



**PROJECT MANUAL
FOR
LEELANAU COUNTY DRAIN COMMISSIONER**

**SOUTH BAR DRAIN
STORM DRAINAGE IMPROVEMENTS**

NOVEMBER 2023

ENGINEER:



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Project No. 2003339

SECTION 00003

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END OF SECTION

**NOTICE OF LETTING DRAIN CONTRACT
FOR THE
SOUTH BAR LAKE DRAIN**

NOTICE IS HEREBY GIVEN that I, Steven Christensen, Leelanau County Drain Commissioner, will open and announce construction bids for the **South Bar Lake Drain** on **Monday, December 11th, 2023 until 1:00 p.m. at the Leelanau County Drain Commissioner's office, located at 8527 E. Government Center Dr., Suite #205, Suttons Bay, Michigan, 49682.**

Bids for the South Bar Lake Drain will be submitted in person at the Leelanau County Drain Commissioner's office and will be accepted until 1:00 p.m. on Monday, December 11th, 2023, unless further advised via Addendum. Bids for the South Bar Lake Drain will then be publicly opened and announced on the above date and time as the construction of a certain drain known and designated as the "South Bar Lake Drain."

The following items of work are viewed as the major items of work comprising the construction of the South Bar Lake Drain. The quantities associated with the items of work are approximate and final payment will be made based upon final installed and measured quantities:

Install 55 LF of 8-Inch AWWA C151 Ductile Iron Pipe

Install Total of 45 LF of 60-Inch x 36-Inch Reinforced Concrete Box Culvert

w/ 60-Inch x 36-Inch Reinforced Concrete Box Culvert Manhole Tee

w/ 60-Inch x 36-Inch Reinforced Concrete Box Culvert Tapered End Section

Install 1 Lake Outlet Control Plate

Install 40 SYD of 3.5" HMA Road Restoration

Install 75 LF of HMA Valley Gutter Curb

Install 6 SYD of HMA Spillway

Install Dune Reestablishment

Install 40 SYD of Flexamat Standard Underlayment

Install 5000 EA of Dune Grass Planting

Install 100 SYD of Rip Rap or Heavy Rip Rap over non-woven geotextile fabric

Includes all tree and stump removals, grading and fill, seeding and restoration, all storm sewer appurtenances, road ditching and channel grading, driveway paving and restoration, berms, driveway construction (fill), SESC, mobilization and various removals.

There will be no (0) bridges and no (1) drain culverts, being approximately 6-feet deep and construction 8-feet in avg. width to be constructed as part of the project. One contract is being let for this work, which will include all material necessary to perform the same. This contract will be let in accordance with the Contract Documents and bids will be made and received in accordance with these documents.

The Contract will be let in accordance with the **Contract Documents (Plans & Specifications) that are available to interested bidders and can be obtained digitally at no cost by emailing either Mitchell Walton at mwalton@geiconsultants.com (616) 560-9049 or Brian Cenci, P.E. at bcenci@geiconsultants.com (517) 449-3478.** In order to receive the Contract Documents, interested Contractors must provide basic company and contact information so that they can receive any addendum that may be issued.

A Non-Mandatory Pre-Bid Meeting will be held at the northern most parking lot of Empire Beach (approx. 500' south of the project site) on Friday, December 1st, 2023, at 1:00 p.m. Prospective Bidders are recommended to attend and participate in the pre-bid meeting. All prospective Bidders in attendance will "sign in" by providing the name of the attendee, business

represented, and email address. The Engineer will transmit to all prospective Bidders of record such Addenda as the Engineer considers necessary in response to questions. Oral statements may not be relied upon and will not be binding or legally effective. The Contractor is responsible for ensuring all addenda have been received and acknowledged prior to submittal of the bid.

Plans and Bidding Documents may be examined at the **Leelanau County Drain Commissioner's Office, located at 8527 E. Government Center Dr., Suite #205, Suttons Bay, Michigan, 49682** after **Monday, November 20th, 2023 at 1:00 p.m. local time.**

The date for the **Substantial Completion** of such contract is **May 15th, 2024**, with the date for the **Final Completion** and ready for Final Payment being **June 15th, 2024**. The terms of payment are contained in the contract specifications. The payments for the above-mentioned work will be made based upon completion of Unit Price work on a monthly basis as outlined in the Contract Documents

Any responsible person wanting to bid on the above-mentioned work will be required to deposit bid security in the amount specified in the bidding documents (5%) as a guarantee that they will enter into a contract and furnish the required bonds as prescribed by the contract specifications and applicable law. **All bids shall remain open for 90 days after the day of the bid opening**, but I reserve the right at my sole discretion to release any bid and bid security before that date.

Contracts will be entered into with the lowest responsible bidder giving adequate security for the performance of the work and meeting all conditions represented in the Instructions to Bidders. I reserve the right to reject any and all bids, for any reason by which is not required to be stated publicly, and to adjourn the letting to such time and place as I shall publicly announce.

The Drain Commissioner shall, within 90 days of receipt of bids, attempt to sell Bonds, Notes, or Drain Orders in an amount sufficient to pay for this project, it being understood that if the Drain Commissioner shall not have marketed Bonds, Notes, or Drain Orders in an amount sufficient to pay for this project within such 90 day period, a contract may not be executed. If, within such 90 day period, the Drain Commissioner shall successfully sell Bonds, Notes, or Drain Orders in an amount to pay for this project, the Drain Commissioner shall issue a Notice of Award to the successful Bidder after such sale, at which time the successful Bidder shall provide the necessary bonds and insurances required and execute the Agreement within fifteen (15) days from the Notice of Award. The bid of the successful Bidder and the Bond securing the same shall remain in full force and effect until the Notice of Award. If the Bonds, Notes, or Drain Orders herein before required to be sold are not marketed within the period provided above, or the Notice of Award is not given by the Drain Commissioner to the successful Bidder within the specified time, the bid may be deemed to be null and void and the bid deposit shall be returned to the successful Bidder. However, the 90 day period provided above for the sale of Bonds, Notes, or Drain Orders and the giving of the Notice of Award may be extended by mutual agreement between the successful bidder, the Surety Company issuing the bid bond for the successful Bidder, and the Drain Commissioner.

Dated: November 21, 2023



Steven Christensen
Leelanau County Drain Commissioner
8527 E. Government Center Dr., Suite #205,
Suttons Bay, Michigan, 49682
(231) 256-9783

SECTION 00100

INSTRUCTIONS TO BIDDERS

ARTICLE 1 - DEFINED TERMS

1.1. Terms used in these Instructions to Bidders and defined in Section 00700: General Conditions (Standard General Conditions of the Construction Contract, EJCDC, C-700, 2002 edition) and have the meanings assigned to them in Section 00700: General Conditions.

1.2. Other terms used in the Bidding Documents and not defined elsewhere have the following meanings, which are applicable to both the singular and plural thereof:

Bidder - One who submits a Bid directly to OWNER, as distinct from a sub-bidder, who submits a bid to a Bidder.

Successful Bidder - The lowest, responsive, responsible Bidder to whom OWNER (on the basis of OWNER's evaluation as hereinafter provided) makes an award. The lowest bidder may not be the Successful Bidder and the Owner's selection of the Successful Bidder will take into account the bidder who Owner feels will most efficiently complete the work and provide the best possible work product and may take into account many factors in making their determination, including but not limited to experience with past bidders' works. Owner will also take guidance from the Engineer as to the Successful Bidder in make the determination of contract award.

ARTICLE 2 - COPIES OF BIDDING DOCUMENTS

2.1. Complete sets of the Bidding Documents in the number and for the deposit sum, if any, stated in the Notice of Letting of Drain Contract (Advertisement for Bids) may be obtained from ENGINEER. The deposit is non-refundable.

2.2. Complete sets of Bidding Documents must be used in preparing Bids; neither OWNER nor ENGINEER assumes any responsibility for errors or misinterpretation resulting from the use of incomplete sets of Bidding Documents.

2.3. OWNER and ENGINEER, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids on the Work and do not confer a license or grant for any other use.

ARTICLE 3 - QUALIFICATIONS OF BIDDERS

3.1. Each Bidder must complete the Statement of Qualifications in the Bid Form or attach a similar document to the Bid Form, which will constitute written evidence of qualifications to perform the Work. The written evidence will include: financial data, previous experience, positive feedback in drain or similar projects for previous work, evidence and compliance with SESC practices, present commitments and other such data as may be requested by OWNER. **Bidder must show previous experience and positive feedback in regards to constructing at least two similar municipal infrastructure projects of a similar type, comparable size and comparable complexity within the past seven years. Bidder's similar projects should focus on public storm drain construction projects, large box culvert crossing projects, underground infrastructure projects and public infrastructure projects involving work near Lake Michigan. Bidder must also show evidence of compliance with SESC measures on past public infrastructure projects in the area and any cited violations by either the DEQ/EGLE or a County Enforcing Agency (CEA) or Municipal Enforcing Agency (MEA) may disqualify Bidder from being considered the Successful Bidder.** Each Bid must contain evidence of Bidder's qualification to do business in the state where the Project is located or Bidder must covenant to obtain such qualification prior to award of the Contract.

3.2. In addition to the above, when so requested, Bidder shall meet with OWNER's representatives and give further information in order to determine Bidder's qualifications, responsibility, and ability to perform and complete the Work in accordance with the Contract Documents.

3.3. OWNER reserves the right to reject any Bid if the evidence submitted by, or investigation of, a Bidder fails to satisfy OWNER that the Bidder is properly qualified to carry out the obligations of the Contract and to complete the work contemplated therein.

3.4. Non-Discrimination. The Bidder agrees not to discriminate against an individual with respect to providing services, hiring, tenure, terms, conditions or privileges of employment or with respect to a matter directly or indirectly related to employment solely on the basis of race, color, religion, national origin, age, sex, sexual orientation or disability. Breach of this covenant may be regarded as a material breach of the Agreement and a cause for termination and or rejection of the Bid as not responsible.

ARTICLE 4 - EXAMINATION OF CONTRACT DOCUMENTS AND SITE

4.1. It is the responsibility of each Bidder before submitting a Bid:

- 4.1.1. To examine thoroughly the Contract Documents and other related data identified in the Bidding Documents including technical data referred to below, if any;
- 4.1.2. To visit the Site to become familiar with and satisfy Bidder as to the general, local and Site conditions that may affect cost, progress, performance or furnishing of the Work;
- 4.1.3. To consider federal, state and local Laws and Regulations that may affect cost, progress, performance or furnishing of the Work;
- 4.1.4. To study and carefully correlate Bidder's knowledge and observations with the Contract Documents and such other related data; and
- 4.1.5. To promptly notify ENGINEER of all conflicts, errors, ambiguities or discrepancies which Bidder has discovered in or between the Contract Documents and such other related documents.

4.2. Refer to Section 00800: Supplementary Conditions for information on reference materials, if any, which ENGINEER has used in preparing the Contract Documents and a determination of the "technical data" therein upon which CONTRACTOR may rely.

4.3. Information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site are based upon information and data furnished to OWNER and ENGINEER by owners of such Underground Facilities or others, and OWNER and ENGINEER do not assume responsibility for the accuracy or completeness thereof unless it is expressly provided otherwise in Section 00800: Supplementary Conditions.

4.4. Provisions concerning responsibilities for the adequacy of data, if any, furnished to prospective Bidders with respect to subsurface conditions, other physical conditions and Underground Facilities, and possible changes in the Contract Documents due to differing or unanticipated conditions appear in paragraphs 4.02 and 4.03 of Section 00700: General Conditions.

4.5. Before submitting a bid, each Bidder will be responsible to obtain such additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the Site or otherwise, which may affect cost, progress, performance or furnishing of the Work and which relate to any aspect of the means, methods, techniques, sequences or procedures of construction to be employed by Bidder and safety precautions and programs incident thereto or which Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price and other terms and conditions of the Contract Documents.

4.6. On request, OWNER will provide each Bidder access to the Site to conduct such examinations, investigations, explorations, tests and studies as each Bidder deems necessary for submission of a Bid. Bidder shall fill all holes, clean up and restore the Site to its former condition upon completion of such examinations, investigations, explorations, tests and studies.

4.7. Reference is made to the Contract Documents and Section 01010: Summary of Work, for the identification of the general nature of work, if any, that is to be performed at the Site by OWNER or others (such as utilities and other prime contractors) that relates to the Work for which a Bid is to be submitted. On request, OWNER will provide to each Bidder for examination access to or copies of Contract Documents, if any, (other than portions thereof related to price) for such work.

4.8. The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the Work required by the Contract Documents and applying the specific means, methods, techniques, sequences or procedures of construction (if any) that may be shown or indicated or expressly required by the Contract Documents, that Bidder has given ENGINEER written notice of all conflicts, errors, ambiguities and discrepancies that Bidder has discovered in the Contract Documents and the written resolutions thereof by ENGINEER is acceptable to Bidder, and that the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.

4.9. The provisions of 4.1 through 4.7, inclusive, do not apply to Asbestos, Polychlorinated biphenyls (PCBs), Petroleum, Hazardous Waste or Radioactive Material covered by Paragraph 4.06 of Section 00700: General Conditions, unless they are shown or indicated in the Documents and Specifications or identified in the Contract Document.

ARTICLE 5 - AVAILABILITY OF LANDS FOR WORK, ETC.

5.1. The lands upon which the Work is to be performed, rights-of-way and easements for access thereto and other lands designated for use by CONTRACTOR in performing the Work are identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment or storage of materials and equipment to be incorporated in the Work are to be obtained and paid for by CONTRACTOR. Easements for permanent structures or permanent changes in existing facilities are to be obtained and paid for by OWNER unless otherwise provided in the Contract Documents.

5.2. OWNER has acquired permanent and temporary easements and access locations to perform the Work. CONTRACTOR will be limited to those areas. Copies of all easement documents have been compiled in a separate Easement Index & Locations and Permit Index book, available upon request. Special provisions or restrictions within these easements may be generally described or listed in the Drawings but it is the requirement and responsibility of the CONTRACTOR to follow the requirements and provisions in these easement documents and to fully understand all of their requirements as it pertains to work within these easement areas.

5.3. Work time limitations, coordination, field office and staging areas, and related matter are included in Section 01010: Summary of Work.

ARTICLE 6 - INTERPRETATIONS AND ADDENDA

6.1. All questions about the meaning or intent of the Bidding Documents are to be directed to ENGINEER. Interpretations or clarification considered necessary by ENGINEER in response to such questions will be issued by Addenda which will be mailed or delivered to all parties recorded by ENGINEER as having received the Bidding Documents. Questions received less than 5 days prior to the date for opening of Bids may not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarification will be without legal effect.

6.2. Addenda may also be issued to modify the Bidding Documents as deemed advisable by OWNER or ENGINEER.

ARTICLE 7 - BID SECURITY

7.1. Each Bid must be accompanied by Bid security made payable to OWNER in the amount of 5% of the Bidders maximum Bid price and in the form of a certified or bank check or a Bid Bond (optional form attached) issued by a surety meeting the requirements of paragraph 5.01 of Section 00700: General Conditions.

7.2. The Bid security of Successful Bidder will be retained until such Bidder has executed the Agreement and furnished the required Contract security and met the other conditions of the Notice of Award, whereupon the Bid security will be returned. If successful Bidder fails to execute and deliver the Agreement and furnish the required Contract security within 15 days after the Notice of Award, OWNER may annul the Notice of Award and the Bid security of that Bidder will be forfeited. The Bid security of other Bidders whom OWNER believes to have a reasonable chance of receiving the award may be retained by OWNER until the earlier of the 7th day after the Effective Date of Agreement or the 91st day after the Bid opening, whereupon Bid security furnished by such Bidders will be returned. Bid security with Bids which are not competitive will be returned within 7 days after the Bid opening.

ARTICLE 8 - CONTRACT TIMES

8.1. The Work is to be **Substantially Completed by May 15th, 2024** and also completed and ready for **Final Payment by June 15th, 2024** (the Contract Times) are set forth in the Bid form and the Agreement.

ARTICLE 9 - LIQUIDATED DAMAGES

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

ARTICLE 10 - SUBSTITUTE AND "OR EQUAL" ITEMS

10.1. The Contract, if awarded, will be on the basis of material and equipment described in the Drawings or specified in the Specifications without consideration of possible substitute or "or equal" items.

10.2. Whenever materials or equipment are indicated in the Drawings or specified in the Specifications by using the name of one or more Suppliers, the bid shall be based on providing the materials or equipment of one of the Suppliers name.

10.3. Whenever it is indicated in the Drawings or specified in the Specifications that a substitute or "or equal" item of material or equipment may be furnished or used by CONTRACTOR if acceptable to ENGINEER, application for such acceptance will not be considered by ENGINEER until after the Effective Date of Agreement. The procedure for submission of any such application

by CONTRACTOR and consideration by ENGINEER is set forth in paragraph 6.05 of Section 00700: General Conditions, which may be supplemented in Division 1 – General Requirements.

ARTICLE 11 - SUBCONTRACTORS, SUPPLIERS AND OTHERS

11.1. If Section 00800: Supplementary Conditions requires or if OWNER requests the identity of certain Subcontractors, Suppliers, and other persons and organizations (including those who are to furnish principal items of material and equipment) to be submitted to OWNER in advance of the specified date prior to the Effective Date of Agreement, the apparent Successful Bidder, and any other Bidder so requested, shall within 7 days after the Bid opening submit to OWNER a list of all such Subcontractors, Suppliers, and other persons and organizations proposed for those portions of the Work for which such identification is required. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualifications for each such Subcontractor, Supplier, person or organization if requested by OWNER. If OWNER or ENGINEER, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, or other person or organization, either may, before the Notice of Award is given request the apparent Successful Bidder to submit an acceptable substitute in which case the apparent Successful Bidder shall submit an acceptable substitute, that Bidders Bid price will be increased (decreased) by the difference in cost occasioned by such substitution and OWNER may consider such price adjustments in evaluating bids and making the Contract award. If apparent Successful Bidder declines to make any such substitution, OWNER may award the Contract to the next lowest bidder that proposed to use acceptable Subcontractors, Suppliers, and other persons and organizations. Declining to make requested substitutions will not constitute ground for forfeiting the Bid security of any Bidder. Any Subcontractor, Supplier, other person or organization listed and to whom OWNER or ENGINEER does not make written objection prior to the giving of the Notice of Award will be deemed acceptable to OWNER and ENGINEER subject to revocation of such acceptance after the Effective Date of the documents as provided in paragraph 6.06 of Section 00700: General Conditions.

11.2. CONTRACTOR shall not be required to employ any Subcontractor, Supplier, other person or organization against whom CONTRACTOR has reasonable objection except as identified in those Procurement Contracts, if any, which will be assigned to the CONTRACTOR and identified in the Contract Documents.

ARTICLE 12 - BID FORM

12.2. All blanks of the Bid form must be completed legibly in ink or by typewriter.

12.3. Bids by corporations must be executed in the corporate name by the president or a vice president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal must be affixed, if required by state law, and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be indicated below the signature.

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

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

12.6. The Bid shall contain an acknowledgement of receipt of all Addenda (the numbers of which shall be filled in on the Bid form).

12.7. The address and telephone number for communications regarding the Bid must be indicated.

12.8. Evidence of authority to conduct business as an out-of-state corporation in the state where the Work is to be performed shall be provided in accordance with Article 3 above. State contractor license number, if any, must also be shown.

ARTICLE 13 - SUBMISSION OF BIDS

13.1. Bids shall be submitted at the time, place and in the manner indicated in the Advertisement for Bids.

13.2. Each prospective Bidder is furnished one digital copy of the Bidding Documents (Plans and Specifications).

ARTICLE 14 - MODIFICATIONS WITH WITHDRAWAL OF BIDS

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

14.2. 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, that Bidder will be disqualified from further bidding on the Work. No withdrawal of a Bid shall be permitted on account of mistake or any other reason after the expiration of this 24 hour period.

ARTICLE 15 - OPENING OF BIDS

15.1. Bids will be opened and, unless obviously nonresponsive, read aloud publicly at the place where Bids are designated to be opened. An abstract of the amount of the Bids and alternatives will be made available to Bidders after the opening of Bids.

ARTICLE 16 - BIDS TO REMAIN SUBJECT TO ACCEPTANCE

16.1. All Bids will remain subject to acceptance for 90 days after the day of the Bid opening, but OWNER may, in its sole discretion, release any Bid and return the Bid security prior to that date.

ARTICLE 17 - AWARD OF CONTRACT

17.1. OWNER reserves the right to reject any or all bids, including without limitation the rights to reject any or all nonconforming, nonresponsive, unbalanced or conditional Bids and to reject the Bid of any Bidder if OWNER believes that it would not be in the best interest of the Project to make an award to that Bidder, whether because the Bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by OWNER. OWNER also reserves the right to waive all informalities not involving price, time or changes in the Work and to negotiate Contract terms with the Successful Bidder. Discrepancies in the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between words and figures will be resolved in favor of the words.

17.2. In evaluating Bids, OWNER will consider the qualifications of the Bidders, whether or not the Bids comply with the prescribed requirements, unit prices and other data, as may be requested in the Bid form or prior to the Notice of Award.

17.3. OWNER may consider the qualifications and experience of Subcontractors, Suppliers and other persons and organizations proposed for the Work. OWNER also may consider the operating costs, maintenance considerations, performance data and guarantees of materials and equipment proposed for incorporation in the Work when such data is required to be submitted prior to the Notice of Award.

17.4. OWNER may conduct such investigations as OWNER deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications and financial ability of the Bidders, proposed Subcontractors, Suppliers, other persons and organizations to do the Work in accordance with the Contract Documents to OWNER's satisfaction within the prescribed time.

17.5. If the Contract is to be awarded, it will be awarded on the basis of the Base Bid to the lowest Bidder whose evaluation by OWNER indicates to OWNER that the award will be in the best interest of the Project.

17.6. If the Contract is to be awarded, OWNER will give Successful Bidder Notice of Award within 120 days after the day of the Bid opening.

ARTICLE 18 - CONTRACT INSURANCE AND SECURITY

18.1. Paragraphs 5.03 through 5.10, of Section 00700: General Conditions and Section 00800: Supplementary Conditions set forth OWNER's requirements as to insurance. When Successful Bidder delivers the executed Agreement to OWNER, it shall be accompanied by the required certificates of insurance (and other evidence of insurance requested by OWNER).

18.2. Paragraph 5.01 of Section 00700: General Conditions and Section 00800: Supplementary Conditions set forth OWNER's requirements as to Performance and Payment Bonds. When Successful Bidder delivers the executed Agreement to OWNER, it shall be accompanied by the required Performance and Payment Bonds.

ARTICLE 19 - SIGNING OF AGREEMENT

19.1. When OWNER gives a Notice of Award to the Successful Bidder, it will be accompanied by the required number of unsigned counterparts of the Agreement with all other written Contract Documents attached. Within 15 days thereafter, CONTRACTOR shall sign and deliver the required number of counterparts of the Agreement to OWNER with the required Bonds and certificates of insurance. Within 10 days thereafter, OWNER will deliver one fully signed counterpart to CONTRACTOR.

ARTICLE 20 - PREBID CONFERENCE

20.1. A Non-Mandatory **Pre-Bid Mtg. will be held on Friday, December 1st, 2023 @ 1:00 p.m. at the northern most parking lot of Empire Beach.** All who wish to submit a bid are recommended to attend and participate in the conference. A sign-in sheet will be distributed at the meeting. ENGINEER will transmit to all prospective Bidders of record such Addenda as ENGINEER considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective.

ARTICLE 21 - RETAINAGE AND PROGRESS PAYMENTS

21.1. Provisions concerning retainage and progress payments are set forth in the Agreement.

21.2. Retainages and progress payments will be in accordance with State of Michigan Act 524 of the Public Acts of 1980.

ARTICLE 22 - MISCELLANEOUS

22.1. Refer to Section 01010: Summary of Work for OWNER furnished materials, if any.

END OF SECTION

SECTION 00314

BID

Bid of _____ hereinafter called Bidder, organized and existing under the laws of or a resident of the State of _____, doing business as _____.*
*Insert as applicable: "a corporation", "a partnership" or "an individual".

To Leelanau County Drain Commissioner, hereinafter called OWNER.

1. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with OWNER in the form included in the Contract Documents to perform and furnish all Work for the South Bar Lake Drainage District as specified or indicated in the Contract Documents for the Contract Price and within the Contract Times indicated in the Bid and in accordance with the other terms and conditions of the Contract Documents.
2. Bidder accepts all of the terms and conditions of the Notice of Letting o Drain Contract (Advertisement for Bids) and Instructions to Bidders including, without limitation, those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 90 days after the day of bid opening. Bidder will sign and submit the Agreement and the Bonds and other documents required by the Bidding Documents within 15 days after the date of OWNER's Notice of Award.
3. In submitting this Bid, Bidder represents, as more fully set forth in the Agreement, that:
 - A. Bidder has examined and carefully studied the Bidding Documents and the following Addenda receipt of all which is hereby acknowledged:

<u>Date</u>	<u>Addendum Number</u>
_____	_____
_____	_____
 - B. Bidder has visited the Site and become familiar with and is satisfied as to the general, local and site conditions that may affect cost, progress, performance and furnishing of the Work.
 - C. Bidder is familiar with and is satisfied as to all federal, state and local laws and regulations that may affect cost, progress, performance and furnishing of the Work.
 - D. Bidder has carefully studied all reports of explorations and test of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) if identified in Section 00800: Supplementary Conditions as provided in paragraph 4.02 of Section 00700: General Conditions. Bidder accepts the determination set forth in paragraph SC-4.02 of Section 00800: Supplementary Conditions of the extent of the "technical data" contained in such reports and drawings upon which Bidder is entitled to rely as provided in paragraph 4.02.1 of Section 00700: General Conditions. Bidder acknowledges that such reports and drawings are not Contract Documents and may not be complete for Bidder's purposes. Bidder acknowledges that OWNER and ENGINEER do not assume responsibility for the accuracy or completeness of information and data shown or indicated in Bidding Documents with respect to Underground Facilities at or contiguous to the Site.
 - E. Bidder has obtained and carefully studied (or assumes responsibility for having done so) all such additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the Site or otherwise which may affect cost, progress, performance or furnishing of the Work or which relates to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by Bidder and safety precautions and programs incident thereto. Bidder does not consider that any additional examinations, investigations, explorations, tests, studies or data are necessary for the determination of the Bid for performance and furnishing of the Work in accordance with the times, price and other terms and conditions of the Contract Documents.
 - F. Bidder is aware of the general nature of Work to be performed by OWNER and others at the Site that relates to Work for which this Bid is submitted as indicated on the Contract Documents.

- G. Bidder has correlated the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings if any are identified in the Contract Documents and all additional or supplementary examinations, investigations, explorations, tests, studies and data with the Contract Documents.
- H. Bidder has given ENGINEER written notice of all conflicts, errors, ambiguities or discrepancies that Bidder has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to Bidder, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work for which this Bid is submitted.
- I. This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham bid; Bidder has not solicited or induced any person, firm or corporation to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other bidder or over OWNER.

4. Bidder will complete the Work for the following:

Unit Price Schedule

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE (\$)	TOTAL (\$)
	<u>Storm Sewer System Installed by Open Cut</u>				
1	8-inch AWWA C151 Ductile Iron Pipe, Bypass Line	LF	55	\$	\$
2	60-inch x 36-inch RCP Box Culvert	LF	29	\$	\$
	<u>Storm Sewer System Appurtenances</u>				
3	60-inch x 36-inch RCP Box Culvert Manhole Tee	EA	1	\$	\$
4	60-inch x 36-inch RCP Box Culvert Tapered End Section	EA	1	\$	\$
	<u>Surface Restoration/Paving</u>				
5	Lake Michigan Drive 3.5" Hot Mix Asphalt (HMA) Road Restoration, 4E1	SYD	40	\$	\$
6	HMA Spillway	SYD	6	\$	\$
7	HMA Valley Gutter Curb	LF	75	\$	\$
8	Flexamat 10NW Underlayment	SYD	40	\$	\$
9	Plain Riprap over Geotextile Fabric	SYD	70	\$	\$
10	Heavy Riprap over Geotextile Fabric	SYD	30	\$	\$
11	Dune Grass Planting	EA	5000	\$	\$
	<u>Earthwork</u>				
12	Dune Reestablishment	LS	1	\$	\$
	<u>Removals</u>				
13	Tree Rem, (6-12")	EA	2	\$	\$
	<u>SESC</u>				
14	Temporary Steel Sheet Piling	LF	50	\$	\$
15	SESC, Silt Fence	LF	130	\$	\$
16	SESC, Type 1 Turbidity Curtain	LF	40	\$	\$
17	SESC, Maintenance, Monitoring and Minor Devices	LS	1	\$	\$
	<u>Miscellaneous And Contingency Items</u>				

18	Lake Outlet Control Plate	LS	1	\$	\$
19	Bypass Dewatering	LS	1	\$	\$
20	Mobilization	LS	1	\$	\$
21	Traffic Control	LS	1	\$	\$

Total Amount (numbers): \$ _____

Total Amount (words): _____ dollars.

5. Bidder agrees that the Work will be **Substantially Complete by May 15th, 2024** after the date when the Contract Time commences to run as provided in paragraph 2.3 of Section 00700: General Conditions and Section 00500: Agreement, and completed and ready for **Final Payment by June 15th, 2024**.

Bidder accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work on time.

6. The following documents are attached to and made a condition of this Bid and must be submitted with bid:
 A. Required bid security.
 B. Qualifications of bidder / Bid Form.

7. Communications to Bidder concerning this Bid shall be addressed to the address indicated below.

8. The terms used in this Bid which are defined in the General Conditions of the construction Contract, included as part of the Contract Documents, have the meanings assigned to them in Section 00700: General Conditions.

