOW"

60. Water line "B" does not have a bid item for #53 Granular Backfill but granular backfill is shown on the plans?

Use pay item W9, W10 and W11 from Water line A1 and A2.

61. On waterline "A2" page C510 states to see connection detail #6 which indicates a 12" butterfly valve however there is no bid item for this work, please add.

The Butterfly Valve at 31+72 is a 20" valve. Reference Detail should be Detail 4, C522

62. Can you please clarify coating requirements for the manholes and lift station? The specifications 33 05 13 3.3 F talks about this. Can you please provide more information regarding this?

There are no interior concrete coating requirements for the concrete MH's, Wet Well or pits.

2. Does the ductile iron pipe that is being used on the gravity sanitary sewer need to be 401 lined? The Bid Bond has "LaPorte Water Main" as project title. Does this need to be changed to match project name?

Where specified DIP 401 lined pipe shall be used for all sanitary sewer applications. Gravity Lift, Station or Forced main.

4. Will "Field Locking Gaskets" or TR Flex be allowed for carrier pipe installation for the water main Jack and Bores?

Field locking gaskets or TR Flex will be required for the carrier pipe.

The casing pipe will need to be one piece or welded.. The ends will need to be sealed. See detail sheet C523

Appendix Answers to Previous Bid Questions

5. CLARIFICATION Bid items W5, W6 & W7 of lines A1 and A2, is this just the labor to perform the jack and bore and material to install the casing pipe, spacers and end seals only and the carrier pipe material will be paid for under line item W1? Please check your quantities since the quantity of pipe listed in W1 is for all of the pipe shown on lines A1 & A2.

The lineal foot of water main pipe used will be paid for on a LF installed basis.

*The Jack and Bore line items shall include all necessary costs to install the **Casing Pipe not Carrier Pipe** for the main water line.*

2. Watermain Line A1 and A2 has 37 trees to be removed, there is more than 37 trees.

Line item W17 should be bid as a lump sum quantity.

ADDITIONAL INFORMATION

Attach Additional Information as Requested and/or as Necessary to Describe, Explain, and/or Clarify the Information Contained in this Construction Permit Application.



**Michigan City Sanitary District
Sanitary Sewer and/or Sanitary Lift Station
Construction Permit Application Form Instructions**

Dear Applicant:

To complete your construction application, you must submit **all** of the necessary items. If your application materials are incomplete, you will be sent a deficiency notice, and your application will be retained for ninety (90) days. If the requested/required information is not received within the ninety (90) day period your application will be denied due to incompleteness. You can also obtain a copy of this application package at:
<http://www.emichigancity.com/cityhall/departments/sanitary/index.htm>.

Please complete the following steps:

- ☐ Complete all information on Page 1 of the Construction Permit Application Form;
- ☐ Sign and Date the Application on Page 1;
- ☐ Complete all the information on the Project Design Summary on Page 2, and certify it with a professional engineer's stamp (or land surveyor's stamp for gravity sewer projects), signature, and date (include additional information as an attachment to the application, as necessary);
- ☐ Complete the Capacity Certification/Allocation Letter on Page 3 (leave signature box and date signed box blank as this page will be signed by the City Engineer upon approval);
- ☐ Complete the Certification of the Registered Professional Engineer or Land Survey Letter on Page 4;
- ☐ Identify the location of the Project on the Michigan City Area Map on Page 5, by inserting the words "The Proposed Project Location," and by using an arrow and other identification such as bracketing or circling the proposed location, or attach a different map of the Project location if necessary; and
- ☐ Include any other information requested by the Michigan City Sanitary District or necessary to describe the project.
- ☐ Include Permit Fee Schedule and the Base Fee in the form of a check made payable to the Michigan City Sanitary District. The Base Fee is \$250. Additional payments may be requested by the MCSD at a rate of \$100 per hour for all time in excess of two (2) hours spent in the review and issuance of the Permit.
- ☐ Submit three (3) sets of plans and specifications, including profiles and bedding details. Every page **must** be stamped and signed by a professional engineer.

You **must** submit three (3) complete copies of the entire Construction Permit Application, including three (3) copies of the Plans and Specifications and all attachments to:

General Manager
Michigan City Sanitary District
1100 E. Eighth Street
Michigan City, IN 46360-2567
Telephone: (219) 874-7799

- ☐ Please be advised that if your project will disturb one (1) or more acres of land area, coverage under 327 IAC 15-5 (Rule 5) is required. If your project will disturb one (1) or more acres of land area you **must** also complete the Michigan City Sanitary District, Storm Water Associated with Construction Permit Application Form, and include three (3) copies of this application with your Construction Permit Application Form. Additionally, upon approval by the Michigan City Sanitary District, you will need to submit a Notice of Intent (NOI) Letter (Application) to the Indiana Department of Environmental Management as required by 327 IAC 15-13 and 327 IAC 15-5.



**MICHIGAN CITY SANITARY DISTRICT
APPLICATION FOR CONSTRUCTION PERMIT
SANITARY SEWER AND/OR SANITARY LIFT STATION
PURSUANT TO 327 IAC 3**

INSTRUCTIONS:

1. This form must be filled out completely.
2. Additional pages (attachments following this form) are part of this application form and must be filled out completely.
3. Submission of plans and specifications are part of the application.
4. If you have any questions regarding this application, call the Michigan City Sanitary District at (219) 874-7799.

Mail or Hand Deliver Completed Application to:
General Manager
Michigan City Sanitary District
1100 E. Eight Street
Michigan City, IN 46360

APPLICANT		APPLICANT'S ENGINEER OR LAND SURVEYOR	
Name: Mitchell Bishop		Name: Paul Vincent	
Company Name: La Porte County Redevelopment Commission		Company Name: RQAW	
Address: 809 State St., La Porte, IN 46350		Address: 703 Michigan Ave., La Porte, IN 46350	
Telephone number: (219) 326-6808		Telephone number: (317) 258-4615	
NAME AND LOCATION OF PROPOSED FACILITY		ATTACHMENT CHECKLIST	
Name: La Porte County Water & Sewer Extensions (SR 421 & CR 300 North Utility Extensions)		A. Sanitary Sewer Design Summary Form: <input checked="" type="checkbox"/> Yes	
		B. Capacity Certification/Allocation Letter: <input checked="" type="checkbox"/> Yes	
Location (Referenced the location by identifying at least two existing streets and briefly describe location): See Narrative Description Below		C. Certification of PE or LS Letter: <input checked="" type="checkbox"/> Yes	
		D. Project Location Map: <input checked="" type="checkbox"/> Yes	
		E. Plans and Specifications: <input checked="" type="checkbox"/> Yes	
City: Michigan City		F. Permit Fee Schedule & Base Permit Fee: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A	
County: La Porte		G. Additional Information Required by the MCSD: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A	
FUNDING SOURCES AND PERMIT APPLICATION FOR CONSTRUCTION, EXPANSION, OR MODIFICATION OF (Check all that apply)			
A. Is this project being funded (in part or entirely) by any local grants or matching funds: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
B. Is this project being funded (in part or entirely) by State Revolving Loan Funds (SRF): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
A. Does the project include Sanitary Sewer(s): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
B. Does the project include Sanitary Sewage Lift Station(s): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
C. Is this new construction: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
D. Is this construction for rehabilitation and/or replacement of an existing Sewer(s) or Lift Station(s): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
CERTIFICATION AND SIGNATURE			
Application is hereby made for a Permit to authorize the activities described herein. I certify that I am familiar with the information contained in this application and to the best of my knowledge and belief such information is true, complete and accurate.			
Printed name of person signing: Mitchell Bishop		Title: County Planner	
Signature of Applicant 		Date application signed (month, day, year): 4-1-2019	

DESIGN SUMMARY - SANITARY SEWER AND/OR LIFT STATION

Narrative Description/Summary of the Proposed Project

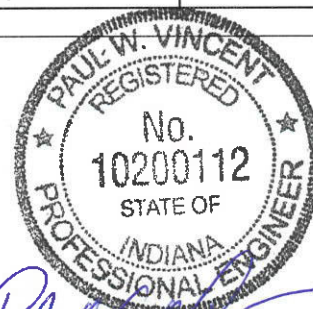
After connecting to the existing sanitary manhole located North of the intersection of I-94 and CR 950 W, the new force main continues South on CR 950 W until the intersection with CR 300 N. Then, the force main continues West until it reaches the lift station, which is located on the Southeast corner of the intersection between CR 300 N and US 421. At this point, the sewer splits into three separate gravity sewer lines. The first crosses Northwest under US 421 and continues West until the landfill. The second crosses North under CR 300 N and continues slightly North along US 421. The last line continues South from the intersection of US 421 and CR 300 N along US 421. This final line also includes a gravity sewer that crosses US 421 from the west side of the street and connects to the sewer line that heads towards the lift station.

Design Flow

Number of units			
	1 bedroom apartments	200 gpd/unit	gpd
	2 bedroom apartments	300 gpd/unit	gpd
	Single family homes	310 gpd/unit	gpd
5	Commercial lots		12,500 gpd
			gpd
			gpd
		Total average flow	12,500 gpd
Peaking factor	3.84	Peak flow	48,000 gpd

Sewer

ft. 135	8-inch DI (sewer type)
ft.	10-inch
ft. 575	18-inch DI Gravity Sewer
ft. 3070	18-inch PVC Gravity Sewer
ft. 185	8-inch PVC Gravity Sewer
ft. 3965	Total length of sewer
The new sewer will be connected to an existing 18-inch diameter sanitary sewer at CR 90 W, I-94 (referenced to two existing streets)	



Paul W. Vincent 7/23/19
(P.E. or L.S. stamp, signature and date)

Lift Station

Type	Submersible (wet/dry, submersible, wet-well mounted, etc.)			
Number of pumps	2			
Capacity of pumps	gpm 251	TDH 66	RPM 1750	HP 12.1
Back-up power source	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Average wet-well detention time	44.9			
Audio/visual alarm with self-contained power supply or telemetry system	Yes			
Force Main	5300 feet of 6-inch (type) HDPE			
Force main discharge elevation	648.00			

Wastewater Treatment

Wastewater treatment will be provided by J.B. Gifford WWTP, Michigan City, IN

Inspection/Maintenance

Inspection during construction will be provided by	Lochner
Maintenance after completion will be provided by	Michigan City Sanitary District

CAPACITY CERTIFICATION/ALLOCATION LETTER

(This form must be filled-out in its entirety)

Name of applicant: La Porte Redevelopment Commission
Name of owner: Paul Vincent
Name of project: La Porte County Water & Sewer Extensions (SR 421 & CR 300 North Utility Extensions)

CERTIFICATION

I, Charles G. Peller, Jr., representing the City of Michigan City, Indiana, in my capacity
(Name of individual) (Name of city or town)
as City Engineer have the authority to act on behalf of the City of Michigan City, Indiana
(Title) (Name of city or town)

certify that I have reviewed and understand the requirements of 327 IAC 3 and that the sanitary collection system proposed, with the submission of this application, plans and specifications, meets all requirements of 327 IAC 3. I certify that the daily flow generated in the area that will be collected by the project system will not cause overflowing or bypassing in the collection system other than NPDES authorized discharge points and that there is sufficient capacity in the receiving water pollution treatment/control facility to treat the additional daily flow and remain in compliance with applicable NPDES permit effluent limitations. I certify that the proposed average flow will not result in hydraulic or organic overload. I certify that the proposed collection system does not include new combined sewers or a combined sewer extension to existing combined sewers. I certify that the ability for this collection system to comply with 327 IAC 3 is not contingent on water pollution/control facility construction that has not been completed and put into operation. I certify that the project meets all local rules or laws, regulations and ordinances. The information submitted is true, accurate, and complete, to the best of my knowledge and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Gallons per day (Total Average Flow for Project): 12,500	
Wastewater Treatment Plant (Name of WWTP): J.B. Gifford WWTP, Michigan City, IN.	
Sewers (Owners of sewers): Michigan City Sanitary District	
Signature:	Date Signed (month, day, year):

(Please refer to IC 13-30-10 for penalties of submission of false information).

CERTIFICATION OF REGISTERED PROFESSIONAL ENGINEER OR LAND SURVEYOR LETTER

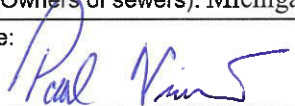
(This form must be filled-out in its entirety)

Name of applicant: La Porte County Redevelopment Commission
Name of owner: Paul Vincent
Name of project: La Porte County Water & Sewer Extensions (SR 421 & CR 300 North Utility Extensions)

CERTIFICATION

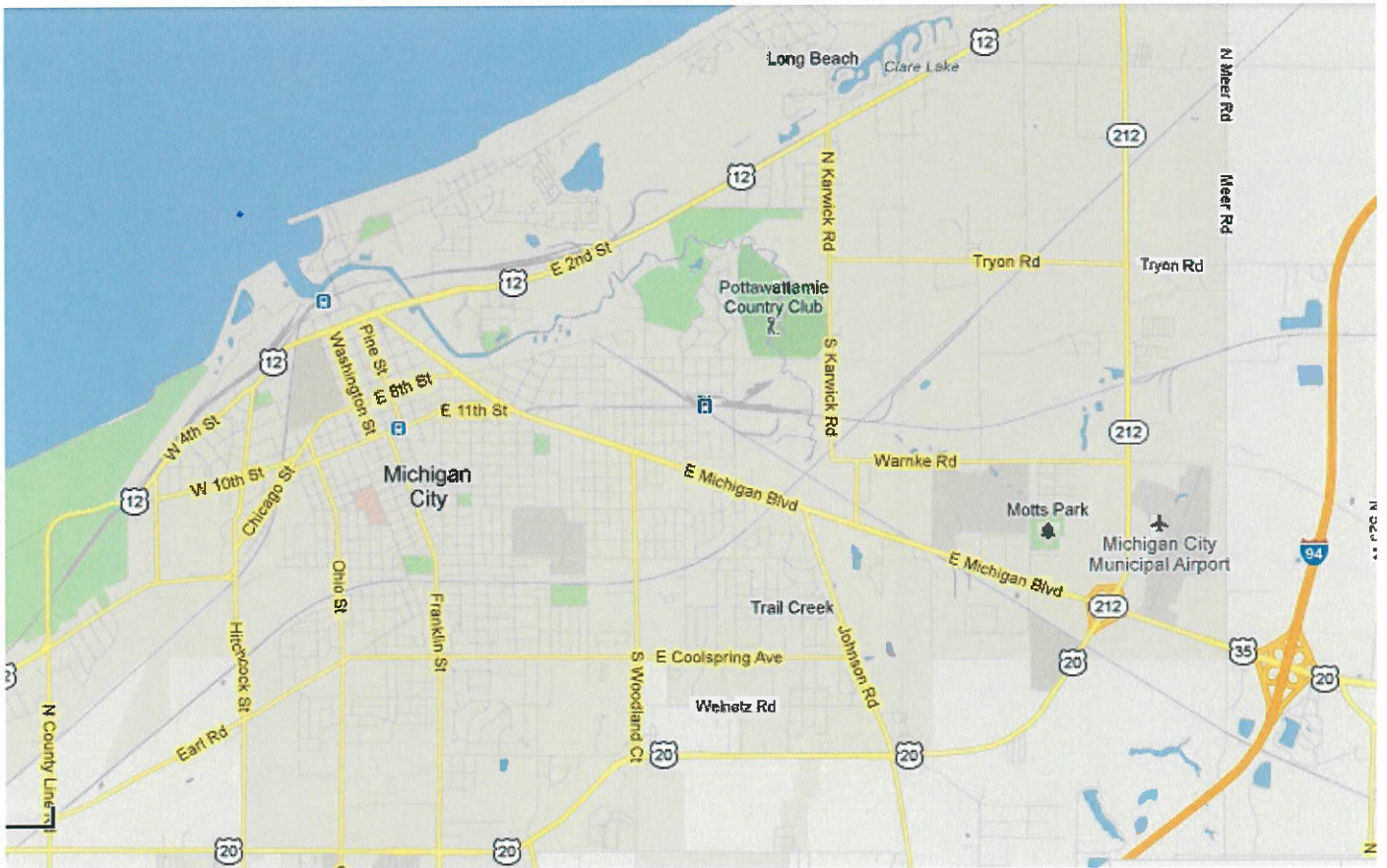
I, Paul Vincent, representing the project applicant, in my capacity as a registered
(Name of individual) (Name of city or town)
professional Engineer, PE10200112 certify the
(Engineer or Land Surveyor) (Indiana registration number)

following under penalty of law: The design of this project has been performed under my direction or supervision to assure conformance with 327 IAC 3 and the plans and specifications require the construction of said project to be performed in conformance with 327 IAC 3-6. The peak daily flow rates, in accordance with 327 IAC 3-6-11 generated from within the specific area that will be collected by the proposed collection system that is the subject of the application, plans, and specifications (when functioning as designed and properly installed), will not cause overflowing or bypassing in the same specific area serviced by the proposed collection system other than from NPDES authorized discharge points. The proposed collection system does not include new combined sewers (serving new areas) or a combined sewer extension to existing combined sewers. The sewer at the point of connection is physically in existence and operational. Based upon information provided by the owner of the Wastewater System, the ability for this collection system to comply with 327 IAC 3 is not contingent on downstream water pollution/control facility construction that has not been completed and put into operation. The design of the proposed project meets applicable local rules or laws, regulations and ordinances. The information submitted is true, accurate, and complete, to the best of my knowledge and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Gallons per day (Total Average Flow for Project): 12,500	
Wastewater treatment plant (Name of WWTP): J.B. Gifford WWTP, Michigan City, IN	
Sewers (Owners of sewers): Michigan City Sanitary District	
Signature: 	Date Signed (month, day, year): <u>7/23/19</u>

(Please refer to IC 13-30-10 for penalties of submission of false information).

Map of Michigan City to Identify Project Location
(Add Additional More Detailed Maps as Necessary)





Fee Schedule

Michigan City Sanitary District
Sanitary Sewer and/or Sanitary Lift Station
Construction Permit

Base Fee: \$250	Is Base Fee Enclosed <input type="checkbox"/> Yes <input type="checkbox"/> No
Remainder of Form to be completed by MCSD Personnel	
Base Fee Received by MCSD?	<input type="checkbox"/> Yes <input type="checkbox"/> No Date: _____
Are Additional Fees Necessary?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Additional Time Spent in Review in excess of 2 Hour Maximum as per Resolution 1304-12.	Additional Time spent _____ hours
Additional Amount due to MCSD:	Amount: _____
Additional Amount received by MCSD:	<input type="checkbox"/> Yes <input type="checkbox"/> No Date: _____

Please remit this form with your Permit Application and upon request if additional Fees are necessary.

Note - Michigan City Sanitary District Resolution 1304-12, effective September 12, 2012, states the following:
“NOW, THEREFORE, BE IT RESOLVED by the Board of Commissioners of the Michigan City Sanitary District that the following fees shall be charged and collected prior to the issuance of a sanitary sewer construction permit by the MCSD: A minimum charge of \$250 per application plus an additional \$100 per hour, billed in 1/4 hour increments, for any time spent on the review, issuance, and construction monitoring in excess of 2 hours.”