SIMILAR WORK EXPERIENCE – GENERAL MUNICIPAL INFRASTRUCTURE WORK: SHOW PREVIOUS FAVORABLE EXPERIENCE AND COMPETENCE IN CONSTRUCTING AT LEAST 2 PUBLIC INFRASTRUCTURE PROJECTS (Village, City, Twp, Road Commission, MDOT, etc) OF SIMILAR TYPE, COMPARABLE SIZE AND COMPARABLE COMPLEXITY COMPLETED WITHIN THE LAST 7 YEARS OF THE ENTITY PERFORMING THE WORK. FOCUS ON PROJECTS INVOLVING WORK NEAR LAKE MICHIGAN AND WORK INVOLVING REGULATED CHANNELS, STREAMS, CREEKS, RIVERS OR WATERWAYS.

CONTRACTOR / SUB-CONTRACTOR PERFORMING THE WORK: _____
 (Circle one) (Company Name)

Project Title: _____

Date of Work Completed: _____

General Description of Work: _____

Owner: _____

Engineer: _____

Engineer Contact Information: _____

Owner Contact Information: _____

Final Construction Cost: _____

Project Title: _____

Date of Work Completed: _____

General Description of Work: _____

Owner: _____

Engineer: _____

Engineer Contact Information: _____

Owner Contact Information: _____

Final Construction Cost: _____

PROJECTS COMPLETED IN THE LAST 2 YEARS OVER \$500,000:

<u>PROJECT TITLE</u>	<u>CONSTRUCTION COST</u>	<u>CONTACT W/ PHONE #</u>

PRESENT WORK COMMITMENTS (OVER \$250,000):

PERTINENT FINANCIAL INFORMATION (LIMITS OF BONDING, LEINS, ETC):

LIST OF MAJOR EQUIPMENT FOR BID WORK:

9. Proposed Major Subcontractors or Suppliers are as follows:

	<u>COMPANY / ENTITY</u>	<u>ITEM(S) SUPPLYING / SUBCONTRACTING</u>	<u>CITY & STATE</u>
A.	_____	_____	_____
B.	_____	_____	_____
C.	_____	_____	_____
D.	_____	_____	_____
E.	_____	_____	_____
F.	_____	_____	_____
G.	_____	_____	_____
H.	_____	_____	_____
I.	_____	_____	_____
J.	_____	_____	_____
K.	_____	_____	_____
L.	_____	_____	_____
M.	_____	_____	_____
N.	_____	_____	_____
O.	_____	_____	_____
P.	_____	_____	_____
Q.	_____	_____	_____
R.	_____	_____	_____

SUBMITTED on _____, 20 __
 Date*

BY: _____
 Name of Bidder*

 Street*

 Signature

 City, State, and Zip*

 Name and Title of Signatory*

 Telephone Number*

 Contact E-mail*

*Typed or printed in ink.

END OF SECTION

10.

SECTION 00410

BID BOND

OWNER: Leelanau County Drain Commissioner
Address: 8527 E. Government Center Dr. Suite #205
City, State, Zip: Suttons Bay, MI 49682

Bid Due Date: December 11th, 2023
Project: South Bar Lake Drain

IN WITNESS WHEREOF, Surety and Bidder, intending to be legally bound hereby, subject to the following terms hereof, do each cause this Bid Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

Surety (Principal Place of Business):

Bidder:

Name of Surety*

Name of Bidder*

Street*

Street*

City, State, Zip*

City, State, Zip*

(Seal)
Surety's Corporate Seal

(Seal)
Bidder's Corporate Seal

By: _____
Signature and Title

By: _____
Signature and Title
(Attach Power of Attorney)

Attest: _____
Signature and Title

Attest: _____
Signature and Title

*Typed or printed in ink.

Bond:

Bond Number: _____

Date (not later than Bid Due Date): _____

Penal Sum: _____

Note: (1) Above addresses are to be used for giving required notice.
(2) Any singular reference to Bidder, Surety, OWNER or other party shall be considered plural where applicable.

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.

2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents and Contract Documents.

3. This obligation shall be null and void if:

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

All Bids are rejected by OWNER, or

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 and any 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 time for issuing notice of award including extension shall not in the aggregate exceed 120 days from 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 Bid Due Date.

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

8. Notice 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 attach 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 the Bond conflicts with any applicable provision of any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not conflict therewith shall continue in full force and effect.

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

END OF SECTION

SECTION 00500

AGREEMENT

THIS AGREEMENT is dated as of the _____ day of _____ in the year 202_ by and between Leelanau County Drain Commissioner (hereinafter called OWNER) and _____ (hereinafter called CONTRACTOR). OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1 - WORK

CONTRACTOR shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows: South Bar Lake Drain.

ARTICLE 2 - ENGINEER

The Project has been designed by GEI Consultants of Michigan, PC., Lansing, Michigan, who is hereinafter called ENGINEER and who will act as OWNER's representative, assume all duties and responsibilities and have the rights and authority assigned to ENGINEER in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

ARTICLE 3 - CONTRACT TIMES

3.1 The Work will be **Substantially Complete by May 15th, 2024** after the date when the Contract Time commences to run as provided in paragraph 2.3 of Section 00700: General Conditions, and completed and ready for **Final Payment by June 15th, 2024**.

3.2 Liquidated Damages: OWNER and CONTRACTOR recognize that time is of the essence of this Agreement and that OWNER will suffer financial loss if the Work is not completed within the times specified in paragraph 3.1 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. They 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) CONTRACTOR shall pay OWNER Amount Dollars \$500.00 for each day that expires after the time specified in paragraph 3.1 for Substantial Completion until the Work is substantially complete. After Substantial Completion if CONTRACTOR shall neglect, refuse or fail to complete the remaining work within the Contract Time, CONTRACTOR shall pay OWNER Amount Dollars \$500.00 for each day that expires after the time specified in paragraph 3.1 for completion and readiness for final payment.

ARTICLE 4 - CONTRACT PRICE

OWNER shall pay CONTRACTOR for completion of the Work in accordance with the Contract Documents at the unit prices in CONTRACTOR's Bid.

ARTICLE 5 - PAYMENT PROCEDURES

CONTRACTOR shall submit Applications for Payment in accordance with Article 14 of Section 00700: General Conditions. Applications for Payment will be processed by ENGINEER as provided in the General Conditions.

5.1 Progress Payments. OWNER shall make progress payments on account of the Contract Price on the basis of CONTRACTOR's Application for Payment as recommended by ENGINEER, monthly during construction as provided in paragraphs 5.1.1 and 5.1.2 below. All such payments will be on the basis of the progress of the Work based on unit prices and quantities of Work completed.

5.1.1 Prior to Substantial completion, progress payments will be made in an amount equal to: 100 percent of the Work completed and 100 Percent of materials and equipment not incorporated in the Work but delivered, suitably stored and accompanied by documentation satisfactory to OWNER as provided in paragraph 14.02 of Section 00700: General Conditions less the aggregate of payments previously made and less such amounts as ENGINEER should determine or OWNER may withhold, in accordance with Article 14 of Section 00700: General Conditions, except that OWNER will retain a portion of each progress payment limited to:

5.1.1.1 Not more than 10 percent of the dollar value of the work completed until 50 percent of the Work has been completed as determined by ENGINEER.

5.1.1.2 After the Work has been 50 percent completed as determined by ENGINEER, additional retainage will not be withheld unless OWNER determines that CONTRACTOR is not making satisfactory progress, or for other specific cause relating to CONTRACTOR's performance under the Contract. If the OWNER so determines, the OWNER may retain not more than 10 percent of the dollar value of the Work more than 50 percent completed.

5.1.2 Upon Substantial Completion, OWNER shall pay an amount sufficient to increase total payments to CONTRACTOR to 95 percent of the Contract Price, less such amounts as ENGINEER shall determine, or OWNER may withhold, in accordance with Article 14 of the General Conditions.

5.1.3 OWNER may deduct from progress payments amounts which are due to OWNER from CONTRACTOR in accordance with the Contract Documents.

5.1.4 After Substantial Completion, OWNER may, at OWNER's sole discretion, pay an amount sufficient to increase total payments to CONTRACTOR to more than 95 percent of the Contract Price (if OWNER has received consent of surety in a form acceptable to OWNER).

5.1.5 Progress payment shall not be due until 15 days after OWNER has received the funds with which to make the progress payment from a department or agency of the federal or state government, if any funds are to come from either of these sources.

5.2 The retained funds will not be commingled with other funds of OWNER and will be deposited in an interest bearing account in a regulated financial institution in this state where in all such retained funds are kept by OWNER which will account for both retainage and interest on each construction contract separately.

5.3 OWNER is not required to deposit retained funds in an interest bearing account if the retained funds are to be provided under a state or federal grant and the retained funds have not been paid to OWNER.

5.4 OWNER, at any time after 94 percent of Work under the Contract has been completed as determined by ENGINEER and at the request of CONTRACTOR, will release the retainage plus interest to the CONTRACTOR only if CONTRACTOR provides to OWNER an irrevocable letter of credit in the amount of the retainage plus interest, issued by a Bank authorized to do business in this state, containing terms mutually acceptable to CONTRACTOR and OWNER.

5.5 Unresolved disputes between OWNER and CONTRACTOR regarding retained funds and interest on retained funds shall be submitted to an agent in accordance with the dispute resolution process described in Section 4 of State of Michigan Act 524 of P.A. of 1980.

ARTICLE 6 - INTEREST

All moneys not paid when due as provided in Article 14 of Section 00700: General Conditions shall bear interest at the rate of 1 percent per month.

ARTICLE 7 - CONTRACTOR'S REPRESENTATIONS

In order to induce OWNER to enter into the Agreement CONTRACTOR makes the following representations:

7.1 CONTRACTOR has examined and carefully studied the Contract Documents (including the Addenda listed in paragraph 8) and the other related data identified in the Bidding Documents including technical data.

7.2 CONTRACTOR has visited the Site 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.

7.3 CONTRACTOR is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.

7.4 CONTRACTOR has carefully studied all reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) if identified in Section 00800: Supplementary Conditions as provided in paragraph 4.02.1 of Section 00700: General Conditions. CONTRACTOR accepts the determination set forth in paragraph SC-4.02 of Section 00800: Supplementary Conditions of the extent of the "technical data" contained in such reports and drawings upon which CONTRACTOR is entitled to rely as provided in paragraph 4.02 of Section 00700: General Conditions. CONTRACTOR acknowledges that such reports and drawings are not Contract Documents and may

not be complete for CONTRACTOR's purposes. CONTRACTOR acknowledges that OWNER and ENGINEER do not assume responsibility for the accuracy or completeness of information and data shown or indicated in the Contract Documents with respect to Underground Facilities at or contiguous to the Site.

7.5 CONTRACTOR has obtained and carefully studied (or assumes responsibility for having done so) all such additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by CONTRACTOR and safety precautions and programs incident thereto. CONTRACTOR does not consider that any additional examinations, investigations, explorations, tests, studies or data are necessary for the performance and furnishing of the Work at the Contract Price, within the Contract Times and in accordance with the other terms and conditions of the Contract Documents.

7.6 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.

7.7 CONTRACTOR has correlated the information known to CONTRACTOR, information and observations obtained from visits to the Site, reports and drawings identified in the Contract Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Contract Documents.

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

ARTICLE 8 - CONTRACT DOCUMENTS

The Contract Documents which comprise the entire agreement between OWNER and CONTRACTOR concerning the Work consist of the following:

- 8.1. CONTRACTOR's Bid dated _____.
- 8.2. Addenda ____ to ____, inclusive.
- 8.3. This Agreement.
- 8.4. Construction Performance Bond.
- 8.5. Construction Payment Bond.
- 8.6. General Conditions.
- 8.7. Supplementary Conditions.
- 8.8. Notice of Award
- 8.9. Notice to Proceed.
- 8.10. Project Manual bearing the title: South Bar Lake Drain and consisting of Sections and Divisions as listed in the Table of Contents thereof and dated November 2023.
- 8.11. Drawings, consisting of sheets as listed on the cover sheet with each sheet bearing the following general title: South Bar Lake Drain and dated November 2023.
- 8.12. Compliance with the obtained SESC Permit for Leelanau Conservation District (CEA)
- 8.13. Compliance with and signing of the obtained Livingston County Road Commission, ROW Permit Application
- 8.14. The following which may be delivered or issued after the Effective Date of the Agreement and are not attached hereto:
 - a. Written Amendments.
 - b. Change Orders.

There are no Contract Documents other than those listed above in Article 8. The Contract Documents may only be amended, modified or supplemented as provided in paragraph 3.04 of Section 00700: General Conditions.

ARTICLE 9 – MISCELLANEOUS

9.1. Terms used in the Agreement which are defined in Article 1 of the General Conditions will have the meanings indicated in Section 00700: General Conditions.

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

9.3. OWNER and CONTRACTOR each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect of all covenants, agreements and obligations contained in the Contract Documents.

9.4. 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.

IN WITNESS WHEREOF, OWNER and CONTRACTOR have signed this Agreement in triplicate. One counterpart each has been delivered to OWNER, CONTRACTOR and ENGINEER.

CONTRACTOR:

OWNER:

By: _____
Name of CONTRACTOR

Signature

Signature

Name and Title of Signatory*

Name and Title of Signatory*

Witness: _____

Witness: _____

Signed on _____, 20__
Date*

Signed on _____, 20__
Date*

Street*

Street*

City, State and Zip*

City, State and Zip*

Telephone Number*

Telephone Number*

Email*

Email*

* typed or printed in ink.

END OF SECTION

SECTION 00610

CONSTRUCTION PERFORMANCE BOND

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

CONTRACTOR (Name and Address):

SURETY (Name and Principal Place of Business):

OWNER (Name and Address):

Leelanau County Drain Commissioner
8527 E. Government Center Dr., Suite #205
Suttons Bay, MI 49682

CONSTRUCTION CONTRACT

Date:

Amount:

Description (Name and Location):

BOND

Date (Not earlier than Construction Contract Date):

Amount:

Modifications to this Bond Form:

CONTRACTOR AS PRINCIPAL

Company:

Signature: _____

Name and Title:

SURETY

(Corp. Seal)

Company:

(Corp. Seal)

Signature: _____

Name and Title:

CONTRACTOR AS PRINCIPAL

Company:

Signature: _____

Name and Title:

SURETY

(Corp. Seal)

Company:

(Corp. Seal)

Signature: _____

Name and Title:

1. The CONTRACTOR and the 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 to participate in conferences as provided in Subparagraph 3.1.

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

- 3.1 The OWNER has notified the CONTRACTOR and the Surety at its address described in Paragraph 10 below, that the OWNER is considering declaring a Contractor Default and has requested and attempted to arrange a conference with the CONTRACTOR and the Surety to be held not later than fifteen days after receipt of such notice to discuss methods of performing the Construction Contract. 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; and
 - 3.2 The OWNER has declared a Contractor Default and formally terminated the CONTRACTOR's right to complete the contract. Such Contractor Default shall not be declared earlier than twenty days after the CONTRACTOR and the Surety have received notice as provided in Subparagraph 3.1; and
 - 3.3 The OWNER has agreed to pay the Balance of the Contract Price to the Surety in accordance with the terms of the Construction Contract or to a contractor selected to perform the Construction Contract in accordance with the terms of the contract with the OWNER.
4. 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:
- 4.1 Arrange for the contractor, with consent of the OWNER, to perform and complete the Construction Contract; or
 - 4.2 Undertake to perform and complete the Construction Contract itself, through its agents or through independent contractors; or
 - 4.3 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 the contractor selected with the OWNER's 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 6 in excess of the Balance of the Contract Price incurred by the OWNER resulting from the CONTRACTOR's default; or
 - 4.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:
 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, tender payment therefor to the OWNER; or
 2. Deny liability in whole or in part and notify the OWNER citing reasons therefor.
5. If the Surety does not proceed as provided in Paragraph 4 with reasonable promptness, the Surety shall be deemed to be in default on this Bond fifteen 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 Subparagraph 4.4 and the OWNER refuses the payment tendered or the Surety had denied liability, in whole or in part, without further notice the OWNER shall be entitled to enforce any remedy available to the OWNER.
6. After the OWNER has terminated the CONTRACTOR's right to complete the Construction Contract, and if the Surety elects to act under Subparagraph 4.1, 4.2, or 4.3 above, 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. To the limit of the amount of this Bond, but subject to commitment by the OWNER of the Balance of the Contract Price to mitigation of costs and damages on the Construction Contract, the Surety is obligated without duplication for:
- 6.1 The responsibilities of the CONTRACTOR for correction of defective work and completion of the Construction Contract;
 - 6.2 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 4; and
 - 6.3 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.

7. 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, or successors.

8. 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.

9. 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 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 period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

10. Notice to the Surety, the OWNER or the CONTRACTOR shall be mailed or delivered to the address shown on the signature page.

11. 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. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

12. Definitions.

12.1 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 to the CONTRACTOR of any amount 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.

12.2 Construction Contract: The agreement between the OWNER and the CONTRACTOR identified on the signature page, including all Contract Documents and changes thereto.

12.3 Contractor Default: Failure of the CONTRACTOR, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Construction Contract.

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

(FOR INFORMATION ONLY - Name, Address and Telephone)
AGENT or BROKER:

OWNER's REPRESENTATIVE (Architect, Professional or other party):

END OF SECTION

SECTION 00620

CONSTRUCTION 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):

Leelanau County Drain Commissioner
8527 E. Government Center Dr., Suite #205
Suttons Bay, MI 49682

CONTRACT

Date:

Amount:

Description (Name and Location):

BOND

Bond Number:

Date (Not earlier than Contract Date):

Amount:

Modifications to this Bond Form:

Surety and CONTRACTOR, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Payment Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

Company:

Signature: _____ (Seal)

Name and Title:

SURETY

(Seal)

Surety's Name and Corporate Seal

By:

Signature and Title

(Attach Power of Attorney)

(Space is provided below for signatures of additional parties, if required.)

Attest:

Signature and Title

CONTRACTOR AS PRINCIPAL

Company:

Signature: _____ (Seal)

Name and Title:

SURETY

(Seal)

Surety's Name and Corporate Seal

By:

Signature and Title

(Attach Power of Attorney)

Attest:

Signature and Title:

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 addresses 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 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. When a Claimant has satisfied the conditions of Paragraph 4, the Surety shall promptly and at Surety's expense take the following actions:
 - 6.1. Send an answer to that Claimant, with a copy to OWNER, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.
 - 6.2. Pay or arrange for payment of any undisputed amounts.
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 Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

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 comply with the other terms thereof.

END OF SECTION

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

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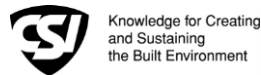
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These General Conditions have been prepared for use with the Suggested Forms of Agreement Between Owner and Contractor Nos. C-520 or C-525 (2002 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other. Comments concerning their usage are contained in the EJCDC Construction Documents, General and Instructions (No. C-001) (2002 Edition). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (No. C-800) (2002 Edition).

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GENERAL CONDITIONS

ARTICLE 1 - DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*--Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. *Agreement*--The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.

3. *Application for Payment*--The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Asbestos*--Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

5. *Bid*--The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

6. *Bidder*--The individual or entity who submits a Bid directly to Owner.

7. *Bidding Documents*--The Bidding Requirements and the proposed Contract Documents (including all Addenda).

8. *Bidding Requirements*--The Advertisement or Invitation to Bid, Instructions to Bidders, bid security of acceptable form, if any, and the Bid Form with any supplements.

9. *Change Order*--A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.

10. *Claim*--A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.

11. *Contract*--The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. *Contract Documents*-- Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor's submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.

13. *Contract Price*--The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).

14. *Contract Times*--The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any, (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.

15. *Contractor*--The individual or entity with whom Owner has entered into the Agreement.

16. *Cost of the Work*--See Paragraph 11.01.A for definition.

17. *Drawings*--That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.

18. *Effective Date of the Agreement*--The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

19. *Engineer*--The individual or entity named as such in the Agreement.

20. *Field Order*--A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.

21. *General Requirements*--Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.

22. *Hazardous Environmental Condition*--The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the Work.

23. *Hazardous Waste*--The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

24. *Laws and Regulations; Laws or Regulations*--Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

25. *Liens*--Charges, security interests, or encumbrances upon Project funds, real property, or personal property.

26. *Milestone*--A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

27. *Notice of Award*--The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.

28. *Notice to Proceed*--A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.

29. *Owner*--The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.

30. *PCBs*--Polychlorinated biphenyls.

31. *Petroleum*--Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.

32. *Progress Schedule*--A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.

33. *Project*--The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.

34. *Project Manual*--The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.

35. *Radioactive Material*--Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

36. *Related Entity* -- An officer, director, partner, employee, agent, consultant, or subcontractor.

37. *Resident Project Representative*--The authorized representative of Engineer who may be assigned to the Site or any part thereof.

38. *Samples*--Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

39. *Schedule of Submittals*--A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.

40. *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.

41. *Shop Drawings*--All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

42. *Site*--Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.

43. *Specifications*--That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain

administrative requirements and procedural matters applicable thereto.

44. *Subcontractor*--An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.

45. *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.

46. *Successful Bidder*--The Bidder submitting a responsive Bid to whom Owner makes an award.

47. *Supplementary Conditions*--That part of the Contract Documents which amends or supplements these General Conditions.

48. *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 any Subcontractor.

49. *Underground Facilities*--All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

50. *Unit Price Work*--Work to be paid for on the basis of unit prices.

51. *Work*--The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

52. *Work Change Directive*--A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times

but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.02 Terminology

A. The following words or terms are not defined but, when used in the Bidding Requirements or Contract Documents, have the following 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 requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

C. Day

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

D. Defective

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

- a. does not conform to the Contract Documents, or
- b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents, or
- c. has been damaged prior to Engineer's - recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

E. Furnish, Install, Perform, Provide

1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. When “furnish,” “install,” “perform,” or “provide” is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, “provide” is implied.

F. Unless stated otherwise in the Contract Documents, words or phrases which have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 - PRELIMINARY MATTERS

2.01 Delivery of Bonds and Evidence of Insurance

A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.

B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 Copies of Documents

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

2.03 Commencement of Contract Times; Notice to Proceed

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement

or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.04 Starting the Work

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

2.05 Before Starting Construction

A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule; indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.06 Preconstruction Conference

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

2.07 Initial Acceptance of Schedules

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

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be provided whether or not specifically called for at no additional cost to Owner.

C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 *Reference Standards*

A. Standards, Specifications, Codes, Laws, and Regulations

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard, specification, manual or code, or any instruction of a Supplier shall be effective to change the duties or

responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, or Engineer, or any of, their Related Entities, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. Reporting Discrepancies

1. *Contractor's Review of Contract Documents Before Starting Work:* Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor may discover and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.

2. *Contractor's Review of Contract Documents During Performance of Work:* If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any Law or Regulation applicable to the performance of the Work or of any standard, specification, manual or code, or of any instruction of any Supplier, Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor knew or reasonably should have known thereof.

B. Resolving Discrepancies

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:

a. the provisions of any standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or

b. the provisions of any Laws or Regulations applicable to the performance of the Work

(unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.

B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:

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

3.05 *Reuse of Documents*

A. Contractor and any Subcontractor or Supplier or other individual or entity performing or furnishing all of the Work under a direct or indirect contract with Contractor, 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 Engineer's consultants, including electronic media editions; or
2. reuse any of 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 adaption by Engineer.

B. The prohibition of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

A. Copies of data furnished by Owner or Engineer to Contractor or Contractor to Owner or Engineer that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's

sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.

B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party..

C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 *Subsurface and Physical Conditions*

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

1. those reports of explorations and tests of subsurface conditions at or contiguous to the Site that Engineer has used in preparing the Contract Documents; and

2. those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) that Engineer has used in preparing the Contract Documents.

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

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

4.03 *Differing Subsurface or Physical Conditions*

A. *Notice:* If Contractor believes that any subsurface or physical condition at or contiguous to the Site that is uncovered or revealed either:

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

2. is of such a nature as to require a change in the Contract Documents; or

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

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

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

C. Possible Price and Times Adjustments

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and

b. with respect to Work that is paid for on a Unit Price Basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:

a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or

b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or

c. Contractor failed to give the written notice as required by Paragraph 4.03.A.

3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, Owner and Engineer, and any of their Related Entities shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

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

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data; and

2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:

a. reviewing and checking all such information and data,

b. locating all Underground Facilities shown or indicated in the Contract Documents,

c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction, and

d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will

promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

4.05 *Reference Points*

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

4.06 *Hazardous Environmental Condition at Site*

A. *Reports and Drawings:* Reference is made to the Supplementary Conditions for the identification of those reports and drawings relating to a Hazardous Environmental Condition identified at the Site, if any, that have been utilized by the Engineer in the preparation of the Contract Documents.

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

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.

C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.

D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any.

E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered to Contractor written notice: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.

F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to

entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.

G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06. G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

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

ARTICLE 5 - BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified

in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.

B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent must be accompanied by a certified copy of the agent's authority to act.

C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

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

5.03 *Certificates of Insurance*

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

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

5.04 *Contractor's Liability Insurance*

A. Contractor shall purchase and maintain such liability and other insurance as is appropriate for the Work being performed and as will provide protection

from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;

2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;

3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;

4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:

a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or

b. by any other person for any other reason;

5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and

6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

B. The policies of insurance required by this Paragraph 5.04 shall:

1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, include as additional insured (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, partners, employees, agents, consultants and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;

2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;

3. include completed operations insurance;

4. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;

5. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);

6. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and

7. with respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two years after final payment.

a. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

5.05 *Owner's Liability Insurance*

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

5.06 *Property Insurance*

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

1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured;

2. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, false work, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage, (other than caused by flood) and such other perils or causes of loss as may be specifically required by the Supplementary Conditions;

3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;

5. allow for partial utilization of the Work by Owner;

6. include testing and startup; and

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

B. Owner shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured.

C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.

D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any

deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

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

5.07 *Waiver of Rights*

A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or additional insureds thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insured or additional insured (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.

B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.

C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the insureds, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order .

B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

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

A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract

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

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

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

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances. The superintendent will be Contractor's representative at the Site and shall have authority to act on behalf of Contractor. All communications given to or

received from the superintendent shall be binding on Contractor.

6.02 *Labor; Working Hours*

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner's written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and "Or-Equals"*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.

1. *"Or-Equal" Items:* If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that:

1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole,

3) it has a proven record of performance and availability of responsive service; and

b. Contractor certifies that, if approved and incorporated into the Work:

1) there will be no increase in cost to the Owner or increase in Contract Times, and

2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. Substitute Items

a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.

b. Contractor shall submit sufficient information as provided below to allow Engineer to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.

c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented in the General Requirements and as Engineer may decide is appropriate under the circumstances.

d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:

1) shall certify that the proposed substitute item will:

a) perform adequately the functions and achieve the results called for by the general design,

b) be similar in substance to that specified, and

c) be suited to the same use as that specified;

2) will state:

a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time;

b) whether or not use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and

c) whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;

3) will identify:

a) all variations of the proposed substitute item from that specified, and

b) available engineering, sales, maintenance, repair, and replacement services;

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

B. Substitute Construction Methods or Procedures: If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.

C. Engineer's Evaluation: Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by either a Change Order for a substitute or an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.

D. Special Guarantee: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

E. Engineer's Cost Reimbursement: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute item so proposed or submitted by Contractor, Contractor shall reimburse Owner for the charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the charges of Engineer for making changes in the Contract

Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

F. Contractor's Expense: Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.06 Concerning Subcontractors, Suppliers, and Others

A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.

B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.

C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity, nor

2. shall anything in the Contract Documents create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual

or entity except as may otherwise be required by Laws and Regulations.

D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.

E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.

F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as an additional insured on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 *Patent Fees and Royalties*

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of Owner or Engineer its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 *Permits*

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

6.09 *Laws and Regulations*

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

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

6.10 Taxes

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

6.11 Use of Site and Other Areas

A. Limitation on Use of Site and Other Areas

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

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

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

D. Loading Structures: Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 Record Documents

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

6.13 Safety and Protection

A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

C. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Draw-

ings or Specifications or to the acts or omissions of Owner or Engineer or , 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).

D. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

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

6.15 *Hazard Communication Programs*

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

6.16 *Emergencies*

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

6.17 *Shop Drawings and Samples*

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

1. Shop Drawings

a. Submit number of copies specified in the General Requirements.

b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.

2. *Samples*: Contractor shall also submit Samples to Engineer for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals.

a. Submit number of Samples specified in the Specifications.

b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.

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

C. Submittal Procedures

1. Before submitting each Shop Drawing or Sample, Contractor shall have determined and verified:

a. all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

b. the suitability of all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work;

c. all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto; and

d. shall also have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.

2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents

with respect to Contractor's review and approval of that submittal.

3. With each submittal, Contractor shall give Engineer specific written notice of any variations, that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawing's or Sample Submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. Engineer's Review

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. Resubmittal Procedures

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

6.18 Continuing the Work

A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or

disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 Contractor's General Warranty and Guarantee

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its Related Entities shall be entitled to rely on representation of Contractor's warranty and guarantee.

B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. observations by Engineer;

2. recommendation by Engineer or payment by Owner of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. use or occupancy of the Work or any part thereof by Owner;

5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;

6. any inspection, test, or approval by others; or

7. any correction of defective Work by Owner.

6.20 Indemnification

A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, 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 respective consultants, agents, officers, directors, partners, or employees by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of, or the failure to prepare or approve, maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.21 *Delegation of Professional Design Services*

A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.

B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal

shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.

E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 7 - OTHER WORK AT THE SITE

7.01 *Related Work at Site*

A. Owner may perform other work related to the Project at the Site with Owner's employees, or via other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:

1. written notice thereof will be given to Contractor prior to starting any such other work; and
2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.

B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and shall properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and

properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will only cut or alter their work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.

C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

7.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:

1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;

2. the specific matters to be covered by such authority and responsibility will be itemized; and

3. the extent of such authority and responsibilities will be provided.

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

7.03 *Legal Relationships*

A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.

B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's actions or inactions.

C. Contractor shall be liable to Owner and any other contractor for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's action or inactions.

ARTICLE 8 - OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

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

8.02 *Replacement of Engineer*

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

8.03 *Furnish Data*

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

8.04 *Pay When Due*

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

8.05 *Lands and Easements; Reports and Tests*

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

8.06 *Insurance*

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

8.07 *Change Orders*

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

8.08 *Inspections, Tests, and Approvals*

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

8.09 *Limitations on Owner's Responsibilities*

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

8.10 *Undisclosed Hazardous Environmental Condition*

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

8.11 *Evidence of Financial Arrangements*

A. If and to the extent Owner has agreed to furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents, Owner's responsibility in respect thereof will be as set forth in the Supplementary Conditions.

ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents and will not be changed without written consent of Owner and Engineer.

9.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep

Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

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

9.03 *Project Representative*

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

9.04 *Authorized Variations in Work*

A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

9.05 *Rejecting Defective Work*

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

9.06 *Shop Drawings, Change Orders and Payments*

A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.

B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.

C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.

D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

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

A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question

B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believe that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.

C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.

D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show

partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to, the Resident Project Representative, if any, and assistants, if any.

ARTICLE 10 - CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall

promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.B.

10.03 *Execution of Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:

1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;

2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and

3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 *Notification to Surety*

A. If notice 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) is required by the provisions of any bond to be given to a surety, the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 *Claims*

A. *Engineer's Decision Required:* All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.

B. *Notice:* Written notice stating the general nature of each Claim, shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Time shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).

C. *Engineer's Action:* Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:

1. deny the Claim in whole or in part,

2. approve the Claim, or

3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.

D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.

E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.

F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

ARTICLE 11 - COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items, and shall not include any of the costs itemized in Paragraph 11.01.B.

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 at the Site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and

Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.

4. Costs of special consultants (including but not limited to Engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, imposed by Laws and Regulations.

e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have

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

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, expresses, and similar petty cash items in connection with the Work.

i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

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

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A and 11.01.B.

C. Contractor's Fee: When all the Work is performed on the basis of cost-plus, Contractor's fee shall

be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.

D. Documentation: Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 Allowances

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

B. Cash Allowances

1. Contractor agrees that:

a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. Contingency Allowance

1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 Unit Price Work

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:

1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and

2. there is no corresponding adjustment with respect any other item of Work; and

3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an

allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).

C. *Contractor's Fee:* The Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;

b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;

c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraph 12.01.C.2.a is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;

e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted

by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 *Delays*

A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.

B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.

D. Owner, Engineer and the Related Entities of each of them shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of Engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

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

13.01 *Notice of Defects*

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

13.02 *Access to Work*

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

13.03 *Tests and Inspections*

A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;

2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in said Paragraph 13.04.C; and

3. as otherwise specifically provided in the Contract Documents.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to

be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.

E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, it must, if requested by Engineer, be uncovered for observation.

F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.

B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.

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

D. If, the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *Owner May Stop the Work*

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

13.06 *Correction or Removal of Defective Work*

A. Promptly after receipt of notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.07 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. repair such defective land or areas; or
2. correct such defective Work; or
3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.

B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.

C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications .

D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

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

13.09 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.

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

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress

payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. Applications for Payments

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

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

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

B. *Review of Applications*

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations on the Site 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, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and to any other qualifications stated in the recommendation); and

c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or

b. that there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

a. to supervise, direct, or control the Work, or

b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or

d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or

e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent

inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:

- a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
- b. the Contract Price has been reduced by Change Orders;
- c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
- d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. Payment Becomes Due

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

D. Reduction in Payment

1. Owner may refuse to make payment of the full amount recommended by Engineer because:

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

2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor corrects to Owner's satisfaction the reasons for such action.

3. If it is subsequently determined that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1.

14.03 *Contractor's Warranty of Title*

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

14.04 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.

B. Promptly after Contractor's notification, , Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will within 14 days after submission of the tentative certificate to Owner notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will within said 14 days execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial

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

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

14.05 *Partial Utilization*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions.

1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor will certify to Owner and Engineer that such part of the Work is substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

14.06 *Final Inspection*

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals

that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 *Final Payment*

A. Application for Payment

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.7;

b. consent of the surety, if any, to final payment;

c. a list of all Claims against Owner that Contractor believes are unsettled; and

d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner or Owner's property might in any way be responsible have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

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

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations

under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. Payment Becomes Due

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

14.08 *Final Completion Delayed*

A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

A. The making and acceptance of final payment will constitute:

1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance

with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

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

15.02 *Owner May Terminate for Cause*

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

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);

2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;

3. Contractor's disregard of the authority of Engineer; or

4. Contractor's violation in any substantial way of any provisions of the Contract Documents.

B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:

1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion),

2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and

3. complete the Work as Owner may deem expedient.

C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph Owner shall not be required to obtain the lowest price for the Work performed.

D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.

E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.

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

15.03 *Owner May Terminate For Convenience*

A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

4. reasonable expenses directly attributable to termination.

B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

ARTICLE 16 - DISPUTE RESOLUTION

16.01 *Methods and Procedures*

A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be

governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.

B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.

C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:

1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions, or

2. agrees with the other party to submit the Claim to another dispute resolution process, or

3. gives written notice to the other party of their intent to submit the Claim to a court of competent jurisdiction.

ARTICLE 17 - MISCELLANEOUS

17.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or

2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

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

17.03 *Cumulative Remedies*

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

17.04 *Survival of Obligations*

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

17.05 *Controlling Law*

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

17.06 *Headings*

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

SECTION 00800

SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement Section 00700: General Conditions (Standard General Conditions of the Construction Contract) and other provisions of the Contract Documents as indicated below. All provisions, which are not so amended or supplemented, remain in full force and effect.

The provisions of these Sections shall be complied with in addition to the provisions of Section 00700: General Conditions and Section 00800: Supplementary Conditions. If conflicts exist among these Sections, the stricter requirements, as determined by ENGINEER, shall govern.

ARTICLE 1 – DEFINITIONS

SC-1.01 Defined Terms

Add new paragraphs immediately after Paragraph 1.52 which are to read as follows:

1.55 Manufacturer – An individual, firm or corporation that manufactures, assembles or fabricates products.

1.56 Products – Systems, materials, manufactured units, equipment, components and accessories used in the Work.

ARTICLE 2 – PRELIMINARY MATTERS

SC-2.01 Delivery of Bonds and Evidence of Insurance

Delete Paragraph 2.01 and insert the following in its place:

2.01.1 When CONTRACTOR delivers the executed Agreements to OWNER, CONTRACTOR shall also deliver to OWNER, with copies to each additional insured identified herein, certificates of insurance endorsements to CONTRACTOR's insurance policies, insurance policies (and other evidence of insurance which OWNER or any additional insured may reasonably request) which CONTRACTOR is required to purchase and maintain in accordance with Article 5.

ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

SC-3.02 Reference Standards

Add a new paragraph immediately after Paragraph 3.02.1.2 which is to read as follows:

3. The CONTRACTOR is responsible for compliance to Part 91, Soil Erosion and Sedimentation Control of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended and is responsible for compliance in accordance with the Michigan Association of County Drain Commissioners (MACDC) Soil Erosion and Sedimentation Control (SESC) Authorized Public Agency (APA) procedures manual. If for any reason, the OWNER is found to be in violation of Part 91 due to the CONTRACTOR found in non-compliance, the CONTRACTOR will be fully responsible for any fines and costs incurred by the OWNER, including legal defense and any and all costs associated with a violation.

The CONTRACTOR acknowledges that the procedures manual is available at macdc.net and has reviewed and understands the manual.

The CONTRACTOR acknowledges the OWNER's right to enter on to the project and install or repair any soil erosion control measures at CONTRACTOR's expense after notice to CONTRACTOR, allowing time for the repair or installation to be made by CONTRACTOR. Such repair or installation may be made by OWNER or by a third party Contractor or Owner.

ARTICLE 5 – BONDS AND INSURANCE

SC-5.01D

Add new paragraph immediately after Paragraph 5.01C which is to read as follows:

All Bonds and insurance required by the Contract Documents to be purchased and maintained by CONTRACTOR shall be obtained from surety or insurance companies that are authorized to transact business in Michigan and are classified

at not lower than each of the following:

5.01.D.1 Best's Key Rating Guide, current edition:

- (1) Rating Classification: A.
- (2) Financial Size Category: Class V.

5.01.D.2 Standard and Poor's:

- (1) Claims-Paying Ability Rating: AA.

SC-5.03 Certificate of Insurance

Delete Paragraph 5.03

Note: Certificate(s) of insurance must be filed with the OWNER and ENGINEER prior to commencement of any work. Failure to do so will be a breach of the Agreement and good cause for immediate termination of the Contract.

SC-5.04 Contractor's Liability Insurance

Add the following after Paragraph 5.04:

The limits of liability for the insurance required by Paragraph 5.04 shall provide the following coverages for not less than the following amounts or greater where required by Laws and Regulations:

5.04.A.1 and 5.04.A.2. Workers' Compensation, etc.:

- (1) State: Statutory
- (2) Applicable Federal (e.g., Longshoreman's) Statutory
- (3) Employer's Liability: \$1,000,000.00

5.04.A.3, 5.04.A.4., and 5.04.A.5. CONTRACTOR's Liability Insurance under Paragraph 5.04.A.3 through 5.04.A.5 which shall also include completed operations and product liability coverages and eliminate the exclusion with respect to property under the care, custody and control of CONTRACTOR:

- (1) General Aggregate
(Except Products-
Completed Operations): \$2,000,000.00
- (2) Products-Completed
Operations Aggregate \$2,000,000.00
- (3) Personal and Advertising
Injury (Per Person/
Organization) \$1,000,000.00
- (4) Each Occurrence
(Bodily Injury and
Property Damage) \$1,000,000.00
- (5) Property Damage liability insurance will provide Explosion, Collapse and Underground coverages
where applicable.
- (6) Contractor's Pollution Liability \$ 500,000.00

5.04.A.6 Automobile Liability (including hired and non-owned vehicles):

- (1) Bodily Injury:
 - \$1,000,000.00 Each Person
 - \$ 2,000,000.00 Each Accident
- (2) Property Damage:
 - \$1,000,000.00 Each Accident

- (3) Combined Single Limit (Bodily Injury and Property Damage):

\$2,000,000.00 Each Accident

- (4) MCS 90 Endorsement on Vehicle Insurance: Statutory

SC-5.04.B.1

Add the following at the end of Paragraph 5.04.B.1:

OWNER, ENGINEER, and the following ENGINEER's Consultants and other persons or entities shall be listed as additional insureds under the policies required by Article 5:

- 5.04.B.a Leelanau County Drain Commissioner.
- 5.04.B.b Leelanau County Road Commission.
- 5.04.B.c GEI Consultants of Michigan, PC.
- 5.04.B.d County of Leelanau.
- 5.04.B.e Empire Township.
- 5.04.B.f Village of Empire
- 5.04.B.g South Bar Lake Drainage District
- 5.04.B.h People of the State of Michigan.

SC-5.04.B.2

Add a new paragraph immediately after Paragraph 5.04.B.2 which is to read as follows:

5.04.B.2.a Umbrella Liability:

- (1) The carrier shall agree to the underlying policies.
- (2) Coverage shall be at least as broad as that in the covered policies.
- (3) Shall cover CONTRACTOR's Liability Insurance and Automobile Liability Insurance.
- (4) Coverage Limit: \$2,000,000.00 General Aggregate
 \$1,000,000.00 Each Occurrence

SC-5.04.B.4 Contractual Endorsement

Add the following to Paragraph 5.04.B.4:

The Contractual Liability coverage required by Paragraph 5.04.B.4 shall provide coverage for not less than the following amounts:

- (1) General Aggregate \$2,000,000.00
- (2) Each Occurrence
 (Bodily Injury &
 Property Damage) \$1,000,000.00

SC-5.04.B.6

Delete Paragraph 5.04.B.6 and insert the following in its place:

- 6. remain in effect at least until the end of the correction period and at all times thereafter when CONTRACTOR may be correcting, removing or replacing defective Work in accordance with Paragraph 13.07; and

SC-5.04.B.7

Amend Paragraph 5.04.B.7 by striking out the following words: "and any insurance coverage written on a claims-made basis". As so amended Paragraph 5.04.B.7 remains in effect.

SC-5.04.B.8

Add new paragraph immediately after Paragraph 5.04.B.7 that is to read as follows:

8. Not to be written on a claims-made basis; and

SC-5.05 Owner's Liability Insurance

Delete Paragraph 5.05 and insert the following in its place:

CONTRACTOR shall purchase and maintain Owner's and Contractor's Protective Liability Insurance which shall:

- (1) Be written by the same insurance carrier as CONTRACTOR's Liability Insurance.
- (2) Be a separate policy to protect OWNER, ENGINEER, their consultants, agents, employees and such public corporations in whose jurisdiction the Work is located for their liability for work performed by CONTRACTOR or Subcontractors under this Contract.
- (3) Name OWNER as the insured.
- (4) Name the following as additional insured:
 - a. GEI Consultants of Michigan, PC
 - b. County of Leelanau.
 - c. Solon Township.
 - d. Leelanau County Road Commission
 - e. People of the State of Michigan.
 - f. South Bar Lake Drainage District
- (5) Provide coverage for not less than the following amounts:
 - a. Separate:
Bodily Injury
\$1,000,000.00 Each Occurrence
and Property Damage
\$1,000,000.00 Each Occurrence
\$2,000,000.00 Annual Aggregate
 - or b. Combined Single Limit:
\$2,000,000.00 Each Occurrence

SC-5.06 Property Insurance

Delete the first sentence of Paragraph 5.06 and insert the following in its place:

CONTRACTOR shall purchase and maintain property insurance, with OWNER as loss payee, upon the Work at the site in the amount of the full replacement cost thereof.

SC-5.06.1

Add the following at the end of Paragraph 5.06.A.1.

ENGINEER, and the following ENGINEER's Consultants and other persons or entities shall be listed as additional insureds under the policy:

- a. County of Leelanau.
- b. Empire Township.
- c. Village of Empire
- d. Leelanau County Road Commission.
- e. People of the State of Michigan.
- f. South Bar Lake Drainage District

SC-5.06.A.2

Add the following Paragraph 5.06.A.2:

Property insurance coverage shall also include flood, start-up and testing, offsite storage, boiler and machinery insurance.

SC-5.08 Amend the first sentence of Paragraph 5.08 by striking out the word "OWNER" where it first occurs and inserting the word "CONTRACTOR" in its place. As so amended, Paragraph 5.08 remains in effect.

SC-5.09 Acceptance of Bonds and Insurance; Option to Replace:

Amend the first sentence of Paragraph 5.14 by deleting 2.7 and inserting 2.1 in its place. As so amended, Paragraph 5.14 remains in effect.

ARTICLE 6 – CONTRACTOR’S RESPONSIBILITIES

SC-6.06 Concerning Subcontractors, Suppliers and Others

Add new Paragraph 6.06.H which is to read as follows:

OWNER or ENGINEER may furnish to any Subcontractor, Supplier or other person or organization, to the extent practicable, evidence of amounts paid to CONTRACTOR in accordance with CONTRACTOR’s Application for Payment.

SC-6.08 Permits

Add the following at the end of Paragraph 6.08:

CONTRACTOR must sign the obtained Leelanau County Road Commission (LCRC) Row Permit Application, list the LCRC as an additional insured on all Insurances and Policies and pay the applicable \$200 fee to LCRC prior to commencing the construction work.

ARTICLE 7- OTHER WORK AT THE SITE

SC-7.02 Coordination

Add the following to the end of Article 7.02.A:

4. CONTRACTOR shall communicate with, schedule, and coordinate the work performed by others.

ARTICLE 9 – ENGINEER’S STATUS DURING CONSTRUCTION

Amend Section 9.09B Limitations on ENGINEER’s Authority and Responsibilities to read: The ENGINEER and OWNER will not be responsible for CONTRACTOR’s failure to perform the Work in accordance with the Contract Documents.

ARTICLE 10 – CHANGES IN THE WORK; CLAIMS

CLAIMS SC-10.02B

Add the following new paragraph immediately after paragraph 10.02A, which is to read the following:

B. Any Change Order or Work Change Directive will not be binding or enforceable unless same is authorized by OWNER in writing. CONTRACTOR acknowledges that it may not submit application for payment or receive payment for changes to the Work that are not authorized by OWNER in writing by a Change Order or Work Change Directive.

SC-10.05 Claims

Add new paragraph immediately after 10.05.B which is to be read as follows:

10.05.B.1. *Keeping of Records:* If CONTRACTOR files a Notice of Intent to File a Claim, the CONTRACTOR shall keep accurate records of all costs of the work or delay and shall afford the ENGINEER every facility for keeping costs of the work or delay which is the subject matter of the claim. The CONTRACTOR and ENGINEER shall compare records and bring them into agreement at the end of each work day, commonly known as a forced account. Failure to maintain the records and maintain a forced account will be a waiver of the claim by the CONTRACTOR. No amounts will be paid on this claim until the claim is resolved in writing and signed by the parties. OWNER’s failure to respond to written notice of a claim shall be deemed a denial of the claim.

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

SC-11.01.B Costs Excluded

Add new paragraph 11.01.B.6 which is to read as follows:

Mobilization and other costs associated with delays expressed in Paragraph 12.03. OWNER will NOT be responsible for any mobilization costs, unabsorbed,, extended, unallocated and/or unspecified home office overhead or other unspecified damages due to delay on the project. Any monies if any that are paid for damages must be agreed to in a signed written change order. Contractor's sole remedy for any alleged delay will be additional time if any is agreed to in a written change order signed by the OWNER, CONTRACTOR and ENGINEER.

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

SC-12.03 Delays

Delete paragraphs 12.03.A.

Add 12.03.A. Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of CONTRACTOR, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefore as provided in Paragraph 12.02.A. Delays beyond the control of CONTRACTOR shall include, fires, floods, epidemics, or acts of God. Time for decisions by OWNER shall not be considered as a delay. There will be no additional costs awarded to CONTRACTOR for any delay as the only remedy will be additional time to complete the project only and will be only allowed pursuant to a written change order signed by the OWNER, CONTRACTOR and ENGINEER.

ADD 12.04 : Any changes in the contract price shall be agreed to in writing and signed by OWNER, CONTRACTOR and ENGINEER prior to starting any work related to the change in contract price. Regardless of the circumstances or course of dealings with the parties during the project, there will be no change in contract price unless the OWNER, CONTRACTOR and ENGINEER agree to said change in a signed written agreement, addendum, or change order.

ARTICLE 14- PAYMENTS TO CONTRACTOR AND COMPLETION

SC-14.02 Application for Progress Payment

Add a new paragraph immediately after paragraph 14.02.A.3 which is to read as follows:

- 14.02.A.4 CONTRACTOR shall indicate on the Application for Payment the amounts that are due to OWNER from CONTRACTOR in accordance with the Contract Documents and which amounts OWNER may deduct from the progress payment. CONTRACTOR shall provide all requested waivers, in satisfactory form to the ENGINEER, from its subcontractors, suppliers and laborers with each application for payment.

SC-14.02.B.5 Refusal to Recommend Payment

Add the following new paragraphs immediately after paragraph 14.02.B.5.d which are to read as follows:

- e. CONTRACTOR has incurred liability for other costs in accordance with Contract Documents.
- f. Liability for liquidated damages has been incurred by CONTRACTOR.
- g. CONTRACTOR's failure to maintain record documents in accordance with paragraph 6.12.

SC – 14.02.C.1 Payment Becomes Due

Amend Section 14.02.C.1 by deleting and replaced by the following: The date for which any payment is due, does not commence to run until the application for progress payment has been signed by OWNER, ENGINEER and CONTRACTOR at which time the payment will become due 30 days after the OWNER, ENGINEER and CONTRACTOR have signed the payment. Payment will not be due should ENGINEER or OWNER not recommend payment.

SC 14.02.D Reduction in Payment.

Amend Section 14.02.D.2 to read as follows: If OWNER refuses to make payment of the full amount recommended by ENGINEER, OWNER will give CONTRACTOR written notice, with a copy to ENGINEER, within 7 days, stating the reasons for such action and within 10 days pay CONTRACTOR any amount remaining after the deduction of the amount so withheld. OWNER may promptly pay CONTRACTOR the amount so withheld, or any adjustment thereto agreed to by OWNER and CONTRACTOR in writing, when Contractor corrects to OWNER's satisfaction the reason(s) for such action.

SC-14.04 Substantial Completion

Add the following new paragraphs immediately after paragraph 14.07B1, which are to read as follows:

14.07B2 The ENGINEER may refuse to recommend any such payment, or, because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously recommended, to such extent as may be necessary in ENGINEER's opinion to protect OWNER from loss because:

- a. the Work is defective, or completed Work has been damaged requiring correction or replacement;
- b. the Contract Price has been reduced by Written Amendment or Change Order;
- c. OWNER has been required to correct defective Work or complete Work in accordance with paragraph 13.14, or
- d. ENGINEER has actual knowledge of the occurrence of any of the events enumerated in paragraph 15.02;
- e. CONTRACTOR has incurred liability for other costs in accordance with Contract Documents;
- f. Liability for liquidated damages has been incurred by CONTRACTOR;
- g. CONTRACTOR's failure to maintain record documents in accordance with paragraph 6.19;
- h. CONTRACTOR's failure to maintain required insurance.

Delete paragraph 14.04.C and insert the following in its place:

OWNER shall make the final determination as to Substantial Completion and items to be completed or corrected prior to Final Completion.

Remove the following sentence from 14.04.D:

Unless OWNER and CONTRACTOR agree otherwise in writing and so inform ENGINEER in writing prior to ENGINEER'S issuing the definitive certification of Substantial Completion, ENGINEER'S aforesaid recommendation shall be binding on OWNER and CONTRACTOR until final payment.

ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

Add a new paragraph immediately after paragraph 15.02.A.4 that is to read as follows:

- 15.02.A.5 CONTRACTOR has filed a bankruptcy petition and if neither CONTRACTOR nor trustee has either assumed or rejected this Contract within 30 days after the filing of the bankruptcy petition.

SC-15.03.A.4 OWNER May Terminate for Convenience

Amend Section 15.03.A.4 by deleting "reasonable" and inserting "actual".

ARTICLE 16 – DISPUTE RESOLUTION

SC-16.01 Methods and Procedures

Delete paragraph 16.01.B.

Add 16.01.B. There shall be no requirement that any disputes and/or claims on this project, and or contract documents be mediated, facilitated or arbitrated prior to filing suit or legal action. OWNER and CONTRACTOR may participate in the mediation process only by the mutual written agreement signed by all parties. OWNER and CONTRACTOR may agree to binding arbitration, only upon a signed written agreement for arbitration between OWNER and CONTRACTOR which may be terminated without recourse at any time by the OWNER so long as the termination is prior to an award being issued by Arbitrator.

Delete paragraph 16.01.C.3.

Add 16.01.C.3. "gives written notice to the other party of their intent to submit the Claim. All claims must be submitted to the Leelanau County Circuit Court, State of Michigan unless otherwise agreed to in a signed written agreement between the parties."

Add the following new paragraph immediately after paragraph 16.01.C.3. to read as follows:

- a. **ATTORNEY FEES:** The prevailing party in the legal action, law suit, binding mediation and/or binding arbitration, shall be compensated for all claims, costs, losses, actual attorney fees and damages (including but not limited to all actual fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration, mediation, facilitation or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others.

ARTICLE 17 – MISCELLANEOUS

Add a new paragraph immediately after 17.06 that is to read as follows:

17.07. **CONTRACTOR** shall maintain records in accordance with those required by the **ENGINEER** and the contract documents.

17.08. **CONTRACTOR** will provide timely written notification to **OWNER**, **ENGINEER** and onsite staff as it relates to site problems encountered and correction notifications that are submitted, if noticed by **CONTRACTOR** during an inspection and work by **CONTRACTOR** and comply with all notice and related requirements of the Contract Documents.

17.09 **CONTRACTOR** shall notify in writing and coordinate with the **ENGINEER** and **OWNER** staff as it relates to violations of the local, state and federal laws, if noticed by **CONTRACTOR** during an inspection by **CONTRACTOR**.

17.10. **CONTRACTOR** shall make its records and staff available when **OWNER** receives State of Michigan audit request at the **CONTRACTOR**'s sole costs and expense.

17.11. **CONTRACTOR** shall provide prompt written notification to **OWNER** of any conflict regarding any past or current customer/client professional relationship with any contractors, sub-contractors, sub-subcontractors, vendors, suppliers, material men, professionals, engineers or other parties on the project.

17.12. **Assignment.** **CONTRACTOR** may not assign this Agreement or any of its duties, obligations, or rights hereunder without the prior written consent of the **OWNER** and any assignment without such consent shall be null and void and deemed a breach of the Agreement by **CONTRACTOR**.

17.13. **Non-Waiver.** Waiver by either party of any default or breach of any provision of this Agreement by the other party shall not be construed as a waiver of any subsequent default or breach.

17.14. **Governing Law and Venue.** This Agreement and all related contract documents and specifications shall be construed in accordance with, and its performance governed by, the laws of the State of Michigan and local ordinances of Leelanau County, without regard to any conflict of laws or choice of law provisions. Any and all court actions if any will be brought in the County of Leelanau, State of Michigan.

17.15. **Default:** In the event of a default by **CONTRACTOR** and legal actions are necessary to enforce the terms of this agreement, the **OWNER** shall be entitled to collect from any judgment, arbitration, mediation award or settlement sums due, plus actual attorneys' fees, court costs, expert costs, consultant costs, engineering costs, and other expenses incurred by the **OWNER** in connection therewith.

17.16. **Severability.** If any provision of this Agreement is held invalid, illegal, or unenforceable, the provision must be modified to reflect the fullest legal and enforceable expression of the intent of the parties, or if not possible, severed, and the remainder of this Agreement will remain in force.

17.17. **Indemnification.** The **CONTRACTOR** shall, at its own expense, protect, defend, indemnify and hold harmless the **OWNER**, its elected and appointed officers, employees, servants and agents from all claims, damages, costs, lawsuits and expenses including, but not limited to, costs from administrative proceedings, court costs, expert costs, consultant costs and actual attorney fees that they may incur as a result of any acts, omissions, unauthorized changes or negligence of the **CONTRACTOR**, its subcontractor, sub-subcontractor, or any of their officers, employees, servants or agents which may arise out of this agreement and/or construction of this project.

17.18. **Independent Review:** The independent review and inspection by **OWNER**, **OWNER**'s employees, agents, representatives or professionals shall not be a release or novation of any duties or responsibilities of the **CONTRACTOR**.

17.19. Non-Discrimination. The CONTRACTOR agrees not to discriminate against an individual with respect to providing services, hiring, tenure, terms, conditions or privileges of employment or with respect to a matter directly or indirectly related to this project solely on the basis of race, color, religion, national origin, age, sex, sexual orientation or disability. Breach of this covenant may be regarded as a material breach of the Agreement and a cause for termination.

17.20. The CONTRACTOR shall comply with the Drain Code of 1956 as amended of the Michigan Public Laws, the National Pollutant Discharge Elimination System (NPDES) permits, Consultant's standard practices in the industry and all other local, State and Federal Laws.

END OF SECTION

SECTION 00900

FORMS

The following forms are to be used during the project if needed:

- 00900.1 Notice of Award
- 00900.2 Work Change Directive
- 00900.3 Change Order
- 00900.4 Application for Payment
- 00900.5 Certificate of Substantial Completion
- 00900.6 Bulletin

END OF SECTION

SECTION 00900.1

NOTICE OF AWARD

Dated _____, _____

TO: _____
(Successful Bidder)

ADDRESS: _____

CONTRACT FOR South Bar Lake Drain Drainage District.

You are notified that your Bid dated _____, _____, for the above Contract has been considered. You are the apparent Successful Bidder and have been awarded a Contract for the South Bar Lake Drain Drainage District.

The Contract Price of your Contract is _____
_____ Dollars (\$_____)

A digital copy of the proposed Project Manual accompanies this Notice of Award.

You must comply with the following conditions precedent within 15 days of the date of this Notice of Award; that is, by _____, 20__.

1. You must deliver to the OWNER three fully executed counterparts of the Agreement included in the Project Manual. Each of the Agreements must bear your signature at the designated location.
 2. You must deliver with the executed Agreement the contract Security (Bonds) as specified in the Instructions to Bidders and Section 00700: General Conditions (paragraph 5.1) and Section 00800: Supplementary Conditions (paragraph SC-5.1.).
 3. You must also deliver with the executed Agreement the insurance documents specified in Article 5 of Section 00700: General Conditions and Article 5 of Section 00800: Supplementary Conditions.
 4. (List other conditions precedent).
- _____

Failure to comply with these conditions within the time specified will entitle OWNER to consider your bid abandoned, to annul this Notice of Award and to declare your Bid Security forfeited.

Within 10 days after you comply with those conditions, OWNER will return to you one fully signed counterpart of the Agreement included in the Project Manual.

Leelanau County Drain Commissioner
on behalf of the South Bar Lake Drain

By _____
(Authorized Signature)

*Typed or Printed in ink

Copy to ENGINEER

(*Name and Title)

ACCEPTANCE OF AWARD:

By: _____
(*Contractor)

(Authorized Signature)

(*Name and Title)

(*Date)

END OF SECTION

SECTION 00900.2

WORK CHANGE DIRECTIVE

No. _____

DATE OF ISSUANCE _____ EFFECTIVE DATE _____

OWNER Leelanau County Drain Commissioner

CONTRACTOR _____

Contract: _____

Project: South Bar Lake Drain

OWNER's Contract No. _____ ENGINEER's Project No. 2003339.00

You are directed to proceed promptly with the following change(s):

Description:

Purpose of Work Change Directive:

Attachments: (List documents supporting change)

If OWNER or CONTRACTOR believes that the above change has affected Contract Price, any Claim for a Change Order based thereon will involve one or more of the following methods as defined in the Contract Documents.

Method(s) of determining change in Contract Price:

- _____ Unit Prices
- _____ Lump Sum
- _____ Cost of the Work

Estimated increase (decrease) in Contract Price:

\$ _____
If the change involves an increase, the estimated amount is not to be exceeded without further authorization.