Initial Flow Rate Calculations

Date: 9/26/2018

Sewer Interceptor (North Connector)					
Business	Parcels	Area (Ac.)	Zone	Q(Avg.)	Q Units
Chevy Dealership	14	9	B3	1,500	GPD
				Q(Avg.)	1,500 GPD
				PF	3.84
				Q(peak)	5,760 GPD
				Q(peak)	4.00 GPM
PIPE SIZES					
8-inch Gravity Sewer					

Sewer Interceptor CR 300 N West of SR 421					
Business	Parcels	Area (Ac.)	Zone	Q(Avg.)	Q Units
Landfill	3	30	B3	0	GPD
Landfill	4	7	B3	0	GPD
Landfill	5	72	B3	0	GPD
Landfill	6	5	B3	0	GPD
Landfill	7	68	B3	4,300	GPD
Landfill	8	71	B3	0	GPD
Love's	9	55	B3	2,700	GPD
				Q(Avg.)	7,000 GPD
				PF	3.84
				Q(peak)	26,880 GPD
				Q(peak)	18.67 GPM
PIPE SIZES					
18-inch Gravity Sewer					

Sewer Interceptor SR 421 South of CR 300 North					
Business	Parcels	Area (Ac.)	Zone	Q(Avg.)	Q Units
Speedway	63	8	B3	3,000	GPD
Speedway	64	5	B3	0	GPD
Harley	65	6	B3	500	GPD
Harley	66	1.5	B3	500	GPD
				Q(Avg.)	4,000 GPD
				PF	3.84
				Q(peak)	15,360 GPD
				Q(peak)	10.67 GPM
PIPE SIZES					
18-inch Gravity Sewer					

FLOW GOING INTO LIFT STATION					
*ADD BLUE & RED					Q Units
CUMULATIVE Q(Avg.)				12,500	GPD
				PF	3.84
CUMULATIVE Q(Peak)				48,000	GPD
				33.33	GPM

Sewer Interceptor CR 300 N East of SR 421					
*No Additional Connections					
				Q(Avg.)	- GPD
				PF	-
				Q(peak)	- GPD
				Q(peak)	- GPM
*ADD BLUE, RED, & GREEN					
CUMULATIVE Q(Avg.)				12,500	GPD
				PF	3.84
CUMULATIVE Q(Peak)				48,000	GPD
				33.33	GPM
PIPE SIZES					
6-inch Force Main					

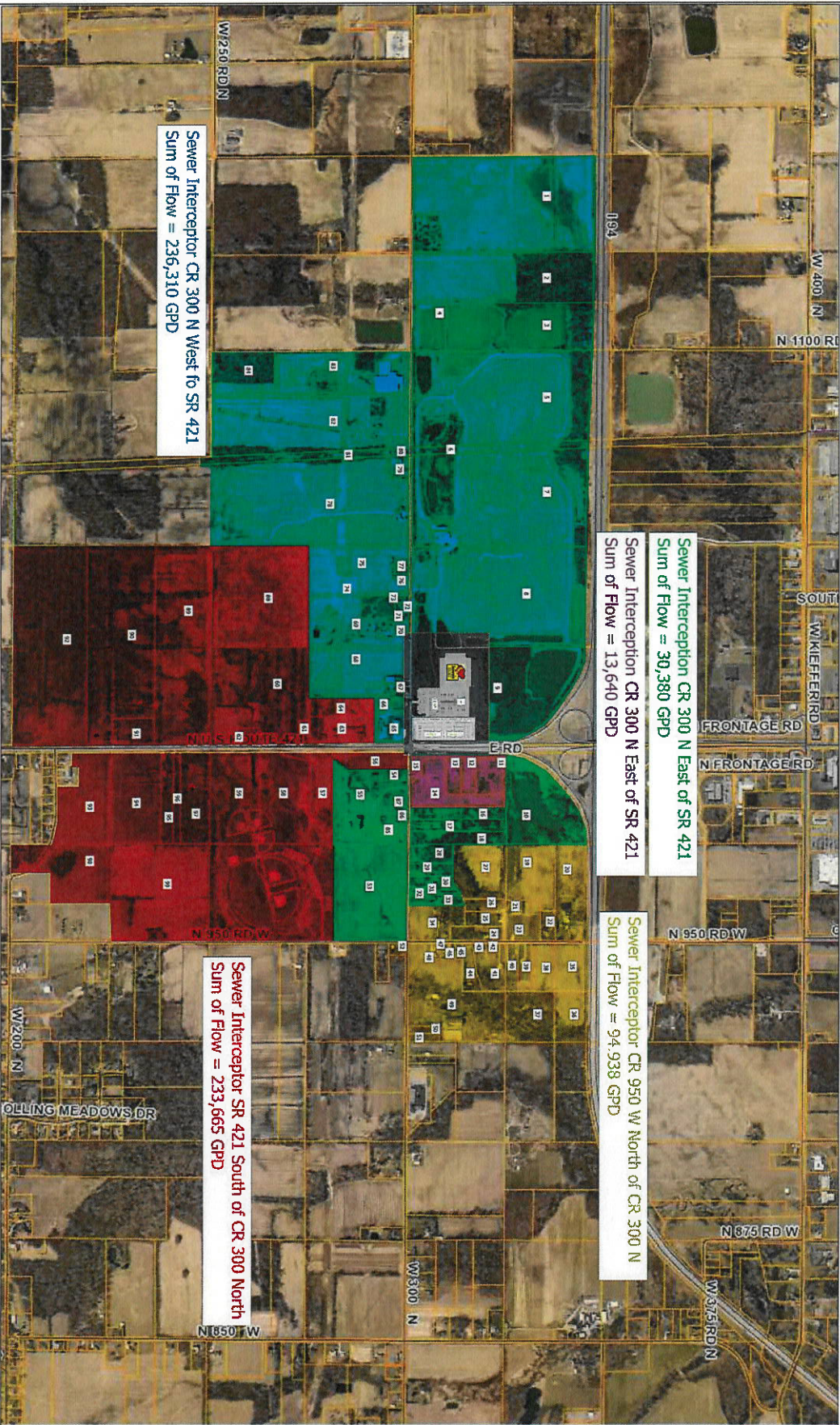
Sewer Interceptor CR 950 W North of SR 300 N					
*No Additional Connections					
*ADD BLUE, RED, GREEN & YELLOW					
CUMULATIVE Q(Avg.)				12,500	GPD
				PF	3.84
CUMULATIVE Q(Peak)				48,000	GPD
				33.33	GPM
PIPE SIZES					
6-inch Force Main					

Residential -	775 gal/acre
Commercial -	620 gal/acre
Industrial -	2500 gal/acre
No Future Development-	0 gal/acre
A - Agriculture	
R1A - Single family Residence	
R1B - Single Family Residence	
R1C - Single Family Residence	
R1D - Single Family Residence	
R1E - Waterfront Residence	
R2A - Townhouse	
R3A - Low-Rise Multiple Family Residence	
R3B - Mid-Rise Multiple Family Residence	
R4 - Manufactured Housing Park	
B1 - Neighborhood Commercial	
B2 - General Commercial	
B3 - Highway Commercial	
O5 - Office Service	
CBD1 - Downtown Core	
CBD2 - Transition or Hamlet Center	
M1 - Light Industrial	
M2 - Heavy Industrial	
MD - Marina District	
AP - Airport	

NOTE:			
Parcel	Flow Rate		
9	LOVE's	2,700 gal/day	
	Hotel X 2 (Future)	7,500 gal/day	*100gal/room
			*75 Rooms Each
53, 57-59	Ballparks	800 gal/day	*No major future changes
7	Landfill	800 gal/day	*400gal/restroom
		3500 gal/day	*flow today
78	Large parcel		
*split into two parcels between interceptors for future flow			

FM Diameter	Area (sq. ft)	Min. Velocity (ft/s)	Q (cfs)	Q (gpm)	GPD
1.5 inch	0.012271844	2.5	0.030679609	13.7690087	19,827
2 inch	0.021816611	2.5	0.054541528	24.4782377	35,249
2.5 inch	0.034088455	2.5	0.085221137	38.2472464	55,076
3 inch	0.049087375	2.5	0.122718438	55.0760348	79,309
4 inch	0.087266444	2.5	0.218166111	97.9129507	140,995
6 inch	0.1963495	2.5	0.49087375	220.304139	317,238
8 inch	0.349065778	2.5	0.872664444	391.651803	563,979
10 inch	0.545415278	2.5	1.363538194	611.955942	881,217
12 inch	0.785398	2.5	1.963495	881.216556	1,268,952
60 inch	19.63495	8	157.0796	70497.3245	101,516,147

Total Day 1 Flows					
Business	Parcels	Area (Ac.)	Zone	Q(Avg.)	Q Units
Landfill	3	30	B3	0	GPD
Landfill	4	7	B3	0	GPD
Landfill	5	72	B3	0	GPD
Landfill	6	5	B3	0	GPD
Landfill	7	68	B3	4,300	GPD
Landfill	8	71	B3	0	GPD
Love's	9	55	B3	2,700	GPD
Chevy Dealership	14	9	B3	1,500	GPD
Speedway	63	8	B3	3,000	GPD
Speedway	64	5	B3	0	GPD
Harley	65	6	B3	500	GPD
Harley	66	1.5	B3	500	GPD
				Q(Avg.)	12,500 GPD
				PF	3.84
				Q(peak)	48,000 GPD
				Q(peak)	33.33 GPM



Sewer Interceptor CR 300 N West to SR 421
Sum of Flow = 236,310 GPD

Sewer Interceptor CR 300 N East of SR 421
Sum of Flow = 30,380 GPD
Sewer Interceptor CR 300 N East of SR 421
Sum of Flow = 13,640 GPD

Sewer Interceptor CR 950 W North of CR 300 N
Sum of Flow = 94,938 GPD

Sewer Interceptor SR 421 South of CR 300 North
Sum of Flow = 233,665 GPD

SEWER INTERCEPTORS & FLOW EXHIBIT

Project Number: 16-106-024-1
Designed By: H.R.N.
Drawn By: H.R.N.
Checked By: P.W.V.
Date: 7/10/2019

LA PORTE COUNTY REDEVELOPMENT COMMISSION

LA PORTE COUNTY WATER AND SEWER EXTENSIONS

SR 421 & CR 300 N

RDAW

INTERNATIONAL INNOVATION



PROJECT: La Porte County Water & Sewer Extensions
(SR 421 / CR 300N)
LOCATION: US 421 & CR 300 N (La Porte County)
RQAW #: 18-400-024-1
DESCRIPTION: DAY 1; FLOW CALCULATIONS 6" FM

DESIGNED BY: BJN
DATE: 3/7/2018
CHECKED BY: PWV
DATE: 3/11/2018

Source of Proposed Flows	#	Unit	Flow Calculation Factor		Total Average Flow		Peaking Factor	Total Peak Flow	
					(gpd)	(gpm)		(gpd)	(gpm)
Landfill	1	Each	4,300	gpd	4,300	2.99	3.84	16,512	11.47
Love's	1	Each	2,700	gpd	2,700	1.88	3.84	10,368	7.20
Speedway	1	Each	3,000	gpd	3,000	2.08	3.84	11,520	8.00
Harley Davidson Dealership	1	Each	1,000	gpd	1,000	0.69	3.84	3,840	2.67
Chevrolet Dealership	1	Each	1,500	gpd	1,500	1.04	3.84	5,760	4.00
Residential	0	EDU	310	gpd	0	0.00	3.84	0	0.00

Totals

12,600

8.7

-

48,000

33.3

LS Design Average Flow =

8.7 gpm

LS Design Peak Flow =

33.3 gpm



PROJECT: La Porte County Water & Sewer Extensions (SR 421 / CR 300N)
 LOCATION: US 421 & CR 300 N (La Porte County)
 RQAW #: 18-400-024-1
 DESCRIPTION: DAY 1 PUMP TDH CALCULATIONS

DESIGNED BY: BJN
 DATE: 3/7/2019
 CHECKED BY: PWV
 DATE: 3/11/2019

GENERAL LIFT STATION INFORMATION:

Controlling Elevations
 Forcemain Discharge = 648.00 ft
 Forcemain High Point = 652.50 ft
 Pump ON = 641.00 ft
 Pump OFF = 639.00 ft

Flow Rate & Pump Rate
 Peak Inflow Rate = 33.3 gpm
 Pumping Rate = 251 gpm
 Pumping Rate = 0.56 cfs
 Pumping Rate = 361,440 gpd

FRICTION LOSSES:

Nominal Pipe Diameter, Pipe Type =
 Pipe Inside Diameter (inches) =
 C value (130 HDPE, 130 PVC, 120 DI) =
 Average velocity in pipe (ft/s) =
 Total length of FM =

LS Discharge Piping

6" DIP
 6.4
 120
 2.50
 40

Forcemain

6" HDPE ASTM D3035; DR-11
 5.571
 120
 3.30
 5300

$V = 1.318 C R^{0.63} S^{0.54}$, therefore, S (ft/ft) =
 $S = h_f / L$

0.0049

0.0095

Total Friction
 Losses
 50.78

therefore, $h(\text{friction})(\text{ft}) =$

0.19

50.59

MINOR LOSSES (PIPE FITTINGS):

Reference: Chicago Pumps, Hydraulics & Useful Information

Fittings Description	K-value	No.	Total	No.	Total
Entrance Loss	0.50	1	0.50	0	0.00
Outlet Loss	1.00	0	0.00	1	1.00
90 degree bend	0.30	2	0.60	0	0.00
45 degree bend	0.23	0	0.00	4	0.92
22.5 degree bend	0.15	0	0.00	0	0.00
11.25 degree bend	0.09	0	0.00	0	0.00
Plug Valve	0.30	1	0.30	1	0.30
Check Valve	2.50	1	2.50	1	2.50
Tee (through)	0.60	0	0.00	0	0.00
Tee (side flow)	1.8	1	1.80	0	0.00
Wye (thru)	1.00	0	0.00	0	0.00
Reducer/Expander	0.19	1	0.19	12	2.28
Total K Values:			5.89		7.00

Head Loss from fittings = $h_m = KV^2 / (2g)$

therefore, $h(\text{fittings})(\text{ft}) =$

0.57

1.19

Total Minor
 Losses
 1.76

STATIC LOSSES:

Elevation of highest point (discharge)(ft) =
 Low water level in LS (Pump OFF)(ft) =
 Static head losses = high point - LS level

Maximum

652.50

639.00

Minimum

652.50

641.00

Total Static Head
 (Max)
 13.50

therefore, $h(\text{static})(\text{ft}) =$

13.50

11.50

TOTAL DYNAMIC HEAD (TDH) = $h(\text{friction}) + h(\text{fittings}) + h(\text{static}) =$

66.0

ft

Pressure (psi): 160

FLOW RATE (gpm)	LS DISCHARGE PIPING			FORCEMAIN PIPING			TDH (ft)
	VELOCITY (ft/s)	FRICTION LOSS (ft)	MINOR LOSS (ft)	VELOCITY (ft/s)	FRICTION LOSS (ft)	MINOR LOSS (ft)	
100	1.00	0.04	0.09	1.32	9.20	0.19	23.0
150	1.50	0.07	0.20	1.97	19.50	0.42	33.7
200	1.99	0.13	0.36	2.63	33.22	0.75	48.0
250	2.49	0.19	0.57	3.29	50.22	1.18	65.7
300	2.99	0.27	0.82	3.95	70.39	1.69	86.7
350	3.49	0.36	1.11	4.61	93.65	2.31	110.9

NET POSITIVE SUCTION HEAD AVAILABLE

Absolute Pressure on surface (ha-ft) 33.96 @ sea level
 Vapor Pressure of liquid (hvpa-ft) 0.78 @ 68°F
 Static Height above impeller (hst-ft) 1.00 (pump off - impeller)
 Suction line losses (hfs-ft) 0.00 (submersible)

NPSHA = $h_a - h_{vpa} + h_{st} - h_{fs}$

34.2 ft

NPSHR must be 5' less than NPSHA (safety factor)



PROJECT: La Porte County Water & Sewer Extensions
(SR 421 / CR 300N)
LOCATION: US 421 & CR 300 N (La Porte County)
RQAW #: 18-400-024-1
DESCRIPTION: DAY 1 WET WELL DESIGN CALCULATIONS

DESIGNED BY: BJN
DATE: 3/7/2019
CHECKED BY: PWV
DATE: 3/11/2019

WET WELL ELEVATIONS

Top of Structure =	657.50	ft	Total Lift Station Depth =	26.00	ft
Lowest Invert into Wet Well =	646.00	ft	Alarm Elevation below Invert =	9.00	ft
Alarm Level =	637.00	ft	Lag Pump ON below Alarm Elevation =	1.00	ft
Lag Pump On =	636.00	ft	Lead Pump ON below Lag Pump ON =	1.00	ft
Lead Pump On =	635.00	ft	Pump Submersible Depth (OFF - Bottom) =	2.50	ft
Pump Off =	634.00	ft	Working Depth (Pump ON-OFF) =	1.00	ft
Top of Pump Volute =	632.00	ft	Working Volume (Pump ON-OFF) =	376.0	gal
Bottom of Wet Well =	631.50	ft			

PUMP CYCLE CALCULATIONS

Circular Wet Well Diameter =	8	ft			
Influent Flow (average rate) =	8.7	gpm	Influent Flow (peak rate) =	33.3	gpm
Pumping Rate - first pump =	250	gpm			
(second pump is standby)	250	gpm			
Total Pumping Rate =	250	gpm			

Cycle Time during Average Flows:			Cycle Time during Peak Flows:		
Wet Well Storage =	376.0	gal/ft	Wet Well Storage =	376.0	gal/ft
Wet Well Fill Time (avg flow) =	43.3	min	Wet Well Fill Time (peak flow) =	11.3	min
Pump Run Time =	1.6	min	Pump Run Time =	1.7	min
Total Cycle Time =	44.9	min	Total Cycle Time (peak flows) =	13.0	min

CAPACITY VERIFICATION

Minimum Diameter =	8	ft	O.K.	(Per municipality specifications)
Minimum Working Volume =	937.5	gal	Design Error	(15 times the rated pump capacity divided by 4)
Maximum Cycle Time =	30.0	min	Insufficient	(Ten State Standards maximum recommended, max is 30 minutes)

NOTES:

Cycle times are shown for both average and peak flows. The station is duplex with each pump sized for the peak influent.



**APPLICATION FOR SANITARY SEWER
CONSTRUCTION PERMIT PER 327 IAC 3**
STATE FORM 53159 (R3 / 9-15)

Indiana Department of Environmental Management
Office of Water Quality – Mail Code 65-42
Facilities Construction Section
100 North Senate Avenue, Room N1255
Indianapolis, IN 46204-2251

INSTRUCTIONS:

1. This form must be filled out completely.
2. Additional pages (attachments following this form) are part of this application form and must be filled out completely.
3. Submission of plans and specifications is part of the application.
4. Submit the application form, additional pages, plans and specifications to the above address.
5. If you have any questions regarding this application, call IDEM's Office of Water Quality at (317) 232-5579.

APPLICANT		APPLICANT'S ENGINEER OR LAND SURVEYOR	
Name Mitchell Bishop		Name Paul Vincent	
Name of organization La Porte County Redevelopment Commission		Name of company RQAW	
Address (number and street, city, state, and ZIP code) 1805 W. 5th Street, La Porte, IN 46350		Address (number and street, city, state, and ZIP code) 703 Michigan Ave, La Porte, IN 46350	
Address (number and street, city, state, and ZIP code)		Address (number and street, city, state, and ZIP code)	
Telephone number (219) 326-6808		Telephone number (317) 258-4615	
NAME AND LOCATION OF PROPOSED FACILITY		ATTACHMENT CHECKLIST	
Name La Porte County Water & Sewer Extensions		A. Sanitary Sewer Design Summary Form: <input checked="" type="checkbox"/> Yes	
Location (Referenced to two existing streets) CR 950 West		B. Capacity Certification/Allocation Letter: <input type="checkbox"/> Yes	
Location CR 300 North		C. Certification of Registered Engineer or Land Surveyor Letter: <input checked="" type="checkbox"/> Yes	
Location SR 421		D. Plans and Specifications: <input checked="" type="checkbox"/> Yes	
City Michigan City		E. Identification of Potentially Affected Persons (see note below): <input checked="" type="checkbox"/> Yes	
County La Porte		F. Mailing Labels for Potentially Affected Persons: <input checked="" type="checkbox"/> Yes	
Along CR 300 North beginning 2750 feet west of the intersection of CR 300 N and US 421, running along CR 300 N to CR 950 West and North to a connection point across I-94 at CR 950 West. Utilities will also extend south of CR 300 North along US 421 approximately a half mile on both sides.		Note Regarding item (E) above: Fully identify all persons, by name and address, who may be potentially affected by the issuance of this permit, such as adjoining landowners, persons with a propriety interest, and/or persons who have expressed concern or interest in the proposed facility. Under IC 4-21.5-3-5, IDEM is required to notify potentially affected persons of its permit decision.	
PERMIT APPLICATION FOR CONSTRUCTION, EXPANSION, OR MODIFICATION OF (Check all that apply)		FUNDING	
A. Municipal Collection Facility: <input checked="" type="checkbox"/> Yes		SRF Funding: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
B. Semipublic Collection Facility: <input type="checkbox"/> Yes			
C. New facility: <input type="checkbox"/> Yes			
D. Expansion or modification of existing facility: <input checked="" type="checkbox"/> Yes			
CERTIFICATION AND SIGNATURE			
Application is hereby made for a Permit to authorize the activities described herein. I certify that I am familiar with the information contained in this application and to the best of my knowledge and belief such information is true, complete and accurate.			
Printed name of person signing Mitchell Bishop		Title County Planner	
Signature of applicant <i>Mitchell Bishop</i>		Date signed (month, day, year) 4-1-2019	
Please refer to IC 13-30-10 for penalties of submission of false information			

Dear Applicant:

To complete your construction application, you must submit **all** of the necessary items. If your application materials are incomplete, you will be sent a deficiency notice, and your application will be retained for 60 days. If the information is not received within the 60 day period your application will be denied due to incompleteness. You can get a copy of this application package on the Internet at: <http://www.in.gov/idem/cleanwater/2430.htm>. Please complete the following steps (only **one** copy of the requested documents needs to be submitted):

- Request that the utility to which you will be connecting your gravity sewer or force main complete the attached Capacity Certification/Allocation Letter.
- A completed Certification of Registered Professional Engineer or Land Surveyor Letter must be completed by the professional engineer or land surveyor who designed and stamped the plans. A copy of this letter is attached.
- Complete all the information on the sewer design summary and certify it with a professional engineer's stamp (or land surveyor's stamp for gravity sewer projects), signature and date.
- Sign and date the application form and fill it out completely. Municipal projects must be signed by an authorized official. Others, such as private projects, can be signed by the owner or a representative.
- Submit one set of plans with profiles and bedding details. Every page must be stamped and signed by a professional engineer (or land surveyor for gravity sewer projects).
- List all potentially affected parties. This list should include: officials of affected counties, cities or towns; adjacent property owners; and all other potentially affected parties, their names and mailing addresses. A completed set of mailing labels with the mailing code of 65-42FC listed above each party on each label is required. A copy of the mailing labels with one set of mailing labels will need to be submitted.
- Please be advised that if your project will disturb one (1) or more acres of land area, coverage under 327 IAC 15-5 (Rule 5) is required. Rule 5 is the General Permit for Storm Water Runoff Associated with Construction Activity. You can review the Storm Water web site for information at: <http://www.in.gov/idem/stormwater> and/or contact the Permits Coordinator at 317/233-1864 for more information.

Please send construction applications to:

Indiana Department of Environmental Management
Office of Water Quality- Mail Code 65-42
100 North Senate Avenue, Rm N1255
Indianapolis, IN 46204-2251
Attention: Facility Construction and Engineering Support Section

Telephone: 317/232-5579

327 IAC 3.5.5 Wastewater Construction Permit Fees
(There are currently no fees required for Sewer Projects, either private or public).