Estimated increase (decrease) in Contract Times:

Substantial Completion: _____ days.
Ready for final payment: _____ days.

RECOMMENDED:

ENGINEER

AUTHORIZED:

OWNER

By: _____

By: _____

END OF SECTION

SECTION 00900.3

CHANGE ORDER

No. 1

DATE OF ISSUANCE _____ EFFECTIVE DATE _____

OWNER Leelanau County Drain Commissioner
 CONTRACTOR _____
 Contract: _____
 Project: South Bar Lake Drain
 OWNER's Contract No. _____ ENGINEER's Contract No. 2003339.00
 ENGINEER GEI Consultants of Michigan P.C.

You are directed to make the following changes in the Contract Documents:
 Description:

Reason for Change Order:

Attachments: (List documents supporting change)

CHANGE IN CONTRACT PRICE:
Original Contract Price \$ _____
Net Increase (Decrease) from previous Change Orders No. ____ To: ____ \$ _____
Contract Price prior to this Change Order: \$ _____
Net increase (decrease) of this Change Order: \$ _____
Contract Price with all approved Change Orders: \$ _____

CHANGE IN CONTRACT TIMES:
Original Contract Times: Substantial Completion: _____ Ready for final payment _____ (days or dates)
Net change from previous Change Orders No. _____ To No: _____ Substantial Completion: _____ Ready for final payment: _____ (days)
Contract Times prior to this Change Order: Substantial Completion: _____ Ready for final payment: _____ (days or dates)
Net increase (decrease) this Change Order: Substantial Completion: _____ Ready for final payment: _____ (days)
Contract Times with all approved Change Orders: Substantial Completion: _____ Ready for final payment: _____ (days or dates)

RECOMMENDED: _____ APPROVED: _____ ACCEPTED: _____
 By: _____ By: _____ By: _____
 ENGINEER (Authorized Signature) OWNER (Authorized Signature) CONTRACTOR (Authorized Signature)

Date: _____ Date: _____ Date: _____

SECTION 00900.4

APPLICATION FOR PAYMENT

	ITEM DESCRIPTION	QUANTITY THIS ESTIMATE	UNIT	UNIT PRICE	COST THIS ESTIMATE	AUTHORIZED QUANTITY	CONTRACT COST	% COMPLETE
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
	TOTAL							

END OF SECTION

SECTION 00900.5

CERTIFICATE OF SUBSTANTIAL COMPLETION

The responsibilities between OWNER and CONTRACTOR for security, operation, safety, maintenance, heat, utilities, insurance, warranties and guarantees shall be as follows:

OWNER: _____

CONTRACTOR: _____

The following documents are attached to and made a part of this Certificate:

For items to be attached, see definition of Substantial Completion as supplemented and other specifically noted conditions precedent to achieving Substantial Completion as required by Contract Documents.

This certificate does not constitute an acceptance of Work not in accordance with the Contract Documents nor is it a release on CONTRACTOR's obligation to complete the work in accordance with the Contract Documents.

Executed by the ENGINEER on: _____
Date

ENGINEER

By: _____
(Authorized Signature)

CONTRACTOR accepts this Certificate of Substantial Completion on: _____
Date

CONTRACTOR

By: _____
(Authorized Signature)

OWNER accepts this Certificate of Substantial Completion on: _____
Date

OWNER

By: _____
(Authorized Signature)

END OF SECTION

SECTION 00900.6

BULLETIN

No. _____

PROJECT: South Bar Lake Drain Drainage District

DATE OF ISSUANCE: _____

OWNER:

Leelanau County Drain Commissioner, 8527 E. Government Center Dr., Suite #205, Suttons Bay, MI 49682
(Name, Address)

CONTRACTOR: _____

OWNER's Project No. _____

ENGINEER: GEI Consultants of Michigan P.C., Inc.

CONTRACT FOR: _____

ENGINEER's Project No. 2003339.00

This is not a Change Order to the Contract. We are requesting a quotation for possible work to be performed.

Description:

Purpose of Bulletin:

Attachments: (list documents supporting possible change)

CHANGE IN CONTRACT PRICE:

CHANGE IN CONTRACT TIME:

Net Increase (decrease) of this Bulletin:

Net Increase (decrease) of this Bulletin:

\$ _____

Day _____

PROPOSED:

By _____

CONTRACTOR

END OF SECTION

SECTION 00920

ADDENDUM

Leelanau County Drain Commissioner
8527 E. Government Center Dr., Suite #205
Suttons Bay, MI 49682

ADDENDUM NO. _____

DATE: _____

ENGINEER: GEI Consultants of Michigan, PC
401 South Washington Square, Suite 103
Lansing, MI 48933

Drawing Revision No: _____

Drawing Sheets Issued Herewith: _____

Bids Due: _____ Issued to all Plan Holders

This Addendum is part of the Contract Documents and modifies the previously issued Bidding Documents. Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may result in rejection of the Bid.

ITEM NO. 1

END OF SECTION

SECTION 00954

NOTICE TO PROCEED

DATED: _____

TO: _____

CONTRACT for: South Bar Lake Drain

You are notified that the Contract Time under the above Contract will commence to run on _____. By that date you are to start performing your obligations under the Contract Documents. In accordance with Article 3 of the Agreement the dates of Substantial Completion and ready for Final Payment are May 15th, 2024, and June 15th, 2024, respectively.

Also, before you may start any work at the Site, you must

(Add other requirements)

Leelanau County Drain Commissioner

By: _____
(Authorized Signature)

(*Name and Title)

*Typed or printed in ink
Copy to ENGINEER

END OF SECTION

SECTION 00958

AFFIDAVIT AND CONSENT OF SURETY

STATE OF MICHIGAN

COUNTY OF _____.

The undersigned CONTRACTOR, being duly sworn, deposes and says that he entered into an Agreement (Contract) with the Leelanau County Drain Commissioner (OWNER) on the _____ day of _____ 202_ for the performance of certain work generally described as follows: South Bar Lake Drain

CONTRACTOR further says that the Work under the terms of the Contract has been completed and all sums due to Contractors, Subcontractors, Suppliers and laborers with whom CONTRACTOR has contracted for performance under the Contract have been paid in full.

Furthermore, in consideration of final payment under the Contract, CONTRACTOR hereby waives and releases any and all claims or rights which CONTRACTOR may have in connection with the Contract against OWNER or the premises upon which the Contract Work was performed and agrees to indemnify OWNER against any and all such claims or rights which may above asserted by Contractors, Subcontractors, Suppliers or laborers with whom CONTRACTOR has contracted for performance under the Contract.

DATE: _____, 20____

Signed in the presence of:

CONTRACTOR Signature

Name*

Title*

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

Notary Public Signature

Notary Public Name:*

My commission expires: _____

County: _____

CONSENT OF SURETY

The undersigned as Surety on the Contract hereby consents to the making of final payment to the CONTRACTOR under the Contract.

Date _____, 20____

Surety Company*

Attorney-in-Fact (Signature)

Name and Title*

*Typed or printed in ink.
(Attach copy of power of attorney certified to date of consent.)

END OF SECTION

SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS:

- A. The Work covered by Contract Documents comprises construction of the South Bar Lake Drain for the Leelanau County Drain Commissioner, OWNER.
- B. The Work includes, but is not limited to, the major items listed in Section 00314: Bid.

1.02 TYPE OF CONTRACT:

- A. Construct the Work of this Contract under a single unit price contract.

1.03 GENERAL:

- A. Imperative language:
 - 1. These Specifications (Divisions 1 through 16) are written in the imperative and abbreviated form. This imperative language of the technical specifications is directed at CONTRACTOR unless specifically noted otherwise. Incomplete sentences shall be completed by inserting “shall”, “shall be” and similar mandatory phrases by inference in the same manner as they are applied to notes on Drawings. The words “shall”, “shall be” and similar mandatory phrases shall be supplied by inference where a colon (:) is used within sentences or phrases. Except as worded to the contrary, fulfill (perform) all indicated requirements whether stated in the imperative or otherwise.
- B. Related Sections:
 - 1. Some Sections of these Specifications (Divisions 1 through 16) may include a paragraph titled “Related Sections”. This paragraph is an aid to the project Manual user and is not intended to include all Sections which may be related. It is CONTRACTOR’s obligation to coordinate all Sections whether indicated under “Related Sections” or not.
- C. Reference to Section 00700: General Conditions:
 - 1. In Divisions 1 through 16, a reference to Section 00700: General Conditions includes by inference all amendments or supplements in Section 00800: Supplementary Conditions.
- D. Substantial Completion refers to the installation of all proposed storm sewer and HMA paving of Lake Michigan Drive.

1.04 CONTRACTOR USE OF PREMISES:

- A. Limit use of premises to allow for public access.
- B. Coordinate use of premises under direction of ENGINEER.
- C. Except in connection with the safety or protection of persons or the Work or property at the Site or adjacent thereto, all Work at the Site shall be restricted to the following hours.
 - 1. Monday through Friday (except legal holidays): 7:00 a.m. to 7:00 p.m.
 - 2. Saturday, Sundays or legal holidays with written approval of OWNER.
- D. Private easements:
 - 1. OWNER will arrange for the necessary easements required for construction across privately owned land. CONTRACTOR shall carry on the construction in such a manner as to cause a minimum of inconvenience to the occupants of the properties.
 - 2. OWNER has obtained restricted easement agreements in some locations. CONTRACTOR shall conduct CONTRACTOR’s operations on easements in such a manner as to comply with the conditions set forth in said easement agreements, which are on file with the OWNER. All easement conditions noted shall be accomplished by CONTRACTOR and shall be included in the Contract Price. CONTRACTOR shall limit CONTRACTOR’s operations to the time of year or time of week required on certain easements, as noted in the Contract Documents.

3. Any agreement made by CONTRACTOR with any property owner that extends the rights as granted under an easement obtained by OWNER or that provides for an additional easement shall be obtained by CONTRACTOR at CONTRACTOR's expense and shall in no way be binding upon OWNER. CONTRACTOR shall defend and hold OWNER and ENGINEER harmless against any action that may arise from activities conducted pursuant to such additional agreements or easements. Unless relieved of responsibility for surface restoration in writing by property owner, CONTRACTOR shall restore areas covered by separate agreements substantially the same as similar areas within the Project.

1.05 OCCUPANCY REQUIREMENTS:

- A. OWNER occupancy during construction:
 1. Access to abutting properties: Provide at all times.
 2. Access for emergency vehicles:
 - a. Provide at all times.
 - b. Provide at least one clear lane during nonwork periods.
 3. Fire hydrants: Provide access to at all times.
 4. Do not block fire access routes.
 5. Detours and street closure: When provided for in the Contract Documents or approved by ENGINEER. Routes and barricades as indicated or as approved by road authority.
 6. Do not block areas for snow removal.
 7. Limit parking for construction vehicles to an area designated by OWNER.
 8. Maintain access to all properties or condo units at all times.

PART 2 - PRODUCTS

2.01 OTHER MATERIALS:

- A. General:
 1. All other materials which are not specified herein and are not indicated on the Drawings, but are required for proper and complete performance of the Work.
- B. Procedure:
 1. Select new, first quality materials.
 2. Obtain ENGINEER's review.
 3. Provide and install.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01012

STAKING AND INSPECTION SERVICES

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section includes:
 - 1. This Section includes, but is not necessarily limited to, staking and inspection services to be provided by ENGINEER and others as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.
 - 2. Related Sections:
 - a. Documents affecting work of this Section include but are not necessarily limited to:
 - i. General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

1.02 PROJECT LAYOUT:

- A. Responsibilities:
 - 1. ENGINEER will furnish stakes as follows:
 - a. For wastewater and storm sewers, line and grade stakes:
 - i. At manhole.
 - ii. At 50, 100, 200 and 300 feet upstream from manholes.
 - iii. At mid-point between manholes.
 - b. For water mains and pumping mains, line stakes:
 - i. At intervals of approximately 300 feet.
 - ii. At other locations generally required to aid the construction.
 - iii. Grades will be established at critical locations only.
 - c. For street, line and grade stakes:
 - i. At intervals of 50 feet.
 - ii. At all P.I., P.C. and side street centerlines.
 - iii. As needed at critical locations.
 - 2. Provide ENGINEER 2 working days' notice to schedule staking.
- B. Expense:
 - 1. Staking described above will be authorized by and paid for by OWNER.
 - 2. Restaking or staking in excess of that described above will be at the expense of CONTRACTOR.

1.03 CONSTRUCTION INSPECTION:

- A. By GEI of Michigan, P.C.:
 - 1. Resident Project Representatives: In accordance with Section 00700: General Conditions.
 - 2. Expense:
 - a. Paid by OWNER with amounts for additional inspection costs deducted from payment or payments to CONTRACTOR in accordance with Section 01700: Contract Closeout.
- B. By OWNER:
 - 1. Periodic site visits, soil erosion control, NPDES compliance.
 - 2. Expense: By OWNER.
- C. By Leelanau County Road Commission:
 - 1. Periodic site visits.
 - 2. Expense: By Leelanau County Road Commission.
- D. Material testing:
 - 1. As determined by ENGINEER.
 - 2. In accordance with Sections 01410 and 02222.
 - 3. Expense: By OWNER. CONTRACTOR will be responsible for the cost of retesting materials that do not comply with Specifications.
- E. By Michigan Department of Environment, Great Lakes, and Energy (EGLE):
 - 1. Periodic site visits.
 - 2. Expense: By EGLE.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01028

MEASUREMENT AND PAYMENT - UNIT PRICE WORK

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section includes:
 - 1. This Section includes, but is not necessarily limited to, descriptions of the method of measurement and the basis of payment for Unit Price Work under this Contract as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.
- B. Related Sections:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to:
 - a. General Conditions, Supplementary Conditions and Sections in Division I of these Specifications.
- C. Basis of Contract payments:
 - 1. Final Contract Price shall be determined by actual quantities installed at unit prices stated in CONTRACTOR's Bid.
 - 2. ENGINEER shall determine actual as-built quantities.
 - 3. All work not included as a Bid item shall be considered incidental to construction.
 - 4. Unit price payments for individual items shall include everything necessary for such item to function as intended in the system.
 - 5. OWNER reserves the right to increase, decrease or eliminate any quantities for items listed in CONTRACTOR's Bid or which become a part of the Contract Documents.
- D. Items included as incidental to unit prices for systems and appurtenances:
 - 1. The unit price payment for all underground systems and appurtenance items shall include, but not be limited to:
 - a. Clearing, excavating, trenching, bedding, trench backfill, disposal of items for clearing and unsuitable or excess excavated materials.
 - b. Drainage and dewatering of excavation.
 - c. Temporary sheeting, bracing and shoring of excavations.
 - d. Support, relocation, replacement, connection or reconnection of existing pipelines and utilities.
 - e. Cleaning flushing, chlorinating and testing.
 - f. Cleanup and surface restoration.
 - g. Appurtenances except such items which are included as Bid items.
 - h. Jacking pits, casing pipes, tunnel liners or similar protective methods.
 - 2. Unit of Measure: Each.

1.02 STORM SEWER SYSTEM INSTALLED BY OPEN CUT:

- A. Items No. 1 – 8-inch AWWA C151 Ductile Iron Pipe, Bypass Line
 - 1. Includes: Force Main and fittings in accordance with Section 15012: Ductile Iron Piping and Section 02222: Excavating, Back filling, and Compacting for Utilities. Also includes all excavation, spoil removal and disposal, dewatering, dewatering discharge end treatment, utility investigation for any crossings prior to installation, temporary capping of pipe, and connection to any structures or pipes, including any adapters or fittings as noted on the Drawings.
 - 2. Unit of Measure: Linear feet of force main, including fittings, as measured from the fitting to the water feature connection.
- B. Items No. 2 – 60-inch x 36-inch RCP Box Culvert
 - 1. Includes: All labor, tools, equipment, and materials necessary to properly install this item of construction in accordance with the Contract Documents, standard details, as specified herein, and at the locations shown on the Drawings or at a location identified in the field by the Engineer and shall include but is not limited to: incidental tree removal, utility

investigation, excavation, spoil removal and disposal, clearing, restoration, dewatering, bedding, sub-base, backfill to specific trench detail, specific trenching detail or requirements, connection of all existing storm sewers noted on the Drawings, removal of existing storm sewer if the existing sewer is within the same excavation/installation trench as the new storm sewer, compaction, natural bottom installation, and all incidental items needed for proper installation as per manufacturers specifications and instructions. Also includes storm sewer in accordance with Section 02720: Storm Sewer System.

2. Unit of Measure: Linear feet

1.03 STORM SEWER SYSTEM APPURTENANCES:

- A. Item No. 3 & 4 – 60-inch x 36-inch RCP Box Culvert Manhole Tee, 60-inch x 36-inch RCP Box Culvert Tapered End Section
 1. Includes: All labor, tools, equipment, and materials necessary to properly install this item of construction in accordance with the Contract Documents, standard details, as specified herein, and at the locations shown on the Drawings or at a location identified in the field by the Engineer and shall include but is not limited to: utility investigation, excavation, spoil removal and disposal, clearing, restoration, dewatering, bedding, backfill to specific trench detail, removal of existing storm sewer if the existing sewer is within the same excavation/installation trench as the new storm sewer, compaction, installation of natural bottom, connection to box culvert, connection plates and bolts, non-shrink grout, footing, geotextile fabric and all incidental items needed for proper installation as per manufacturers specifications and instructions. Also includes storm sewer in accordance with Section 02720: Storm Sewer System.
 2. Unit of Measure: Each.

1.04 SURFACE RESTORATION/PAVING:

- A. Item No. 5 – Lake Michigan Drive 3.5” Hot Mix Asphalt (HMA) Road Restoration, 4E1
 1. Includes the following in accordance with Section 02510: Asphalt Paving:
 - a. Sawcutting at pavement limits
 - b. Removal of existing pavement and subgrade
 - c. Compaction of existing subbase. Subbase to be tested for compaction.
 - d. Maintenance & any necessary repairs for sub-base completion to base course
 - e. Temporary 21AA aggregate to bring trench to grade at end of workday, and removal as needed for traffic control before base paving work.
 - f. 6-Inch MDOT 21AA aggregate base, CIP
 - g. Performance grade: PG 58-28
 - h. 2-inch lift 220 lbs/syd MDOT HMA 4E1 Base course
 - i. 1.5-inch lift 165 lbs/syd MDOT HMA 4E1 Wearing course
 - i. Bond coat between lifts and between HMA curb, if needed
 - k. Sweeping
 - l. Cleanup
 2. Unit of Measure: Square Yard.
- B. Item No. 6 – HMA Spillway
 1. Includes: All labor, tools, equipment, and materials necessary to properly install this item of construction in accordance with the Contract Documents, standard details, as specified herein, and at the locations shown on the Drawings or at a location identified in the field by the Engineer and shall include but is not limited to the following in accordance with Section 02210: Grading, Section 02230: Base courses, Section 02510: Asphalt Paving and Details as indicated on the Drawings:
 - a. Sawcutting at pavement limits.
 - b. Removal of existing pavement and subgrade
 - c. Compaction of existing subbase. Subbase to be tested for compaction.
 - d. Maintenance & any necessary repairs for sub-base completion to base course
 - e. 4-Inch MDOT 21AA aggregate base, CIP
 - f. Performance Grade: PG 58-28
 - g. One 3-Inch Lift 330 lbs/syd MDOT HMA 4E1 Course
 - h. Bond coat between lifts and between HMA curb, if needed.

- i. Adjustment of all existing utility covers, structures, valves, manholes or inspection points and setting to new final grade of utility cover.
 - j. Sweeping.
 - k. Cleanup.
 2. Unit of Measure: Square Yard.
- C.
- D. Item No. 7 – HMA Valley Gutter Curb
 1. Includes: All labor, tools, equipment, and materials necessary to properly install this item of construction in accordance with the Contract Documents, standard details, as specified herein, and at the locations shown on the Drawings or at a location identified in the field by the Engineer and shall include but is not limited to: sawcutting at removal limits, removal of existing curb, excavation of existing subgrade material, subgrade preparation, granular or aggregate base, all work to match existing curb type and all incidental items needed for proper installation as per manufacturers specifications and instructions. All work in accordance with Section 02510: Asphalt Paving and per appropriate detail on the Drawings.
 2. Unit of Measure: Linear Feet measured along gutter line.
- E. Item No. 8 – Flexamat 10NW Underlayment
 1. Includes the following in accordance with Section 02210: Grading and Details as indicated on the Drawings:
 - a. Excavating, spoil removal & disposal, grading, shaping, and compacting material. Subgrade to be smooth and free of rocks, roots, debris, or other protrusions that could prevent intimate contact between the block and subgrade.
 - b. Furnishing and installing Flexamat 10NW underlayment according to the plans and manufacturer’s details.
 - c. Adjustment of all existing utility covers, structures, valves, manholes or inspection points and setting to new final grade of utility cover.
 2. Unit of measure: Square yard.
- F. Item No. 9 – Plain Riprap over Geotextile Fabric
 1. Includes: All labor, tools, equipment, and materials necessary to properly install this item of construction in accordance with the Contract Documents, standard details, as specified herein, and at the locations shown on the Drawings or at a location identified in the field by the Engineer and shall include but is not limited: all specific grading and shaping required for the area and per the appropriate details or location as indicated on the Drawings, installation of cobblestone or field stone riprap, or as equal, as well as nonwoven geotextile fabric underneath all areas of applied riprap in accordance with Section 02271: Riprap and per the Drawings, repair of any washouts or erosion prior to final payment and all incidental items needed for proper installation as per manufacturers specifications and instructions.
 2. Unit of Measure: Square Yard.
- G. Item No. 10 – Heavy Riprap over Geotextile Fabric
 1. Includes: All labor, tools, equipment, and materials necessary to properly install this item of construction in accordance with the Contract Documents, standard details, as specified herein, and at the locations shown on the Drawings or at a location identified in the field by the Engineer and shall include but is not limited: all specific grading and shaping required for the area and per the appropriate details or location as indicated on the Drawings, installation of cobblestone or field stone riprap, or as equal, as well as nonwoven geotextile fabric underneath all areas of applied riprap in accordance with Section 02271: Riprap and per the Drawings, repair of any washouts or erosion prior to final payment and all incidental items needed for proper installation as per manufacturers specifications and instructions.
 2. Unit of Measure: Square Yard.
- H. Item No. 11 – Dune Grass Plantings
 1. Includes: All labor, tools, equipment, and materials necessary to properly install this item of construction in accordance with the Contract Documents, standard details, as specified herein, and at the locations shown on the Drawings or at a location identified in the field by the Engineer in accordance with Section 02930, Lawns and Grass. All work per the details on the Drawings and in accordance with Section 02920 - Soil Preparation and Section 02936: Seeding. Also includes watering as may be necessary to maintain the viability,

growth and establishment of the specific seed and repair of any washouts or rutting in material through uniform grass establishment.

2. Unit of Measure: Each.

1.05 EARTHWORK:

A. Item No. 12 – Dune Reestablishment

1. Includes:
 - a. Locating any nearby potentially impacted utilities.
 - b. Furnishing native dune sand, placing, and grading per the appropriate details and typical cross sections on the Drawings.
 - c. Maintenance until final completion, including repair of washouts and re-prepping or re-seeding bare areas.
 - d. Adjustment of all existing utility covers, structures, valves, manholes or inspection points and setting to new final grade of utility cover.
2. Unit of Measure: Lump Sum.

1.06 REMOVALS AND ADJUSTMENTS:

A. Items No. 13 – Tree Rem, (6-12”)

1. Includes: All labor, tools, equipment, and materials necessary to properly complete this item of construction in accordance with the Contract Documents, standard details, as specified herein, and at the locations shown on the Drawings or at a location identified in the field by the Engineer and shall include but is not limited: Removal and disposal of trees, stumps and all woody material from trees off-site by Contractor or stacked neatly as detailed on the Drawings and all incidental items needed for proper completion of this item as per Drawings.
2. Unit of Measure: Each based upon measurement of diameter at breast height, if a tree is split at the trunk at breast height than the tree will be measured by the addition of the individual trunks summed together.

1.07 SOIL EROSION AND SEDIMENTATION CONTROL

A. Item No. 14 – Temporary Steel Sheet Piling

1. Includes: All equipment, materials, and labor necessary to install and maintain temporary steel sheeting to facilitate construction of the storm sewer as shown on the Drawings. Also includes removal of steel sheet piling upon completion of use, unless where noted on the Drawings or directed by the ENGINEER to be left in place.
2. Unit of measure: Linear feet.

B. Item No. 15 – SESC, Silt Fence

1. Includes: Silt fence as indicated on the Drawings or marked by ENGINEER in accordance with Section 02272: Soil Erosion and Sedimentation Control and per the appropriate detail(s) and notes on the Drawings. Also includes maintenance and removal upon final site stabilization.
2. Unit of measure: Linear Feet.

C. Item No. 16 – SESC, Type 1 Turbidity Curtain

1. Includes: Turbidity curtain as indicated on the Drawings or marked by ENGINEER in accordance with Section 02272: Soil Erosion and Sedimentation Control and per the appropriate detail(s) and notes on the Drawings. Also includes maintenance and removal upon final site stabilization.
2. Unit of measure: Linear Feet.

D. Item No. 17 – SESC, Maintenance, Monitoring and Minor Devices

1. Includes: All equipment, materials, and labor necessary to comply with the SESC requirements in Section 02272: Soil Erosion and Sedimentation Control, APA Manual, the Notes and Details on the Drawings and Part 91 of Act 451 of 1994. This includes but is not limited to dust control, temporary vegetative covers, any infiltration basin protective inlets according to detail, monitoring and maintenance of all devices as identified on the plans or

- as directed by the ENGINEER or APA, all modifications to devices necessary due to site conditions, and removal of all temporary devices upon final site stabilization.
2. Unit of measure: Lump Sum, paid as a percentage as work progresses.

1.08 MISCELLANEOUS AND CONTINGENCY ITEMS:

- A. Item No. 18 – Lake Outlet Control Plate
 1. Includes: All labor, tools, equipment, and materials necessary to furnish and install a lake outlet control plate as detailed on the Drawings.
 2. Unit of Measure: Lump Sum.
- B. Item No. 19 – Bypass Dewatering
 1. Includes: All labor, tools, equipment, fuel, and material necessary to provide safe working conditions to complete various items of work on the project and to maintain existing drainage of South Bar Lake. Bypass dewatering is necessary while any construction on the South Bar Lake outlet culvert is taking place and there needs to be bypass pumping to maintain existing site and upstream drainage. Includes but is not limited to bypass pumps, well systems, deep well systems, trench dewatering, any dewatering and discharge in accordance with Section 02206 – Dewatering.
 2. Unit of measure: Lump sum.
- C. Item No. 20 – Mobilization
 1. Includes: All mobilization of material and equipment to the site. Also includes all general overhead and project management items from bid acceptance to beginning of construction, including all bonding and insurance costs. Also includes furnishing and maintenance of onsite port-a-john throughout the duration of construction.
 2. Unit of measure: Lump Sum.
- D. Item No. 21 – Traffic Control
 1. Includes: Signing, lighting, barrels, cones, maintaining traffic and adjacent parking areas.. Includes all other requirements of any road agency for the material haul off and to maintain private drives or access drives and to maintain traffic in accordance with Section 01570: Traffic Regulation. Includes all existing/temporary sign relocation and restoration and temporary mailbox station or mailbox locations during construction and restoration of mailboxes after construction work to appropriate detail on the Drawings. Also includes the CONTRACTOR either maintaining access for trash and recycling collection or pulling bins to a common location each week (depending on pick up day for the area) to be collected until at least the base course of HMA is on the streets for the impacted properties with trash or recycling collection. Includes signage for any road closures or partial road closures (public or private) and all incidental items needed for proper completion including all labor, tools, equipment, and materials necessary. Also includes signing of ROW Permit Application and listing the LCRC as an additional insured on all insurance certificates and binders and also includes paying the \$200 ROW Permit Application fee to the LCRC.
 2. Unit of Measure: Lump Sum, paid based upon overall performance and completion of overall contract work.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01035

MODIFICATION PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY:

A. Section includes:

1. This Section includes, but is not necessarily limited to, procedures for modifying the Contract Documents, as herein specified and as necessary for the proper and complete performance of the Work.
2. Procedures for the following documents are included:
 - a. Bulletin.
3. Procedures for the following documents shall be in accordance with Section 00700: General Conditions:
 - a. Field Order.
 - b. Work Change Directive.
 - c. Change Order.

B. Related Sections:

1. Documents affecting work of this Section include, but are not necessarily limited to:
 - a. General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

1.02 DEFINITIONS:

A. Bulletin:

1. A document regarding possible changes to the Contract Documents which is issued by ENGINEER for OWNER and requests add or deduct costs from CONTRACTOR.

1.03 BULLETIN:

A. Changes in cost:

1. Indicate add or deduct lump sum or unit price for each item.
2. Include:
 - a. Labor.
 - b. Material.
 - c. Overhead and profit.
 - d. All related work.
 - e. All trades and Subcontractors.
3. Provide a complete cost breakdown with supporting documentation.

B. Notification to ENGINEER:

1. Notify ENGINEER in writing if any of the listed items will cause a change in the Work for which a cost item is not provided in the Bulletin.

C. Submit:

1. Under provisions of Section 01300: Submittals.
2. Three copies.
3. To ENGINEER.
4. On or before due date noted.

D. OWNER: May issue one or more Change Orders for some or all items listed.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.01 SCHEDULES:

- A. Refer to Section 00900: Forms for the following forms:
 - 1. Bulletin.
 - 2. Work Change Directive.
 - 3. Change Order.

END OF SECTION

SECTION 01200

MEETINGS

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section includes:
 - 1. This Section includes all scheduling and administering of preconstruction and progress meetings as herein specified and as necessary for the proper and complete performance of the Work.
- B. Related Sections:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to:
 - a. General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.
- C. Scheduling and administration of meetings:
 - 1. Responsibility:
 - a. Preconstruction meeting: ENGINEER.
 - b. Progress meetings: ENGINEER.
 - 2. Procedures:
 - a. Prepare agenda.
 - b. Distribute written notice and agendas of meetings 4 days in advance of the meeting date.
 - c. Make physical arrangements for the meetings.
 - d. Preside at meetings.
 - e. Record minutes and include significant proceedings and decisions.
 - f. Distribute copies of the minutes within 4 days after meetings to:
 - i. Participants.
 - ii. Others affected by proceedings.

1.02 PRECONSTRUCTION MEETING:

- A. Schedule:
 - 1. Preconstruction meeting will be scheduled by ENGINEER:
 - a. Within 20 days after the Effective Date of Agreement.
 - b. Before starting the Work at the Site.
- B. Attendance:
 - 1. Representatives of the following parties are to be in attendance at the meeting:
 - a. OWNER.
 - b. ENGINEER.
 - c. CONTRACTOR.
 - d. Major subcontractors.
 - e. Governmental or regulatory agencies when appropriate.
 - f. Utility companies.

1.03 PROGRESS MEETINGS:

- A. Types of progress meetings:
 - 1. Regular.
 - 2. Called.
- B. Schedule meetings as follows unless otherwise approved by ENGINEER:
 - 1. Regular: Biweekly until informed by ENGINEER of a variation in the schedule.
 - 2. Called: As the progress of the Work dictates.
 - 3. Preinstallation: At least 5 working days prior to start of installation.
- C. Location:
 - 1. Hold meetings on-site or as indicated in the notice.
- D. Attendance:

1. Representatives of the following parties are to be in attendance at the meeting:
 - a. ENGINEER.
 - b. CONTRACTOR.
 - c. Major subcontractors as pertinent to the agenda.
 - d. OWNER's representative as appropriate.
 - e. Governmental or other regulatory agencies as appropriate.

- E. Minimum agenda:
 1. The minimum agenda for progress meetings shall consist of the following:
 - a. Review and approve minutes of previous meetings.
 - b. Review progress of the Work since the previous meeting.
 - c. Note field observations, problems and decisions.
 - d. Identify problems which impede planned progress.
 - e. Review off-site fabrication problems.
 - f. Develop corrective measures and procedures to regain plan schedule.
 - g. Revise construction schedule as indicated.
 - h. Review submittal schedules; expedite as required to maintain schedule.
 - i. Maintenance of quality and work standards.
 - j. Review changes proposed by OWNER for their effect on the construction schedule and completion date.
 - k. Identify all claims and potential claims.
 - l. Pending changes and substitutions.
 - m. Complete other current business.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section includes: This Section includes, but not necessarily limited to, the submittal of Shop Drawings. Samples and other information as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.
- B. Related Sections:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to:
 - a. General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.
 - b. Individual submittals required: Pertinent Sections of these Specifications.

PART 2 - PRODUCTS

2.01 SUBMITTALS REQUIRING ENGINEER'S REVIEW AND RETURN:

- A. Drawings:
 - 1. Scale required: Unless otherwise specifically directed by ENGINEER, make all drawings accurately to a scale sufficiently large to indicate all pertinent features of the item and its method of connection to the Work.
 - 2. Type and number of prints required:
 - a. Submit the number of copies which are required to be returned plus 4.
- B. Manufacturer's literature and product data:
 - 1. General: Where content of submitted literature from Manufacturers includes data not pertinent to this submittal, clearly indicate which portion of the contents is being submitted for ENGINEER's review.
 - 2. Number of copies required: Submit the number of copies which are required to be returned plus 4.
- C. Calculations:
 - 1. Performance type design calculations: Shall be prepared and sealed by a Professional Engineer licensed in the state where the project is being constructed.
 - 2. Number of copies required: Submit the number of copies which are required to be returned plus 4.
- D. Samples:
 - 1. General:
 - a. Samples:
 - i. Illustrate materials, equipment and workmanship.
 - ii. Establish standards by which completed work is judged.
 - 2. Accuracy of Sample: Unless otherwise specifically directed by ENGINEER, all Samples shall be of the precise articles proposed to be furnished.
 - 3. Number of Samples required: Submit all Samples in the quantity which is required to be returned plus 1.
- E. Colors and patterns: Unless the precise color and pattern is specifically described in the Contract Documents, whenever a choice of color or pattern is available in a specified Product, submit accurate color charts and pattern charts to ENGINEER for review and selection.
- F. Manuals :
 - 1. General:
 - a. Where manuals are required to be submitted covering items included in this Work, prepare all such manuals in durable plastic binders approximately 8 ½ inches x 11 inches in size and with at least the following:
 - i. Identification on, or readable through, the front cover stating general nature of the manual.

- ii. Neatly typewritten index near the front of the manual.
 - iii. Complete instructions regarding operation and maintenance of all equipment involved.
 - iv. Complete nomenclature of all replaceable parts, their part numbers, current costs and name and address of nearest vendor of parts.
 - v. Copies of all guarantees and warranties issued.
 - vi. Copies of the reviewed drawings.
 - vii. Copies of all data concerning all changes made during construction.
2. Extraneous Data: Where contents of the manuals include Manufacturer's catalog pages. Clearly indicate the precise items included in this installation and delete or otherwise clearly indicate all Manufacturer's data with which this installation is not concerned.
 3. Number of copies required: Unless otherwise specifically directed by ENGINEER or stipulated in the pertinent Section of these Specifications. Deliver 4 copies of the manual to ENGINEER.

2.02 SUBMITTALS NOT REQUIRING ENGINEER'S RETURN:

- A. General:
 1. Including, but not necessarily limited to:
 - a. Test Reports.
 - b. Certifications and affidavits.
 - c. Installation instructions.
 2. Number required: Submit 4 copies.

PART 3 - EXECUTION

3.01 SCHEDULE OF SUBMITTALS:

- A. Preparation and submittal of a schedule of submittals:
 1. Prepare and submit a schedule of submittals as required by Section 00700: General Conditions.
 2. The schedule of submittals shall include the following:
 - a. Shop Drawings.
 - b. Manufacturer's literature and product data.
 - c. Samples.
 - d. Colors and patterns.
 - e. Manuals.
 - f. Other submittals required by the Contract Documents.
 3. Allow at least 15 full working days for ENGINEER's review following ENGINEER's receipt of the submittal unless ENGINEER has agreed to a shorter period for specific submittals.
 4. Schedule submittals, except operation and maintenance manuals, far enough in advance of scheduled dates for installation to provide all required time for reviews for securing necessary approvals for possible revision and resubmittal, and for placing orders and securing delivery.
 5. Schedule submittal of operation and maintenance manuals at least 60 days prior to system Substantial Completion unless otherwise specified.
- B. Make all submittals in accordance with the schedule of submittals.
- C. Be responsible for costs of delays caused by tardiness of submittals.

3.02 COORDINATION OF SUBMITTALS:

- A. General:
 1. Prior to submittals for ENGINEER's review. Use all means necessary to fully coordinate all material including the following procedures.
 - a. Determine and verify all field dimensions and conditions, catalog numbers and similar data.
 - b. Coordinate as required with all trades and all public involved.
 - c. Secure all necessary approvals from public agencies and others; signify by stamp or other means that all required approvals have been obtained.
 - d. Clearly indicate all deviations from the Contract Documents.

- B. Grouping of submittals:
 - 1. Unless otherwise specifically permitted by ENGINEER, make all submittals in groups containing all associated items.
 - 2. ENGINEER may reject partial submittals as not complying with the provisions of the Contract Documents.

3.03 IDENTIFICATION OF SUBMITTALS:

- A. General:
 - 1. Consecutively number all submittals.
 - 2. Accompany each submittal with a letter of transmittal showing the following:
 - a. Project title and number.
 - b. OWNER.
 - c. Subcontractor.
 - d. Date of submittal.
 - e. Specification Section or Drawing number to which the submittal pertains.
 - f. Brief description of the material submitted.
 - g. Submittal identification number.
 - 3. Mark each submittal with:
 - a. Company name of the originator of the submittal.
 - b. Deviations from Contract Documents.
 - c. CONTRACTOR's approval of the submittal.
 - d. Submittal identification number adjacent to CONTRACTOR's approval.
- B. Resubmittal:
 - 1. When material is resubmitted for any reason, transmit under a new letter of transmittal with a suffix added to the original submittal identification number.
 - 2. Indicate that this is a resubmittal and refer to the previous submittal.
- C. Submittal Log:
 - 1. Maintain an accurate submittal log for the duration of the construction period showing the status of all submittals of all types.
 - 2. Make the log available to ENGINEER for review upon request.

3.04 RETURN OF SUBMITTALS:

- A. Submittals requiring ENGINEER review and return:
 - 1. With status: "Rejected. Resubmit":
 - a. Drawings: ENGINEER will retain 1 copy and return the rejected copies to CONTRACTOR.
 - b. Manufacturer's literature and product data: ENGINEER will retain 1 copy and return remaining copies to CONTRACTOR.
 - c. Other submittals: ENGINEER will notify CONTRACTOR of rejection.
 - 2. With status: "Reviewed. No Exceptions Taken" and "Reviewed w/Corrections Noted":
 - a. Drawings: ENGINEER will retain 4 copies and return the remaining copies to CONTRACTOR.
 - b. Manufacturer's literature and product data: ENGINEER will retain 4 copies and return the remaining copies to CONTRACTOR.
 - c. Samples: ENGINEER will retain 1 Sample and return the remaining Samples to CONTRACTOR.
 - d. Colors: ENGINEER will retain color charts and pattern charts and will indicate color and pattern choices to CONTRACTOR.
- B. Submittals not requiring ENGINEER return: No copies will be returned.

3.05 RESUBMISSION REQUIREMENTS:

- A. Drawings:
 - 1. Revise initial drawings as required and resubmit as specified for initial submittal.
 - 2. Indicate on drawings all changes which have been made other than those requested by ENGINEER.
 - 3. If the same drawings are submitted with additional data and revisions, clearly identify the added data and revisions on the drawings.
- B. Other submittals: Submit as required for initial submittal.

3.06 RE-REVIEW COST:

- A. Should ENGINEER be required to review a submittal more than twice because of failure of the submittal to meet the requirements of the Contract Documents, ENGINEER will record ENGINEER's expenses for performing all additional reviews. The OWNER will compensate ENGINEER for these additional services and deduct the amount paid from payments to CONTRACTOR.

END OF SECTION

SECTION 01310

CONSTRUCTION PROGRESS SCHEDULES

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section includes:
 - 1. This Section includes, but is not necessarily limited to, the preparation, furnishing, distribution and periodic revision of construction progress schedules as herein specified and as necessary for the proper and complete performance of the Work.
- B. Related Sections:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to:
 - a. General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

PART 2 - PRODUCTS

2.01 FORM OF SCHEDULE:

- A. Preparation:
 - 1. Prepare in the form of a horizontal bar chart, CPM network, or other form as previously approved by the ENGINEER.
 - 2. Provide a separate horizontal bar column or part for each trade or operation.
 - 3. Prepare the schedule in the chronological order of the beginning of each item of work.
 - 4. Identify each column or path by:
 - a. Major Specification Section number.
 - b. Distinct graphic delineation.
 - 5. Use a horizontal time scale and identify the first work day of each week.
 - 6. Allow space for updating.
- B. Size:
 - 1. The schedule sheets shall be 11 inches x 17 inches unless otherwise approved by ENGINEER.

2.02 CONTENT OF SCHEDULES:

- A. Construction sequence:
 - 1. Provide a complete sequence of construction by activity (identifying work of separate stages) and (milestones).
 - 2. For Shop Drawing, project data and Samples indicate the following:
 - a. Submittal dates.
 - b. Dates review copies will be required.
 - 3. Show decision dates for selection of finishes.
 - 4. Show Product procurement and delivery dates (including those furnished by OWNER or under Allowances).
 - 5. Show dates for beginning and completion of each element of construction.
- B. Percentage completion:
 - 1. Show the projected percentage of completion for each item of work as of the first day of each month.
- C. Subschedules:
 - 1. Provide separate subschedules showing submittals, review times, procurement schedules and delivery days.
 - 2. Provide subschedules to define critical porportions of the entire schedule.

PART 3 - EXECUTION

3.01 SUBMITTALS:

- A. Preliminary schedule:
 - 1. Submit the preliminary schedule within 10 days after the Effective Date of Agreement.
 - 2. ENGINEER will review schedules and will return the reviewed copy within 15 days after receipt.
 - 3. If required, resubmit within 7 days after receipt of a returned review copy.
 - 4. Meet with ENGINEER at least 10 days prior to the submission of the first Application for Payment to review the Schedule.
- B. Periodic adjustment:
 - 1. Monthly, submit a revised schedule accurately depicting adjustments and progress to the first day of each month.
- C. Number of copies:
 - 1. Submit the number of copies required by the CONTRACTOR, plus 4 copies to be retained by ENGINEER.

3.02 DISTRIBUTION:

- A. Reviewed schedules:
 - 1. Distribute copies of the reviewed schedules to:
 - a. Job Site file.
 - b. Subcontractors.
 - c. Other concerned parties.
- B. Instructions to recipients:
 - 1. Instruct recipients to report inability to comply with the schedule, and provide detailed explanations with suggested remedies.

3.03 ADJUSTMENT OF PROGRESS SCHEDULE:

- A. Changes:
 - 1. Show all changes occurring since previous submission of the schedule.
- B. Progress:
 - 1. Indicate progress of each activity and show completion dates.
- C. Other items:
 - 1. Include major changes in scope.
 - 2. Include activities modified since previous updating.
 - 3. Include revised projections due to changes.
 - 4. Include other identifiable changes.
- D. Narrative report:
 - 1. Provide a narrative report including:
 - a. A discussion of problem areas including current and anticipated delay factors and their impact.
 - b. Direct action taken, or proposed, and its effect.
 - c. A description of revisions including:
 - i. Their effect on the schedule due to change of scope.
 - ii. Revisions in duration of activities.
 - iii. Other changes that may affect the schedule.
 - d. The status of completion of Milestones.

END OF SECTION

SECTION 01410

TESTING SERVICES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. This section includes, but is not necessarily limited to, testing services, as indicated in the Drawings, as specified herein and as necessary for the proper and complete performance of the Work.
2. General requirements:
 - a. Testing services and certifications which are to be included in CONTRACTOR's unit prices:
 - i. Inspections and tests required by codes or ordinances or by a plan approval authority and made by a legally constituted authority.
 - ii. Inspections, testing services and certifications including, but not limited to, the following items shall be furnished by CONTRACTOR:
 - a) Pipe leakage tests.
 - b) Pipe material yield strength tests at ENGINEER's request.
 - c) Cement Manufacturers' certification tests at ENGINEER's request.
 - d) Fine and coarse aggregate certification tests by Supplier at ENGINEER's request
 - e) Bedding material certification tests by Supplier at ENGINEER's request.
 - f) Testing in connection with ENGINEER's review of materials and equipment proposed to be incorporated into the Work.
 - g) Testing performed for CONTRACTOR's convenience.
3. OWNER paid items:
 - a. OWNER may elect to test or to employ either ENGINEER or an independent testing agency to test any materials or systems on the Project. The cost of this testing will be paid for by OWNER.

B. Related Sections:

1. Documents affecting work of this Section include, but are not necessarily limited to:
 - a. General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.
2. Additional requirements for testing of materials and systems mentioned in this Section may be described in other Sections of these Specifications.

1.02 REFERENCES:

- A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
1. ASTM Standard Specifications:
 - a. C 31 – Making and Curing Concrete Test Specimens in the Field.
 - b. C 39 – Test for Compressive Strength of Cylindrical Concrete Specimens.
 - c. C 138 – Test for Unit Weight, Yield and Air Content of Concrete.
 - d. C 143 – Test for Slump of Hydraulic Cement Concrete.
 - e. C 172 – Sampling Fresh Concrete.
 - f. C 173 – Test for Air Content of Freshly Mixed Concrete by the Volumetric Method.
 - g. C 192 – Making and Curing Concrete Test Specimens in the Laboratory.
 - h. C 231- Test for Air Content of Freshly Mixed Concrete by the Pressure Method.
 - i. D 1556 – Density of Soil In Place by the Sand-Cone Method.
 - j. D 1557 – Moisture-Density Relations of Soils and Soils Aggregate Mixture Using 10 Pound Hammer and 18 Inch Drop.
 - k. D 1586 – Penetration Test and Split Barrel Sampling of Soils.
 - l. D 2166 – Unconfined Compressive Strength of Cohesive Soil.
 - m. D 2922 – Density of Soil and Soil Aggregates by Nuclear Methods.
 - n. D 2937 – Density of Soil in Place by Drive Cylinder Method.
 2. AWS – American Welding Society:
 - a. D1.1 – Structural Welding Code.

3. ACI – American Concrete Institute:
 - a. 211.1 – Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.
 - b. 301 – Specification for Structural Concrete for Buildings.
 - c. 318 – Building Code Requirements for Reinforced Concrete.
 - d. 506R – Guide to Shotcrete.
4. BOCA Building Code.

1.03 TEST REQUIREMENTS:

- A. In accordance with:
 1. Laws and Regulations.
 2. Sections of these Specifications.
 3. Reference procedures and requirements.
 4. Pertinent standards for testing.
 5. BOCA Building Code.

1.04 COLLECTING AND TRANSPORTING SAMPLES:

- A. Samples:
 1. Collected by CONTRACTOR and transported by CONTRACTOR to a location determined by ENGINEER.

1.05 RETESTING COSTS:

- A. Retesting:
 1. When initial tests of all items except soil compaction indicate noncompliance with the Contract Documents, all subsequent testing occasioned by the noncompliance shall be performed by the same testing laboratory, and the costs thereof will be deducted by OWNER from the Contract Sum.
 2. The first retesting of soil compaction shall be paid for by OWNER. The second and subsequent retesting costs for soil compaction due to noncompliance with the Contract Documents shall be performed by the same laboratory, and the costs thereof will be deducted by OWNER from the Contract Sum.
- B. Costs:
 1. Uncovering costs shall be paid for as described in Article 13 of Section 00700: General Conditions.

1.06 REPORTS:

- A. Provide typed copies of all laboratory reports, inspections, and certifications:
 1. ENGINEER's office: Two copies.
 2. CONTRACTOR's office: One copy.

1.07 SCHEDULES FOR TESTING:

- A. Establishing schedule:
 1. By advance discussion with the independent testing laboratory, determine the time required to perform tests and issue findings.
- B. Revising schedule:
 1. When changes of construction schedule are necessary during construction, coordinate all such changes of schedule with the independent testing laboratory as required.
- C. Adherence to schedule:
 1. When the independent testing laboratory is ready to test according to the determined work schedule, but is prevented from testing or taking specimens due to incompleteness of Work, all extra costs for testing attributable to the delay may be charged to CONTRACTOR and shall not be borne by OWNER.

1.08 CONTRACTOR'S DUTIES:

- A. Coordinate and schedule the work of the independent testing laboratory:
 1. Notify ENGINEER and the independent testing laboratory 24 hours prior to expected time when testing services will be required.
 2. Provide the following as necessary for laboratory to properly perform its functions:
 - a. Access to the Work.
 - b. Facilities for access to the Work.

- c. Tools.
- d. Samples of materials.
- e. Storage.
- f. Assistance as requested.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.01 TESTING REQUIREMENTS:

- A. Fine and coarse aggregate and bedding material:
 - 1. Test to ensure compliance with the materials specifications, at the request of ENGINEER.
- B. Fill material from on-site and off-site:
 - 1. Test to ensure compliance with the materials specifications.
- C. Soil Compaction:
 - 1. Perform all necessary laboratory and field testing required to verify compaction of fill, trench backfill, and structure of backfill to 95 percent Modified Proctor in accordance with ASTM D 1557.
 - 2. Verify the compaction of the first 12 inches of the existing subgrade below all structures, paved areas and areas to be filled to 95 percent Modified Proctor in accordance with ASTM D 1557.
 - 3. Independent testing laboratory shall inform ENGINEER's Resident Project Representative and CONTRACTOR's on-site supervisor immediately of all on-site test results.
 - 4. Place no additional fill in areas where compaction results do not meet Specification requirements.
- D. Concrete testing:
 - 1. Point of sampling and the method of securing the Samples:
 - a. Determined by the independent testing laboratory.
 - b. In accordance with ASTM C 172.
 - 2. Slump tests:
 - a. Perform slump tests in accordance with ASTM C 143.
 - b. Perform one slump test on the job for each 10 cubic yards of concrete.
 - c. At ENGINEER's request, also perform slump tests at batch plant.
 - d. Perform more slump tests if deemed necessary by ENGINEER.
 - 3. Perform 1 air-entraining test in accordance with ASTM C 231 or C 173 for each truckload or every 10 yards of concrete placed, whichever is more frequent.
 - 4. Test the concrete unit weight in accordance with ASTM C 138.
 - 5. Test the air content of each set of concrete cylinders.
 - 6. Concrete cylinder testing:
 - a. In accordance with ASTM C 31 and C 39.
 - b. Take concrete cylinder Samples as follows:
 - i. Once each day a given class of concrete is placed, nor less than
 - ii. Once for each 150 cubic yards (or fraction thereof) of each class of concrete placed on each day, nor less than
 - iii. Once for each 5000 square feet of slab or wall surface area placed each day.
 - c. Concrete cylinder Sample shall consist of 4 standard 6-inch cylinders.
 - d. Handle cylinders carefully.
 - e. On-site storage:
 - i. 12 hours, minimum, 48 hours maximum.
 - ii. At a temperature range of 60 to 80 degrees F and in a moist environment.
 - iii. Shielded from direct sunlight and radiant heat.
 - iv. CONTRACTOR shall construct heated enclosure if conditions require.
 - f. Laboratory curing: For duration of curing after on-site storage.
 - g. Test 1 of the cylinders at 7 days and 2 cylinders at 28 days. Save 1 cylinder as a spare.
 - h. Acceptance and evaluation of the concrete shall be based on ACI 301.

- E. Miscellaneous tests:
 - 1. OWNER or ENGINEER may elect to order testing of other materials by Independent Testing Laboratory.

END OF SECTION

SECTION 01570

TRAFFIC REGULATION

PART 1 - GENERAL

1.01 SECTION INCLUDES:

- A. Traffic control.
- B. Construction parking control.
- C. Flag person.
- D. Flares and lights.
- E. Haul routes.
- F. Traffic signs and signals – placement and operation.
- G. Removal.

1.02 RELATED SECTIONS:

- A. Section 01010: Summary of Work.
- B. Section 01500: Construction Facilities and Temporary Controls: Barriers and enclosures. Access roads and parking areas.

1.03 TRAFFIC CONTROL:

- A. Comply with the rules and regulations of the County, City, Township, Village, or MDOT having jurisdiction over the road.
- B. Provide, install and maintain traffic control devices.
- C. Control devices shall conform to the Michigan Manual of Uniform Traffic Control Devices and the MDOT Standard Specifications for Highway Construction latest edition.
- D. Maintain through traffic unless written permission to do otherwise is obtained from the authority having jurisdiction over the road.
- E. Maintain traffic to all businesses.

1.04 CONSTRUCTION PARKING CONTROL:

- A. Control vehicular parking to prevent interference with public traffic and parking, access by emergency vehicles, access to businesses, access to dwellings, and OWNER's operations.
- B. Monitor parking of construction personnel's vehicles in existing facilities. Maintain vehicular access to and through parking areas.
- C. Prevent parking on or adjacent to access roads or in non-designated areas.

1.05 FLAG PERSON:

- A. Provide trained and equipped flag person to regulate traffic when construction operations or traffic encroach on public traffic lanes.

1.06 FLARES AND LIGHTS:

- A. Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.

1.07 HAUL ROUTES:

- A. Consult with authority having jurisdiction in establishing public thoroughfares to be used for haul routes and site access.

- B. Confine construction traffic to designated haul routes.
 - C. Provide traffic control at critical areas of haul routes to regulate traffic, to minimize interference with public traffic.
- 1.08 TRAFFIC SIGNS AND SIGNALS – PLACEMENT AND OPERATION:
- A. At approaches to site and on-site, install at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.
 - B. Install and operate traffic control signals to direct and maintain orderly flow of traffic in areas under CONTRACTOR's control, and areas affected by CONTRACTOR's operations.
 - C. Relocate as Work progresses, to maintain effective traffic control.
 - D. Provide traffic control equipment and labor to meet the requirements of authority having jurisdiction.
- 1.09 REMOVAL:
- A. Remove equipment and devices when no longer required.
 - B. Repair damage caused by installation.

END OF SECTION

SECTION 01700

CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section includes:
 - 1. This Section includes, but is not necessarily limited to, the instructions for and the responsibilities of each party in contract closeout as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.
- B. Related Sections:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to:
 - a. General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

1.02 SUBSTANTIAL COMPLETION:

- A. When CONTRACTOR considers that Work or any portion of the Work is ready for its intended use, CONTRACTOR shall submit:
 - 1. Written certification to ENGINEER and OWNER that the Work, or designated portion of the Work, is substantially complete.
 - 2. A list of major items to be completed or corrected.
 - 3. Request that ENGINEER issue a certificate of Substantial Completion.
- B. ENGINEER's inspection:
 - 1. ENGINEER will make an inspection:
 - a. Within 10 days after receipt of certification.
 - b. Together with OWNER and CONTRACTOR.
- C. ENGINEER's determination of Substantial Completion in response to CONTRACTOR's request:
 - 1. Should ENGINEER consider the Work or designated portion of the Work substantially complete, the following steps shall be taken:
 - a. CONTRACTOR shall prepare and submit to ENGINEER, a list of items to be completed or corrected as determined by the inspection.
 - b. ENGINEER will prepare and deliver to OWNER:
 - i. A tentative certificate of Substantial Completion.
 - ii. A tentative list of items to be completed or corrected before final payment.
 - c. OWNER shall have 7 days after receipt of the tentative certificate during which to make written objection to ENGINEER as to any provisions of the certificate or attached list.
 - d. ENGINEER will, within 14 days after delivery of tentative certificate to OWNER, decide:
 - i. Not substantially complete: ENGINEER will issue written notice to CONTRACTOR stating reasons.
 - ii. Substantially complete: ENGINEER will issue definitive certificate of Substantial Completion and a final list of items to be corrected or completed.
 - 2. Should ENGINEER consider that the Work or designated portion of the Work is not substantially complete, the following steps shall be taken:
 - a. ENGINEER shall notify CONTRACTOR in writing stating ENGINEER's reasons.
 - b. CONTRACTOR shall complete the work and send a second written notice to ENGINEER certifying that the Project, or designated portion of the Project, is substantially complete.
 - c. ENGINEER and OWNER will reinspect the work.
- D. Division of responsibilities:
 - 1. ENGINEER:
 - a. At the time of delivery of tentative certificate of Substantial Completion.
 - b. Deliver to OWNER and CONTRACTOR a written recommendation as to division of responsibilities pending final payment with respect to:
 - i. Security.

- ii. Operation.
 - iii. Safety.
 - iv. Maintenance.
 - v. Heat.
 - vi. Utilities.
 - vii. Insurance.
 - viii. Warranties.
2. ENGINEER's written recommendation on division of responsibilities shall be binding on OWNER and CONTRACTOR until final payment unless OWNER and CONTRACTOR agree otherwise in writing and so notify ENGINEER prior to ENGINEER's issuance of a definitive certificate of Substantial Completion.

1.03 FINAL INSPECTION:

A. CONTRACTOR certification:

1. Prior to final inspection, CONTRACTOR shall submit written certification that:
 - a. The Contract Documents have been reviewed.
 - b. The Project has been inspected in compliance with the Contract Documents.
 - c. Work has been completed in accordance with the Contract Documents.
 - d. Equipment and systems have been tested in the presence of the OWNER's representative and are optional.
 - e. The Project is complete and ready for final inspection.

B. ENGINEER's inspection:

1. The ENGINEER will make final inspection:
 - a. Within 10 days after receipt of certification.
 - b. Together with OWNER and CONTRACTOR.

C. ENGINEER's determination of final completion:

1. Should ENGINEER consider the Work finally complete in accordance with the requirements of the contract documents, ENGINEER shall request CONTRACTOR to make Project closeout submittals.
2. Should ENGINEER consider the Work not finally complete:
 - a. ENGINEER shall notify CONTRACTOR in writing stating the reasons.
 - b. CONTRACTOR:
 - i. Take immediate steps to remedy the stated deficiencies.
 - ii. Send a second written notice to ENGINEER certifying that the Work is complete.
 - c. ENGINEER and OWNER will reinspect the Work.

1.04 REINSPECTION COSTS:

- A. Should ENGINEER be required to perform second inspections because of failure of the Work to comply with the original certifications of CONTRACTOR, OWNER will compensate ENGINEER for additional services and deduct the amount paid from payment or payments to CONTRACTOR.

1.05 ADDITIONAL INSPECTION COSTS:

A. Substantial Completion:

1. OWNER will compensate ENGINEER for inspection services rendered between the scheduled date of Substantial Completion and the actual date of Substantial Completion and deduct the amounts paid from payment or payments to CONTRACTOR.

B. Final Completion:

1. OWNER will compensate ENGINEER for inspection services rendered between the scheduled date of final completion and the actual date of final completion and deduct the amounts paid from payment or payments to CONTRACTOR.

1.06 CLOSEOUT SUBMITTALS:

A. CONTRACTOR:

1. Provide closeout submittals as required in the Contract Documents.
2. These submittals shall include, but not necessarily be limited to:
 - a. Project record documents.
 - b. Operation and maintenance manuals.

- c. Guarantees.
- d. Spare parts and maintenance materials.
- e. Instruction in operation of all systems.

1.07 EVIDENCE OF PAYMENTS AND RELEASE OF LIENS:

- A. Affidavits:
 - 1. Submit with final Application for Payment an affidavit of payment of debts and release of claims.
 - 2. Affidavit shall include:
 - a. CONTRACTOR's release or waiver of lien.
 - b. Consent of surety of final payment.
 - c. Separate releases or waivers of liens for Subcontractors, Suppliers and others with lien rights against property of OWNER together with a list of those parties.
- B. Execution:
 - 1. All submittals shall be duly executed before delivery to ENGINEER.