SANITARY SEWER DESIGN SUMMARY**Design Flow**

Number of units			
0	1 bedroom apartments	200 gpd/unit	0 gpd
0	2 bedroom apartments	300 gpd/unit	0 gpd
0	Single family homes	310 gpd/unit	0 gpd
5	Commercial lots		12,500 gpd
			gpd
			gpd
		Total average flow	12,500 gpd
		Peak flow	48,000 gpd
Peaking factor	3.84		

Sewer

135 ft.	8-inch DI _____ (sewer type) Gravity Sewer
ft.	10-inch _____
575 ft.	18-inch DI Gravity Sewer
3070 ft.	18-inch PVC Gravity Sewer
185 ft.	8-inch PVC Gravity Sewer
3965 ft.	Total length of sewer

The new sewer will be connected to an existing 18 -inch diameter sanitary sewer CR 950 W, I-94 (referenced to two existing streets)

(P.E. or L.S. stamp, signature and date)

Lift Station

Type	Submersible (wet/dry, submersible, wet-well mounted, etc.)			
Number of pumps	2			
Capacity of pumps	250 gpm	TDH	RPM	HP
Back-up power source or pumping	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Average wet-well detention time				
Audio/visual alarm with self-contained power supply or telemetry system	Yes			
Force Main	5300 feet of 8 -inch HDPE (type)			
Force main discharge elevation	648.00			

Wastewater Treatment

Wastewater treatment will be provided by J.B. Gifford WWTP, Michigan City, IN

Inspection / Maintenance

Inspection during construction will be provided by	Lochner
Maintenance after completion will be provided by	Michigan City Sanitary District

CAPACITY CERTIFICATION/ALLOCATION LETTER*This form must be filled-out in its entirety.*

Name of applicant	La Porte County Redevelopment Commission
Name of applicant representative	Paul Vincent
Name of project	La Porte County Water & Sewer Extensions

CERTIFICATION

I, Michael Kuss, representing the Michigan City Sanitary District, in my capacity
(Name of individual) (Name of municipality or utility)

as General Manager have the authority to act on behalf of the Michigan City Sanitary District
(Title) (Name of municipality or utility)

certify that I have reviewed and understand the requirements of 327 IAC 3 and that the sanitary collection system proposed, with the submission of this application, plans and specifications, meets all requirements of 327 IAC 3. I certify that the daily flow generated in the area that will be collected by the project system will not cause overflowing or bypassing in the collection system other than NPDES authorized discharge points and that there is sufficient capacity in the receiving water pollution treatment/control facility to treat the additional daily flow and remain in compliance with applicable NPDES permit effluent limitations. I certify that the proposed average flow will not result in hydraulic or organic overload. I certify that the proposed collection system does not include new combined sewers or a combined sewer extension to existing combined sewers. I certify that the ability for this collection system to comply with 327 IAC 3 is not contingent on water pollution/control facility construction that has not been completed and put into operation. I certify that the project meets all local rules or laws, regulations and ordinances. The information submitted is true, accurate, and complete, to the best of my knowledge and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Gallons per day (Total Average Flow for Project)	12,500	
Wastewater treatment plant (Name of WWTP)	J.B. Gifford WWTP, Michigan City, IN	
Sewers (Owners of sewers)	Michigan City Sanitary District	
Signature		Date signed (month, day, year) / /

(Please refer to IC 13-30-10 for penalties of submission of false information.)

CERTIFICATION OF REGISTERED PROFESSIONAL ENGINEER OR LAND SURVEYOR LETTER*This form must be filled-out in its entirety.*

Name of applicant La Porte County Redevelopment Commission
Name of applicant representative Paul Vincent
Name of project La Porte County Water & Sewer Extensions

CERTIFICATION

I, Paul Vincent, representing the project applicant, in my capacity as a registered
(Name of individual)
 professional Engineer, PE10200112 certify the
(Engineer or Land Surveyor) (Indiana registration number)

following under penalty of law: The design of this project has been performed under my direction or supervision to assure conformance with 327 IAC 3 and the plans and specifications require the construction of said project to be performed in conformance with 327 IAC 3-6. The peak daily flow rates, in accordance with 327 IAC 3-6-11 generated from within the specific area that will be collected by the proposed collection system that is the subject of the application, plans, and specifications (when functioning as designed and properly installed), will not cause overflowing or bypassing in the same specific area serviced by the proposed collection system other than from NPDES authorized discharge points. The proposed collection system does not include new combined sewers (serving new areas) or a combined sewer extension to existing combined sewers. The sewer at the point of connection is physically in existence and operational. Based upon information provided by the owner of the Wastewater System, the ability for this collection system to comply with 327 IAC 3 is not contingent on downstream water pollution/control facility construction that has not been completed and put into operation. The design of the proposed project meets applicable local rules or laws, regulations and ordinances. The information submitted is true, accurate, and complete, to the best of my knowledge and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Gallons per day (Total Average Flow for Project)	12,500
Wastewater treatment plant (Name of WWTP)	J.B. Gifford WWTP, Michigan City, IN
Sewers (Owners of sewers)	Michigan City Sanitary District
Signature	Date signed (month, day, year) / /

(Please refer to IC 13-30-10 for penalties of submission of false information.)

SANITARY SEWER SUBMISSION CHECKLIST	
1. Application (Only one copy of these documents needs to be submitted.)	Check here
A. Applicant's name and address	<input checked="" type="checkbox"/>
B. Applicant's Engineer: company name, engineer's name, address, telephone	<input checked="" type="checkbox"/>
C. Name and location of proposed sanitary sewer	<input checked="" type="checkbox"/>
D. Type of collection facility the project will connect to (municipal or semipublic)	<input checked="" type="checkbox"/>
E. Signature of applicant or authorized agent including date signed	<input checked="" type="checkbox"/>
2. Sanitary Sewer Design Summary	Check here
A. Design flow	<input checked="" type="checkbox"/>
1. Multiply number of units by recommended average flow for that type of unit. Refer to 327 IAC 3-6-11 design flow rate requirements for collection systems and water pollution treatment/control facilities. This is a section of the Article 3 Administrative Code and is available on the internet at www.in.gov/legislative/iac/T03270/A00030.PDF .	
2. Total all average flow and enter total average flow	
3. Enter peaking factor. If peaking factor and factor is unknown, a factor of 4 is usually sufficient, however, an exact factor may be calculated from the following equation: $\text{Peaking factor} = \frac{18 + (\text{Square root of } P)}{4 + (\text{Square root of } P)}$ Where P is the population in thousands:	
4. Multiply total average flow by peaking factor and enter product as peak flow	
B. Gravity sewer length and type. Please include the length, diameter, and type of sewer pipe with applicable SDR and ASTM / AWWA specifications, and type of bedding.	<input checked="" type="checkbox"/>
C. Certifier's seal. Sanitary Sewer Design Summary should be sealed and signed by a registered professional engineer or a land surveyor if no lift station is involved.	<input type="checkbox"/>
D. Connection Point	<input checked="" type="checkbox"/>
1. Diameter of existing sewer at connection point (unless connection point is at a lift station)	
2. Location of connection point relative to an intersection of two (2) streets, i.e. so many feet west and so many feet north of the intersection of street A and street B	
E. Lift station: enter all proposed lift station information, or enter N/A if no lift station is involved. (If an existing lift station is being directly affected, enter existing lift station information and specify that it is an existing lift station and include its current load).	<input type="checkbox"/>
1. Number and capacity of pumps.	
2. Provide design calculations for TDH and wet-well detention time.	
3. Provide pump and system curves.	
4. Specify highest elevation in the force main.	
5. Specify force main length, diameter and material (ASTM / AWWA and SDR), and bedding.	
6. Specify an audio and visual alarm with self contained power supply and telemetry.	
7. Specify nature of back-up power source or pumping for lift station, if any.	
F. Waste treatment: enter the name of semipublic or municipal treatment facility which the project will be connecting to. If there is more than one treatment facility in the municipality or sanitary district, please specify which one.	<input checked="" type="checkbox"/>
G. Inspection/Maintenance: please specify name of company, individual or party responsible for inspection during the construction of the project and maintenance of the project after construction is complete.	<input checked="" type="checkbox"/>
3. Capacity certification/allocation letter	Check here
This certification must be filled out in its entirety by the municipality or utility which conveys and treats the flow.	<input type="checkbox"/>
4. Plans and specifications	Check here
A. Every page of the plans should be signed and sealed, as well as the cover page for any specifications.	<input type="checkbox"/>
1. Professional engineers who are registered within the state of Indiana are eligible to certify plans and specifications for all types of projects.	
2. A land surveyor who is registered within the state of Indiana may certify plans and specifications for gravity type sanitary sewers only, and may not certify plans and specifications involving lift stations and force mains.	

4. Plans and specifications (continued)	Check here
B. The following items are usually necessary for proper technical review of sanitary sewers and lift stations:	<input checked="" type="checkbox"/>
1. Plan view of the sewers including minimum ten foot horizontal separations of sewer and water mains, and connection point of the proposed sanitary sewer. Location of all drinking water wells to be shown.	
2. Profile view of the sewers including: slope, invert elevations, existing grade, proposed grade, distances from manhole to manhole, existence of special features, and a minimum of 18-inch vertical separation of sewer and water mains.	
3. Where applicable, details of all appurtenances including manholes, drop manholes, inverted siphons, etc.	
4. Bedding details for installation of Sanitary Sewer/Force Main:	
a. Rigid pipe: should be class A, B or C as described in ASTM C 12.	
b. Flexible pipe: should be class I, II, or III as described in ASTM D 2321	
5. Minimum three foot cover depth above the crown of the sanitary sewer force main.	
6. Automatic Air Relief valves to be placed at all relative high points in the force main to prevent air locking.	
7. Mechanical joints should be specified for all aerial, river or lake crossings.	
* Note: construction within a floodway (river, lake, etc.) must receive approval from Indiana Department of Natural Resources, Division of Water.	
5. A list of names and addresses of all persons or parties who may be potentially affected by the issuance of this project.	Check here
A. The applicant must take full responsibility for proper identification of all potentially affected persons or parties.	<input checked="" type="checkbox"/>
B. The following are the minimum recommendations made as to who should be included in this list:	<input checked="" type="checkbox"/>
1. All landowners adjacent to the property where the proposed construction is to occur.	
2. All persons with a substantial and direct proprietary interest in the issuance of this permit, such as, nearby businesses that could have their business in some way affected by the issuance of this Construction Permit.	
3. Anyone who is known to have expressed concern or an interest in this particular project or projects in this specific area.	
4. Anyone else whom the applicant may feel that might be potentially affected by the issuance of this permit.	
6. The Application form must be signed and dated by the applicant or a duly authorized agent.	
Please note that this checklist is only designed to expedite the review process by assisting the applicant in submission for sanitary sewer construction permits, and in no way is intended to replace the technical review process, nor is it a substitute for the actual Construction Permit.	

IDENTIFICATION OF POTENTIALLY AFFECTED PERSONS

Please list any and all persons whom you have reason to believe have a substantial or proprietary interest in this matter, or could otherwise be considered to be potentially affected under law. Failure to notify a person who is later determined to be potentially affected could result in voiding our decision on procedural grounds. To ensure conformance with Administrative Orders and Procedures Act (AOPA), please list all such parties. The letter on the opposite side of this form will further explain the requirements under the AOPA. Attach additional names and addresses on a separate sheet of paper, as needed.

Name	
Address (<i>number and street</i>)	
City	
State	ZIP code

Name	
Address (<i>number and street</i>)	
City	
State	ZIP code

Name	
Address (<i>number and street</i>)	
City	
State	ZIP code

Name	
Address (<i>number and street</i>)	
City	
State	ZIP code

Name	
Address (<i>number and street</i>)	
City	
State	ZIP code

Name	
Address (<i>number and street</i>)	
City	
State	ZIP code

Name	
Address (<i>number and street</i>)	
City	
State	ZIP code

Name	
Address (<i>number and street</i>)	
City	
State	ZIP code

CERTIFICATION

I certify that to the best of my knowledge I have listed all potentially affected parties, as defined by IC 4-21.5-3-5.

Proposed facility name		City
Printed name of person signing		County
Signature		Date (<i>month, day, year</i>) / /

IDENTIFICATION OF POTENTIALLY AFFECTED PERSONS (CONTINUED)

To: Applicant

Subject: Identification of Potentially Affected Persons

The Administrative Orders and Procedures Act (AOPA), IC 4-21.5-3-5, requires that the Indiana Department of Environmental Management (IDEM) give notice of its decision on your application to the following persons:

- Each person to whom the decision is specifically directed,
- Each person to whom a law requires notice be given.

IC 13-15-3-1 requires IDEM to provide notice of receipt of a permit application to the following:

- 1. The county executive of a county affected by a permit application,**
- 2. The executive of a city affected by a permit application,**
- 3. The executive of a town council of a town affected by a permit application.**

Under IC 13-15-3-1 (b) IDEM is requesting information necessary to provide such notice to the appropriate officials.

Attention:

Since June 17, 1999, mailing labels are required to be submitted with your project. Having these labels with your application is helpful to you as well as our office. These mailing labels need to have the names and addresses of the affected parties along with our mailing code (which is 65-42FC) listed above each affected party listing.

For Example: 65-42FC
 JOHN DEERE
 111 CIRCLE DR
 YOUR CITY IN 44444

Construction/Stormwater Pollution Prevention Plan Technical Review and Comment (Form 1)

Project Information	Project Name: LaPorte County Warer & Sewer Extension-300N/421		County: LaPorte			
	Plan Submittal Date: 4.9.19		Hydrologic Unit Code:			
	Project Location Description: Hwy 421/Co Rd 300N					
	Latitude and Longitude Lat 41d 39; 5.18" N Long 86d 53' 5.24W					
	Civil Township: Coolspring		Quarter: NW	Section: 16/22	Township: 37N	Range: 4W
	Project Owner Name: LaPorte County Redevelopment Commission					
	Contact: Mitchel Bishop					
	Address: 809 State Street					
	City: LaPorte		State: IN		Zip: 46350	
	Phone: 219-326-6808		FAX:		E-Mail: mbishop@laportecounty.org	
Plan Review	Plan Preparer Name: RQAW Corporation					
	Affiliation: Paul Vincent-engineering					
	Address: 703 Michigan Ave.					
	City: LaPorte		State: IN		Zip: 46350	
	Phone: 219-380-5902		FAX:		E-Mail: pvincent@rqaw.com	
	Review Date: 4.11.19					
	Principal Plan Reviewer: Rick Brown, MS4 Coordinator					
	Agency: LaPorte County MS4					
	Address: 2857 W St. Rd. #2					
	City: LaPorte		State: IN		Zip: 46350	
Phone: 219-608-8243		FAX:		E-Mail: rbrown@laportecounty.org		
Assisted By:						
<input checked="" type="checkbox"/> PLAN IS ADEQUATE: A comprehensive plan review has been completed and it has been determined that the plan satisfies the minimum requirements and intent of 327 IAC 15-5.						
<input type="checkbox"/> Please refer to additional information included on the following page(s).						
<input type="checkbox"/> Submit Notice of Intent (NOI): Attach a copy of this cover page when submitting the NOI to the Indiana Department of Environmental Management. Construction activities may begin 48 hours following the submittal of the NOI. A copy of the NOI must also be sent to the Reviewing Authority (e.g. SWCD, DNR).						
<input type="checkbox"/> A preliminary plan review has been completed; a comprehensive review will not be completed within the 28-day review period. The reviewing authority reserves the right to perform a comprehensive review at a later date and revisions to the plan may be required at that time to address deficiencies.						
<input type="checkbox"/> Please refer to additional information included on the following page(s).						
<input type="checkbox"/> Submit Notice of Intent (NOI): Attach a copy of this cover page when submitting the NOI to the Indiana Department of Environmental Management. Construction activities may begin 48 hours following the submittal of the NOI. A copy of the NOI must also be sent to the Reviewing Authority (e.g. SWCD, DNR).						
<input type="checkbox"/> PLAN IS DEFICIENT: Significant deficiencies were identified during the plan review.						
<input type="checkbox"/> Please refer to additional information included on the following page(s).						
<input type="checkbox"/> DO NOT file a Notice of Intent for this project.						
<input type="checkbox"/> DO NOT commence land disturbing activities until all deficiencies are adequately addressed, the plan re-submitted, and notification has been received that the minimum requirements have been satisfied.						
<input type="checkbox"/> Plan Revisions <input type="checkbox"/> Deficient Items should be mailed or delivered to the Principal Plan Reviewer identified in the Plan Review Section above.						

Construction/Stormwater Pollution Prevention Plan - Technical Review and Comment (Form 1)

Project Name: LaPorte County Warer & Sewer Extension-300N/421

Date Reviewed: 4.11.19

The technical review and comments are intended to evaluate the completeness of the Construction/Stormwater Pollution Prevention Plan for the project. The Plan submitted was not reviewed for the adequacy of the engineering design. All measures included in the plan, as well as those recommended in the comments should be evaluated as to their feasibility by a qualified individual with structural measures designed by a qualified engineer. The Plan has not been reviewed for other local, state, or federal permits that may be required to proceed with this project. Additional information, including design calculations may be requested to further evaluate the Plan.

All proposed stormwater pollution prevention measures and those referenced in this review must meet the design criteria and standards set forth in the "Indiana Stormwater Quality Manual" from the Indiana Department of Natural Resources, Division of Soil Conservation or similar Guidance Documents.

Please direct questions and/or comments regarding this plan review to:

Rick Brown, MS4 Coordinator

Please refer to the address and contact information identified in the Plan Review Section on page 1.

Assessment of Construction Plan Elements (Section A)

The Construction Plan Elements are adequately represented to complete a plan review:

☒ **Yes** ☐ **No**

The items checked below are deficient and require submittal to meet the requirements of the rule.

A		A	
<input type="checkbox"/> 1	Index showing locations of required Plan Elements	<input type="checkbox"/> 2	11 by 17 inch plat showing building lot numbers/boundaries and road layout/names
<input type="checkbox"/> 3	Narrative describing the nature and purpose of the project	<input type="checkbox"/> 4	Vicinity map showing project location
<input type="checkbox"/> 5	Legal Description of the Project Site (Include Latitude and Longitude - NOI Requirement)	<input type="checkbox"/> 6	Location of all lots and proposed site improvements (roads, utilities, structures, etc.)
<input type="checkbox"/> 7	Hydrologic unit code (14 Digit)	<input type="checkbox"/> 8	Notation of any State or Federal water quality permits
<input type="checkbox"/> 9	Specific points where stormwater discharge will leave the site	<input type="checkbox"/> 10	Location and name of all wetlands, lakes and water courses on and adjacent to the site
<input type="checkbox"/> 11	Identification of all receiving waters	<input type="checkbox"/> 12	Identification of potential discharges to ground water (abandoned wells, sinkholes, etc.)
<input type="checkbox"/> 13	100 year floodplains, floodways, and floodway fringes	<input type="checkbox"/> 14	Pre-construction and post construction estimate of Peak Discharge (10 Year storm event)
<input type="checkbox"/> 15	Adjacent landuse, including upstream watershed	<input type="checkbox"/> 16	Locations and approximate boundaries of all disturbed areas (Construction Limits)
<input type="checkbox"/> 17	Identification of existing vegetative cover	<input type="checkbox"/> 18	Soils map including soil descriptions and limitations
<input type="checkbox"/> 19	Locations, size and dimensions of proposed stormwater systems (e.g. pipes, swales and channels)	<input type="checkbox"/> 20	Plans for any off-site construction activities associated with this project (sewer/water tie-ins)
<input type="checkbox"/> 21	Locations of proposed soil stockpiles and/or borrow/disposal areas	<input type="checkbox"/> 22	Existing site topography at an interval appropriate to indicate drainage patterns
<input type="checkbox"/> 23	Proposed final topography at an interval appropriate to indicate drainage patterns		

Construction/Stormwater Pollution Prevention Plan - Technical Review and Comment (Form 1)

Project Name: LaPorte County Warer & Sewer Extension-300N/421

Date Reviewed: 4.11.19

Assessment of Stormwater Pollution Prevention Plan (Sections B & C)

Stormwater Pollution Prevention Plan - Construction Component (Section B)

Adequate	Deficient	Not Applicable		
			B	<i>The construction component of the Stormwater Pollution Prevention Plan includes stormwater quality measures to address erosion, sedimentation, and other pollutants associated with land disturbance and construction activities. Proper implementation of the plan and inspections of the construction site are necessary to minimize the discharge of pollutants. The Project Site Owner should be aware that unforeseen construction activities and weather conditions may affect the performance of a practice or the effectiveness of the plan. The plan must be a flexible document, with provisions to modify or substitute practices as necessary.</i>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	Description of potential pollutant sources associated with construction activities
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2	Sequence describing stormwater quality measure implementation relative to land disturbing activities
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3	Stable construction entrance locations and specifications (at all points of ingress and egress)
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4	Sediment control measures for sheet flow areas
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5	Sediment control measures for concentrated flow areas
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6	Storm sewer inlet protection measure locations and specifications
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7	Runoff control measures (e.g. diversions, rock check dams, slope drains, etc.)
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8	Storm water outlet protection specifications
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9	Grade stabilization structure locations and specifications
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10	Location, dimensions, specifications, and construction details of each stormwater quality measure
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11	Temporary surface stabilization methods appropriate for each season (include sequencing)
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12	Permanent surface stabilization specifications (include sequencing)
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	13	Material handling and spill prevention plan
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14	Monitoring and maintenance guidelines for each proposed stormwater quality measure
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15	Erosion & sediment control specifications for individual building lots

Stormwater Pollution Prevention Plan - Post Construction Component (Section C)

Adequate	Deficient	Not Applicable		
			C	<i>The post construction component of the Stormwater Pollution Prevention Plan includes the implementation of stormwater quality measures to address pollutants that will be associated with the final landuse. Post construction stormwater quality measures should be functional upon completion of the project. Long term functionality of the measures are critical to their performance and should be monitored and maintained.</i>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	Description of pollutants and their sources associated with the proposed land use
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2	Sequence describing stormwater quality measure implementation
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3	Description of proposed post construction stormwater quality measures (Include a written description of how these measures will reduce discharge of expected pollutants)
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4	Location, dimensions, specifications, and construction details of each stormwater quality measure
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5	Description of maintenance guidelines for post construction stormwater quality measures

Construction/Stormwater Pollution Prevention Plan - Technical Review and Comment

Project Name: LaPorte County Sewer and Water Extension

Date Reviewed: 4.10.19

Comments:

Please let The MS4 Coordinator know 48 Hour prior to commencement to starting of project.

A Plan review fee of \$320.00 is payable to the LaPorte County MS4 Program for approval to be valid.

NOTE:

After January 1, 2014 a "Performance Bond" for 100% of the BMP's is required by LaPorte County MS4.

A guarantee shall include a schedule of costs associated to the different improvements. Any partial release of funds shall not reduce the original to less than 10% of the original Bond amount.

Note: Any off-site areas for stockpiles, borrow and disposal areas will need to have permit coverage for 327 IAC 15-5 (Rule 5)

Note:

Please forward to this office a copy of the Notice of Sufficiency (NOS). **A copy of the NOI shall be Posted on the Jobsite in public view!**

Note:

Beginning **March 10th, 2010** all SWPPP approvals will now require a responsible person on the job-site to forward or fax weekly log reports to the MS4 Office (219-342-8317 fax). These logs are to be maintained each week and after a 1/2" rain event for erosion control BMPs, maintenance, and performance. Per 327-IAC 15-5/13 requirements and Local ordinance.

Self-Inspection forms are available upon request, you may design your own!