1.08 FINAL ADJUSTMENT OF ACCOUNTS:

- A. Final statement:
 - 1. Submit a final statement of accounting, which reflects all adjustment, to ENGINEER. This statement shall contain the following:
 - a. Original Contract Price.
 - b. Additions and deductions.
 - c. Total Contract Price as adjusted.
 - d. Previous payments.
 - e. Sum remaining due.
- B. Final Change Order:
 - 1. ENGINEER will prepare a final Change Order reflecting approved adjustments to the Contract Price not previously made by Change Orders and based on final field measurements of quantities installed.

1.09 FINAL APPLICATION FOR PAYMENT:

- A. CONTRACTOR shall submit a final Application for Payment in accordance with the requirements of the Contract Documents.
- B. Disposition of final Application for Payment:
 - 1. ENGINEER will, within 10 days after receipt of the Application for Payment:
 - a. Submit to OWNER a written recommendation for payment.
 - b. Submit to OWNER and CONTRACTOR a written notice that the Work is acceptable subject to the provisions of GC 14.07 of Section 00700: General Conditions.
 - 2. OWNER will, within 30 days after receipt of the Application for Payment and ENGINEER's recommendations in accordance with the Contract Documents, pay to CONTRACTOR the amount recommended.
- C. If the Application for Payment, the Work or both are unacceptable:
 - 1. ENGINEER will return the Application for Payment to CONTRACTOR, indicating in writing the reasons for refusing to recommend final payment.
 - 2. CONTRACTOR shall make the necessary corrections and resubmit the Application for Payment.
- D. OWNER shall make payment of the balance due for that portion of the Work fully completed and accepted:
 - 1. If ENGINEER confirms that final completion of the Work is significantly delayed through no fault of CONTRACTOR.
 - 2. Payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.
- E. If CONTRACTOR submits written consent of surety for reduction of retainage to less than the amount stipulated in the Agreement.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL:

1.01 SUMMARY:

- A. Section includes: This Section includes, but is not necessarily limited to, procedures for the maintenance, recording and submittal of Project record documents as herein specified indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.
- B. Related Sections: Documents affecting work of this Section include, but are not necessarily limited to General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

1.02 MAINTENANCE OF DOCUMENTS AND SAMPLES:

- A. Storage:
 - 1. Store documents and Samples in CONTRACTOR's field office apart from documents used for construction.
 - 2. Provide files and racks for storage documents.
 - 3. Provide locked cabinet or secure storage space for storage Samples.
 - a. Filing: File record documents in accordance with CSI Master format.
- B. Maintenance:
 - 1. Maintain documents in a clean, dry, legible condition and in good order.
 - 2. Do not use record documents for construction purposes.
- C. Availability: Make documents and Samples available at all times for inspection by ENGINEER.

1.03 RECORDING:

- A. Labeling: Label each document "PROJECT RECORD" in neat large printed letters.
Recording:
 - 1. Record actual revisions to the Work.
 - 2. Record information concurrently with construction progress.
 - 3. Do not conceal any work until required information is recorded.
- B. Drawings:
 - 1. Legibly mark, with notes or graphic representations, to record actual construction:
 - a. Depths of various elements of foundation in relation to approved datum.
 - b. Horizontal and vertical locations of Underground Facilities and appurtenances, referenced to permanent surface improvements.
 - c. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.
 - d. Field changes of dimension and detail.
 - e. Changes made by Field Order, Work Change Directive or Change Order.
 - f. Details not on original Contract Drawings.
 - 2. At ENGINEER's option, after ENGINEER's review of the record drawings, transfer all marks to a set of Mylars provided by ENGINEER.

1.04 SUBMITTAL:

- A. Delivery: At Contract closeout, deliver record documents to ENGINEER for the OWNER.
- B. Transmittal letter:
 - 1. Accompany submittal with transmittal letter in duplicate, containing:
 - a. Date.
 - b. Project title and number.
 - c. CONTRACTOR's name and address.
 - d. Title and number of each record document.
 - e. Signature of CONTRACTOR or his authorized representative.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 02070

SELECTIVE DEMOLITION

PART 1 - GENERAL

1.01 GENERAL:

- A. The CONTRACTOR's attention is directed to the CONDITIONS OF THE CONTRACT, as well as DIVISION 1: GENERAL REQUIREMENTS. They shall apply to all work of this section.

1.02 DESCRIPTION:

- A. The work shall include the demolition of existing pavements and miscellaneous Site improvements found and noted on the topographic survey.

1.03 REGULATIONS AND STANDARDS:

- A. All work shall comply with the rules and regulations of the Division of Industrial Safety and all other local and State agencies having jurisdiction. Nothing contained herein shall be construed as permitting work that is contrary to such rules, regulations and codes.
- B. All work where applicable shall conform to the State of Michigan Soil Erosion and Sedimentation Act Part 91, Act 451 of P.A. 1994.
- C. Obtain and pay for all permits required to perform the demolition work as required by all agencies and authorities having jurisdiction.

1.04 PROTECTION:

- A. Avoid injury to soil, vegetation, paving, etc., on adjacent properties.
- B. Erect and maintain temporary bracing, shoring, lights, barricades, warning signs, and guards necessary to protect streets, sidewalks, trees and adjoining property from damage, all in accordance with applicable rules and regulations.

1.05 MAINTENANCE OF TRAFFIC AND ACCESS:

- A. Throughout progress of work do not interfere with use of access to adjacent buildings or property.
- B. Do not close or otherwise obstruct sidewalks or streets.

1.06 HANDLING OF MATERIALS:

- A. Remove salvage and debris from the Site as it accumulates. Do not store, sell, burn, or otherwise dispose of debris on the Site. Remove all materials in such manner as to prevent spillage. Keep all pavements and areas adjacent to and leading from the Site clean and free from mud, dirt and debris at all times.
- B. All demolished materials shall become the property of the CONTRACTOR unless indicated otherwise. No persons other than the CONTRACTOR's employees shall be allowed to remove salvage from the Site.

PART 2 - PRODUCTS

2.01 FILL MATERIALS:

- A. Clean bank run sand shall be used to fill all voids left by removal of foundations, utilities, walks or similar demolition.

PART 3 - EXECUTION

3.01 PRIOR TO STARTING:

- A. Demolition work, make inspection with OWNER representative to determine physical condition of adjacent improvements to remain. Install silt fence at outside edge of existing walk around pond. Site lights: Coordinate removal or relocation of existing pole lights adjacent to pond walk as necessary.

3.02 REMOVE:

- A. Existing bituminous paving, concrete foundations, and miscellaneous materials and backfill immediately with surrounding soils.

3.03 WORKMANSHIP:

- A. Execute demolition work to ensure safety of persons and adjacent property against damage by settlement, falling debris, or other causes in connection with this work. Concrete and masonry damaged during course of work shall be repaired or replaced to equal their present quality.

END OF SECTION

SECTION 02110

CLEARING, GRUBBING AND SNAGGING

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section includes:
 - 1. This Section includes, but is not necessarily limited to, the major items listed below, as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.
 - 2. Major items:
 - a. Clearing.
 - b. Grubbing.
 - c. Snagging.
 - d. Disposal.
 - e. Salvaging.
 - f. Relocating.
 - g. Bank protection.
- B. Related Sections:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to:
 - a. General Conditions, Supplementary Conditions and Sections in Division I of these Specifications.
 - b. Section 02210: Site Grading.

1.02 REFERENCES:

- A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
 - 1. MDOT:
 - a. 2020 Standard Specifications for Construction.
 - b. Standard Plans.

1.03 DEFINITIONS:

- A. Terms:
 - 1. Clearing: Cutting and removal of trees, brush and shrubs.
 - 2. Grubbing: Removal of tree stumps and roots from below ground.
 - 3. Snagging: Removal of loose and fallen trees, limbs, logs, debris and stumps.
 - 4. Disposal: Burial or removal from site of all debris and woody material that is removed during the clearing, grubbing and snagging operations.
 - 5. Salvaging: Saving of merchantable timber resulting from the clearing and snagging operation for use by OWNER.
 - 6. Relocating: Removal and replanting of live trees and shrubs.
 - 7. Bank protection: Securing trees and brush to prevent erosion of channel banks and encourage the deposit of sediment in the area in which bank protection is secured. It is also the intent of this work to deflect the current into midstream and/or the opposite bank.
 - 8. Trees: 1. Vegetation with trunks or stalks with diameters exceeding 4 inches as measured at breast height (DBH). 2. A stump with numerous branches, trunks or sprouts shall be considered one tree.
 - 9. Brush: Vegetation with trunks or stalks with diameters less than or equal to 4 inches as measured at breast height (DBH).
 - 10. Merchantable timber: Trees having a stump diameter of 6 inches or more.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Bank protection material:
 - 1. Upper tree top material from hardwood trees such as oak and ash. Maple tree branches may be used only when adequate hardwood material is not available.
 - 2. Material from dead (or diseased) trees shall not be used for bank protection and must be removed from the Site.

- B. Cable:
 - 1. Woven wire cable with a minimum 3/16-inch diameter.
 - 2. Woven wire cables shall be 6 x 19 Fiber Core or 6 x 19 IWRC and shall be rated at a minimum of 3,000 lbs. breaking strength.
 - 3. Wire rope ends shall be connected using U-bolt wire rope clips. Each connection shall use a minimum of 2 clips.
 - 4. Clips shall be malleable iron saddle with steel U-bolt and nuts, meeting Federal Specification FF-C-450, Type 1, Class 2.

- C. Herbicide:
 - 1. Dow Chemical Company: Tordon RTU.
 - 2. Vesicol: Banvel CST.
 - 3. Or equal.

PART 3 - EXECUTION

3.01 GENERAL:

- A. Limits of work:
 - 1. Clear within drain right-of-way for access lane on one side only. Remove only those trees that interfere with execution of the Work.
 - 2. Clear and snag both sides of channel to top of bank. Trees are to remain if they do not interfere with the flow or the construction process and are not in danger of falling into the drain.
 - 3. Grubbing is omitted except where tree roots interfere with construction.

- B. Precautions:
 - 1. Avoid damage to stable, vegetated channel banks, or trees and shrubs that are not designated for excavation or removal during completion of the clearing, grubbing and snagging operation.

- C. Selective clearing and grubbing:
 - 1. In areas where called for on the Drawings. Remove only those trees as designated by ENGINEER.

- D. Ownership:
 - 1. The property owner shall have the option of retaining ownership of any trees that are removed on his property.
 - 2. CONTRACTOR shall notify the property owner of CONTRACTOR's schedule for clearing, grubbing and snagging in order to allow a reasonable amount of time for removal of material by the property owner.
 - 3. Any trees, stumps, etc., that are not removed by the property owner after a reasonable amount of time shall become the property of CONTRACTOR and shall be removed or disposed of in accordance with the Specifications.
 - 4. All trees, debris and vegetation which are removed shall be the property of CONTRACTOR. Everything not used by CONTRACTOR for bank protection or placed in designated debris piles shall be removed from the Project Site.

3.02 CLEARING:

- A. Cutting:
 - 1. Cut trees and brush a maximum of 18 inches above the ground.
 - 2. Remove tree tops and limbs prior to cutting the entire tree if necessary to avoid damage to adjacent structures or trees that are not designated for removal.
 - 3. The final cut shall be an even cut, parallel with the ground.
 - 4. Identification for channel restoration: The trees that are specified for cutting will be marked by ENGINEER. Only marked trees shall be cut.
 - 5. Fruit trees: Clear only when authorized by ENGINEER.

3.03 GRUBBING:

- A. Stump removal:
 - 1. Unless stumps are specifically designated for chipping, pull the entire stump and roots out from below ground.

- B. Stump treatment:
 - 1. Not in this Contract.

- a. General:
 - i. Applied by licensed applicators only.
 - b. Procedure:
 - i. Chemically treat with herbicides in accordance with Manufacturer's directions in areas designated on the Drawings only.
 - ii. Apply within 4 hours of the time the tree is cut.
 - iii. Cut trees with sprouts again and treat the trunk chemically immediately following the cut.
- C. Utilities:
- 1. Notify ENGINEER of all instances in which stump removal may result in damage to existing utilities or culverts.
 - 2. Be responsible for any damage to utilities that may result from stump removal.
- D. Chipping:
- 1. Where authorized by ENGINEER, stumps may be chipped to a minimum depth of 1 foot below ground in lieu of pulling the stump and roots.
- 3.04 SNAGGING:
- A. Identification:
- 1. Trees and log jams specified for pulling will be marked by ENGINEER. Only marked trees shall be pulled.
- B. Access:
- 1. Restrict equipment access for snagging operations to areas indicated on the Drawings as designated by ENGINEER.
 - 2. Equipment shall remain outside of the channel limits unless authorized by ENGINEER.
- 3.05 BANK PROTECTION:
- A. Locations: Locations as indicated on the Drawings or as directed by ENGINEER.
- B. Procedures:
- 1. Bank protection shall consist of dense piles of tree tops and brush material placed against the bank with the cut ends facing upstream against the bank.
 - 2. The approximate size of the bank protection shall be 20 feet along the bank and 5 to 10 feet wide.
 - 3. The tree tops and brush material shall be secured with wire or cable to stakes or trees on the adjacent bank.
 - 4. Final channel width shall not be less than 2/3 of the existing channel width, unless authorized by ENGINEER.
- 3.06 DISPOSAL:
- A. General:
- 1. Trash and other nonwoody material that are removed during the snagging operation: Sort out and dispose of in a licensed landfill.
- B. Burial:
- 1. Trees, brush, stumps and other woody material may be disposed of by burial where authorized by ENGINEER and in areas that do not conflict with present land use.
 - 2. Bury material in compacted trenches with a minimum of 2 feet of compacted earth cover.
 - 3. Locate buried trenches a minimum of 10 feet (horizontal) beyond the top edge of the proposed channel.
- C. Burning:
- 1. Small amounts of woody material may be disposed of by burning where authorized by the ENGINEER and then after such approval, a burning permit must be obtained as well.
 - 2. Maintain a minimum 200 feet horizontal isolation distance between overhead public utilities or wooded areas and all burning piles.
 - 3. Bury material that remains following burning or remove from the Site.
 - 4. Burning shall not be permitted in areas with combustible organic soils.
- D. Debris piles:
- 1. Woody material may be placed in debris piles as authorized by ENGINEER and in locations that do not conflict with present land use.

2. Neatly windrow debris piles beyond the spoil piles or place in debris piles at intervals of not less than 100 feet.
 3. Maintain a minimum clearance of 200 feet (horizontal) between debris piles and overhead public utilities.
 4. Floodplains: Secure debris piles to prevent movement of debris during flooding events.
- E. Removal:
1. Material that is required to be removed from the Site shall become the property of the CONTRACTOR.

3.07 SALVAGING:

- A. Cut mercantile timber that is designated for salvaging into 8-foot lengths or lengths as designated by ENGINEER. Mercantile timber shall become the property of OWNER.
- B. Avoid damage to materials designated for salvaging during clearing, grubbing and snagging operations.
- C. Replace all damaged materials that were designated for salvaging at no expense to OWNER.
- D. Deliver all salvaged materials to locations designated by OWNER.

END OF SECTION

SECTION 02202

EARTHWORK

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section includes:
 - 1. This Section includes, but is not necessarily limited to, the furnishing and installation of the major items listed below, as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.
 - 2. Major items:
 - a. Earthwork.
 - b. Excavation.
 - c. Trenching.
 - d. Filling.
 - e. Backfilling.
 - f. Sheeting.
 - g. Bracing.
 - h. Shoring.
 - i. Grading.
 - j. Disposal of excavated materials.
 - k. Topsoil.
 - l. Excess water control.
- B. Related Sections:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to:
 - a. General Conditions, Supplementary Conditions and Sections in Division I of these Specifications.

1.02 REFERENCES:

- A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
 - 1. MDOT:
 - a. 2020 Standard Specifications for Construction.
 - b. Standard Plans.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. General fill: Bank run sand, approved by ENGINEER.
- B. Select fill for inside of building: Sand - gravel fill; 100 percent passing 3/8-inch sieve; 10 percent maximum loss by washing.
- C. Granular drainage fill: MDOT Granular Material Class II; 100 percent passing 1-inch sieve, 0-35 percent passing No. 100 sieve; loss by washing 0-7 percent.
- D. Topsoil on lawn and planting areas: Dark organic, weed free loam, no muck or peat.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Compaction of fill shall conform to ASTM D 1557, Method D. Compact fill to 95 percent modified proctor.
- B. Provide dewatering equipment as required for placement of utilities until backfilling operations have been completed.

- C. Furnish, put in place and maintain all sheeting, bracing and shoring as may be required to properly support the sides of all excavations and to prevent all movement of earth which could cause damage to the Work or adjacent property.

END OF SECTION

SECTION 02206

DEWATERING

PART 1 GENERAL

1.01 DESCRIPTION

- A. Section includes dewatering requirements and procedures.

1.02 QUALITY CONTROL

- A. Dewatering as required for achieving suitable conditions for installation of piping, drainage structures, pumping stations, wet wells, excavation, grading and other associated items is the responsibility of the Contractor.
- B. Dewatering shall consist of controlling large volumes of ground water from entering the area of the utility placement through the circumference or face of the excavation. This work involves the use of well points, deep wells, or other acceptable measures capable of controlling ground water.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 WELL POINTS AND DEEP WELLS

- A. Ground water controlled by deep well and/or well point pumping systems shall be done without damage to property or structures and without interference with the rights of the public, owners of private property, pedestrians, vehicular traffic, or the work of other contractors.
- B. Any pumping methods used for dewatering and control of the ground water and seepage shall have properly designated filters to ensure that adjacent soil will not be pumped with the water, thus creating voids in the ground around the face of the excavation of the sewer or under existing structures.
- C. The dewatering operations shall be performed in a proper and predetermined sequence with the work operations such that the circumference and face of the excavation are stable. Dewatering well diameter, pumping rate and well spacing shall provide adequate drawdown of the water level. Wells shall be properly located to intercept ground water that otherwise would enter the excavation and interfere with the work.
- D. The Contractor shall pump water from dewatering operations into silt bags as detailed in the Drawings. Water may be discharged directly into the watercourse provided it remains below 100 NTU turbidity and only upon written approval from the Engineer.
- E. The Contractor shall submit a written plan and detail Drawings showing the methods and locations for dewatering procedures to be utilized during the performance of the Work for the Engineer's written approval.

END OF SECTION

SECTION 02210

SITE GRADING

PART 1 - GENERAL

1.01 GENERAL:

- A. The CONTRACTOR's attention is directed to the CONDITIONS OF THE CONTRACT, as well as DIVISION 1 - GENERAL REQUIREMENTS. They shall apply to all work of this section the same as if herein repeated in full.

1.02 DESCRIPTION:

- A. Related Work specified elsewhere:
1. Section 02110: Clearing, Grubbing & Snagging.
 2. Section 02222: Excavating, Backfilling & Compacting for Utilities.
 3. Section 02230: Base Courses
 4. Section 02271: Riprap.
 5. Section 02920: Soil Preparation.
 6. Section 02920: Lawns and Grass.
 7. Section 02950: Trees, Plants, and Groundcovers.

1.03 REGULATIONS AND STANDARDS:

- A. All work shall comply with the rules and regulations of the Division of Industrial Safety and all other local and State agencies having jurisdiction. Nothing contained herein shall be construed as permitting work that is contrary to such rules, regulations and codes.
- B. All work where applicable shall conform to State of Michigan Soil Erosion and Sedimentation Part 91, Act 451 of the Public Acts of 1994, as amended and related Ordinance.
- C. Grades and Elevations: A licensed Professional Surveyor shall be required to establish all vertical and horizontal layout of Site construction.
- D. Compaction: A registered soils engineer shall verify that the required densities have been achieved.

1.04 EXISTING CONDITIONS:

- A. A topographic survey of the property has been included in the Drawings for reference only. Bidders shall be expected to have inspected the Site and satisfy themselves as to actual grades and levels and the true conditions under which the Work is to be performed. The bench mark shall be preserved. Any removal or necessary replacement shall be at CONTRACTOR's expense.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.01 TOPSOIL STRIPPING:

- A. Prior to mass earthwork, excavation, all topsoil must be removed from the construction Site. All topsoil shall be stripped from the areas to be occupied by the building and from areas within the Contract Limits which will receive walks, or other impervious surfacing. Remove topsoil to a maximum depth of 6 inches over the remainder of the Site within the Contract Limits where grading is required or areas to be occupied by storage areas. Topsoil may be required to be stored off-site due to soil conditions, existing trees to remain, or space limitations. Topsoil not required for replacement shall be disposed by the CONTRACTOR. See SOIL EROSION CONTROL PLAN for topsoil storage recommendations.

3.02 ROUGH GRADING:

- A. Perform all exterior cut, fill, backfill and grading as required to conform to the contours and elevations shown on the Drawings. Rough grading to be held below finish grades as follows: 6 inches minimum for topsoil at lawn areas; 11 inches below areas to receive concrete platforms; 8 inches below areas to receive sidewalks; and as specified to receive surfacing in Section 02513.
1. Staking and Checking: A licensed Professional Surveyor shall set all grading stakes required and shall be responsible for checking and verifying their correctness. Any additional work required to bring rough grades to their proper levels shall be at the expense of the CONTRACTOR, including rechecking. CONTRACTOR shall certify in writing that subgrades are as shown on the drawings prior to spreading topsoil, paving or installation of utilities.
 2. Cut: Excavate all materials as required to establish rough grades. Excavated material in excess of that needed for fill shall be disposed of at OWNER's direction.
 3. Fill: Except as noted below, fill material shall be ordinary soil as excavated on the Site, free from debris, roots, stones larger than 2 inches, silt, muck or peat. Fill under paving, sidewalks and similar areas shall be coarse sand or bank run gravel, capable of being compacted to the specified densities. Additional fill material required shall be furnished by the CONTRACTOR, equivalent to that obtained on the Site. Fill material shall be installed in layers not exceeding 9 inches and shall be moistened only as required to obtain the specified degree of compaction.
 4. Compaction: Upon completion of "cut" operations and prior to installation of fill over existing grades, the soil shall be proof rolled and inspected for suitability. If, in the opinion of the CONTRACTOR, the specified degrees of compaction cannot be obtained for this Contract, a test area of approximately 50 square feet shall be scarified, treated by the introduction of approved additives and/or water and compaction attempted. If the specified degree of compaction cannot be obtained, the ENGINEER, upon consultation with the soils engineer, may direct in writing the removal and replacement of the unsuitable area. Upon completion of removal of surface soils and inspection of specified areas, the construction for the general building area may proceed. Subgrades and each layer of fill material shall be compacted uniformly to a minimum density of 95 percent and a maximum of 98 percent dry density as determined by ASTM D 1557. Sub-bases for paving and sidewalks shall be compacted to a minimum density of 95 percent as determined by ASTM D 2049. All other areas shall be compacted to a minimum of 90 percent by ASTM D 1557.
 5. CONTRACTOR shall provide written verification from a registered soils engineer that described densities are being achieved.

3.03 SHAPING:

- A. After rough grading is completed and prior to applying topsoil, the surface shall be dragged and floated to remove ridges, depressions and other irregularities. Remove all roots, debris, and stones larger than 2 inches in diameter.

3.04 DEWATERING:

- A. CONTRACTOR shall be responsible for the drained condition of the Site and shall employ such means as well-pointing, ditching, pumping or bailing to prevent the impoundment of water which in any way hinders construction.

3.05 SUBGRADE UNDERCUTTING:

- A. If weak, loose, soft, or unsatisfactory soils are encountered at subgrade elevations in areas to receive pavements or pathway, remove all unsuitable material and backfill with material as indicated in the Contract Documents or as directed by the ENGINEER. The depth of undercutting shall be determined by the ENGINEER and verified for depth by the CONTRACTOR and ENGINEER. Excavated material is the property of the CONTRACTOR. The excavation shall be replaced with material of the type specified.
1. Type 1: Backfill Subgrade Undercutting, Type 1 with granular material Class II.
 2. Type 2: Backfill Subgrade Undercutting, Type 2, with MDOT 21A with non-woven geotextile separator.

END OF SECTION

SECTION 02222

EXCAVATING, BACKFILLING AND COMPACTING FOR UTILITIES

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section includes:
1. This Section includes, but is not necessarily limited to, the furnishing and installation of the major items listed below, as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.
 2. Major items:
 - a. Excavation and trenching in earth and in rock.
 - b. Disposal of items from clearing and unsuitable or excess excavated materials.
 - c. Complete drainage of excavations.
 - d. Temporary or permanent sheeting, bracing and shoring of excavations.
 - e. Installation of normal and special foundations, bedding and backfill materials.
- B. Related Sections:
1. Documents affecting work of this Section include, but are not necessarily limited to:
 - a. General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.
 - b. Section 02210: Site Grading.
 - c. Section 02272: Soil Erosion and Sedimentation Control.
 - d. Section 02510: Asphalt Paving.
 - e. Section 02720: Storm Sewer System.
 - f. Section 02930: Lawns and Grass.

1.02 REFERENCES:

- A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
1. ASTM Standard Specifications:
 - a. D 1557 - Test Methods for Moisture-Density Relations of Soils and Soil Aggregate Mixtures using 10 lb. Hammer and 18-inch Drop.
 2. MDOT:
 - a. 2020 Standard Specifications for Construction.
 - b. Standard Plans.

1.03 DEFINITIONS:

- A. Terms:
1. Bedding: The material placed around a utility between 4 inches below to 12 inches above the utility the full width of the trench.
 2. Driving surface: A pavement, curb, or sidewalk.
 3. Excavation:
 - a. Removing the following materials from their present location:
 - i. Native below-grade material such as soil, rocks, boulders less than 1/2-cubic yard in volume, and buried trees.
 - ii. Man-made items such as, but not necessarily limited to:
 - 1) Hot mix asphalt and concrete paving.
 - 2) Curbs.
 - 3) Riprap.
 - 4) Head walls.
 - 5) Underground utilities.
 - 6) Manholes and catch basins.
 - 7) Foundation.
 - 8) Sidewalks.
 4. Extra earth excavation: Excavation of native material from below the normal trench bottom.
 5. Foundation materials: The material placed in a trench undercut to replace extra earth excavation.

6. Hardpan:
 - a. Cemented soil layers.
 - b. Is not hard clay layers that are not cemented.
7. Imported material: Soil material which is hauled onto the Site by CONTRACTOR.
8. Native material: Soil and other natural earth materials, except rock, which are existing on the Site prior to the start of Work.
9. Normal trench bottom: The surface of the undisturbed native material at an elevation 4 inches below the bottom of the utility.
10. Pavement: Any combination of subbase, base course and concrete, hot mix asphalt or aggregate surface course, including shoulders, placed on a subgrade. Includes roadways, parking areas, driveways, and hot mix asphalt seal coat.
11. Rock excavation:
 - a. Excavation of igneous, metamorphic or sedimentary rock or hardpan which cannot be excavated without continuous drilling and blasting or continuous use of a ripper or other special equipment.
 - b. Excavation of all boulders of ½ cubic yard or more in volume.
12. Special foundations:
 - a. Specially constructed systems for support of underground utilities such as timber piling, concrete foundations and surcharge techniques.
 - b. Extra earth excavation and placing imported or native materials is not a special foundation.
13. Structure: A building, retaining wall, tank, footing, slab, or other similar construction.
14. Suitable material:
 - a. Native material excavated from the trench and approved as backfill by ENGINEER.
 - b. Not used under or within 1 on 1 slope of surface improvements or structures.
15. Trench backfill:
 - a. The material placed between the top of bedding and the bottom of suitable material, the surface restoration or surface improvement.
 - b. Used under and within 1 on 1 slope of surface improvements or structures.
16. Utility structure: A manhole, catch basin, valve chamber, junction chamber, water main valve, or other similar utility appurtenance.
17. Other definitions: Other earthwork terms not defined herein shall be as defined in MDOT Standard Specifications.

1.04 DESIGN AND PERFORMANCE REQUIREMENTS:

- A. Trench bottom suitability:
 1. Notify ENGINEER and await ENGINEER's decision if a possible unsuitable condition exists.
 2. Poor dewatering techniques or lack of excess water control shall not be a reason for additional payment for corrective measures.
 3. Poor dewatering techniques or lack of excess water control shall not be a reason for additional payment for remedial measures.
- B. Trench wall stability:
 1. Be responsible for the trench configuration, including all sheeting, shoring and bracing necessary to support trench side walls from collapsing.
 2. Be responsible for the structural design and stability of a pipe-laying box if necessary to prevent trench walls from collapsing.

1.05 QUALITY ASSURANCE:

- A. Testing: Testing will be performed in accordance with Section 01410: Testing Services.
- B. Compaction:
 1. Determine density by the modified Proctor method, ASTM D 1557.
 2. Compact trench backfill and bedding to at least 95 percent maximum density.
 3. Compact suitable material to at least 90 percent maximum density.
 4. The first 12 inches of native material at the bottom of utility trenches:
 - a. Test for density.
 - b. Compact to at least 95 percent maximum density if the existing density is below 95 percent.

1.06 PROJECT CONDITIONS:

- A. Dust control:
 - 1. Control dust on and near the Work and on and near all off-site borrow areas if such dust is caused by CONTRACTOR's operations.
 - 2. Moisten or otherwise treat haul roads, delivery roads, temporary site access roads and other surfaces as required to prevent dust from being a nuisance to the public.
 - 3. Scrape, broom, or vacuum adjacent streets to remove tracked dirt as necessary if directed by ENGINEER.