Note: Return inspection reports via email--on MS4 website. (for form)

Please forward the top copy of the SWPPP approval with the required fee of \$100/acre and the proof and publication to:

Per 2/27/15

IDEM, Office of Water Quality

Attn: Storm Water Program

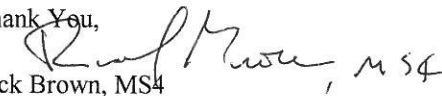
100 North Senate Avenue

IGCN Room 1255

Indianapolis, IN 46204

**A Notice of Termination (NOT I Must be provided to this office)
submitted at project completion--available in my office.**

Thank You,


Rick Brown, MS4

LaPorte County Coordinator

***Please forward a Notice of Intent (NOI) to this office & IDEM within 48 hours of project start!**

If the engineer of record is not doing weekly rept's-The owner is responsible to Notify MS4 Contractor or Company that is-or the owner may be responsible for fines: (9/14/18)

**RULE 5 - NOTICE OF INTENT (NOI)**

State Form 47487 (R6 / 2-15)
Indiana Department of Environmental Management
Office of Water Quality
Approved by State Board of Accounts, 2005

Type of Submittal (Check Appropriate Box):

☒ Initial ☐ Amendment ☐ Renewal

Permit Number:

(Note: The initial submittal does not require a permit number; the Department will assign a number. A permit number is required when filing an amendment, applying for renewal, or correspondence related to this permit).

Note: Submission of this Notice of Intent letter constitutes notice that the project site owner is applying for coverage under the National Pollutant Discharge Elimination System (NPDES) General Permit Rule for Storm Water Discharges Associated with Construction Activity. Permitted project site owners are required to comply with all terms and conditions of the General Permit Rule 327 IAC 15-5 (Rule 5).

NAME AND LOCATION OF PROJECT

Name of Project:

La Porte County Water & Sewer Extensions (SR 421 & CR 300 North Utility Extensions)

County:

La Porte

Brief Description of Project Location:

Along CR 300 North beginning 2750 feet west of the intersection of CR 300 N and US 421, running along CR 300 N to CR 950 West and North to a connection point across I-94 at CR 950 West. Utilities will also extend south of CR 300 North along US 421 approximately a half mile on both sides.

Project Location: Describe location in Latitude and Longitude (Degrees, Minutes, and Seconds or Decimal representation) and by legal description (Section, Township, and Range, Civil Township)

Latitude:

41°39'5.1588" N

Longitude:

86°53'38.5224" W

Quarter: NW

Section: 16 & 17 & 21 & 22 Township: 37N

Range: 4W

Civil Township: Coolspring

Does ☒ all or ☐ part of this project lie within the jurisdictional boundaries of a Municipal Separate Storm Sewer System (MS4) as defined in 327 IAC 15-13?

☒ Yes ☐ No If yes, name the MS4(s):

LaPorte County

SITE OWNER OF PROJECT AND CONTACT INFORMATION OF PROJECT

Name of Company (If Applicable):

La Porte County Redevelopment Commission

Name of Project Site Owner: (An Individual)

Mitchell Bishop

Title/Position:

County Planner

Address:

809 State St.

City:

La Porte

State:

Indiana

ZIP Code:

46350

Phone:

(219) 326-6808

FAX:

(219) 324-6349

E-Mail Address: (If Available)

mbishop@LaPorteCounty.org

Ownership Status (check one):

Governmental Agency: ☐ Federal ☐ State ☒ Local Non-Governmental: ☐ Public ☐ Private ☐ Other: (Explain)

Contact Person:

Paul Vincent

Name of Company: (If Applicable)

RQAW Corporation

Affiliation to Project Site Owner:

Professional Engineer

Address: (if different from above)

703 Michigan Ave.

City:

La Porte

State:

Indiana

ZIP Code:

46350

Phone:

(219) 380-5902

FAX:

E-Mail Address: (If Available)

pvincent@rqaw.com

PROJECT INFORMATION

Project Description:

☐ Residential-Single Family ☐ Residential-Multi-Family ☐ Commercial ☐ Industrial ☒ Other: (Explain) Water & Sewer Extension

Name of Receiving Water:

Norris Ditch

(Note: If applicable, name of municipal operator of storm sewer and the ultimate receiving water. If a retention pond is present on the property, the name of the nearest possible receiving water receiving discharge must be provided).

Project Acreage

Total Acreage: 3.2

Proposed Land Disturbance: (in acres) 3.2

Total Impervious Surface Area: (in square feet, estimated for completed project) 3035

Project Duration

Estimated Start Date: June 2019

Estimated End Date for all Land Disturbing Activity: June 2020

(Continued on Reverse Side)

CONSTRUCTION PLAN CERTIFICATION

By signing this Notice of Intent letter, I certify the following:

- A. The storm water quality measures included in the Construction Plan comply with the requirements of 327 IAC 15-5-6.5, 327 IAC 15-5-7, and 327 IAC 15-5-7.5;
- B. the storm water pollution prevention plan complies with all applicable federal, state, and local storm water requirements;
- C. the measures required under 327 IAC 15-5-7 and 327 IAC 15-5-7.5 will be implemented in accordance with the storm water pollution prevention plan;
- D. if the projected land disturbance is One (1) acre or more, the applicable Soil and Water Conservation District or other entity designated by the Department, has been sent a copy of the Construction Plan for review;
- E. storm water quality measures beyond those specified in the storm water pollution prevention plan will be implemented during the life of the permit if necessary to comply with 327 IAC 15-5-7; and
- F. implementation of storm water quality measures will be inspected by trained individuals.

In addition to this form, I have enclosed the following required information:

- ☒ Verification by the reviewing agency of acceptance of the Construction Plan.
- ☒ Proof of publication in a newspaper of general circulation in the affected area that notified the public that a construction activity is to commence, including all required elements contained in 327 IAC 15-5-5 (8). The Proof of Publication Must include company name and address, project name, address/location of the project, and the receiving stream to which storm water will be discharged. Following is a sample Proof of Publication:


"XERT Development Inc. (10 Willow Lane, Indianapolis, Indiana 46206) is submitting a Notice of Intent to the Indiana Department of Environmental Management of our intent to comply with the requirements of 327 IAC 15-5 to discharge storm water from construction activities associated with Water Garden Estates located at 24 Washout Lane, Indianapolis, Indiana 46206. Runoff from the project site will discharge to the White River. Questions or comments regarding this project should be directed to Walter Water of XERT Development Inc."

- ☒ \$100 check or money order payable to the Indiana Department of Environmental Management. A permit fee is required for all NOI submittals (initial and renewal). A fee is not required for amendments.

SITE OWNER OF PROJECT RESPONSIBILITY STATEMENT

By signing this Notice of Intent letter, I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information or violating the provisions of 327 IAC 15-5, including the possibility of fine and imprisonment for knowing violations.

Printed Name of Project Owner: Mitchell Bishop

Signature of Project Owner:  Date (month, day, year): 4-1-2019

This Notice of Intent must be signed by an individual meeting the signatory requirements in 327 IAC 15-4-3(g).
All NOI submittals must include an original signature (FAX and photo copies are not acceptable).

Note: Within 48 hours of the initiation of construction activity, the project site owner must notify the appropriate plan review agency and IDEM, Office of Water Quality of the actual project start date if it varies from the date provided above.

Note: A permit issued under 327 IAC 15-5 is granted by the commissioner for a period of five (5) years from the date coverage commences. Once the five (5) year permit term duration is reached, a general permit issued under this rule will be considered expired, and as necessary for construction activity continuation, a new Notice of Intent letter (Renewal) is required to be submitted ninety (90) days prior to the termination of coverage. The submittal must include the NOI Letter, Proof of Publication, Fee, and verification that the plan for the project was approved (original verification of plan approval is acceptable provided the scope of the project has not changed from the original submittal).

Mail this form to: Indiana Department of Environmental Management
Storm Water Program, IGCN, Room 1255
100 North Senate Avenue
Indianapolis, IN 46204-2251

327 IAC 15-5-6 (a) also requires a copy of the completed Notice of Intent letter be submitted to the local Soil and Water Conservation District or other entity designated by the Department, where the land disturbing activity is to occur.

Questions regarding the development or implementation of the Construction Plan/Storm Water Pollution Prevention Plan should be directed to the local county Soil and Water Conservation District (SWCD). If you are unable to reach the SWCD or have other questions please direct those inquiries to the IDEM Storm Water Permit Coordinator at 317/233-1864 or 800/451-6027 ext.3-1864.
For information and forms visit <http://www.in.gov/idem/4896.htm>.



INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

**INSTRUCTIONS FOR COMPLETING THE FORM
FOR NOTICE OF INTENT TO CONSTRUCT A WATER MAIN EXTENSION - 327 IAC 8-3.5-4**

TYPE OR PRINT ALL ENTRIES.

The following numbers refer to the enclosed form.

1. Enter the title of the proposed project (i.e. Meadow Brook Subdivision – Phase 2).
2. Enter the county(s) where the water main extension construction will take place.
3. Indicate the location of the project, which includes the city and reference to adjacent streets or roads.

Example: "Bowling Green (city), Madison Street, one block east of Eel River, along State Road 46"

4. Enter the name, title, e-mail address and affiliated business name of the responsible person as defined in 327 IAC 8-3.5-6.
5. Enter the telephone number of the responsible person listed in box 4.
6. Enter the address of the responsible person listed in box 4.
7. Enter the name of the public water system providing water service to the water main extension.
8. Enter the Public Water System Identification Number (PWSID) as chartered by the State of Indiana.
9. Enter the address of the public water system listed in box 7.
10. Enter the telephone number of the public water system listed in box 7.
11. Enter the name of the professional engineer and his/her firm name designing this water main extension.
12. Enter the telephone number of the professional engineer listed in box 11.
13. Enter the address and e-mail address of the professional engineer listed in box 11.
14. Enter the name and e-mail address of the developer (if applicable) for the water main extension.
15. Enter the telephone number of the developer (if applicable) listed in box 14.
16. Enter the address of the developer (if applicable) listed in box 14.
17. Check the applicable box for "timing of construction" for the water main extension. For the first check box option, you must enter a start date and an approximate completion date. For the second check box option, you must provide written notification within at least ten (10) working days before construction begins. **NOTE: For both options, construction cannot begin less than thirty (30) days after IDEM receives a complete and sufficient NOI application. IDEM receipt date will be either e-mail receipt when submitted via the NOI dedicated e-mail address (dwnoi@idem.in.gov) or certified mail receipt.**

18. Check 327 IAC 8-3-7(a) to see if a processing fee is required. Exempt organizations are **both** a governmental entity and one of the listed categories. If you are not a governmental entity, then you are not exempt from the construction permit processing fee. If you are unsure, contact the Permits Section via e-mail at dwnoi@idem.in.gov or by calling (317) 234-7421, prior to submitting the NOI form. If a processing fee is required, payment must be submitted using one of the following methods:
- A. Make check/money order payable to IDEM (Acct.#3240-414000-140000) and mail with a copy of the completed first page of the NOI form to:

IDEM
PO Box 3295
Indianapolis, IN 46206-3295
 - B. Remit by ACH to:

ABA#: 071921891
Bank Account Number: 4620695315
Bank Account Name: State of Indiana

AND send a copy of the first page of the completed NOI form, amount of payment and payment date to water@idem.in.gov.
 - C. To pay by credit card, call (317) 234-3099 and leave the information requested in the telephone message **and** e-mail copy of the first page of the completed NOI, the amount of payment and payment date to water@idem.in.gov.
19. All applicable certifications must be signed and dated. For all water main extensions, there must be a responsible person, professional engineer and public water system official. The developer certification may or may not be applicable. **If a person fills more than one certification role, they must sign and date each applicable certification section.**
20. Check the appropriate box. Design and construction must follow all technical standards for water main extensions found in 327 IAC 8-3.2. Alternate technical standards are not allowed under an NOI, unless the alternate technical standard has already been approved for this water system by the commissioner in accordance with 327 IAC 8-3.2-20. A copy of this alternative technical standard approval must be submitted with the NOI form.
21. Enter the public water system's daily production firm capacity (see 327 IAC 8-3.3-3) in million gallons per day (MGD) in box A and gallons per minute (GPM) in box B.
22. Enter the public water system's five (5) highest demand days and volumes in the **previous two (2) years only**. **NOTE: the volumes must be in million gallons per day (MGD).** The public water system will need to review their demand numbers for the current year, previous year and the year before to determine the five (5) highest demand dates and volumes. For example, if the NOI form was being submitted on August 1, 2014, then the five (5) highest days would be sometime within January 1, 2012 – July 31, 2014. Any other days and volumes prior to that date range would not be acceptable.
23. Calculate and enter into box C the average of five highest demand days listed in box 22.
24. Divide box C number by box A number, and then multiply by 100. Enter the calculated percent into box D.
- 25E. Enter the number of residential homes being provided water by this water main extension into box E. If this water main extension is not adding any new residential homes/customers due to it being a water main replacement only, or if it is only adding commercial and/or industrial customers, then enter 0 into box E.
- 25F. Enter the Peak Daily Demand Factor, calculated in accordance with 327 IAC 8-3.3-2, into box F. For residential homes, this number must be at least 0.87 gallons per minute/home.

25G. Multiply box E number and box F number and enter result into box G.

25H. For commercial and industrial customers being added as a result of the water main extension, provide a description of each including size of meter and safe maximum operating capacity of the meter. If fire protection is being provided, include appropriate fire flow demand. **NOTE: For commercial and industrial customer demand see Table 2-1 in 327 IAC 8-3.3-2(b).**

25I. Add box G and box H and enter result into box I.

25J. Divide box I by box B, then multiply by 100. Enter the calculated percent into box J.

26A. Check the appropriate box. If no commercial or industrial customers are being added, check "N/A". In accordance with 327 IAC 8-10-4(c) the following facilities are designated as cross connection hazards:

1. Aircraft and missile manufacturing plants;
2. Automotive plants, including those plants that manufacture motorcycles, automobiles, trucks, recreational vehicles, and construction and agricultural equipment;
3. Beverage bottling plants, including dairies and breweries;
4. Canneries, packing houses, and reduction plants;
5. Car washes;
6. Chemical, biological, and radiological laboratories, including those in high schools, trade schools, colleges, universities, and research institutions;
7. Hospitals, clinics, medical buildings, autopsy facilities, morgues, other medical facilities, and mortuaries;
8. Metal and plastic manufacturing, fabricating, cleaning, plating, and processing facilities;
9. Plants manufacturing paper and paper products;
10. Plants manufacturing, refining, compounding, or processing fertilizer, film, herbicides, natural or synthetic rubber, pesticides, petroleum or petroleum products, pharmaceuticals, radiological materials, or any chemical that could be a contaminant to the public water supply;
11. Commercial facilities that use herbicides, pesticides, fertilizers, or any chemical that could be a contaminant to the public water supply;
12. Plants processing, blending, or refining animal, vegetable, or mineral oils;
13. Commercial laundries and dye works, excluding coin-operated laundromats;
14. Sewage, storm water, and industrial waste treatment plants and pumping stations;
15. Waterfront facilities, including piers, docks, marinas, and shipyards;
16. Industrial facilities that recycle water; and,
17. Restricted or classified facilities (federal government defense or military installations), or other facilities closed to the supplier of water or to the commissioner.

26B. Check the appropriate box. In accordance with 327 IAC 8-10-4, an air gap must be constructed or a reduced pressure principal backflow preventer shall be installed on the customer service line to any facility that is designated as a cross connection control hazard (*see list above*).

If you have any questions on filling out this form, or if your project will qualify for an NOI, please e-mail your question(s) to dwnoi@idem.in.gov or contact the Drinking Water Branch at (317) 234-7421.

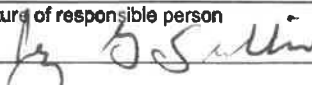
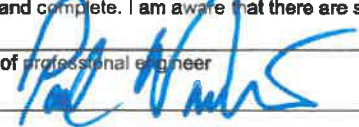


NOTICE OF INTENT TO CONSTRUCT A WATER MAIN EXTENSION

State Form 49008 (R3 / 4-15)

Approved by State Board of Accounts, 2015

General Construction Permit For Water Main Extensions

1. Title of proposed project La Porte County Water & Sewer Extensions (SR 421 & CR 300 North Utility Extensions)		2. County of proposed project La Porte	
3. Location of proposed project (including nearest public intersection and nearest quarter Section, Township, Range) 41°39'5.1588" N, 86°53'38.5224" W. Quarter: NW, Section: 16 & 17, Township: 37N, Range: 4W, Civil Township: Coolspring. The project is located near Michigan City, IN with a drinking water and sanitary sewer extension stretching from CR 950 West to CR 300 North and SR 421.			
4. Name, title, e-mail address and firm of responsible person (as defined in 327 IAC 8-3.5-6) Paul Vincent, Professional Engineer, pvincent@rqaw.com, RQAW		5. Telephone number of responsible person (219) 380-5902	
6. Address of responsible person (number and street, city, state, and ZIP code) 703 Michigan Ave., La Porte, IN 46350			
7. Name of Public Water System (PWS) Michigan City Department of Water Works		8. PWS identification number IN5246020	
9. Address of PWS (number and street, city, state, and ZIP code) 532 Franklin Square Michigan City, Indiana 46360		10. Telephone number of PWS (219) 874-3228	
11. Name and firm of professional engineer Paul Vincent, RQAW		12. Telephone number of professional engineer (317) 258-4615	
13. Address (number and street, city, state, and ZIP code) and e-mail address of professional engineer 703 Michigan Ave., La Porte, IN 46350 , pvincent@rqaw.com			
14. Name and e-mail address of developer (if applicable) La Porte County Redevelopment Commission		15. Telephone number of developer (219) 326-6808	
16. Address of developer (number and street, city, state, and ZIP code) 809 State St., La Porte, IN 46350			
17. Timing of construction (check one of the following): <input checked="" type="checkbox"/> The proposed construction of the water main will begin on <u>6/1/2019</u> and be completed on <u>1/1/2021</u> . (Cannot begin construction less than thirty (30) days after IDEM receives a complete and sufficient NOI.) <input type="checkbox"/> The proposed construction schedule will be submitted separate from this NOI at least ten (10) working days before the commencement of the construction and will include a copy of the information on the first page of this NOI. (Cannot begin construction less than thirty (30) days after IDEM receives a complete and sufficient NOI.)			
18. Fee Schedule: <input checked="" type="checkbox"/> No fee, exempted under 327 IAC 8-3-7(a). <input type="checkbox"/> No fee for water main extensions under 2,500 linear feet. <input type="checkbox"/> \$150 for water main extensions from 2,501 to 5,000 linear feet. <input type="checkbox"/> \$250 for water main extensions from 5001 to 10,000 linear feet. <input type="checkbox"/> \$500 for water main extensions greater than 10,000 linear feet. The complete NOI form may be submitted by e-mail (dwnct@idem.in.gov) or by certified mail to the address below. Indiana Department of Environmental Management Drinking Water Permits Section (IGCN Rm 1201) 100 North Senate Avenue Indianapolis, IN 46204 If a fee is required, see instructions for payment options.			
19. Certifications: Responsible Person: "I certify that I have reviewed and understand the applicability and eligibility requirements of this rule and that the water main proposed with the submission of this NOI meets the applicability and eligibility requirements of this rule. I also certify that the design and construction of this project will be performed under my direction or supervision to assure conformance with 327 IAC 8-3.5 and will meet all local rules or laws, regulations and ordinances. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment." Signature of responsible person  Date signed (month, day, year) <u>4/1/19</u> Professional Engineer: "I certify under the penalty of law that the design of this project will be performed under my direction or supervision to assure conformance with 327 IAC 8-3.5 and that the plans and specification will require the construction of said project to be performed in conformance with this rule. The design of the proposed project will meet all local rules or law, regulations and ordinances. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment." Signature of professional engineer  Date signed (month, day, year) <u>4/8/19</u>			

Developer: "I certify under the penalty of law that the construction of this project will be performed under my direction or supervision to assure conformance with 327 IAC 8-3.5. The construction of proposed project will meet all local rules or laws, regulations and ordinances. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."		
Signature of developer		Date signed (month, day, year)
PWS Representative: "I certify under the penalty of law that I have agreed to furnish water to the area in which the water main is proposed. I acknowledge the public water system's responsibility for examining the plans and specifications to determine that the proposed water main meet local rules or laws and ordinances. I also acknowledge the public water system's responsibilities as outlined in 327 IAC 8-3.5-12. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."		
Signature of PWS representative		Date signed (month, day, year)
Project Design Criteria: <div style="text-align: center;">Alternative Technical Standards (327 IAC 8-3.2-20)</div> 20. Are any "Alternative Technical Standards" proposed to be used in this project? <input type="checkbox"/> Yes, I have attached copies of the approval with the NOI. <input checked="" type="checkbox"/> No		
Public Water System Capacity Status		
21. The PWS's Daily Production Firm Capacity:		A. 32,000,000 MGD B. 22,222 GPM
22. The PWS's five (5) highest demand days in the previous two (2) years only:		
Demand (MGD)	Date (month, day, year)	
1. 9.72	6/12/2017	
2. 8.92	6/14/2017	
3. 9.09	6/27/2017	
4. 9.02	6/28/2017	
5. 8.97	7/27/2018	
23. Average of five (5) Peak Daily Demand (PDD) listed above:		C. 9.14 MGD
24. Ratio of PDD to PWS Daily Production Capacity = (Item D = Item C / Item A x 100)		D. 28.56 %
25. Anticipated Customer Demand of Proposed Water Main		
Residential Customers: 37		
E. Number of homes 37	F. Average Daily Demand times Peaking Factor (at least 0.87 gpm/home) .87	G. Total Average Daily Demand times Peaking Factor (G = E x F) 32.1 gpm
Other (Commercial and Industrial) Customers: Love's, Chevrolet, Speedway, Harley Davidson		
Description (including size of domestic meter):		Average Daily Demand (the "Safe Maximum Operating Capacity" of domestic meter)
See Attached List. All will be sized 5/8" or 3/4" domestic meter.		5.7 gpm
		gpm
Sub Total:		H. 5.7 gpm
Total Customer Demand of Proposed Water Main (gpm) = (Item G + item H)		I. 37.8 gpm
Ratio of total Customer Demand of Proposed Water Main (gpm) to the PWS Daily Production Firm Capacity (gpm) (Item J = Item I / Item B x 100)		J. .170 %
26. Cross Connection Hazard Prevention		
A. Are any of the new customers included in Section 25 designated as cross connection hazards (see instructions)?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
B. Will an air gap be constructed or a reduced pressure principal backflow preventer be installed on the customer's service line?		<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A



PROJECT: La Porte County Water & Sewer
 Extensions (SR 421 / CR 300N)
LOCATION: US 421 & CR 300 N (La Porte County)
RQAW #: 18-400-024-1
DESCRIPTION: WATER DEMAND

Commercial Sources of Proposed Demand	#	Unit	Flow Calculation Factor		Total Average Flow		Peaking Factor	Total Peak Flow	
					(gpd)	(gpm)		(gpd)	(gpm)
Love's	1	Each	2,700	gpd	2,700	1.88	3.84	10,368	7.20
Speedway	1	Each	3,000	gpd	3,000	2.08	3.84	11,520	8.00
Harley Davidson Dealership	1	Each	1,000	gpd	1,000	0.69	3.84	3,840	2.67
Chevrolet Dealership	1	Each	1,500	gpd	1,500	1.04	3.84	5,760	4.00
Totals					8,200	5.7	-	31,488	21.9

Residential Sources of Proposed Demand	#	Unit	Flow Calculation Factor		Total Average Flow		Peaking Factor	Total Peak Flow	
					(gpd)	(gpm)		(gpd)	(gpm)
Residential	37	Each	500	gpd	18,500	12.85	2.5	46,250	32.12
Totals					18,500	12.8	-	46,250	32.1

Overall Totals					26,700	19	-	77,738	54
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**RULE 5 - NOTICE OF INTENT (NOI)**

State Form 47487 (R6 / 2-15)
Indiana Department of Environmental Management
Office of Water Quality
Approved by State Board of Accounts, 2005

Type of Submittal (Check Appropriate Box):

☒ Initial ☐ Amendment ☐ Renewal

Permit Number:

(Note: The initial submittal does not require a permit number; the Department will assign a number. A permit number is required when filing an amendment, applying for renewal, or correspondence related to this permit).