- B. Existing structures, utility structures, and utilities:
 - 1. Call Miss Dig to locate all existing underground utilities prior to starting excavation.
 - 2. Where utilities, utility structures or structures are encountered which are in active use:
 - a. Provide adequate protection for them.
 - b. Be responsible for damage to them.
 - 3. Provide stand-by utility service if temporary removal is necessary for a period exceeding 2 hours.
 - 4. Where utility service connections to occupied buildings must be temporarily disconnected, give 48 hours notice to the affected occupants of the time and duration of the anticipated shutoff.
 - 5. Notify Fire Department 48 hours in advance if water main or fire supply line shutoff is required.
 - 6. Raise, lower, or move underground utilities, utility structures or structures which interfere with the utility or utility structure being constructed as part of this Work.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. General:
 - 1. Approval required: All material shall be subject to the approval of ENGINEER.
 - 2. Notification: For approval of imported material, notify ENGINEER at least 1 week in advance of intention to import material, designate the proposed borrow area, and permit ENGINEER to sample as necessary from the borrow area for the purpose of making acceptance test to prove the quality of the material.

- B. Material sources and uses:
 - 1. Imported material:
 - a. Foundation material.
 - b. Bedding.
 - c. Pea stone.
 - d. Trench backfill.
 - 2. Native material unless quantity is not sufficient; then shall be imported material: Suitable material.

- C. Foundation material:
 - 1. Crushed stone: 1½ inch maximum size.

- D. Bedding:
 - 1. For all HDPE or PVC pipes:
 - a. Bedding and material as indicated for specific detail on the Drawings.
 - 2. For concrete pipes (RCP):
 - a. Suitable material or MDOT Class II granular material to sub-base, depending on location of pipe. Refer to specific detail on the Drawings.
 - 3. For utility structures:
 - a. Sand gravel fill of such gradation that 100 percent will pass a ½-inch sieve and not more than 10 percent by weight is lost by washing.
 - b. MDOT Granular Material Class II modified to 100 percent passing a ½-inch sieve.

- E. Pea Stone: clean stone with 100 percent passing 3/8-inch sieve and 100 percent being retained on a No. 8 sieve.

- F. Trench backfill: MDOT Granular Material Class II.

- G. Suitable material:
 - 1. Native material which is used as backfill:

- a. Exclusive of gray or blue clay, peat, organic matter, or frozen lumps.
 - b. Containing no rocks or lumps over 3 inches in greatest dimension.
 - c. Having a moisture content such that material is capable of being compacted to 90 percent maximum density.
2. MDOT Granular Class II if native material is not adequate in opinion of ENGINEER.
- H. Special backfilling requirements: All backfill within the railroad right-of-way shall meet Class II regulations.
- I. Special foundations:
1. Only if approved by ENGINEER.
 2. MDOT Grade P2 concrete.
 3. MDOT 912.06 timber piles.
- J. Concrete encasement of utilities:
1. Only as indicated on the Drawings.
 2. MDOT Grade M.
- 2.02 OTHER MATERIALS:
- A. All other materials, not specifically described but required for proper completion of the work of this Section, shall be as selected by CONTRACTOR subject to the approval of ENGINEER.

PART 3 - EXECUTION

3.01 GENERAL:

- A. Excavating, backfilling and compacting:
1. For utility structures: In accordance with this Section.
- B. Obstructions:
1. Remove and dispose of buried trees, rocks, boulders, driving surfaces, pipes and the like, as required for the performance of the Work.
 2. Exercise care in excavating around catch basins, inlets and manholes.
 3. Avoid removing or loosening castings.
 4. Repair and replace damaged or displaced castings; remove dirt entering utility structures during the performance of the Work at no additional cost to OWNER.
- C. Cutting paved surfaces and similar improvements:
1. Cut pavement prior to excavating.
 2. All cuts shall be a minimum of 1 foot wider than trench on each side. When the remaining width of paved surface is less than 4 feet, remove the entire paved surface.
 3. Before removing pavement, mark the pavement neatly, paralleling pipelines and existing street lines. Space the marks the width of the trench.
 4. Concrete:
 - a. Pavements: Saw cut if over 3 feet from expansion or construction joint, otherwise remove to joint.
 - b. Sidewalks: Remove to joints.
 - c. Curb and gutter: Remove to joints.
 5. Final surface course hot mix asphalt: Saw cut joints unless otherwise approved by ENGINEER.
 6. Do not disturb or damage the adjacent pavement. If the adjacent pavement is disturbed or damaged, remove and replace the damaged pavement.
 7. CONTRACTOR may tunnel under curbs that are encountered. Replace curb disturbed by construction.
 8. Dispose of materials removed.

- D. Utilities to be abandoned:
 - 1. When pipes, conduits, sewers or utility structures are removed from the trench leaving dead ends in the ground, fully plug such ends with brick and mortar.
 - 2. Entirely remove abandoned utility structures unless otherwise specified or indicated on the Drawings.
 - 3. Remove from the excavation all materials which can be readily salvaged and store on the Site.
 - 4. All salvageable materials will remain the property of OWNER unless otherwise indicated by OWNER.

- E. Extra earth excavation:
 - 1. If soft material, which in the opinion of ENGINEER is not suitable, is encountered below the normal trench bottom or below a utility structure, ENGINEER may order the removal of this soft material and its replacement with specified material in order to make a suitable foundation for the construction of the utility or utility structure.
 - 2. All extra earth excavation made at the order of ENGINEER will be paid for on the basis of the actual quantity of material excavated.
 - 3. No extra payment will be made if removal is required as a result of poor dewatering techniques.
 - 4. Special foundations shall be determined on an individual basis by ENGINEER in cooperation with CONTRACTOR, unless otherwise provided in the Contract Documents.

3.02 EXCAVATION AND TRENCHING:

- A. General:
 - 1. By open cut from surface unless designated otherwise.
 - 2. Slope sides of trench adequately for protection of the Work and safety of workers.

- B. Maximum length of open trench: 200 feet.

- C. Width:
 - 1. Minimum clearance on each side of utility: 6 inches.
 - 2. Maximum width of trench at top of bedding:
 - a. Up through 30-inch diameter utility: 16 inches plus utility diameter.
 - b. Greater than 30-inch diameter utility: 24 inches plus utility diameter.
 - 3. Maximum width of trench at ground surface:
 - a. Not outside of the property line or easement.
 - b. As required for protection of the Work and safety of workers.
 - c. Use sheeting, bracing and shoring if required.
 - d. Provide sufficient space in the trench to permit the joint to be properly made.

- D. Depth:
 - 1. Excavate to provide the elevations, grades, and depths of cover indicated on the Drawings and herein specified.
 - 2. The 4 inches of required bedding material below the utility may be omitted if:
 - a. Approved by ENGINEER.
 - b. CONTRACTOR arranges and pays for testing of the native material.
 - c. The native material complies with MDOT Granular Material Class II material, modified so that 100 percent passes a 1/2-inch sieve.
 - d. The material is compacted as specified herein.
 - 3. Excavate to the normal trench bottom elevation with an accuracy of ± 0.10 feet.

- E. Rock excavation:
 - 1. Where rock excavation is encountered within the excavation, expose the surface of the rock sufficient to permit adequate measurements to be taken before the rock excavation is started.
 - 2. Notify ENGINEER prior to removal if rock is encountered.
 - 3. No utility shall be within 6 inches of rock.
 - 4. Blasting:
 - a. Only with permission of ENGINEER and in accordance with laws and regulations applying thereto.
 - b. Secure permit if required.
 - c. Notify utility and public agencies.
 - d. Explosives shall be used with extreme care by experienced workers only.
 - e. Hours shall be fixed by ENGINEER.
 - f. CONTRACTOR solely responsible for safety, damage and control of blasting operations.

- F. Bedding:
1. Place the bedding material up to 1/8 the height of the utility. Compact as herein specified.
 2. Accurately shape the bedding material to fit the pipe shape. Recess the bedding to relieve the pressure on the bell or other projecting utility joint.
 3. After laying out the utility, tamp additional bedding in place up to the midpoint of the utility. Use hand-operated compactors to achieve the required compaction.
 4. Place additional bedding up to 12 inches above the top of the utility. Use hand operated compactors to achieve required compaction.
 5. Place all bedding in maximum lifts of 10 inches.
 6. No payment shall be made for aggregate or stone bedding when used for CONTRACTOR's convenience.
 7. Provide concrete encasement at utilities so indicated on Drawings.
- G. Trench backfill:
1. Use backfill material as each Drawing detail indicates and as the material is defined herein.
 2. Place all backfill in 12-inch lifts and compact as herein specified. ENGINEER will consider greater lifts if testing indicates that the required compaction is being achieved.
- H. Utility structures:
1. Place and compact specified bedding below all utility structures.
 2. Backfill around utility structures shall be of the same type backfill as that required for the trench in accordance with these Contract Documents.
 3. Place all backfill in 12-inch lifts and compact as herein specified.

3.03 DISPOSAL OF EXCESS EXCAVATED MATERIAL:

- A. General: CONTRACTOR responsibility and expense.
- B. Disposal sites:
1. Material desired by OWNER shall be disposed of by CONTRACTOR in the following priority order:
 - a. At locations designated by the Contract Documents.
 - b. At locations on or within 10 miles of the Project Site designated by OWNER after construction starts.
 - c. At locations on the Project Site by written arrangement with individual property owners.
 - d. OWNER may choose not to accept certain materials, including but not necessarily limited to, items from clearing, muck, peat, marl and whole or broken man-made items removed by construction.
 2. Material not desired by OWNER shall be disposed of in a location determined by CONTRACTOR.
 3. Disposal of all materials shall not violate laws, rules, regulations and the like regarding the filling of flood plains, wetlands and other environmentally sensitive areas.
 4. Provide adequate controls to maintain disposal sites in a neat and safe condition by periodic leveling of material, and such other practices as are necessary.
 5. Provide all soil erosion control measures necessary to prevent soil erosion and sedimentation of wetlands, rivers, ditches, or similar low lying areas.

3.04 EXCESS WATER CONTROL:

- A. All work where applicable shall conform to the State of Michigan Soil Erosion and Sedimentation Part 91, Act 451 of the Public Acts of 1994, as amended and related Ordinance.
- B. Unfavorable weather:
1. Do not place, spread or roll any fill material during unfavorable weather conditions.
 2. Do not resume operations until moisture content and fill density are satisfactory to ENGINEER.
- C. Pumping and drainage:
1. Provide, maintain and use at all times during construction adequate means and devices to promptly remove and dispose of all water from every source entering the excavations or other parts of the Work.
 2. Dewater by means which will ensure dry excavations, preserve final lines and grades, and will not disturb or displace adjacent soil. Use wells, portable pumps, temporary underdrains, or other methods as necessary.
 3. Perform pumping and drainage:

- a. In such a manner to cause no damage to property or structures and without interference to the rights of the public, owners of private property, pedestrians, vehicular traffic, or the work of other contractors.
- b. In accordance with all pertinent laws, rules, ordinances, and regulations.

D. General:

- 1. Keep excavations dry during construction.
- 2. Remove water by use of wells, well points, portable pumps, bailing, drains, underdrains or other acceptable methods.
- 3. Provide crushed stone or gravel as required to aid dewatering operations.
- 4. Divert or temporarily reroute existing sewers and drainage of discharge lines to adequate and acceptable outlets during construction. CONTRACTOR responsible to ascertain availability of outlets.
- 5. Divert surface water from entering excavations by construction and maintenance of channels or berms.
- 6. Sediment traps and other soil erosion control measures shall prevent soil particles from entering any sewer, watercourse or similar conveyance.
- 7. Protect all utilities, utility structures, and structures, existing and new, from hydrostatic uplift.

3.05 SHEETING, SHORING AND BRACING EXCAVATIONS:

A. General:

- 1. Furnish, put in place and maintain all sheeting, bracing and shoring as may be required to properly support the sides of all excavations and to prevent all movement of earth which could in any way injure the Work or adjacent property.
- 2. Exercise care in the removal of sheeting, shoring, bracing and timbering to prevent collapse or caving of the excavation faces being supported and damage to the Work and adjacent property.
- 3. A pipe-laying box may be used in lieu of sheeting.

B. Sheeting:

- 1. Do not install by jetting.
- 2. Remove as backfilling proceeds, unless ordered left in place by ENGINEER. Use care to fill and compact voids created by removal, especially below mid-height of utility.

C. Sheeting left in place:

- 1. Requires written approval of ENGINEER.
- 2. Cut off minimum of 2 feet below finished grade.

3.06 CLEANUP:

- A. Upon completion of the work of this Section, remove all excess excavated material, trash, and debris resulting from construction operations. Remove equipment and tools. Leave the Site in a neat and orderly condition acceptable to ENGINEER.

END OF SECTION

SECTION 02230

BASE COURSES

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section includes:
 - 1. This Section includes, but is not necessarily limited to, the furnishing and installation of the major items listed below, as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.
 - 2. Major items:
 - a. Base course.
 - b. Subbase.
- B. Related Sections:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to:
 - a. General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.
 - b. Section 02210: Site Grading.

1.02 REFERENCES:

- A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
 - 1. ASTM Standards: D 1557 - Test Methods for Moisture-Density Relations of Soils and Soil Aggregate Mixtures using 10 lb. Hammer and 18-inch Drop.
 - 2. MDOT:
 - a. 2020 Standard Specifications for Construction.
 - b. Standard Plans.

1.03 DEFINITIONS:

- A. Terms:
 - 1. Base course: The layer of specified material of designed thickness placed on a subbase or a subgrade to support a surface course.
 - 2. Pavement structure: Any combination of subbase, base course, and surface course, including shoulder, placed on a subgrade.
 - 3. Plan grade: Vertical control grade indicated on the Drawings.
 - 4. Roadbed: That portion of the roadway between the outside edges of finished shoulders, or the outside edges of berms back of curbs gutters, when constructed.
 - 5. Roadside: That portion of the right-of-way outside of the roadway.
 - 6. Roadway: That portion of the right-of-way required for construction, limited by the outside edges of slopes and including ditches, channels, and all structures pertaining to the work.
 - 7. Shoulder: The portion of the roadway contiguous with the traveled way for accommodation of stopped vehicles, for emergency use, and for lateral support of base and surface courses.
 - 8. Subbase: The layer of specified material of designed thickness placed on the subgrade as a part of the pavement structure.
 - 9. Subgrade: That portion of the earth grade upon which the pavement is to be placed.

1.04 SUBMITTALS:

- A. Submit in accordance with Section 01300: Submittals.
- B. Quality control submittals:
 - 1. Aggregate:
 - a. Source.
 - b. MDOT classification.
 - c. Gradation.

1.05 QUALITY ASSURANCE:

- A. Testing:
 - 1. Testing of aggregate materials: In accordance with Section 01410: Testing Services.

- B. Compaction:
 - 1. Determine density by the modified Proctor method, ASTM D 1557.
 - 2. Compact subbase and base course to at least 95 percent maximum density.

1.06 PROJECT CONDITIONS:

- A. Dust control:
 - 1. Use all legal means necessary to control dust on and near the Work and on and near all off-site borrow areas if such dust is caused by CONTRACTOR's operations during performance of the Work or if resulting from the condition of the Site when earthwork operations are suspended.
 - 2. Moisten or otherwise treat haul roads, delivery roads, temporary site access roads and other surfaces as required to prevent dust from being a nuisance to the public, neighbors, and concurrent performance of other work on the Site.
- B. Existing utility structures:
 - 1. Where utility structures are encountered which are in active use:
 - a. Provide adequate protection.
 - b. Be responsible for damage.
 - 2. Adjust utility structures to meet plan grade.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. General:
 - 1. Approval required: All material shall be subject to the approval of ENGINEER.
 - 2. Notification: For approval of all materials, notify ENGINEER at least 1 week in advance of intention to import material, designate the proposed stockpile area, and permit ENGINEER to sample as necessary from the stockpile area for the purpose of making acceptance tests to prove the quality of the material.
- B. Subgrade: In accordance with Section 02210: Site Grading.
- C. Material source:
 - 1. Imported material:
 - a. Subbase.
 - b. Base course.
- D. Subbase:
 - 1. MDOT Granular Material Class II.
 - 2. Thickness compacted in place: 12 inches.
- E. Aggregate base course:
 - 1. Aggregate MDOT 22A.
 - 2. Thickness compacted in place: 8 inches.

PART 3 - EXECUTION

3.01 PREPARATION:

- A. Subgrade:
 - 1. Prepared in accordance with Section 02210: Site Grading.
 - 2. Maintain in a smooth and compacted condition until the subbase or base course has been placed.
 - 3. Proof roll subgrade prior to placing subbase or base course.
 - 4. No base course shall be placed on the subgrade until it has been approved by ENGINEER.

3.02 INSTALLATION:

A. Subbase:

1. Smooth, spread and compact.
2. Placed in one layer, provided that the depth of the compacted layer does not exceed 15 inches.
3. Constructed to the grade and cross section as indicated on the Drawings.
4. Should the subgrade at any time prior to or during the placing of subbase become soft or unstable to the extent that rutting occurs in the subgrade or to the extent that subgrade material is forced up into the subbase materials the operation of hauling and placing subbase shall be immediately discontinued. Where subgrade material has become mixed with the subbase material, the mixed material shall be removed and disposed of. After the subgrade has been corrected as directed by ENGINEER, new subbase material shall be placed and compacted as specified above.
5. Shape to specified crown and grade and maintain in smooth condition.
6. Do not place on a frozen subgrade.
7. Proof roll subbase prior to installation of base course.

B. Base course:

1. Place in uniform layers to such a depth that when compacted, the course will have the thickness indicated on the Drawings.
2. The compacted depth of any layer shall be no more than 6 inches nor less than 3 inches.
3. Compact each layer of aggregate.
4. Place aggregate shoulder material in conjunction with the top layer of aggregate base material.
5. Shape to the crown and grade within a tolerance of ± 0.05 feet unless otherwise specified. The surface of each spreading operation shall be continuously maintained in a smooth condition.
6. Roll the shaped surface, when required, to provide thorough compaction.
7. Where the existing surface is very irregular, the use of a scarifier may be required. Wetting may be required to facilitate shaping the surface and to assist in providing compaction.
8. Final shaping and compacting shall be accomplished by use of subgrade machine operation on crawler tracks, or by the use of a maintainer or surface planer, with a rigid frame.

END OF SECTION

SECTION 02261

OPEN CHANNEL EXCAVATION

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section includes:
 - 1. This Section includes, but is not necessarily limited to, the excavation of open channel drains as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.
- B. Related Sections:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to:
 - a. General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.
 - b. Section 02110: Clearing, Grubbing and Snagging.

1.02 DEFINITIONS:

- A. Excavated materials:
 - 1. Earth:
 - a. All materials which can be excavated with equal facility by equipment used for normal earth excavation. Examples include, but are not limited to:
 - i. Common materials such as sand, clay, loam, gravel, silt and stones less than ½ cubic yard in volume.
 - ii. Organic materials such as muck, peat and marl.
 - iii. Rock-like material that is fragile, friable or fragmented.
- B. Rock:
 - 1. Igneous, metamorphic and sedimentary rock and hardpan requiring continuous drilling, blasting or use of ripper:
 - a. Solid ledge rock.
 - b. Solid boulders more than ½ cubic yard in volume.
 - c. Hardpan consists of cemented soil layers but does not include uncemented clay layers.
- C. Other:
 - 1. Natural items, such as trees, stumps, logs, brush, shrubs and other vegetation.
 - 2. Man-made items, including but not limited to:
 - a. Surface items, such as hot mix asphalt and concrete paving, curb, headwalls and the like.
 - b. Underground items, such as pipes, culverts, manholes, catch basins, foundations, walls, chambers, refuse and the like.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.01 OPEN CHANNEL EXCAVATION:

- A. Location:
 - 1. Excavate existing channels from one side only with the intent to incur minimal disturbance to the opposite bank.
- B. Tolerance:
 - 1. Excavation of the open channel drain shall conform to the cross-sections and horizontal and vertical alignment indicated on the Drawings.
 - 2. The completed cross-section shall not be more than 0.2 foot above or 1.0 foot below the plan elevation without the prior approval of ENGINEER.
 - 3. The finished bottom grade shall not be greater than 0.5 foot below the plan elevation within 300 feet upstream or downstream of structures or enclosures.

- C. Rock excavation:
1. CONTRACTOR shall notify ENGINEER immediately when rock is encountered during excavation.
 2. Rock excavation and removal methods shall be approved by ENGINEER prior to initiating the work.
 3. Rock excavation shall be paid under separate change order unless a specific item appears in the bid schedule.
- D. Unstable soils:
1. CONTRACTOR shall notify ENGINEER immediately when a significant amount of unstable soils are encountered during excavation.
 2. Additional excavation that is deemed necessary by ENGINEER to compensate for unstable soil conditions will be compensated for in a separate change order.
- E. Spoil banks:
1. Spoil material shall be placed and graded in the location and to the slopes indicated on the Drawings.
 2. Location:
 - a. On one side of channel only unless indicated otherwise on the Drawings.
 - b. Away from existing tributary water courses or drains.
 - c. Away from landscaped areas.
 - d. Away from the trunks of trees.
 3. Grading:
 - a. Grade spoil banks to proposed grades as identified on the Drawings.
 - b. Level spoil piles as identified with proposed grades as identified on the Drawings.
 - c. Level spoil to allow broad, flat drainage ways to enter the drain without the ponding of surface water behind the spoil banks.
- F. Side inlets:
1. Required where concentrated surface runoff enters the drain.
 2. Type and location as indicated on the Drawings or to be addressed during construction as directed by the ENGINEER based on field conditions.
- G. Pilot channel:
1. Location:
 - a. Where indicated on the Drawings.
 - b. In areas with wet or unstable soils.
 2. Schedule:
 - a. Construct pilot channel at least 30 days prior to final drain excavation.
 - b. Following completion of replacement of structures located immediately downstream.
 3. Design:
 - a. Bottom elevation at or below the proposed final drain bottom elevation.
 - b. Bottom width equal to half the proposed finished bottom width.
 - c. Side slopes at 1 on 1 minimum.
- H. Tributaries:
1. Grade tributaries at a constant slope away from the drain excavation throughout the limit of the available right-of-way or 75 feet, whichever is less.
 2. Begin tributary grading at the proposed drain elevation and meet the existing grade at the limit of the regrading.
 3. Regrade the tributary to a bottom width equal to the existing bottom width. Regraded channel side slopes shall be a minimum of 2 on 1.
- I. Channels parallel to roads or parking lots:
1. Excavate from field side of drain.
 2. Comply with requests of highway authority having jurisdiction within road right-of-way or landowner having jurisdiction over parking area.
 3. Preserve and maintain existing driveways.

END OF SECTION

SECTION 02271

RIPRAP

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section includes:
 - 1. This Section includes, but is not necessarily limited to, the major items listed below, as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.
 - 2. Major items:
 - a. Preparation of subgrade.
 - b. Geotextile fabric.
 - c. Riprap.
 - 3. Grout.
- B. Related Sections:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to:
 - a. General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.
 - b. Section 02210: Site Grading.
 - c. Section 02222: Excavating, Backfilling and Compacting for Utilities.

1.02 REFERENCES:

- A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
 - 1. MDOT:
 - a. 2020 Standard Specifications for Construction.
 - b. Standard Plans.
 - 2. AASHTO Standard Specifications:
 - a. M288 - Geotextiles Used for Subsurface Drainage Purposes.

1.03 DELIVERY, STORAGE AND HANDLING:

- A. Receiving and storage:
 - 1. Geotextile fabric shall be delivered in original, unbroken, brand marked containers or wrapping indicating Manufacturer's name and Product description.
 - 2. Handle and store materials:
 - a. In a manner which will prevent:
 - i. Deterioration or damage.
 - ii. Contamination with foreign matter.
 - iii. Damage by weather or elements.
 - b. In accordance with Manufacturer's directions.
- B. Rejected material and replacements:
 - 1. Reject damaged, deteriorated or contaminated material and immediately remove from the Site.
 - 2. Replace rejected materials with new materials at no additional cost to OWNER.

1.04 SUBMITTALS:

- A. Submit in accordance with Section 01300: Submittals.
- B. Product data:
 - 1. Submit for geotextile material.
- C. Shop Drawings:
 - 1. Submit for precast concrete blocks.
 - 2. Required information:
 - a. Dimensions.
 - b. Details of construction and installation.

- D. Quality control Submittals:
 - 1. Certificates:
 - a. Submit for grout.
 - b. Submit for concrete used for precast concrete blocks.
 - c. Submit for concrete used for bag riprap.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Geotextile fabric:
 - 1. Comply with MDOT 910.03 except as herein specified.
 - 2. Nonwoven:
 - a. Mirafi, Inc.: Mirafi, 140N.
 - b. Or equal.
- B. Riprap:
 - 1. Comply with MDOT 813 except as herein specified.
 - 2. Rock:
 - a. Fieldstone
 - b. Sound, tough and durable rock.
 - c. Smaller pieces may be used for filling spaces between riprap rock.
 - d. Minimum dimension:
 - i. Small cobblestones: 3 inches.
 - ii. Cobblestones: 6 inches.
 - iii. Riprap: 8 inches.
 - iv. Heavy riprap: 16 inches.

PART 3 - EXECUTION

3.01 PREPARATION:

- A. Grading:
 - 1. Slope bank to a minimum slope of 1½ horizontal to 1 vertical.
 - 2. Compact subsurface to 90 percent of Maximum Unit Weight.
 - 3. Tolerance: +0.2-feet from plan grade.

3.02 INSTALLATION:

- A. Comply with MDOT 813.03 except as herein specified.
- B. Geotextile fabric:
 - 1. Secure geotextile fabric in foundation and bank area prior to placing riprap. Toe in edges of geotextile fabric under pipe outlets and at upstream end of each roll a minimum of 12 inches.
 - 2. Secure geotextile fabric against movement during placement of riprap.
 - 3. Unroll textile material perpendicular to direction of flow of water.
 - 4. Overlap at joints: 2 feet minimum.
 - 5. Comply with Manufacturer's direction.
 - 6. Required where indicated on Drawings only.
- C. Filter blanket.
- D. Riprap:
 - 1. Rock:
 - a. Place rock with minimum dimension perpendicular to slope.
 - b. Place material above filter blanket and beginning at toe of slope and progress up slope.

END OF SECTION

SECTION 02272

SOIL EROSION AND SEDIMENTATION CONTROL

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section includes:
 - 1. This Section includes but is not necessarily limited to, the furnishing and installation of soil erosion and sedimentation control measures as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.
- B. Related Sections:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to:
 - a. General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.
 - b. Section 02210: Site Grading.
 - c. Section 02222: Excavating, Backfilling and Compacting for Utilities.
 - d. Section 02271: Riprap.
 - e. Section 02930: Lawns and Grass.

1.02 REFERENCES:

- A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
 - 1. Soil erosion control and sedimentation rules and guidelines of:
 - a. Michigan EGLE.
 - b. Leelanau County Planning and Zoning Office.
- B. MDOT:
 - 1. 2020 Standard Specifications for Construction.
 - 2. Standard Plans.
- C. ASTM Specifications:
 - 1. A 690 – High-Strength Low-Alloy Steel H-Piles and Sheet Piling for Use in Marine Environments.

1.03 SUBMITTALS:

- A. Submit in accordance with Section 01300: Submittals.
- B. Manufacturer's literature and Product data:
 - 1. Submit for soil erosion control materials when requested by ENGINEER:
 - a. Product Samples.
 - b. Name of Manufacturer.
 - c. Trade Name.

1.04 QUALITY ASSURANCE:

- A. OWNER: Reserves the right to issue a stop work order if soil erosion and sedimentation controls are not properly installed or maintained.
- B. Work performed under a stop work order will not be considered for payment.

1.05 DELIVERY, STORAGE AND HANDLING:

- A. Receiving and storage:
 - 1. All materials shall be delivered in original, unbroken, brand marked containers or wrapping as applicable.
 - 2. Handle and store materials:
 - a. In a manner which will prevent:
 - i. Deterioration or damage.
 - ii. Contamination with foreign matter.
 - iii. Damage by weather or elements.
 - b. In accordance with Manufacturer's directions.
- B. Rejected material and replacements:

1. Reject damaged, deteriorated or contaminated material and immediately remove from the Site.
2. Replace rejected materials with new materials at no additional cost to OWNER.

PART 2 - PRODUCTS

2.01 SOIL EROSION AND SEDIMENTATION CONTROL MATERIALS:

- A. Vegetation:
 1. Temporary vegetative cover: Perennial ryegrass.
 2. Permanent vegetative cover: Seed, fertilizer, mulch and sod as specified in Section 02930: Lawns and Grass.
- B. Mulch:
 1. For all slopes:
 - a. Straw blanket as specified in 02930: Lawns and Grass.
- C. Riprap:
 1. In accordance with Section 02271: Riprap.
- D. Filter bags:
 1. Made from geotextile blanket:
 - a. Comply with MDOT 910.
 - b. Dandy Bag II, or equal.
- E. Geotextile silt fence:
 1. Comply with MDOT 916.02 except as herein specified.
 2. Manufacturer:
 - a. Synthetic Industries, Terra Tex SC.
 - b. Or equal.
- F. Turbidity Curtain:
 1. Comply with MDOT 916.07.

PART 3 - EXECUTION

3.01 GENERAL:

- A. Standard:
 1. Achieve effective erosion control:
 - a. Provide all materials.
 - b. Promptly take all actions necessary.
 2. Comply with MDOT 208 and 816 except as herein specified.
- B. Site evaluation:
 1. Conduct a field evaluation of the Site:
 - a. Prior to start of the Work.
 - b. With representatives of:
 - i. ENGINEER.
 - ii. OWNER.

3.02 TEMPORARY VEGETATIVE COVER:

- A. General:
 1. Temporary vegetative cover under this Section will be required for areas which, within the time limits specified herein, are not:
 - a. Permanently seeded or sodded in accordance with Section 02930: Lawns and Grass.
 - b. Covered with permanent structures such as: Buildings, pavement, walks and parking lots.
 - c. Used for other soil erosion control measures such as: Sedimentation basin and silt fences.
 2. Seed, fertilize and mulch bare soil unless otherwise required by the Contract Documents:
 - a. Within 30 days from the time final grade has been established if permanent measures are not completed within 15 days.