Note: Submission of this Notice of Intent letter constitutes notice that the project site owner is applying for coverage under the National Pollutant Discharge Elimination System (NPDES) General Permit Rule for Storm Water Discharges Associated with Construction Activity. Permitted project site owners are required to comply with all terms and conditions of the General Permit Rule 327 IAC 15-5 (Rule 5).

NAME AND LOCATION OF PROJECT

Name of Project: **La Porte County Water & Sewer Extensions (SR 421 & CR 300 North Utility Extensions)** County: **La Porte**

Brief Description of Project Location:

Along CR 300 North beginning 2750 feet west of the intersection of CR 300 N and US 421, running along CR 300 N to CR 950 West and North to a connection point across I-94 at CR 950 West. Utilities will also extend south of CR 300 North along US 421 approximately a half mile on both sides.

Project Location: Describe location in Latitude and Longitude (Degrees, Minutes, and Seconds or Decimal representation) and by legal description (Section, Township, and Range, Civil Township)

Latitude: **41°39'5.1588" N** Longitude: **86°53'38.5224" W**

Quarter: **NW** Section: **16 & 17 & 21 & 22** Township: **37N** Range: **4W** Civil Township: **Coolspring**

Does ☒ all or ☐ part of this project lie within the jurisdictional boundaries of a Municipal Separate Storm Sewer System (MS4) as defined in 327 IAC 15-13?
☒ Yes ☐ No If yes, name the MS4(s):

LaPorte County

SITE OWNER OF PROJECT AND CONTACT INFORMATION OF PROJECT**Name of Company (If Applicable):**

La Porte County Redevelopment Commission

Name of Project Site Owner: (An Individual)

Mitchell Bishop

Title/Position:

County Planner

Address:

809 State St.

City:

La Porte

State:

Indiana

ZIP Code:

46350

Phone:

(219) 326-6808

FAX:

(219) 324-6349

E-Mail Address: (If Available)

mbishop@LaPorteCounty.org

Ownership Status (check one):

Governmental Agency: ☐ Federal ☐ State ☒ Local Non-Governmental: ☐ Public ☐ Private ☐ Other: (Explain)

Contact Person:

Paul Vincent

Name of Company: (If Applicable)

RQAW Corporation

Affiliation to Project Site Owner:

Professional Engineer

Address: (if different from above)

703 Michigan Ave.

City:

La Porte

State:

Indiana

ZIP Code:

46350

Phone:

(219) 380-5902

FAX:

E-Mail Address: (If Available)

pvincent@rqaw.com

PROJECT INFORMATION

Project Description:

☐ Residential-Single Family ☐ Residential-Multi-Family ☐ Commercial ☐ Industrial ☒ Other: (Explain) **Water & Sewer Extension**

Name of Receiving Water:

Norris Ditch

(Note: If applicable, name of municipal operator of storm sewer and the ultimate receiving water. If a retention pond is present on the property, the name of the nearest possible receiving water receiving discharge must be provided).

Project Acreage

Total Acreage: **3.2** Proposed Land Disturbance: (in acres) **3.2**

Total Impervious Surface Area: (in square feet, estimated for completed project) **3035**

Project Duration

Estimated Start Date: **June 2019**

Estimated End Date for all Land Disturbing Activity: **June 2020**

(Continued on Reverse Side)

CONSTRUCTION PLAN CERTIFICATION

By signing this Notice of Intent letter, I certify the following:

- A. The storm water quality measures included in the Construction Plan comply with the requirements of 327 IAC 15-5-6.5, 327 IAC 15-5-7, and 327 IAC 15-5-7.5;
- B. the storm water pollution prevention plan complies with all applicable federal, state, and local storm water requirements;
- C. the measures required under 327 IAC 15-5-7 and 327 IAC 15-5-7.5 will be implemented in accordance with the storm water pollution prevention plan;
- D. if the projected land disturbance is One (1) acre or more, the applicable Soil and Water Conservation District or other entity designated by the Department, has been sent a copy of the Construction Plan for review;
- E. storm water quality measures beyond those specified in the storm water pollution prevention plan will be implemented during the life of the permit if necessary to comply with 327 IAC 15-5-7; and
- F. implementation of storm water quality measures will be inspected by trained individuals.

In addition to this form, I have enclosed the following required information:

- ☒ Verification by the reviewing agency of acceptance of the Construction Plan.
- ☒ Proof of publication in a newspaper of general circulation in the affected area that notified the public that a construction activity is to commence, including all required elements contained in 327 IAC 15-5-5 (9). The Proof of Publication **Must** include company name and address, project name, address/location of the project, and the receiving stream to which storm water will be discharged. Following is a sample Proof of Publication:

"XERT Development Inc. (10 Willow Lane, Indianapolis, Indiana 46206) is submitting a Notice of Intent to the Indiana Department of Environmental Management of our intent to comply with the requirements of 327 IAC 15-5 to discharge storm water from construction activities associated with Water Garden Estates located at 24 Washout Lane, Indianapolis, Indiana 46206. Runoff from the project site will discharge to the White River. Questions or comments regarding this project should be directed to Walter Water of XERT Development Inc."

- ☒ \$100 check or money order payable to the Indiana Department of Environmental Management. A permit fee is required for all NOI submittals (initial and renewal). A fee is not required for amendments.

SITE OWNER OF PROJECT RESPONSIBILITY STATEMENT

By signing this Notice of Intent letter, I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information or violating the provisions of 327 IAC 15-5, including the possibility of fine and imprisonment for knowing violations.

Printed Name of Project Owner: Mitchell Bishop

Signature of Project Owner:  Date (month, day, year): 4-1-2019

**This Notice of Intent must be signed by an individual meeting the signatory requirements in 327 IAC 15-4-3(g).
All NOI submittals must include an original signature (FAX and photo copies are not acceptable).**

Note: Within 48 hours of the initiation of construction activity, the project site owner must notify the appropriate plan review agency and IDEM, Office of Water Quality of the actual project start date if it varies from the date provided above.

Note: A permit issued under 327 IAC 15-5 is granted by the commissioner for a period of five (5) years from the date coverage commences. Once the five (5) year permit term duration is reached, a general permit issued under this rule will be considered expired, and as necessary for construction activity continuation, a new Notice of Intent letter (Renewal) is required to be submitted ninety (90) days prior to the termination of coverage. The submittal must include the NOI Letter, Proof of Publication, Fee, and verification that the plan for the project was approved (original verification of plan approval is acceptable provided the scope of the project has not changed from the original submittal).

Mail this form to: **Indiana Department of Environmental Management
Storm Water Program, IGCN, Room 1255
100 North Senate Avenue
Indianapolis, IN 46204-2251**

327 IAC 15-5-6 (a) also requires a copy of the completed Notice of Intent letter be submitted to the local Soil and Water Conservation District or other entity designated by the Department, where the land disturbing activity is to occur.

Questions regarding the development or implementation of the Construction Plan/Storm Water Pollution Prevention Plan should be directed to the local county Soil and Water Conservation District (SWCD). If you are unable to reach the SWCD or have other questions please direct those inquiries to the IDEM Storm Water Permit Coordinator at 317/233-1864 or 800/451-6027 ext.3-1864.
For information and forms visit <http://www.in.gov/idem/4896.htm>.

ORDINANCE NO. 2013-09

**AN ORDINANCE ESTABLISHING RESPONSIBLE BIDDER
REQUIREMENTS ON PUBLIC WORKS PROJECTS**

WHEREAS, Indiana Code § 36-1-3-1 et seq. permits any County in the State of Indiana to exercise any power or perform any function necessary to the public interest in the context of its local affairs, which is not prohibited by the Constitution of the United States or of the State of Indiana, or denied or preempted by any other law, or is not expressly granted by any other law to another governmental entity;

WHEREAS, the County government expends substantial funds for the construction of public work, a portion of that money being derived from taxes paid by residents;

WHEREAS, the County government seeks to preserve administrative resources by ensuring that only qualified contractors and subcontractors are awarded contracts on public work construction projects;

WHEREAS, the County government, based upon its experience, has determined that quality workmanship, efficient operation, safety, and timely completion of projects are not necessarily insured by awarding a construction contract solely on the basis of the low bid;

WHEREAS, the County government seeks to enhance its ability to identify the lowest "responsible and responsive bidder" on all public work construction projects by instituting more comprehensive submission requirements which are in compliance with Indiana State Law; and

WHEREAS, "An Ordinance Establishing Responsible and Responsive Bidder Requirements on Public Work Projects" will assure efficient use of taxpayer dollars, will promote public safety, and is in the public interest.

NOW, THEREFORE, BE IT ORDAINED by the Board of Commissioners of La Porte County, Indiana (hereinafter "County"), that:

Section 1. Public works

For purposes of this chapter, the term "public work" has the meaning set forth in IC 36-1-12-2. "Public work" shall also include the following: any constructing, altering, reconstructing, repairing, rehabilitating, refinishing, refurbishing, remodeling, remediating, renovating, custom fabricating, maintenance, landscaping, improving, moving, wrecking, painting, decorating, demolishing, and adding to or subtracting from any public building, structure, airport facility, highway, roadway, street, alley, bridge, sewer, drain, ditch, sewage disposal plant, water work, parking facility, railroad, excavation, or other project, development, real property, or improvement, or to do any part thereof, whether or not the performance of the work herein described involves the addition to, or fabrication into, any structure, project or development, real property or improvement herein described of any material or article of merchandise, which is paid for out of a public fund or out of a special assessment. The term also includes any public work leased by a political subdivision under a lease containing an option to purchase.

Section 2. Application

This ordinance applies whenever the cost of the public work project is estimated to be at least seventy-five thousand dollars (\$75,000) or more.

In order for a bid to be accepted, the bidder must submit the information listed in Section 3 below at or before the date and time that bids are due. Alternatively, the bidder may seek prequalification by submitting the information listed in Section 3 below to the County. All required information shall be submitted on forms provided by the County.

If the bidder participates in a multi-employer program and/or plan that relates to any of the matters referred to in Subsection F and/or G of Section 3 below, then the requirements of such subsections with respect to said bidder shall be satisfied if: (a) the applicable documents with respect to said program and/or plan are submitted to the County; and (b) the bidder certifies to the County that the bidder participates in and is bound by said programs and/or plans. The applicable documents with respect to said programs and/or plans may be submitted by the bidder and/or by the programs/plans and/or a representative of the programs/plans.

A prequalified bidder shall be deemed a "responsible bidder" for purposes of this ordinance for a period of one (1) year from the date the County determines that the bidder is a "responsible bidder" based upon the relevant factors, including those referenced in Section 3 below. The failure and/or refusal of the County to "prequalify" a bidder as a "responsible bidder" shall not prohibit a bidder from bidding on a public project, but the County may consider all relevant factors, including any prequalification submissions, in determining whether or not the bidder is a "responsible bidder" with respect to said public project.

Requirements for subcontractors are set forth in Section 4 below.

Any provisions of this Ordinance that conflict with any applicable federal statute, regulation and/or rule that applies to a federally-funded construction project shall not apply to said federally-funded construction project.

Section 3. Responsible and Responsive Bidder

In determining whether a bidder is a "responsible and responsive bidder" for the award of a public work contract, the County shall consider the factors set forth in IC 36-1-12-4(b)(10) and IC 36-1-12-4(b)(11). In addition, the bidder must submit the following information with supporting documentation, verified under oath on a form provided by the County:

- A. A copy of a print-out of the Indiana Secretary of State's on-line records for the bidder dated within sixty (60) days of the submission of said document showing that the bidder is in existence, current with the Indiana Secretary of State's Business Entity Reports, and eligible for a certificate of good standing. If the bidder is an individual, sole proprietor or partnership, this subsection shall not apply;

- B. A valid federal employer tax identification number for the bidder, or, if the bidder is an individual, a valid social security number;
- C. Documents evidencing registration with the Indiana Department of Revenue;
- D. A statement of compliance with provisions of Section 2000e of Chapter 21, Title 42 of the United States Code and Federal Executive Order No. 11246 as amended by Executive Order No. 11375 (known as the Equal Opportunity Employer provisions);
- E. A statement of compliance with all provisions of the Indiana Common Construction Wage law (IC 5-16-7) and the federal Davis-Bacon and any related acts, and all rules and regulations therein, for the past five (5) years.

Such statement shall also provide that the bidder has reviewed the Common Construction Wage law, the federal Davis-Bacon Act, and any related acts, has reviewed and agrees to pay the applicable common construction wage (or prevailing wage rate) as set forth in the common construction wage rate schedule (or prevailing wage determination) attached to the bid specifications, and will strictly comply with the Common Construction Wage law (and federal Davis-Bacon and any related acts, if applicable) and related requirements.

A bidder who has been found by the Indiana Department of Labor to have a violation of the Common Construction Wage law that has not been fully remedied within sixty (60) days of the bidder's receipt of notice of said violation shall be deemed not to be a responsible and responsive Bidder for two (2) years from the date of said finding. A bidder may also be deemed not to be a responsible and responsive Bidder if the bidder has committed multiple violations of the Common Construction Wage law, regardless of whether or not such violations have been remedied. Further, a bidder on the federal Excluded Parties List System (www.epls.gov) shall be deemed not to be a responsible and responsive Bidder;

- F. Evidence of participation in apprenticeship and training programs applicable to the work to be performed on the project which are approved by and registered with the United States Department of Labor's Office of Apprenticeship, or its successor organization. The required evidence includes a copy of all applicable apprenticeship standards and Apprenticeship Agreement(s) for any apprentice(s) who will perform work on the public work project;
- G. A copy of a written plan for employee drug testing that: (i) covers all employees of the bidder who will perform work on the public work project; and (ii) meets, or exceeds, the requirements set forth IC 4-13-18;
- H. Documents evidencing bidder's safety and health activities, e.g. a written safety policy statement or plan;
- I. A statement that individuals who will perform work on the public work project on behalf of the bidder will be properly classified as either (i) an employee or (ii) an independent contractor, under all applicable state and federal laws and local ordinances;

- J. A statement that all employees of the bidder who will perform work on the public work project are (i) covered under a current worker's compensation insurance policy and (ii) properly classified under such policy.

The evidence of worker's compensation insurance shall include a copy of the Certificate of Insurance showing the minimum statutory coverage. Further, if the bidder is insured with a carrier, the evidence of worker's compensation insurance shall also be a copy of the Declaration Page(s) of the current worker's compensation insurance policy showing the name and address of the insured, policy period, description, categories, class codes, estimated payroll and rates;

- K. Documents evidencing any professional or trade license or registration required by federal or state law or local ordinance for any trade or specialty area in which the contractor is seeking a contract award. Additionally, the bidder must disclose any suspension or revocation of such license held by the company, or of any director, officer or manager of the company;
- L. Disclosure of any federal, state or local claim for unpaid compensation (wages and/or fringe benefits) to bidder's employees filed against the bidder in the last five years, where such claim totals \$100,000 or more; and
- M. Disclosure of any federal, state or local tax liens or tax delinquencies against the contractor or any officers of the contractor in the last five (5) years.

Section 4. Subcontractors

The bidder shall provide a written list that discloses the name, address, and type of work for each first-tier subcontractor from whom the bidder has accepted a bid and/or intends to hire on any part of the public work project, including individuals performing work as independent contractors, within five (5) business days from the date the bids are due.

In addition, each such first-tier subcontractor shall be required to adhere to the requirements of Section 3 and Section 4 of this Ordinance as though it were bidding directly to the County, except that first-tier subcontractors shall submit the required information (including the name, address, and type of work for each of their first-tier subcontractors) to the successful bidder no later than the date of the subcontractor's first application for payment for the public work project and the bidder shall then forward said information to the County. Payment shall be withheld from any first-tier subcontractor who fails to timely submit said information until such information is submitted and approved by the County.

Upon request, the County may require any second- and lower-tier subcontractors to provide a written list that discloses the name, address, and type of work for each of their first-tier subcontractors to the successful bidder. Payments shall be withheld from any second- or lower tier subcontract who fails to timely submit said information until such information is submitted and approved by the County.

Failure of a subcontractor to submit the required information shall not disqualify the successful bidder from performing work on the project and shall not constitute a contractual default and/or breach by the successful bidder. However, the County may withhold all payments otherwise due for work performed by a subcontractor, until the subcontractor submits the required information and the County approves such information.

The disclosure of a subcontractor ("Disclosed Subcontractor") by a bidder or a subcontractor shall not create any rights in the Disclosed Subcontractor. Thus, a bidder and/or subcontractor may substitute another subcontractor ("Substitute Subcontractor") for a Disclosed Subcontractor by giving the County written notice of the name, address, and type of work of the Substitute Subcontractor. The Substitute Subcontractor is subject to all of the obligations of a subcontractor under this Ordinance.

Section 5. Additional Criteria Available

If the criteria in Sections 3 and 4 are otherwise satisfied, the County may also consider the following in determining whether or not a bidder is a "responsible bidder" for purposes of awarding the public work project:

- A. For projects in excess of \$100,000, the County may require submission of Form 96 – Contractor's Bid for Public Work and may consider the information contained in said document if the submission of said document was required by the bidding documents and/or required by applicable bidding statutes and laws.
- B. Any determinations by a court or governmental agency for violations of federal, state, or local laws including, but not limited to violations of contracting or antitrust laws, tax or licensing laws, environmental laws, the Occupational Safety and Health Act (OSHA), the National Labor Relations Act (NLRA), or federal Davis-Bacon and related Acts.

Section 6. Credit Toward Bid Award

The following criteria shall be used as credit toward a bid in determining the lowest responsible bidder if the County provides in the solicitation that local credits shall apply. If the County applies any credit(s) towards a bid, the credit(s) will not reduce the amount of a contract.

EXAMPLE: \$1,000,000 bid, receives \$50,000 local bidder credit. For purposes of determining the lowest bidder, the contractor's bid is \$950,000. However, the contract price will remain \$1,000,000.

- A. A local bidder shall receive a credit equal to 5% or \$50,000, whichever is less, of the lowest bid submitted by a non-local bidder. A local bidder is an individual or business entity that (1) has principal place of business located in the county where the work is to be performed for at least 1 year prior to the deadline for submitting bids, as registered in official documents with the Indiana

Secretary of State; and (2) can demonstrate for one year prior to the deadline for submitting bids that it has paid a minimum of \$5,000 of sales tax in the county where the work is to be performed.

In the event a local bidder does not bid on the project, a bidder that has a principal place of business located within an Indiana county contiguous to the county where the work is to be performed for at least one year prior to the deadline for submitting bids, as registered in official documents with the Indiana Secretary of State, will receive a credit equal to 1% or \$10,000, whichever is less, of the lowest bid submitted by a non-local bidder whose principal place of business is not located within a contiguous county; and

- B. A bidder with a local workforce shall receive a credit equal to 2% or \$20,000, whichever is less, of the lowest bid submitted by a bidder without a local workforce. "Local workforce" means at least 25% of the bidder's construction employees reside in the county where the work is to be performed or Indiana counties contiguous to the county where the work is to be performed. The bidder is not required to have a principal place of business in the county where the work is to be performed for this credit to apply.

The bidder is responsible for requesting credit based upon any of the above criteria.

Section 7. Material Change

Any material changes to the bidder's or first-tiered subcontractors' status at any time must be reported in writing to the County within fourteen (14) days of the occurrence of said material change.

Section 8. Incomplete Submissions by Bidders and Subcontractors

It is the sole responsibility of the bidder to comply with all of its submission requirements within the time periods set forth in this Ordinance. Submissions that are inadequate and/or incomplete may result in a determination that the bidder is not a "responsible bidder."

Section 9. Lowest Bidder Not Chosen

If the County awards the contract to a bidder other than the lowest bidder, the County must state in the minutes or memoranda, at the time the award is made, the factors used to determine which bidder is the lowest responsible and responsive bidder and to justify the award. The County shall keep a copy of the minutes or memoranda available for public inspection.

Section 10. Certified Payroll Reports

For projects in which the cost is at least \$250,000, the successful bidder and all subcontractors working on a public work project shall submit a certified payroll report utilizing the federal form now known as a WH-347 (or a successor form or a State of Indiana certified payroll form if and when such a form is adopted) which must be prepared on a weekly basis and submitted to the County within ten (10) calendar days after the end of each week in which the bidder or subcontractor performed its work on the public work project. The County may withhold payment due for work performed by a bidder if

the bidder fails to timely submit its certified payroll reports until such time as such certified payroll reports are submitted. The County may also withhold payment due for work performed by a subcontractor if the subcontractor fails to timely submit its certified payroll reports until such time as such certified payroll reports are submitted. The County shall not withhold payment to a bidder for work performed by the bidder or for work performed by subcontractors who have submitted their certified payroll reports, because one or more other subcontractors failed to timely submit their certified payroll reports.

Section 11. Public Records

All information submitted by a bidder or a subcontractor pursuant to this Ordinance, including certified payrolls, are public records subject to review pursuant to the Indiana Access to Public Records law (IC 5-14-3).

Section 12. Materiality

The requirements of this Ordinance are a material part of the bidding documents and any contract for a public work project subject to this Ordinance. The County shall include a copy of the Ordinance and a copy of the forms for submission of the information required in Section 3 and 4 above, in all bidding documents for all public work projects subject to the Ordinance. If the County fails to include a copy of the Ordinance in such bidding documents, the County may not reject a bid submitted by a bidder on the basis that the bidder failed to submit the information required in Section 3 or 4 in accordance with the applicable time periods; provided, however, that the County may require bidders to submit such information after bids are submitted and then consider such information in determining whether or not a bidder is "responsible." Regardless of whether or not the Ordinance is included in the bidding documents, however, any bidder awarded a contract for a public work project subject to this Ordinance is subject to the requirements of this Ordinance.

Any bidder awarded a contract for a public work project subject to this Ordinance shall insert provisions in all subcontracts for the public work project that require the subcontractor: (a) to perform the subcontractor's obligations under this Ordinance; and (b) to include similar language in all lower-tiered subcontracts for the public work project; provided, however, that a subcontractor performing any work on a public work project subject to this Ordinance shall be subject to this Ordinance regardless of whether or not such provisions are included in its subcontract.

Section 13. Severability

If any portion of this Ordinance or the application thereof to any person or circumstance is held invalid, such invalidity shall not affect other portions or applications of this Ordinance which can be given effect without the invalid portions or applications and, to this end, the portions of this Ordinance are severable.

Section 14. Other Ordinances

Any prior ordinance or portion thereof in conflict with this Ordinance is hereby revoked.

Section 15. Effective Date

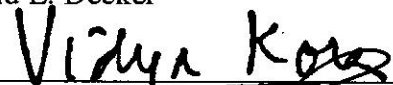
This Ordinance shall take effect upon passage by the Board of Commissioners of La Porte County, Indiana.

PASSED AND ADOPTED this 18th day of September, 2013.

LA PORTE COUNTY COMMISSIONERS



David L. Decker

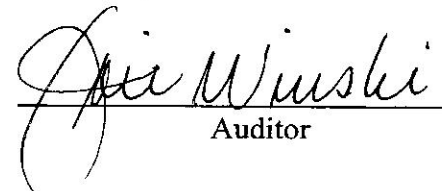


Vidya Kora



Willie Milsap

ATTEST:



Auditor

Attachment J

Required Certification from Contractor Related to American Iron and Steel

A certification substantially like the below will be obtained in advance of entering each procurement contract when such contract involves the procurement of iron and steel products to be used in the Project. The SRF Applicant shall remain responsible for compliance with applicable law (including American Iron and Steel). Such SRF Applicant has been encouraged to consult with its advisors and counsel regarding such matters and, in any event, understands that the use of the following does not relieve the SRF Applicant from its obligation to comply with applicable law (including American Iron and Steel) and related provisions of any financial assistance agreement entered into with the Indiana Finance Authority, nor will the State Revolving Fund Loan Programs, the Indiana Finance Authority or the State of Indiana be responsible for or limited by any SRF Applicant's use of the following certification.

CERTIFICATION

I _____, of _____
(Name and Title of Certifying Officer) (Successful Bidder)

hereby certify and agree on behalf of the Successful Bidder as its duly authorized representative (and under penalties of perjury) that the Successful Bidder understands and agrees a material term and consideration applicable to the award and entry into a contract with the Successful Bidder by the _____ related to its _____

(SRF Applicant)

(Project Name)

involves the procurement and provision of work, goods and services under a procurement contract to be entered into with the SRF Applicant is the Successful Bidder's compliance with the provisions of H.R. 3547, "Consolidated Appropriations Act, 2014" commonly known as "American Iron and Steel" provisions as contained therein requiring that all of the iron and steel products used in the Project be produced in the United States ("American Iron and Steel Requirements"). The Successful Bidder hereby represents and warrants to and for the benefit of the SRF Applicant and the Indiana Finance Authority, as a lender to the SRF Applicant for the funding of its Project, and agrees, that (a) the Successful Bidder has reviewed and understands the American Iron and Steel Requirements, (b) all of the iron and steel products used in the Project as provided by the Successful Bidder under its agreement related to the Project will be produced in the United States in a manner that complies with the American Iron and Steel Requirements and (c) the procurement contract will include a provision substantially like Attachment I.

I SWEAR OR AFFIRM UNDER THE PENALTIES FOR PERJURY THAT THE ABOVE STATEMENTS ARE TRUE TO THE BEST OF MY KNOWLEDGE.

(Signature)

(Date)

Instructions – DHEC 2556

PURPOSE: The Bidder's *"American Iron and Steel" Certification* is used to certify that, as required by federal law, all of the iron and steel products permanently incorporated into a project funded with assistance by the State Revolving Fund are produced in the United States in a manner that complies with the AIS requirement, unless a waiver is granted by the EPA.

GENERAL INFORMATION: American Iron and Steel (AIS) Guidance identifies "iron and steel" products as the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers, *municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, *structural steel, *reinforced precise concrete, and *construction materials. (*Note that several of these products are actually categories of products.)

Relevant AIS information is posted on the EPA's website, including guidance, examples of AIS-compliant documentation, currently approved national waivers, and information on how to request an individual project waiver: <http://www.epa.gov/cwsrf/state-revolving-fund-american-iron-and-steel-ais-requirement>.

INSTRUCTIONS: The contractor bidding on a project funded in whole or in part by the SRF will enter SRF project number, name, and project sponsor's name (utility, town, etc.).

Certify that the contractor will comply with AIS requirements by signing the form. Include the date, name, and title of the bidder, name of bidder's company, bidder's address, and bidder's telephone number. Please note that AIS covered materials to be supplied by a subcontractor must be AIS compliant as well.

The Project Sponsor must submit this form from the winning bidder (typically as part of the bid package) either by email to the DHEC project manager or by mail to: SRF Section - Water Facilities Permitting Division, S.C. DHEC, 2600 Bull Street, Columbia, SC 29201.

DHEC REVIEW AND FILING: The SRF Section will use this form to document bidder compliance with AIS. The form will be kept in the Bidding file for the named project and will be retained for three years following the final SRF disbursement to the project's Sponsor - per Retention Schedule 15795.



Employment Eligibility Verification
Department of Homeland Security
U.S. Citizenship and Immigration Services

USCIS
Form I-9
OMB No. 1615-0047
Expires 10/31/2022

► **START HERE:** Read instructions carefully before completing this form. The instructions must be available, either in paper or electronically, during completion of this form. Employers are liable for errors in the completion of this form.

ANTI-DISCRIMINATION NOTICE: It is illegal to discriminate against work-authorized individuals. Employers **CANNOT** specify which document(s) an employee may present to establish employment authorization and identity. The refusal to hire or continue to employ an individual because the documentation presented has a future expiration date may also constitute illegal discrimination.

Section 1. Employee Information and Attestation *(Employees must complete and sign Section 1 of Form I-9 no later than the first day of employment, but not before accepting a job offer.)*

Last Name (Family Name)		First Name (Given Name)		Middle Initial	Other Last Names Used (if any)	
Address (Street Number and Name)		Apt. Number	City or Town		State	ZIP Code
Date of Birth (mm/dd/yyyy)	U.S. Social Security Number [][][] - [][] - [][][][]		Employee's E-mail Address		Employee's Telephone Number	

I am aware that federal law provides for imprisonment and/or fines for false statements or use of false documents in connection with the completion of this form.

I attest, under penalty of perjury, that I am (check one of the following boxes):

<input type="checkbox"/> 1. A citizen of the United States	
<input type="checkbox"/> 2. A noncitizen national of the United States <i>(See instructions)</i>	
<input type="checkbox"/> 3. A lawful permanent resident (Alien Registration Number/USCIS Number): _____	
<input type="checkbox"/> 4. An alien authorized to work until (expiration date, if applicable, mm/dd/yyyy): _____ Some aliens may write "N/A" in the expiration date field. <i>(See instructions)</i>	
<p><i>Aliens authorized to work must provide only one of the following document numbers to complete Form I-9: An Alien Registration Number/USCIS Number OR Form I-94 Admission Number OR Foreign Passport Number.</i></p> <p>1. Alien Registration Number/USCIS Number: _____ OR 2. Form I-94 Admission Number: _____ OR 3. Foreign Passport Number: _____ Country of Issuance: _____</p>	<p>QR Code - Section 1 Do Not Write In This Space</p>

Signature of Employee	Today's Date (mm/dd/yyyy)
-----------------------	---------------------------

Preparer and/or Translator Certification (check one):

☐ I did not use a preparer or translator. ☐ A preparer(s) and/or translator(s) assisted the employee in completing Section 1.
(Fields below must be completed and signed when preparers and/or translators assist an employee in completing Section 1.)

I attest, under penalty of perjury, that I have assisted in the completion of Section 1 of this form and that to the best of my knowledge the information is true and correct.

Signature of Preparer or Translator		Today's Date (mm/dd/yyyy)	
Last Name (Family Name)		First Name (Given Name)	
Address (Street Number and Name)		City or Town	State ZIP Code



Employer Completes Next Page





Employment Eligibility Verification
Department of Homeland Security
U.S. Citizenship and Immigration Services

USCIS
Form I-9
OMB No. 1615-0047
Expires 10/31/2022

Section 2. Employer or Authorized Representative Review and Verification

(Employers or their authorized representative must complete and sign Section 2 within 3 business days of the employee's first day of employment. You must physically examine one document from List A OR a combination of one document from List B and one document from List C as listed on the "Lists of Acceptable Documents.")

Employee Info from Section 1	Last Name (Family Name)	First Name (Given Name)	M.I.	Citizenship/Immigration Status
List A Identity and Employment Authorization	OR	List B Identity	AND	List C Employment Authorization
Document Title		Document Title		Document Title
Issuing Authority		Issuing Authority		Issuing Authority
Document Number		Document Number		Document Number
Expiration Date (if any) (mm/dd/yyyy)		Expiration Date (if any) (mm/dd/yyyy)		Expiration Date (if any) (mm/dd/yyyy)
Document Title		<div>Additional Information</div> <div>QR Code - Sections 2 & 3 Do Not Write In This Space</div>		
Issuing Authority				
Document Number				
Expiration Date (if any) (mm/dd/yyyy)				
Document Title				
Issuing Authority				
Document Number				
Expiration Date (if any) (mm/dd/yyyy)				
Document Title				
Issuing Authority				
Document Number				
Expiration Date (if any) (mm/dd/yyyy)				

Certification: I attest, under penalty of perjury, that (1) I have examined the document(s) presented by the above-named employee, (2) the above-listed document(s) appear to be genuine and to relate to the employee named, and (3) to the best of my knowledge the employee is authorized to work in the United States.

The employee's first day of employment (mm/dd/yyyy): _____ (See instructions for exemptions)

Signature of Employer or Authorized Representative		Today's Date (mm/dd/yyyy)		Title of Employer or Authorized Representative	
Last Name of Employer or Authorized Representative		First Name of Employer or Authorized Representative		Employer's Business or Organization Name	
Employer's Business or Organization Address (Street Number and Name)			City or Town		State ZIP Code

Section 3. Reverification and Rehires (To be completed and signed by employer or authorized representative.)

A. New Name (if applicable)			B. Date of Rehire (if applicable)	
Last Name (Family Name)		First Name (Given Name)	Middle Initial	Date (mm/dd/yyyy)

C. If the employee's previous grant of employment authorization has expired, provide the information for the document or receipt that establishes continuing employment authorization in the space provided below.

Document Title	Document Number	Expiration Date (if any) (mm/dd/yyyy)
----------------	-----------------	---------------------------------------

I attest, under penalty of perjury, that to the best of my knowledge, this employee is authorized to work in the United States, and if the employee presented document(s), the document(s) I have examined appear to be genuine and to relate to the individual.

Signature of Employer or Authorized Representative	Today's Date (mm/dd/yyyy)	Name of Employer or Authorized Representative
--	---------------------------	---

LISTS OF ACCEPTABLE DOCUMENTS

All documents must be UNEXPIRED

Employees may present one selection from List A
or a combination of one selection from List B and one selection from List C.

LIST A Documents that Establish Both Identity and Employment Authorization	OR	LIST B Documents that Establish Identity	AND LIST C Documents that Establish Employment Authorization
<ol style="list-style-type: none"> 1. U.S. Passport or U.S. Passport Card 2. Permanent Resident Card or Alien Registration Receipt Card (Form I-551) 3. Foreign passport that contains a temporary I-551 stamp or temporary I-551 printed notation on a machine-readable immigrant visa 4. Employment Authorization Document that contains a photograph (Form I-766) 5. For a nonimmigrant alien authorized to work for a specific employer because of his or her status: <ol style="list-style-type: none"> a. Foreign passport; and b. Form I-94 or Form I-94A that has the following: <ol style="list-style-type: none"> (1) The same name as the passport; and (2) An endorsement of the alien's nonimmigrant status as long as that period of endorsement has not yet expired and the proposed employment is not in conflict with any restrictions or limitations identified on the form. 6. Passport from the Federated States of Micronesia (FSM) or the Republic of the Marshall Islands (RMI) with Form I-94 or Form I-94A indicating nonimmigrant admission under the Compact of Free Association Between the United States and the FSM or RMI 		<ol style="list-style-type: none"> 1. Driver's license or ID card issued by a State or outlying possession of the United States provided it contains a photograph or information such as name, date of birth, gender, height, eye color, and address 2. ID card issued by federal, state or local government agencies or entities, provided it contains a photograph or information such as name, date of birth, gender, height, eye color, and address 3. School ID card with a photograph 4. Voter's registration card 5. U.S. Military card or draft record 6. Military dependent's ID card 7. U.S. Coast Guard Merchant Mariner Card 8. Native American tribal document 9. Driver's license issued by a Canadian government authority For persons under age 18 who are unable to present a document listed above: 10. School record or report card 11. Clinic, doctor, or hospital record 12. Day-care or nursery school record 	<ol style="list-style-type: none"> 1. A Social Security Account Number card, unless the card includes one of the following restrictions: <ol style="list-style-type: none"> (1) NOT VALID FOR EMPLOYMENT (2) VALID FOR WORK ONLY WITH INS AUTHORIZATION (3) VALID FOR WORK ONLY WITH DHS AUTHORIZATION 2. Certification of report of birth issued by the Department of State (Forms DS-1350, FS-545, FS-240) 3. Original or certified copy of birth certificate issued by a State, county, municipal authority, or territory of the United States bearing an official seal 4. Native American tribal document 5. U.S. Citizen ID Card (Form I-197) 6. Identification Card for Use of Resident Citizen in the United States (Form I-179) 7. Employment authorization document issued by the Department of Homeland Security

Examples of many of these documents appear in the Handbook for Employers (M-274).

Refer to the instructions for more information about acceptable receipts.

Wage/Fringe Benefit Certification

Grantee:

Project Number:

Project:

This is to certify that (contractor) plans to use the following classifications of workers on the above referenced project:

[illegible]

Certified by: _____

(contractor)

Title: _____

Date:_____

Kevin VanSickle

219-898-1344



STANDARD LIFT STATION NOTES
(Approved 10/3/2012)

1. The electric service, electrical controls, the natural gas service (if required), and the telemetry monitoring system for the lift station shall be provided by the contractor. All coordination with these utility companies and the cost of their fees, permits and installation work shall be the responsibility of the contractor.
2. All electrical work shall be performed in accordance with the National Electrical Code (NEC), all local electric codes and the requirements of the electrical utility, NIPSCO.
3. The location of all buried electrical conduit shall be marked with continuous plastic tape, a minimum of 6 inches wide and 4 mils thick and buried directly above the conduit, approximately 8 inches below finished grade.
4. The lift station contractor shall meet on-site with Michigan City Sanitary District (MCSD) officials and the engineer at the following lift station construction stages: (1) prior to beginning, (2) at 50% completion, (3) at substantial completion start-up and (4) at 100% completion of the lift station. Prior to scheduling the substantial completion start-up with MCSD officials, the contractor shall fully start-up all lift station equipment. MCSD officials will issue a letter of acceptance at 100% completion upon compliance with any "punch list" of items to be completed, which was generated at the substantial completion start-up of all lift station equipment, or thereafter.
5. The contractor shall furnish the MCSD with one (1) digital and four (4) hard copies of the following documents: (a) lift station operation and maintenance manual, with complete detailed information on all lift station equipment and components and a first page summary sheet or index which clearly indicates the contents of the manual all referenced and marked by numbered tabs; (b) as-built construction drawings of the lift station, including a site plan, with state plane coordinates and NGVD88 elevation data for rims and inverts of wet well, other manholes, and connecting sewers; (c) lift station start-up procedure and results check list; and (d) parts list.
6. The following lift station equipment shall be provided:

A. Submersible pumps, minimum 3 HP (2.7 HP) and complete pump controls by ABS Pumps, Inc. or approved equal.

B. If a permanent generator is required for emergency electrical power supply, it shall be natural gas powered and with an automatic transfer switch with adjustable time delay, all by Onan Corp., Generac Corp., Caterpillar Corp. or approved equal

C. Electrical power for the lift station shall be 240/480 volt, 3-phase, depending on the available power supply and the requirements of the lift station equipment. If an electrical phase converter is required for 3 phase electrical power supply, it shall be a static type by Ronk Electrical Industries, or approved equal, and shall be sized for the proper HP rating.

D. The portable generator receptacle, if required, shall have an A/B switch or knife switch, which shall be mounted on the bottom right-hand corner of the switch enclosure, facing downward, matching the available power supply and shall be one of the following:

1. Hubbell 560B9W for 240 volt, 3-phase for KW/KVA less than 65/81
2. Hubbell 460B7W for 480 volt, 3-phase for KW/KVA less than 65/81
3. Appleton AR20044 for 480 volt, 3-phase for KW/KVA greater than 288

E. Permanent stainless steel chains for the installation and removal of each pump on its guide rail system. Each chain shall have sufficient strength and length to reach from each pump to at least four (4) feet above the top of the lift station wet well. Each chain shall be secured on a stainless steel hook bolt, anchored to the top slab of the wet well, in the pump access opening.

F. The pump level control and control transmission system shall include a pressure transducer in the wet well, an Ametek Model 575, complete with 50 feet of cable to extend to the electronic unit without splicing. The electronic unit shall be located in the station control panel.

G. The preceding electronic unit in Item 6(F) shall include one 24"x24"x8" NEMA 4X fiberglass enclosure, provided complete with a swing-out front panel. The swing-out front panel shall include an ~~SJE Rhombus SP6R-LSC~~ Level Controller which shall be programmable to start-stop the pumps at the wet well levels indicated on the drawings. A digital display shall be included to display the wet well levels.

MPE SC2000 Level Controller

H. The rear of the electronic unit enclosure shall include a Mission M800 Real Time RTU, ~~provided by J.M. Process Equipment Co., telephone number 708-429-3040,~~ and with card addition capability for eight (8) digital inputs (DI) and two (2) analog inputs (AI). The Mission M800 shall transmit the following signals to the Sanitary District of Michigan City.

AI-1 Wet Well Level

- DI-1 Pump 1 Run/Off
- DI-2 Pump 2 Run/Off
- DI-3 Pump 1 Fail/Normal
- DI-4 Pump 2 Fail/Normal
- DI-5 Low Wet Well Level/Normal
- DI-6 High Wet Well Level/Normal
- DI-7 Power Fail
- DI-8 Float Control

Also included in the 24"x24"x8" electronic unit enclosure shall be a UPS, power fail relay, 24 VDC power supply, lightning arrestor, condensation heater with thermostat, terminal blocks, circuit breaker, receptacle, and GFI.

All alarms shall be automatically self-correcting (alarm condition is removed when event that triggers alarm is corrected). Pump failure shall be monitored through the motor starters with isolated contacts. The M800 and pressure transducer shall be provided with battery back-up to send water level data to the plant in the event of a power failure

I. Provide two (2) mercury-free float switches, each with 50 ft. of cable to extend to the electronic unit with no splicing of cables allowed. The floats shall be utilized to start and stop the "lead" and "lag" pumps in the event of a failure of the level transmitter or controller and to alarm the failure at the elevations indicated on the drawings. The pump controls shall prevent the simultaneous start of both pumps under this situation

J. The pump level control floats shall have sufficient weight to hang freely, without intermediate support, from stainless steel supports that are secured to the wet well wall, just below the top slab of the wet well. The transducer shall be attached to a 1/8" 316 stainless steel cable and 316 stainless steel clamps. A weight shall be attached at the bottom of cable and transducer and shall be attached just above the weight near the bottom of the wet well.

K. Supplier(s) of the pump station control system shall provide one day of supervisory startup service to insure proper operation of the system.

L. If Variable Frequency Drives (VFD) for pump motors are required, they shall be of appropriate make, type and size for this application.

Approved equal in the preceding items shall mean by another manufacturer that is approved prior to bidding the project. This pre-bid approval shall involve a submittal for the engineer's review and recommendation, and final approval by MCSD officials, which verifies that the manufacturer has acceptable experience and the equipment meets specifications, operating conditions and installation requirements.

7. The pump controls shall be provided by the pump manufacturer and shall include the following:

A. A NEMA 3R stainless steel enclosure with outside solid door and an inside door with instrumentation mounting. The control panel shall be designed to conveniently hold the outside door in a 180 degree fully open position and the inside instrument door in a 120 degree open position.

B. The following starting and overload protection facilities for each pump:

1. A combination NEMA rated motor starter and circuit protector to provide short circuit protection per NEC code.
2. A manual reset for dual protection against current overloads and short circuits.
3. An overload relay to be pre-calibrated to match motor characteristics.
4. A hand/off/auto selector switch mounted on the inside door of the control enclosure.

C. Thermal overload protection shutoff switches, restart buttons and warning lights for each pump.

D. A 20 amp 115 volt GFI receptacle in the pump control system enclosure.

E. Run and moisture sensor warning lights for each pump mounted on the inside door of the control enclosure.

F. A separate circuit breaker for the pump control system.

G. Lightning/surge protection for the entire pump control system.

H. A 100 watt heater with thermostat and over-temperature control for moisture control inside the pump control enclosure.

I. Dry contacts for pump thermal failure.

J. Either a 3-phase electrical supply monitor or a low electrical voltage monitor, if an electrical phase converter is used for lift station power supply. This monitor shall interrupt power to the pump controls in an electrical supply problem condition.

K. Circuit breakers shall be provided in the pump control panel for the following accessories:

1. Area light
2. GFI receptacle
3. 100 watt heater
4. Controls

8. The lift station accessories shall be provided, as indicated on the details contained on-the drawings and/or specified below and as required:

A. The aluminum hatches for the tops of the lift station wet well and valve vault structures shall be series SIS, as manufactured by Halliday Products or approved equal. The hatches shall be the size indicated, or larger if required, for the easy removal of the wet well pumps or the valve vault valves. Each hatch shall have a recessed slam-lock and 90 degree open holding latch.

B. The area light shall have a 70 watt HP sodium lamp, vandal-proof acrylic prismatic reflector, cast aluminum housing, and integral plug-in photoelectric cell for automatic dusk to dawn operation.

C. All cables and conductors shall be in conduit; schedule 80 PVC for buried and rigid galvanized steel for exposed. All conduit sizes shall be oversized for easy future removal of the cables and conductors and their replacement with the next larger size.

D. Two valve operating T-wrenches shall be provided, one eight (8) feet long and one three (3) feet long, for opening the plug valves in the valve vault from the top of the vault.

9. The lift station piping, fittings and valves shall be provided as indicated on the details contained on the drawing and/or as specified below.

A. The sizes of the piping, fittings and valves for the submersible pump discharge and the emergency pump suction and discharge connections shall be specifically determined for the pump station design capacity.

B. All interior or buried piping shall be class 50 ductile iron.

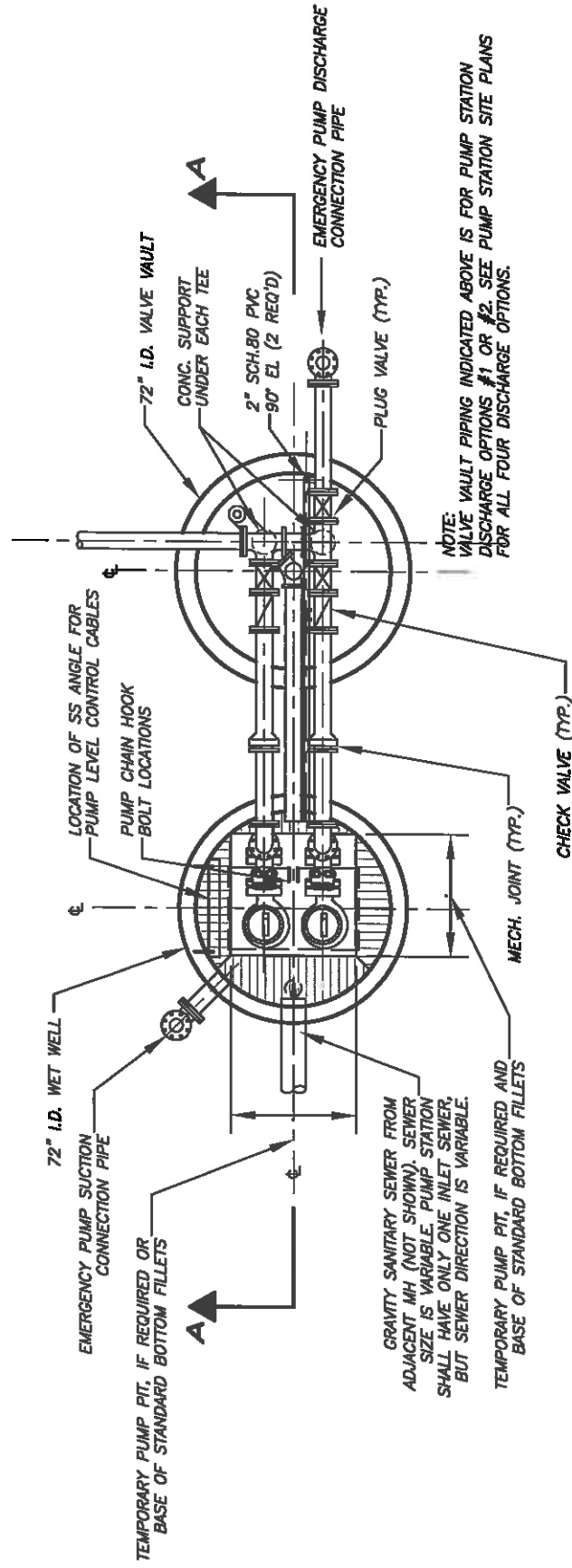
C. All interior or buried fittings shall be class 250 ductile iron with flanged joints.

D. Pump discharge check valves shall be swing-check type with outside weighted arm and manufactured in accordance with AWWA specification C508. The check valves shall be ductile iron and have flanged ends as per ANSI B.16.1 Class 125. The valves shall have an access flange for internal valve maintenance, without removing the valve from the pipeline.

E. Pump discharge plug valves shall have eccentric action such that the valve plug rises off the seat during operation. The valve plug shall be neoprene or BUNA-N faced. The plug valves shall be iron or semi-steel and have flanged ends as per ANSI B.16.1 Class 125. Plug valve operators shall be as indicated in the drawing details. Plug valves shall be DeZurick series 100, or equal.

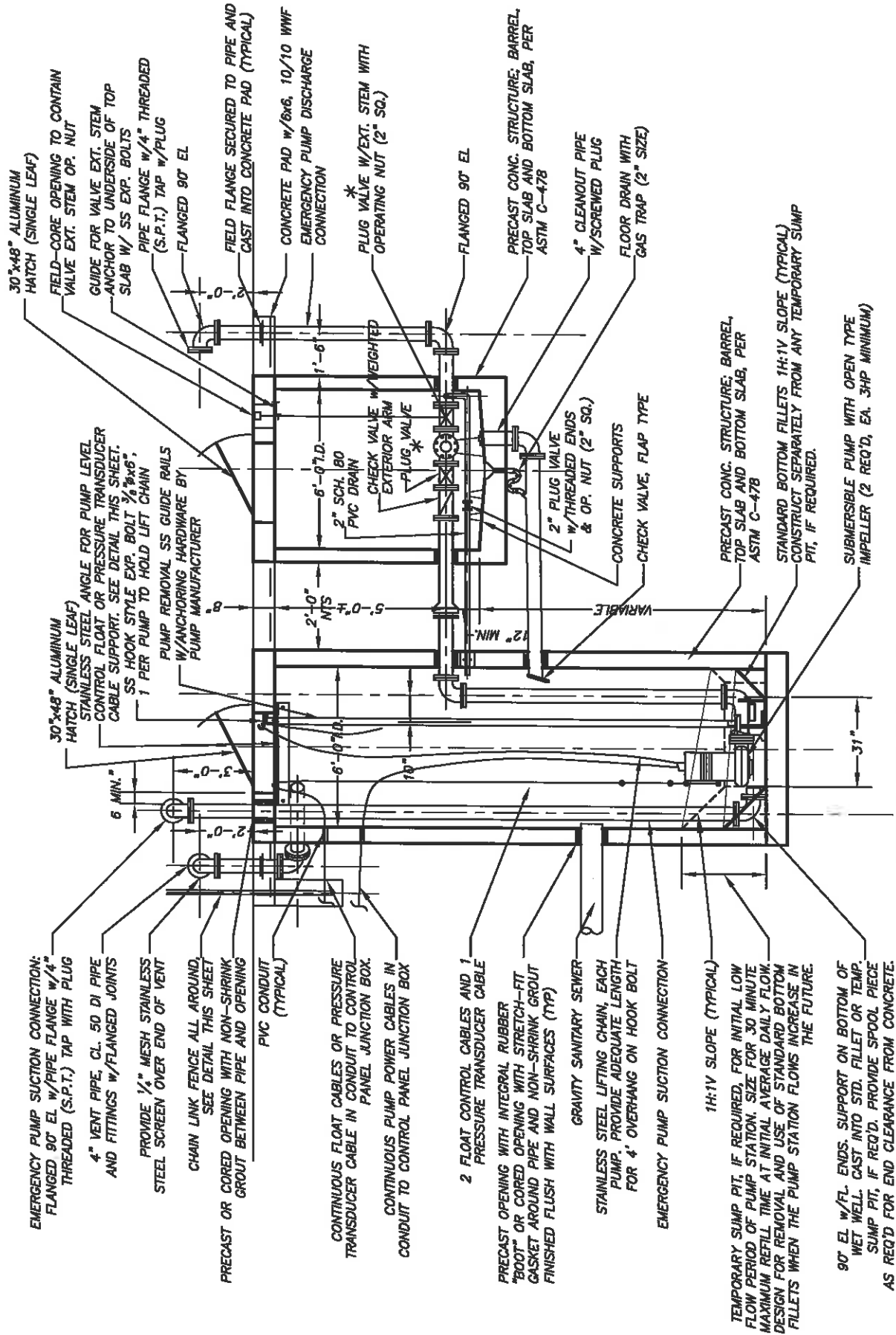
F. All pipe connections to fittings and valves can be with field flanges, Uni-flange or equal.

G. Pump discharge check, plug, and bypass valves shall be located in a separate structure with aluminum hatch. This structure shall have a drain that returns to the wet well with an appropriate trap, as indicated on the drawing.



PUMP STATION PLAN

SCALE: $\frac{3}{16}"=1'-0"$



SECTION A-A
SCALE: 3/16"=1'-0"

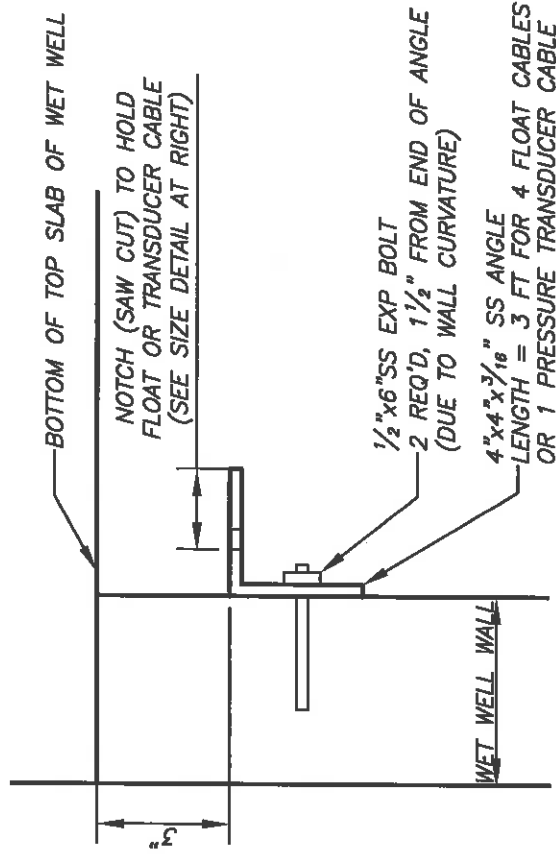
LIFT STATION STANDARDS **SANITARY DISTRICT OF MICHIGAN CITY** **DRAWING 2 OF 8**

* 4" VALVES SHALL INCLUDE AN OPERATING NUT (2" SQ.).
6" AND LARGER VALVES SHALL INCLUDE A GEAR OPERATOR WITH AN OPERATING NUT (2" SQ.).

EMERGENCY PUMP SUCTION CONNECTION:
FLANGED 90° EL. W/PIPE FLANGE W/4" THREADED (S.P.T.) TAP WITH PLUG

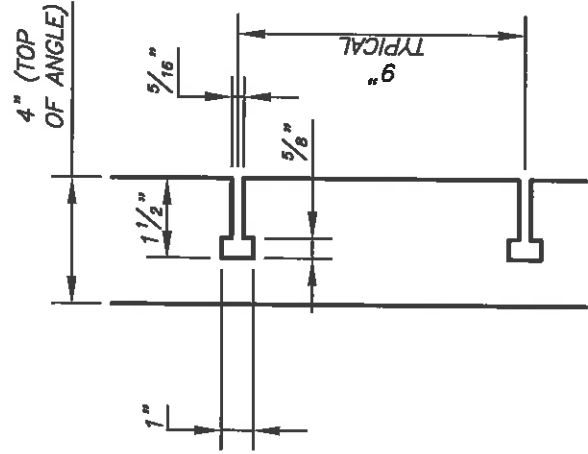
EMERGENCY PUMP SUCTION CONNECTION:
FLANGED 90° EL. W/PIPE FLANGE W/4" THREADED (S.P.T.) TAP WITH PLUG

EMERGENCY PUMP SUCTION CONNECTION:
FLANGED 90° EL. W/PIPE FLANGE W/4" THREADED (S.P.T.) TAP WITH PLUG



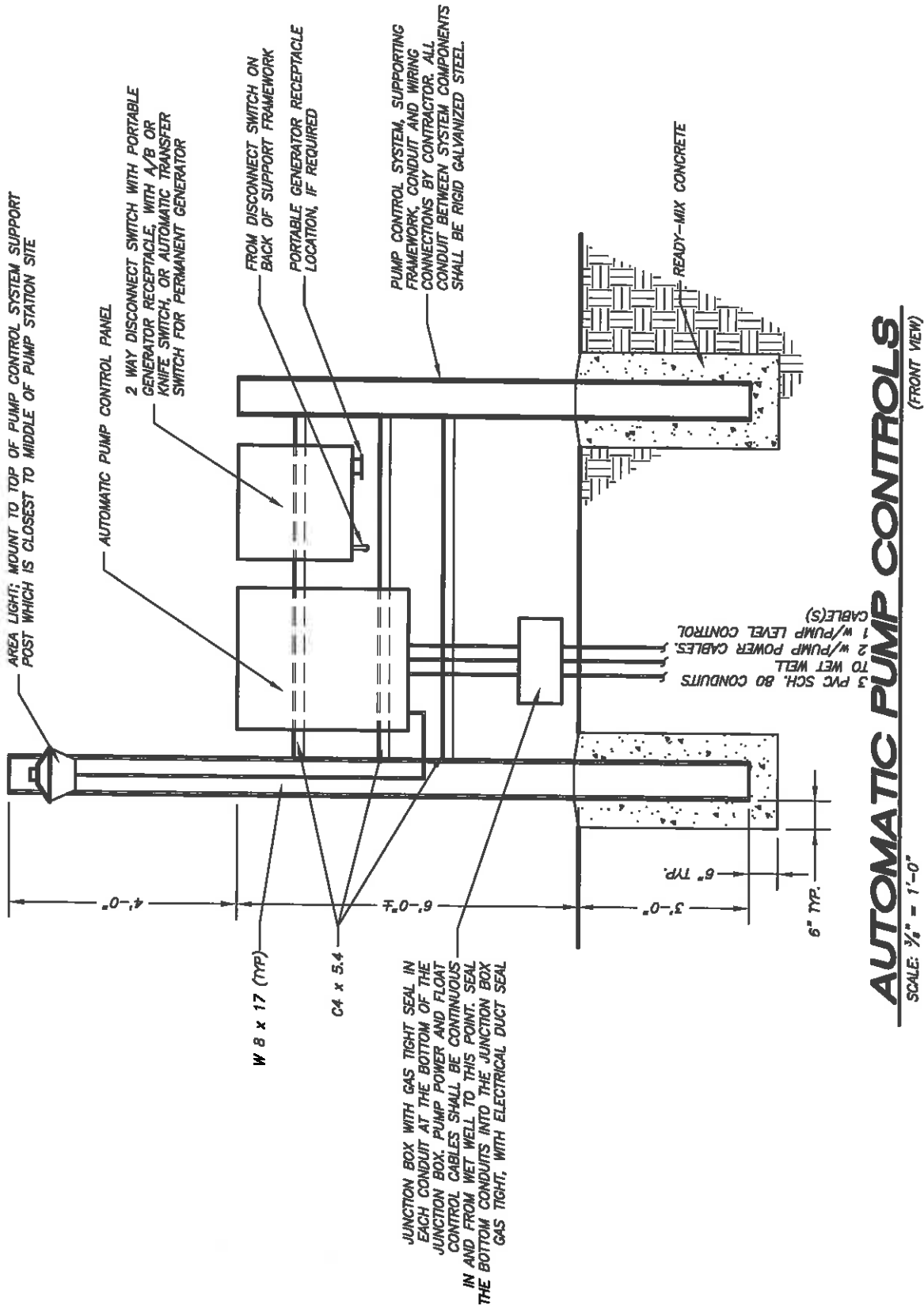
PUMP CONTROL LEVEL FLOAT OR TRANSDUCER CABLE SUPPORT

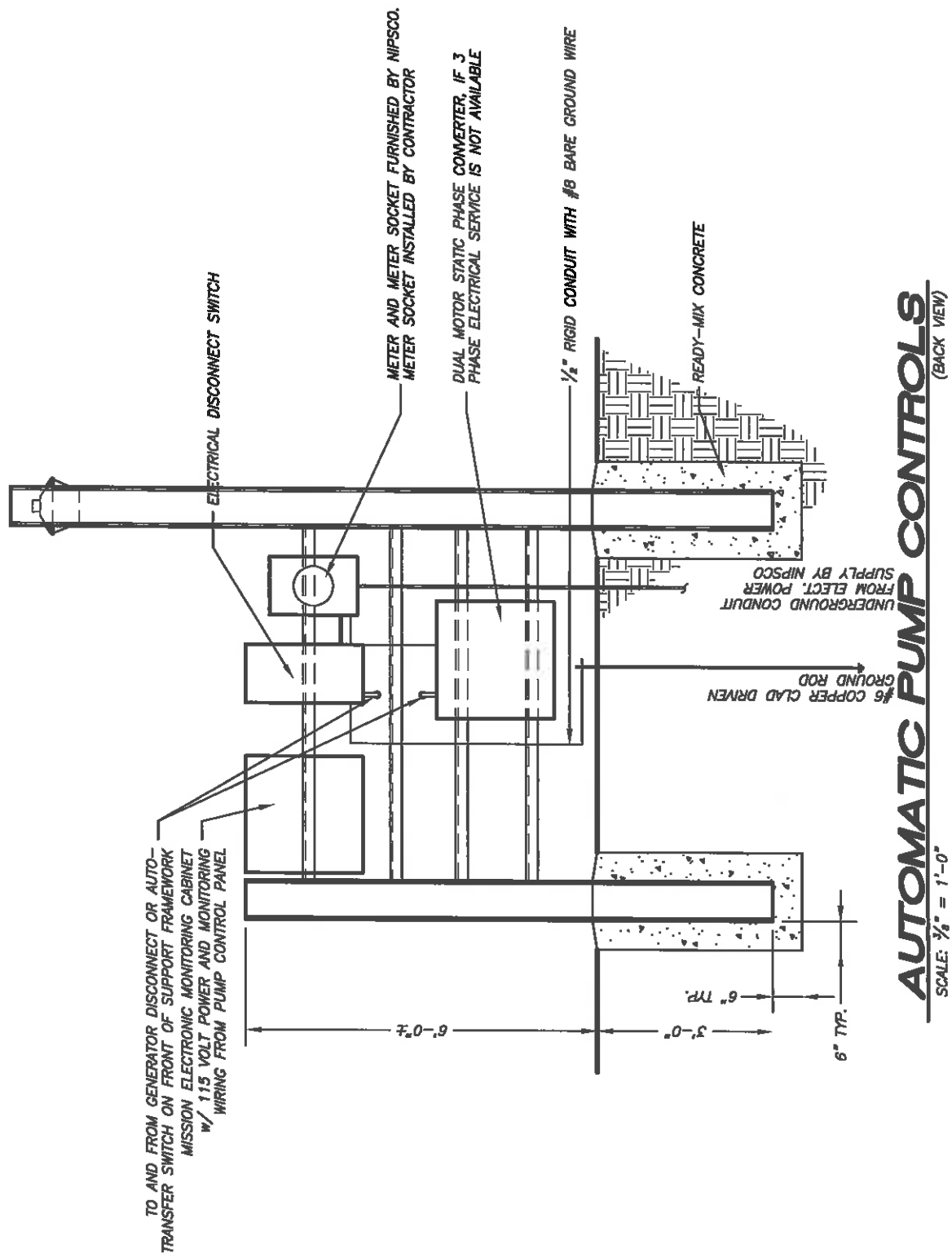
SCALE: NONE



NOTCH PLAN

SCALE: NONE





SCALE: $\frac{3}{16}'' = 1'-0''$

PUMP STATION SITE PLAN

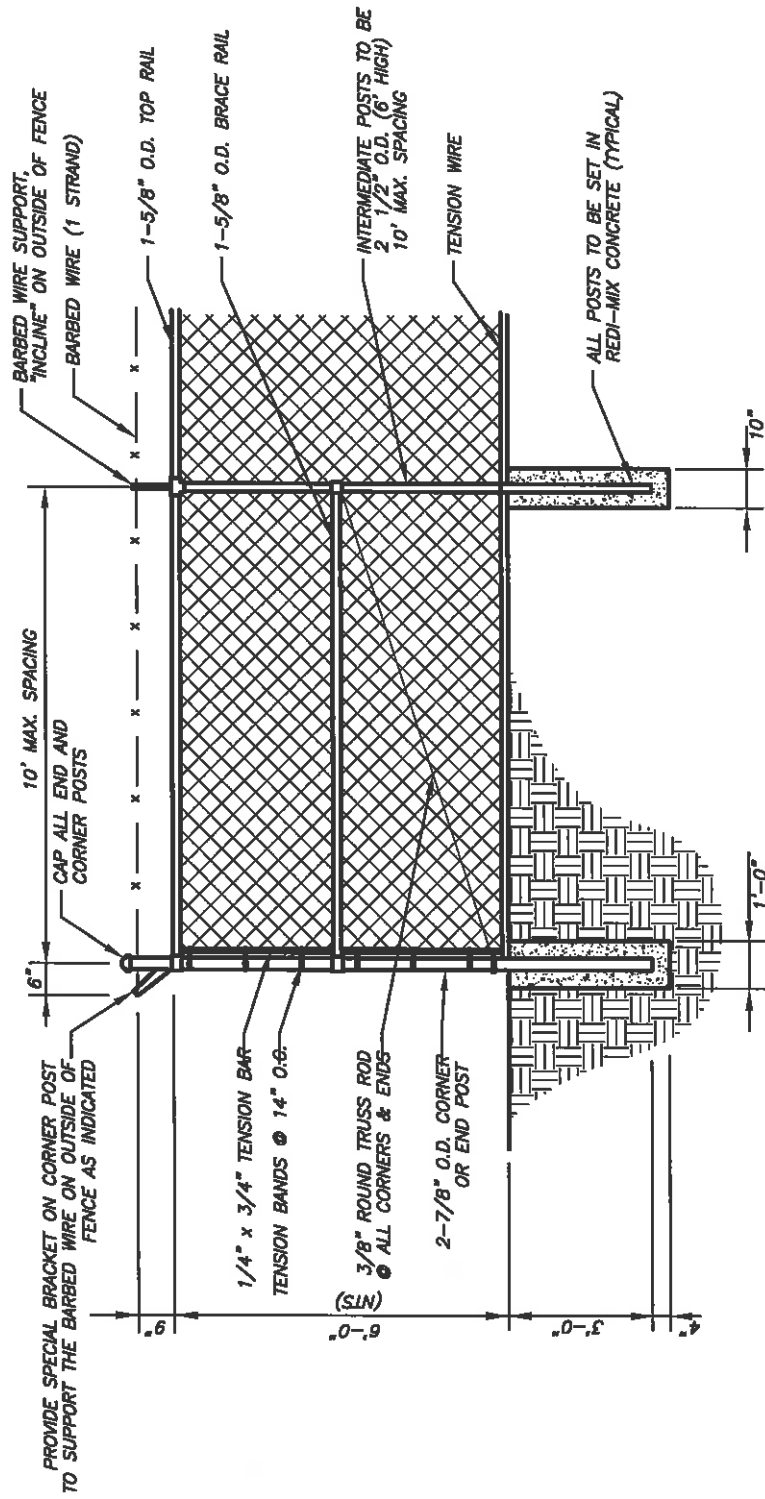
(MINIMUM SIZE) WITHOUT PERMANENT ELECTRICAL GENERATOR

SCALE: $\frac{3}{16}'' = 1'-0''$

LIFT STATION STANDARDS

SANITARY DISTRICT OF MICHIGAN CITY

DRAWING 6 OF 8



FENCE DETAIL

SCALE: 3/8"=1'-0"

EXHIBIT A



SANITARY SEWER SPECIFICATIONS
(Approved 10-3-2012)

GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Furnish and install materials and equipment required to complete the installation of the sanitary collection piping and appurtenances indicated on the Drawings.

1.03 DEFINITIONS

- A. Regulatory agencies and their standards are referenced by abbreviation as follows:

- | | | |
|----|--|------|
| 1. | American National Standards Institute..... | ANSI |
| 2. | American Society for Testing and Materials..... | ASTM |
| 3. | American Water Works Association..... | AWWA |
| 4. | Indiana Administrative Code | IAC |
| 5. | Indiana Department of Environmental Management | IDEM |

- B. Materials and product information are referenced by abbreviations as follows:

- | | | |
|----|---------------------------------|------|
| 1. | Ductile Iron Pipe..... | DIP |
| 2. | Polyvinyl Chloride | PVC |
| 3. | High-Density Polyethylene | HDPE |
| 4. | Inner Diameter | I.D. |
| 5. | Outer Diameter | O.D. |
| 6. | Standard Dimension Ratio..... | SDR |

- C. Flexible Pipe: Pipes manufactured from plastics such as PVC and HDPE.

- D. Non-Flexible Pipe: Pipes manufactured from rigid or semi-rigid materials including, reinforced concrete and ductile iron.

EXHIBIT A

1.04 PERFORMANCE REQUIREMENTS

- A. Provide materials, equipment, and labor to produce piping systems as indicated on the Drawings and as specified herein.

- 1. Sanitary Sewer Gravity Service Piping

1.05 SUBMITTALS

- A. Shop Drawings and Manufacturer's Product Data for the following standards, except where more stringent requirements are indicated.

- 1. Pipe
 - 2. Flexible Couplings
 - 3. Manholes
 - 4. Manhole Frames and Covers
 - 5. Manhole Steps
 - 6. Cleanouts

1.06 QUALITY ASSURANCE

- A. General

- 1. Examine each piece of pipe before installing. Remove all defective material from the site. Ductile iron pipe is to be rung with a light hammer to detect cracks.

- B. Testing Requirements for Gravity Sanitary Sewers

- 1. Prior to performing tests, the Contractor shall do the following:
 - a. As-Built Drawings must be on file at the Michigan City Sanitary District Wastewater Treatment Facility Administration Office at least three (3) business days prior to testing. These drawings must include all manholes, pipes and lateral locations installed as part of the project. The Contractor must provide proper documentation on official letterhead including a detailed list of material, invert elevations and total lengths installed.
 - 2. In accordance with 327 IAC 3-6-19 (d), all gravity sewer pipe shall be tested for infiltration/exfiltration using one of the standard methods, listed below in preferential order.
 - a. Low Pressure Air Test – Preferred test method for all sewer pipe materials other than concrete. (Refer to Paragraph C below.)
 - b. Water Infiltration Test (Weir Test) – Preferred test method for concrete sewers. Alternate test method for other sewer pipe materials when the Low Pressure Air Test is failed. (Refer to Paragraph D below.)
 - c. Water Exfiltration Test – Alternate test method for all sewer pipe materials when the Low Pressure Air Test is failed and environmental conditions do not allow for the Water Infiltration Test. (Refer to Paragraph E below.)

EXHIBIT A

3. All proposed sewers constructed of flexible pipe and truss pipe shall be tested for deflection according to the standard method described in Paragraph F below.
4. Test Limits
 - a. Infiltration/Exfiltration shall not exceed 100 gallons per inch of pipe diameter per mile per day (100 gpd/in/mi).
 - b. Deflection shall not exceed 5% of the inside pipe diameter.
5. Test Scheduling
 - a. Infiltration/Exfiltration shall be tested within 15 days after installation and under the supervision of the Michigan City Sanitary District.
 - b. Deflection shall be tested within 45 days but no sooner than 30 days after final backfill has been placed.
6. Test Results
 - a. Test results shall be submitted to the Michigan City Sanitary District within three (3) months of completion of construction.
 - b. If the above limits are exceeded, the Contractor shall, at his own expense, remove and reconstruct as much of the defective work as is necessary to obtain a passing system.
 - c. Regardless of the test results, the Contractor shall, at his own expense, remove and reconstruct any portion of the system exhibiting visible leaks or other obvious flaws.
7. Responsibility for Testing
 - a. All testing of the installed sanitary sewer system shall be the responsibility of the Contractor, unless otherwise noted.
 - b. The Contractor shall furnish, install, and operate all necessary equipment and materials.
 - c. The Contractor shall notify the Owner and the City Engineer at least three (3) business days prior to any testing.
 - d. The Contractor shall provide all water for testing.

C. Low Pressure Air Test

1. The Low Pressure Air Test shall be conducted in accordance with the requirements of the applicable ASTM standard.
 - a. For plastic pipe, refer to ASTM F1417.

EXHIBIT A

2. Leakage shall be determined by the inability to stabilize test pressure.

D. Water Infiltration Test (Weir Test)

1. A minimum two (2) feet of static head must be maintained above the sewer throughout the course of testing. If the groundwater level is insufficient, this shall be achieved by flooding the trench, if possible. Otherwise, a Water Exfiltration Test shall be conducted.
2. The infiltrated flow of water shall be measured by means of a weir set up in the inside of the sewer a known distance from a temporary bulkhead or other limiting point of infiltration, after the sewer has been pumped out. The test shall last for a minimum of four hours, with readings at 30-minute intervals.
3. A segment of sewer shall be deemed acceptable if it passes the Water Infiltration Test, even if it has failed the Low Pressure Air Test.

E. Water Exfiltration Test

1. Leakage shall be determined by constructing a bulkhead in the sewer at the lower end of the section under test, and filling the section being tested with water to a level two (2) feet above the crown of the sewer in the manhole at the upper end of the test section. Leakage will be the measured amount of water added to maintain the water at that level. The test shall last for a minimum of four hours, with readings at 30-minute intervals.
2. A segment of sewer shall be deemed acceptable if it passes the Water Exfiltration Test, even if it has failed the Low Pressure Air Test.

F. Deflection Test for Flexible Pipe

1. The deflection of all flexible pipe shall be determined after the final backfill has been in place for at least thirty (30) days in accordance with test procedures from the pipe manufacturer and AWWA standards. No pipe shall experience a vertical deflection (reduction in vertical inside diameter) of more than five percent (5%).
2. If the deflection test is to be run using a rigid ball or mandrel, it shall have a diameter equal to 95% of the inside diameter of the pipe. The test shall be performed without mechanical pulling devices.
3. Deflection tests are not necessary for pipe identified as non-flexible. (See Section 1.03 – "Definitions".)

G. Negative Air Pressure (Vacuum) Test for Concrete Manholes

1. All manholes shall be visually inspected after assembly and backfilling for evidence of leakage. Manholes that show evidence of leakage shall be replaced by the Contractor at his own expense and re-inspected until satisfactory.
2. All manholes installed shall be subjected to a Vacuum Test in accordance with the requirements of ASTM C 1244.

EXHIBIT A

H. Inspection

1. All pipe and manhole installations are subject to inspection by the City Engineer of Michigan City, the Michigan City Sanitary District, and civil authorities having jurisdiction.

I. Separation of Sewer and Water

1. Separation of sewer and water piping, structures, and appurtenances must comply with 327 IAC 3-6-9 and with applicable IDEM Standards.

2. Parallel Installation

- a. Normal Conditions

- (1) Water lines shall be at least 10 feet horizontally from any existing or proposed sewer lines and at least 8 feet horizontally from any existing or proposed sewer manholes, whenever possible. These distances shall be measured edge to edge.

- b. Unusual Conditions

- (1) When local conditions prevent a horizontal separation as described above for parallel installation under normal conditions, then maximum horizontal separation shall be provided with a vertical separation such that the bottom of the water line is at least 18 inches above the top of the sewer. The water line shall be laid in a separate trench or on an undisturbed earth shelf to one side of the sewer.
 - (2) In these circumstances, any proposed sewers shall be constructed of waterworks grade ductile iron pipe, pressure rated to 150 psi, with compression type joints, in accordance with Part 2 of this section.

3. Crossing

- a. Normal Conditions:

- (1) When water lines and sewer lines cross, a vertical clearance of at least 18 inches shall be provided, whenever possible, between the edges of either pipe, and the water line should be above the sewer line. In instances where such separation is not possible, the sewer line will need to meet water grade piping specifications.
 - (2) One full length of water pipe shall be placed at the crossing such that maximum separation is achieved between either pipe joint and the sewer.
 - (3) The above conditions must be maintained for a minimum distance of 10 feet on either side of the water line, measured edge to edge.

EXHIBIT A

- (4) All sewer pipe joints within 10 feet of the outside edge of the water line must be compression type joints.

- b. Unusual Conditions

- (1) When local conditions prevent a vertical separation as described above for crossing under normal conditions, then the sewer must be constructed of waterworks grade ductile iron pipe, pressure rated to 150 psi, with compression type joints, in accordance with Part 2 of this section.

- 4. No water line shall pass through or come in contact with any part of a sewer or sewer manhole.

1.07 JOB CONDITIONS

- A. The Contractor is responsible for site conditions and no extra cost will be allowed for failure to visit the site and ascertain existing conditions.

1.08 EXCAVATION, BEDDING AND BACKFILL

- A. Excavation, bedding and backfill shall be as specified as shown on the Drawings.

1.09 REQUIREMENTS OF REGULATORY AGENCIES

- A. All sanitary sewer utility work must conform to the requirements of the Michigan City Sanitary District, and the applicable rules and regulations of the Indiana Department of Environmental Management (IDEM), and federal and local agencies.
- B. In every case the latest formally adopted version of the applicable standards shall be used.
- C. The Contractor shall secure all necessary permits and approvals and shall assume any associated costs and fees.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Sanitary Sewer Piping

- 1. Sanitary sewer gravity pipe shall be selected in accordance with the pipe schedule below, unless otherwise indicated on the drawings. The X's designate acceptable standard dimension ratios (SDR) and pressure classes for given depths of bury.

EXHIBIT A

SANITARY SEWER GRAVITY PIPE SCHEDULE

Depth (ft.)	Ductile Iron Pipe (Pressure Class) 350	PVC Pipe SDR	
		35	26
0-14	X	X	X
14-19	X		X
19-24	X		

2. Polyvinyl Chloride (PVC) Plastic Pipe

- a. Polyvinyl chloride (PVC) gravity piping shall be constructed of polyvinyl chloride (PVC) sewer pipe and fittings in accordance with the requirements of ASTM D 3034. Pipes shall be joined with integral bells and bell and spigot type rubber gaskets. Joints shall conform to ASTM D 3212. Gaskets shall conform to ASTM F 477.

3. Polyvinyl Chloride (PVC) Corrugated Sewer Pipe

- a. Polyvinyl chloride (PVC) corrugated sewer piping with smooth interior and fittings shall meet the requirements of ASTM F 949.

B. Mechanical Couplings

1. Flexible couplings shall be of a gasketed, sleeve type. Each coupling shall consist of a steel middle ring, two steel followers, two rubber compound wedge section gaskets, and a galvanized track having sufficient steel bolts to properly compress the gaskets. Couplings shall be manufactured by Dresser Manufacturing Company, Rockwell International, or an approved equal.

C. Flanged Adapters

1. Flanged adapters for joining plain-end-pipe to flanged items shall be 128 or 127 as manufactured by Dresser Manufacturing Division of Dresser Industries or Rockwell International, Type 912 or 913, Uniflange or approved equal.

D. Cleanouts

1. Cleanouts shall be constructed in accordance with the details for the type and size of sewer indicated on the Drawings.

E. Manholes

1. Manholes shall be constructed in accordance with the details for the type and size of manhole indicated on the Drawings.
2. Manhole frames and covers shall be provided in accordance with the details for the type of frame and cover indicated on the Drawings.

EXHIBIT A

3. Manholes shall be constructed in accordance with ASTM C 478, with joints meeting the requirements of ASTM C 443.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Depth of Cover Over Sewer Pipe

1. Depth of cover over sewer pipe shall be as shown on the plans, but in no case shall be less than four (4) feet.

B. Laying Pipe

1. Take all precautions necessary to insure that pipe, fittings, and related items are not damaged in unloading, handling, and placing in trench. Examine each piece of material just prior to installation to determine that no damage has occurred. Remove any damaged material from the site and replace with undamaged material.
2. Keep pipe clean. Exercise care to keep foreign material and dirt from entering pipe during storage, handling and placing in trench. Close ends of in-place pipe at the end of any work period to prevent entry of animals and foreign material.
3. Bed pipe as specified by the manufacturer and as shown on the Drawings.
4. Gravity lines must be laid at a constant and uniform slope from the beginning of the line to its end. The constant and uniform slope shall be maintained through all manholes.
5. Do not lay pipe when weather or trench conditions are unsuitable.
6. Underground detectable warning tape shall be placed above the sewer approximately three (3) feet below finished grade. Tape to be two (2) inches wide, metallic lined, with the wording "CAUTION SEWER LINE BURIED BELOW" continuously printed, as manufactured by the Seton Name Plate Corp. (New Haven, Connecticut) or approved equal.

C. Gravity Lines

1. Lay gravity sewers so that true alignment and grade, as indicated on the Drawings, are maintained. All sewer pipes shall be laid using a laser beam method to control alignment. All sewer pipes shall be laid true to both horizontal and vertical alignment, and will be subject to review by the Project Representative. After completion the pipe shall exhibit a 100% full circle of light when lighted at one manhole and viewed from the next. Pipes that do not "Lamp" shall be removed and re-laid to a true line and grade. An Owner's representative must be present for viewing the lamping of each segment.
2. Commence laying gravity sewers at the lowest point on a section of line and lay pipe with the bell ends uphill.

EXHIBIT A

3. Prior to making pipe joints on gravity sewer lines, clean and dry all surfaces of joint pipe and jointing material. Use lubricants, primers, adhesives and similar materials as recommended by the manufacturers. Place, fit, join and adjust the jointing materials or factory-fabricated joints as recommended by the manufacturer to obtain the degree of water tightness required. As soon as possible, after the joint is made, place sufficient backfill material, as in accordance with manufacturers recommendation with the pipe and on the Drawings along each side of the pipe to resist forces that might tend to move the pipe off line and off grade.
4. Backfill shall be in accordance with pipe manufacturer's recommendation and on the Drawings. Place backfill over the pipe immediately after the pipe has been laid.

D. Joint Assembly

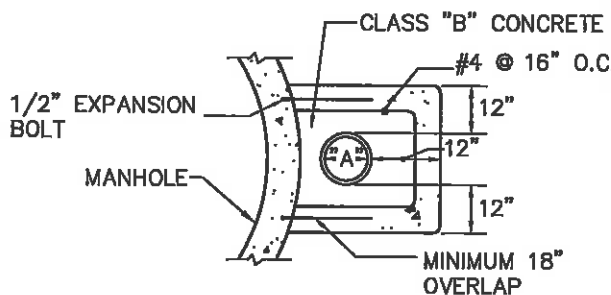
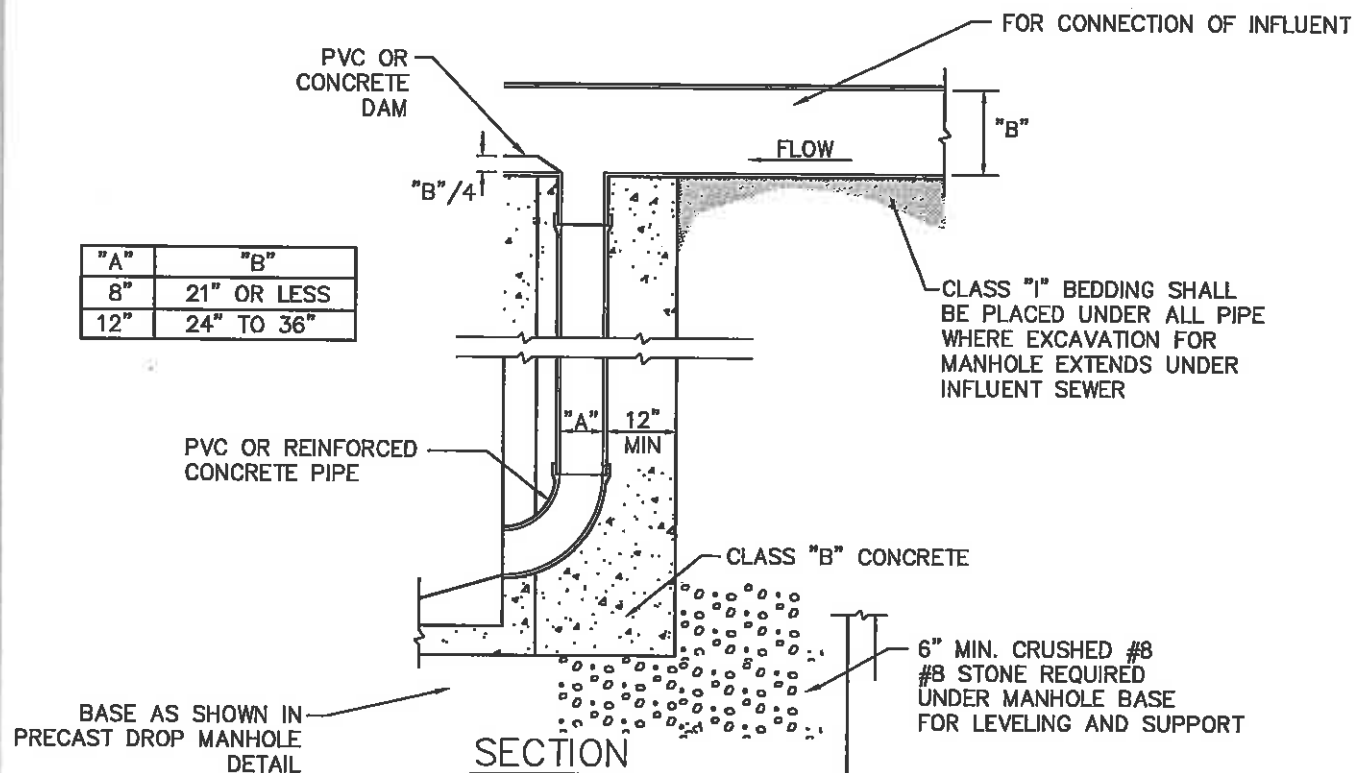
1. Thoroughly clean inside of the bell and 8 inches of the outside of the spigot end of the joint pipe to remove oil, grit, excess coating, and other foreign matter. Flex the rubber gasket and insert it in the gasket recess of the bell socket. Apply a thin film of gasket lubricant, as supplied by the pipe manufacturer, to either the gasket or the spigot end of the joining pipe.
2. Start spigot end of pipe into socket with care. The joint shall then be completed by forcing the plain end to the bottom of the socket with a forked tool or jacked type device. Field-cut pipe shall be filed on the cut end to match the manufactured spigot end.

3.02 CONNECTION TO THE MICHIGAN CITY SANITARY DISTRICT SEWER SYSTEM

- A. Notice shall be given to the Michigan City Sanitary District at least three (3) business days before any connection to the City's sewer system is to be made.

3.03 PAVEMENT, CURB & SIDEWALK REPLACEMENT

- A. All pavement, curbs or sidewalks (or other structures) damaged or removed during the course of the work performed by the contractor and/or subcontractors must be replaced to a condition equal to or better than its condition at the time it was damaged, removed, or replaced. Additionally, any improvements must be made to such pavement, curbs or sidewalks (or other structures) in accordance with any ADA Standards or other applicable rules and/or regulations.



CAST-IN-PLACE DROP PIPE DETAILS