- b. Immediately upon completion of a section of the Work as required by ENGINEER.
- B. Seed:
- 1. Apply uniformly at a minimum rate of:
 - a. Temporary vegetative cover: 70 pounds per acre.
 - 2. Fertilizer:
 - a. Comply with MDOT 816.03.
 - 3. Mulch:
 - a. Comply with MDOT 816.03.
 - 4. Mulch blanket:
 - a. In accordance with Manufacturer's directions.
 - b. Fibers in direct contact with soil.
 - c. Staple pattern as specified in Manufacturer's literature for Site conditions.
 - d. Direction of installation:
 - i. Shorelines and channel banks: Parallel with direction of flow.
 - ii. Slopes and steep channel banks: Vertical to the slope.
- 3.03 GEOTEXTILE SILT FENCE:
- A. Install silt fence in accordance with Manufacturer's instructions.
 - B. Regularly inspect and maintain silt fence to verify it is functioning as designed.

END OF SECTION

SECTION 02510

ASPHALT PAVING

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section includes:
 - 1. This Section includes, but is not necessarily limited to, the furnishing and installation of the major items listed below, as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.
 - 2. Major items:
 - a. Hot mix asphalt base course.
 - b. Hot mix asphalt leveling course.
 - c. Hot mix asphalt top course.
- B. Related Sections:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to:
 - a. General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.
 - b. Section 02210: Site Grading.
 - c. Section 02222: Excavating, Backfilling and Compacting for Utilities.
 - d. Section 02230: Base Courses.

1.02 REFERENCES:

- A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
 - 1. ASTM:
 - a. D 1557 – Test Methods for Moisture-Density Relations of Soils and Soil Aggregate Mixtures Using 10 lb. Hammer and 18-inch Drop.
 - 2. MDOT:
 - a. 2020 Standard Specifications for Construction.
 - b. Standard Plans.

1.03 SUBMITTALS:

- A. Submit in accordance with Section 01300: Submittals.
- B. Quality control submittals:
 - 1. Hot mix asphalt mixtures:
 - a. Source.
 - b. MDOT Classification.
 - c. Mix design.
 - d. Aggregate gradation.

1.04 QUALITY ASSURANCE:

- A. Qualifications:
 - 1. Installation personnel:
 - a. Trained and experienced in the fabrication and installation of the materials and equipment.
 - b. Knowledgeable of the design.
- B. Testing of hot mix asphalt materials and base courses: In accordance with Section 01410: Testing Services.
- C. Compaction:
 - 1. Determine density by the Modified Proctor Method, ASTM D 1557.
 - 2. Compact base to at least 95 percent maximum density.

- D. Weight slips:
 - 1. Furnish weight slips for all material incorporated in the Project to verify that the required tonnage has been applied.

1.05 DELIVERY, STORAGE AND HANDLING:

- A. Rejected material and replacements:
 - 1. Reject damaged, deteriorated or contaminated material and immediately remove from the Site.
 - 2. Replace rejected materials with new materials at no additional cost to OWNER.
- B. Protection:
 - 1. Use all means necessary to protect the materials of this Section before, during, and after installation.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Subgrade:
 - 1. In accordance with:
 - a. Section 02210: Site Grading.
 - b. Section 02222: Excavating, Backfilling and Compacting for Utilities.
- B. Subbase and base course: In accordance with Section 02230: Base Courses.
- C. Hot mix asphalt material:
 - 1. Asphalt cement:
 - a. Performance grade: PG 58-28.
 - 2. Bond coat:
 - a. SS-1H.
 - b. 0.50 gals/sq yd.
 - 3. Base course:
 - a. As noted on Drawings.
 - b. Weight: As noted on Drawings.
 - c. Reclaimed asphalt: MDOT Tier 1 RAP 0% to 17%
 - 4. Top Course:
 - a. As noted on Drawings.
 - b. Weight: As noted on Drawings.
 - c. Reclaimed asphalt: MDOT Tier 1 RAP 0% to 17%
 - d. Percentage of shale, siltstone, and clay ironstone particles in aggregate:
 - i. Determined on that portion of the sample retained on all sieves down to and including No. 4.
 - ii. Sum of shale and siltstone particles: Maximum 5.0 percent.
 - iii. Clay ironstone particles: Maximum 12.0 percent.

PART 3 - EXECUTION

3.01 EXCAVATION, FILLING, AND GRADING:

- A. Subgrade:
 - 1. In accordance with:
 - a. Section 02210: Site Grading.
 - b. Section 02222: Excavating, Backfilling and Compacting for Utilities.
- B. Base course: In accordance with Section 02230: Base Courses.

3.02 PREPARATION:

- A. Fine grading:
 - 1. Immediately prior to placing paving materials, test the base course for conformity to the elevations and cross-section indicated on the Drawings.
 - 2. Fine grade as necessary to bring base course into conformance with the proper elevation and cross-section.

3. Compact all areas which have been regraded.
 - B. Place no hot mix asphalt material until the aggregate surface has been inspected and approved by ENGINEER.
 - C. Immediately before placing the hot mix asphalt material, remove all excess loose material remaining on the surface to the shoulder.
- 3.03 INSTALLATION:
- A. Placing the hot mix asphalt mix:
 1. Do not begin paving work until unsatisfactory base course conditions have been corrected.
 2. Place the hot mix asphalt mixtures on the prepared base course surface. Spread and strike-off using an acceptable hot mix asphalt paver.
 3. Spread mixture at minimum temperature of 225 degrees F.
 4. Inaccessible and small areas may be placed by hand.
 - B. Bond Coat:
 1. Clean contact surfaces of sand, dirt, or other objectionable material before applying bond coat.
 2. Apply a bond coat to each layer of hot mix asphalt material immediately prior to applying the succeeding layer.
 3. Application rate: 0.05 to 0.10 gallons per square yard.
 4. Use whatever means necessary to prevent bond coat from coming into contact with structures near the areas to be paved.
- 3.04 CLEANING:
- A. Prior to acceptance of work of this Section, clean the pavement and related areas as acceptable to ENGINEER.

END OF SECTION

SECTION 02720

STORM SEWER SYSTEM

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section includes:
 - 1. This Section includes, but is not necessarily limited to, the furnishing and installation of storm sewer system as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.
- B. Related Sections:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to:
 - a. General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.
 - b. Section 02222: Excavating, Backfilling and Compacting for Utilities.

1.02 REFERENCES:

- A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
 - 1. ASTM Standard Specifications:
 - a. A 48 - Gray Iron Castings.
 - b. A 536 - Ductile Iron Castings.
 - c. C 14 - Concrete Sewer, Storm Drain, and Culvert Pipe.
 - d. C 55 - Concrete Building Brick.
 - e. C 62 - Building Brick (Solid Masonry Units made from Clay or Shale).
 - f. C 76 - Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
 - g. C 139 - Concrete Masonry Units for Construction of Catch Basins and Manholes.
 - h. C 270 - Mortar for Unit Masonry.
 - i. C 443 - Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.
 - j. C 478 - Precast Concrete Manhole Sections.
 - k. C 923 - Resilient Connectors between Reinforced Concrete Manhole Structures and Pipes.
 - l. D 449 - Asphalt used in Dampproofing and Waterproofing.
 - m. F 405 - Corrugated Polyethylene (PE) Tubing and Fittings.
 - n. F 667 - Large Diameter Corrugated Polyethylene Tubing and Fittings.
 - 2. ASTM Standards:
 - a. C 497 - Method of Testing Concrete Pipe, Sections, or Tile
 - b. C 822 - Definitions of Terms Relating to Concrete Pipe and Related Products.
 - c. C 924 - Practice for Testing Concrete Sewer Lines by Low Pressure Air Test Method.
 - d. F 449 - Subsurface Installation of Corrugated Thermoplastic Tubing for Agricultural Drainage or Water Table Control.
 - 3. AASHTO Standards:
 - a. Corrugated Steel Pipe, Metallic-Coated for Sewers and Drains.
 - b. M218 - Steel Sheet, Zinc-Coated (Galvanized) for Corrugated Steel Pipe.
 - c. M274 - Steel Sheet, Aluminum-Coated (Type 2) for Corrugated Steel Pipe.
 - d. M252 - Corrugated Polyethylene Drainage Tubing.
 - e. M294 - Corrugated Polyethylene Pipe, 12 to 24-inch diameter.
 - f. M288 - Geotextiles Used for Subsurface Drainage Purposes, as modified in MDOT Section 910.03.
 - 4. MDOT:
 - a. 2020 Standard Specifications for Construction.
 - b. Standard Plans.

1.03 DEFINITIONS:

- A. Abbreviations:
 - 1. EJIW - East Jordan Iron Works.
 - 2. CSP - Corrugated steel pipe.
 - 3. PVC - Polyvinyl chloride.

4. RCP - Reinforced concrete pipe.
5. PE - Polyethylene pipe.
6. DIP - Ductile iron pipe.

1.04 SUBMITTALS:

- A. Submit in accordance with Section 01300: Submittals.
- B. Shop Drawings:
 1. Submit for junction chambers and structures.
 2. Required information:
 - a. General:
 - i. Dimensions.
 - ii. Details of construction and installation.
- C. Go, no-go gage and proving ring for plastic pipe.
- D. Quality control submittals:
 1. Design data.
 2. Test reports:
 - a. MDOT single and triple spot coating test results for CSP.
- E. Certificates:
 1. Manufacturer's certification and sworn statement for CSP.

1.05 QUALITY ASSURANCE:

- A. Qualifications:
 1. Fabrication and installation personnel:
 - a. Trained and experienced in the fabrication and installation of the materials and equipment.
 - b. Knowledgeable of the design and the reviewed Shop Drawings.
 2. Testing of materials:
 - a. Corrugated steel pipe (CSP):
 - i. Furnish Manufacturers' certification with chemical and mechanical Specifications.
 - ii. Furnish acceptable MDOT single and triple spot coating test results in accordance with MDOT 909.05.
 - b. Polyvinyl chloride (PVC).
 3. Testing of material installation:
 - a. Light or reflected light test for alignment.
 - b. Visual inspection for leakage and workmanship.
 - c. Deflection Testing for PVC installed.
 - i. Electronic Deflectometer.
 - ii. Rigid "Go, No-Go" device.

1.06 DELIVERY, STORAGE AND HANDLING:

- A. Receiving and storage:
 1. All materials shall be delivered in original, unbroken, brand marked containers or wrapping as applicable.
 2. Handle and store materials:
 - a. In a manner which will prevent:
 - i. Deterioration or damage.
 - ii. Contamination with foreign matter.
 - iii. Damage by weather or element.
 3. In accordance with Manufacturer's directions.
- B. Rejected material and replacements:
 1. Reject damaged, deteriorated or contaminated material and immediately remove from the Site.
 2. Replace rejected materials with new materials at no additional cost to OWNER.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

- A. Reinforced concrete pipe (RCP) and concrete pipe:
 - 1. Premarc Corporation, Northern Concrete Pipe; or equal.
- B. Corrugated steel pipe (CSP):
 - 1. Contec, Republic; or equal.
- C. Polyethylene pipe (PE):
 - 1. Advanced Drainage Systems, Inc.; Hancor, Inc.; or equal.
- D. Polyvinyl chloride pipe (PVC):
 - 1. Contec; J-M Pipe; or equal.
- E. Ductile iron pipe (DIP):
 - 1. American Pipe; U.S. Pipe; or equal.

2.02 PIPE MATERIALS:

- A. Concrete pipe:
 - 1. General: Type and class as indicated on the Drawings.
 - 2. Types:
 - a. Concrete: ASTM C 14.
 - b. Reinforced concrete (RCP): ASTM C 76.
 - 3. Joints:
 - a. Premium: O-ring gasket on grooved pipe ends.
 - b. Plain with mastic: DeWitt's No. 10WN; Carey, Sewertite; J.P. Petroleum Products, Tex-Mastic 726; Gralm, Anchor-Tite Plastic Mastic; or equal.
 - c. Lubricants:
 - i. Furnished by pipe Supplier.
 - d. Mastic:
 - i. Trowel grade sewer sealing compound.
 - e. External sealing bond:
 - i. ASTM C 877.
 - ii. Polymer of synthetic rubber
 - iii. Width: 13 inches.
 - f. Geotextile fabric:
 - i. In accordance with MDOT Section 910.03.
 - ii. Width: 3 feet.
 - g. Gaskets:
 - i. ASTM C 443.
 - ii. Furnished by pipe Supplier.
 - 4. End Sections:
 - a. As indicated on the Drawings.
 - 5. Flared end section.
 - a. Flared end section with concrete footing:
 - i. MDOT Standard Plan IV-86C.
 - 6. Rodent guard: MDOT Special Detail No. 4.
- B. Corrugated polyethylene (PE):
 - 1. General: type as indicated on the Drawings.
 - 2. Types:
 - a. Agricultural drainage and ground water capture system:
 - i. 3-inch to 6-inch diameter: ASTM F 405.
 - ii. 8-inch to 24-inch diameter: ASTM F 667.
 - b. Highway culverts and underdrains.
 - i. 3-inch to 10-inch diameter: AASHTO M252.
 - ii. 12-inch to 24-inch diameter: AASHTO M294.

[For perforated pipe only]

3. Filters:
 - a. AASHTO M288 as modified in 2020 MDOT Standard Specifications for Construction Section 910.03.
 4. End Sections:
 - a. As indicated on the Drawings.
 - b. Flared end section.
 - i. Material and coating:
 - 1) Match pipe.
 - 2) Zinc-coated steel.
 5. Joints and fittings:
 - a. Joints:
 - i. 90-degree twist lock: In conjunction with a 2-inch self-topping screw at each joint to prevent the joint from twisting apart.
 - ii. Split coupling: In conjunction with a metal strap which can be tightened around the coupling.
 - iii. Snap-on coupling: Not allowed.
- C. Polyvinyl chloride (PVC):
1. General: type and schedule as indicated on the Drawings.
 2. Types:
 - a. Smooth walled 4 to 15-inch ASTM D 3034, 18 to 24-inch ASTM F 679.
 - b. Ribbed ASTM F 794.
 - c. Perforated: 1/4-inch diameter holes at 6 inches on center at 90 degrees from previous perforation.
 3. Section properties: SDR 35, Schedule 40.
 4. Joints: ASTM D 3212 Push-on type joint.
 5. Fittings: Manufactured and furnished by the pipe Supplier.

2.03 FABRICATION:

- A. Bends:
1. Fabricated from segments of a steel cylinder with concrete mortar lining and reinforced concrete exterior covering, or from segments of concrete pipe miter-cut while the pipe is still green.
 2. Steel cylinder:
 - a. US S 10 gauge.
 - b. Lined with mesh reinforced concrete or mortar a minimum of 3/4-inch thick.
 - c. Designed for the same three-edge bearing loads as adjacent pipe.
 3. Miter-cut:
 - a. Remove concrete from around reinforcing steel as necessary.
 - b. Weld steel.
 - c. Replace concrete.

2.04 MANHOLES, CATCH BASINS AND INLETS:

- A. Type of units: As indicated on the Drawings.
1. Precast reinforced concrete:
 - a. Base section: ASTM C 478, [separate base slab] [base riser section with integral floor].
 - b. Riser and cone sections: ASTM C 478.
 - i. Watertight manholes: Provide four 5/8-inch threaded anchor bolts in cone section.
 - c. Joints:
 - i. Premium: ASTM C 443, 0-ring Rubber gasket.
 2. PVC or HDPE:
 - a. Drainage structures: ADS Nyloplas, or equal.
 - i. ASTM D3350, ASTM F405, ASTM F667, ASTM F810.

- B. Hardware:
 - 1. Steps:
 - a. General:
 - i. 10 inches deep x 10-inches wide.
 - ii. Tread:
 - 1) Depth: 5 inches.
 - 2) Rail height: 2 inches.
 - 2. Castings: As shown on the Drawings.
 - 3. Waterproofing:
 - a. Bituminous: ASTM D 449.
 - b. Cement: Masonry filler.

PART 3 - EXECUTION

3.01 PREPARATION:

- A. Alignment and grade:
 - 1. If there is a grade discrepancy or an obstruction which is not indicated on the Drawing, notify ENGINEER and obtain instructions prior to proceeding.
 - 2. Where storm sewer crosses water main:
 - a. Expose water main prior to laying storm sewer to verify existing depth.
 - b. Maintain minimum clearance of 18 inches unless otherwise indicated on Drawings or approved by ENGINEER.
 - c. Space joints equidistant from crossing.
 - 3. Control:
 - a. Laser beam:
 - i. Check line and grade at: Set-up point, 25 feet, 50 feet, 100 feet and 100-foot intervals thereafter.
 - ii. Reset projector at each manhole with a 600-foot maximum.
 - b. Allowable deflection:
 - i. Horizontal: 0.20 feet.
 - ii. Vertical: 0.10 feet.

3.02 INSTALLATION:

- A. General:
 - 1. Install pipe, fittings and appurtenances in accordance with Manufacturer's recommendations except as herein specified or indicated on the Drawings.
 - 2. Prevent entrance of foreign material.
 - 3. 12-inch and larger P.E. pipe: Excavate trench with a hydraulic excavator or backhoe.
- B. Pipe laying:
 - 1. Bearing: Support entire length of pipe barrel evenly with extra excavation at joints.
 - 2. Direction: Commence at outlet and proceed up grade with spigot ends pointing in direction of flow.
 - 3. Method:
 - a. Wipe clean the socket of pipe last laid.
 - b. Center spigot end of pipe to be laid and push home against base of socket.
 - c. Center pipe to form a sewer with a uniform invert.
- C. Jointing:
 - 1. Mastic:
 - a. Surfaces of joint: Clean and dry before mastic is applied.
 - b. Apply mastic to a depth of ½-inch or more before placing the pipe.
 - c. Take care in laying that the pipe does not shift and that it remains in a home position after assembly.
 - d. Remove mastic from inside the pipe for diameters 36-inches and larger.
 - 2. Lubricants: As required for coated CSP pipe. As required for gaskets.
 - 3. Gaskets:
 - a. Surfaces of joint: Clean and dry before lubricant is applied.
 - b. Take care in laying that the pipe does not shift and that gasket remains in a home position after assembly.
 - 4. Band Connector for CSP:
 - a. Bar, bolt and strap: Tighten bolts to a torque of 100 to 300 foot pounds.

5. External sealing bond:
 - a. In accordance with Manufacturer's recommendations.
 - b. Ensure stretch of bond along bottom of pipe and prevent pulling the sealing band into the joint by keeping the weight of the pipe off the bedding until band is fully installed.
 6. Geotextile wrap:
 - a. Wrap around joint surfaces.
 7. Allowable joint tolerance:
 - a. Maximum: ½ inch at newest surfaces of the joint.
 - b. Allowable joint tolerance shall not affect the lines and grades and their permissible tolerances.
- D. Manholes:
1. Base section placement: Full and even bearing.
 2. Precast units: Mortar joints, lift holes and around pipe.
 3. Block units:
 - a. Block: Set in full bed of mortar with key slots filled.
 - b. Joints: Maximum ½ inch wide at inside face and wiped.
 4. Top of casting elevation:
 - a. Gravel areas: 6 inches below surface.
 - b. Hot mix asphalt base course: At base course grade.
 - c. Final wearing surface:
 - i. At finished grade.
 - ii. Adjustment of castings from base course grade to finished grade is incidental.
 - d. Ditches: 6 inches below ditch bottom or protruding not more than 6 inches above slope; as applicable.
 - e. Other areas: As directed by ENGINEER or as indicated on Drawings.
 5. Waterproofing: Prevent visible leakage.
 6. Refer to standard detail on Drawings.
- E. Catch basins:
1. Base section placement: Full and even bearing.
 2. Precast units: Mortar joints, lift holes and around pipes.
 3. Block units:
 - a. Block: Set in full bed of mortar with key slots filled.
 - b. Joints: Maximum ½ inch below gutter grade.
 - c. Sump: ½-inch mortar coat inside and outside.
 4. Casting elevation:
 - a. Gutter area: ½ inch below gutter grade.
 - b. Other areas: As indicated on Drawings or directed by ENGINEER.
 5. Waterproofing: Visible leakage shall be prevented.
 6. Refer to standard detail on Drawing.
- F. Connections:
1. To existing structures: Relay and repoint loose blocks and bricks as required.
 2. For future use:
 - a. Plug: Pipe 4 through 21-inches with standard disc.
 - b. Bulkhead: Pipe 24-inches and larger with 8-inch thick brick and mortar and ½-inch plaster outside.
- 3.03 REPAIR:
- A. Treatment of field welds and damaged galvanized steel surfaces:
 1. Clean with wire brush.
 2. Two coats of zinc rich paint conforming to Federal Specifications ML-P-21035.
- 3.04 CLEANING:
- A. Debris: Remove dirt and debris, including cemented or wedged material, from the inside of sewers, manholes and catch basins.
 - B. Final acceptance: Clean all sewers, manholes and catch basins before requesting final acceptance.
- 3.05 TESTING AND INSPECTION:
- A. Observation: By ENGINEER.

- B. Notification:
 - 1. Testing: Arrange with ENGINEER following backfill, cleaning and pretesting.
- C. Equipment and manpower: Provide everything required for testing.
- D. Alignment and grade tests:
 - 1. Visual:
 - a. Each manhole to manhole section.
 - b. Mirrors or lights: Adequate to illuminate the section.
 - 2. Laser beam:
 - a. Set laser beam and target:
 - i. At respective manholes.
 - ii. Sequentially at $\frac{3}{4}$ -inch offset from:
 - 1) Invert.
 - 2) Crown.
 - 3) Left 1/4 point.
 - 4) Right 1/4 point.
 - b. One or more laser beam discontinuous:
 - i. Remove and replace section.
 - ii. Undamaged pipe may be reused.
- E. Deflection test for plastic pipe:
 - 1. Go, no-go gage:
 - a. Standard Details in Drawings.
 - b. Gage O.D.: Not less than 95 percent of maximum inside pipe diameter.
 - 2. Allowable maximum deflection: 5 percent of diameter.
 - 3. Pull go, no-go gage through each section:
 - a. At least 30 days after completion of backfill.
 - b. Pulled by one person with no mechanical advantage.
 - 4. Go, no-go gage will not pass:
 - a. Remove and replace section.
 - b. Undamaged pipe may be reused.
 - 5. Vibratory rerounding device:
 - a. Use not permitted Obtain ENGINEER's approval.

END OF SECTION

SECTION 02920

SOIL PREPARATION

PART 1 - GENERAL

1.01 GENERAL:

- A. The CONTRACTOR's attention is directed to the CONDITIONS OF THE CONTRACT, as well as DIVISION 1 – GENERAL REQUIREMENTS. They shall apply to all work of this section as if herein repeated in full.

1.02 DESCRIPTION:

- A. Related Work specified elsewhere:
 - 1. Section 02210: Site Grading.
 - 2. Section 02930: Lawns and Grass.

1.03 TESTS:

- A. CONTRACTOR shall provide soil fertility and calcium test results for topsoil used in lawns and plantings for review by ENGINEER.

PART 2 - PRODUCTS

2.01 TOPSOIL:

- A. Shall be obtained from the stockpiles upon completion of testing and approval. Topsoil shall be a friable sandy loam consisting of dark organic, natural surface soil, not including peat or muck. Float topsoil to a uniform surface.

2.02 FERTILIZER:

- A. Shall be commercially prepared chemical fertilizer furnished to the job site in unopened bags showing weight and analysis. Any material which has been damaged or has deteriorated shall be promptly removed from the job site.

PART 3 - EXECUTION

3.01 TOPSOIL SPREADING:

- A. The topsoil shall be spread uniformly to a minimum depth of 3 inches over all areas to be lawn. Ground cover beds shall receive a minimum depth of 8 inches. Additional topsoil material required shall be furnished by the CONTRACTOR and approved by the ENGINEER before placement. Float topsoil to a uniform surface.

3.02 RAKING:

- A. Rake out from the topsoil all weeds, brush or stones, loosening as required to receive fertilizer.

3.03 FERTILIZING AND LIME:

- A. Fertilizer and lime shall be applied over the prepared topsoil at the minimum rate recommended by tests and shall be disked, harrowed or raked into the topsoil to a depth of not less than 2 inches.

END OF SECTION

SECTION 02930

LAWNS AND GRASS

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section includes:
 - 1. This Section includes, but is not necessarily limited to, the furnishing and installation of the major items listed below, as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the Work.
 - 2. Major items:
 - a. Seed.
 - b. Fertilizer.
 - c. Mulch.
 - d. Sod.
 - e. Dune grass.
- B. Related Sections:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to:
 - a. General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.
 - b. Section 02210: Site Grading.
 - c. Section 02272: Soil Erosion and Sedimentation Control.
 - d. Section 02920: Soil Preparation.

1.02 REFERENCES:

- A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
 - 1. MDOT:
 - a. 2020 Standard Specifications for Construction.
 - b. Standard Plans.

1.03 DEFINITIONS:

- A. Follow-up maintenance: Maintenance required when seeding, sodding, or other vegetative practices do not achieve the desired degree of stabilization.
- B. Periodic maintenance: Maintenance performed after the vegetation has been established.

1.04 LOCATION:

- A. Sodded areas: As indicated on the Drawings.
- B. Seeded areas: All disturbed areas within the project limits not covered by other surface improvements or features.
- C. Mulch blankets: As indicated on the Drawings.

1.05 SUBMITTALS:

- A. Submit in accordance with Section 01300: Submittals.
- B. Product data: Submit for netting and mulch blanket.
- C. Samples: Submit for netting and mulch blanket.
- D. Quality control submittals:
 - 1. Certificates: Submit Supplier's certified analysis for each seed and fertilizer mixture required.

1.06 QUALITY ASSURANCE:

- A. Qualifications:
 - 1. Fabrication and installation personnel:
 - a. Trained and experienced in the fabrication and installation of the materials and equipment.
 - b. Knowledgeable of the design and the reviewed submittals.

1.07 DELIVERY, STORAGE AND HANDLING:

- A. Receiving and storage:
 - 1. All materials shall be delivered in original, unbroken, brand marked containers or wrapping indicating weight, analysis and Manufacturer's name.
 - 2. Handle and store materials:
 - a. In a manner which will prevent:
 - i. Deterioration or damage.
 - ii. Contamination with foreign matter.
 - iii. Damage by weather or elements.
 - b. In accordance with Manufacturer's directions.
- B. Rejected material and replacements:
 - 1. Reject damaged, deteriorated or contaminated material and immediately remove from the Site.
 - 2. Replace rejected materials with new materials at no additional cost to OWNER.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Topsoil: In accordance with Section 02210: Site Grading.
- B. Fertilizer:
 - 1. Comply with MDOT 917.09 except as herein specified.
 - 2. Liquid fertilizer for hydroseed: 16-32-4 containing no chlorine.
- C. Seed:
 - 1. Comply with MDOT 917.11 except as herein specified.
 - 2. Uniform mixtures composed of seed of the following proportions by weight:
 - a. Lawns: Spartan Grade A.
- D. Mulch:
 - 1. Small grain:
 - a. Straw.
 - b. Hay.
 - 2. Anchoring material for small grain mulch:
 - a. Netting:
 - i. Biodegradable.
 - ii. Openings not to exceed 1½ inches x 2 inches.
 - iii. Minimum roll width: 35 inches.
 - iv. Anchoring staples or pins: Steel wire not permitted. Wood pegs at least 6 inches long.
 - b. Latex-based adhesive.
 - 3. Hydromulch:
 - a. Slurry: Minimum 60 percent wood fiber mulch with remaining being recycled cellulose fibers.
 - b. Tackifier:
 - i. Manufacturers: Finn Fiber Plus; Finn Fiber gum; or equal.
 - ii. Synthetic fiber or gum.

4. Mulch blankets:
 - a. Biodegradable:
 - i. Straw: North American Green S-150; or equal.
 - b. Anchoring staples or pins: Wood pegs at least 6 inches long. Steel wire not permitted.
- E. Sod:
 1. Comply with MDOT Section 917.12.
 2. MDOT Class A.
- F. Dune grass:
 1. The dune grass (*Ammophila breviligulata*) plants shall be true to species and shall originate from a Great Lakes source
 2. Each plant or culm (a single stem with roots attached) shall be bare root and have one live rhizome minimum.
 3. Culms with seed heads shall not be used.

PART 3 - EXECUTION

3.01 TOPSOIL:

- A. In accordance with Section 02210: Site Grading.

3.02 SEEDBED PREPARATION:

- A. General:
 1. After the areas to be seeded have been brought to the required grade and properly trimmed, bring soil to a friable condition by disking, harrowing, or otherwise loosening and mixing to a depth of 3 to 4 inches. Thoroughly break all lumps and clods.
 2. If the prepared seedbed is not fertilized, satisfactorily seeded, and mulched before the friable condition is lost through compaction or crusting, repeat the seedbed preparation prior to seeding or reseeded.
- B. Raking: Rake prepared seedbed before seeding.

3.03 FERTILIZING:

- A. Dry fertilizer:
 1. Broadcast on surface as first step in seeding process.
 2. Apply with seeding if drilled.
 3. Work fertilizer into the soil to a depth of 1 to 2 inches.
 4. Apply uniformly.
 5. Application rate: Equivalent to 240 pounds per acre of 12-12-12.
- B. Hydroseeding:
 1. Apply fertilizer with seed.
 2. Application rate: Equivalent to 6.25 pounds per 1,000 square feet of 16-32-4.

3.04 SEEDING:

- A. Scheduling:
 1. Within 30 days from the time the area was first disturbed.
 2. Channel banks: Within 24 hours from the time the area was first disturbed.
 3. Seasonal limitations:
 - a. April 20 through October 31.
 - b. Dormant seeding after November 1.
- B. Sowing:
 1. Sow the seed following or in conjunction with the fertilizer and while the seed bed is in a friable condition.
 2. Do not sow seeds through mulch.
 3. Application rate:
 - a. Lawn area: Sow seed at a minimum rate of 5 pounds per 1000 square feet.
 - b. Other areas: Sow seed at a minimum rate of 35 lbs/acre.

- C. Finishing:
 - 1. Float and lightly compact areas sown by hydroseeder or the broadcast method to incorporate the seed into the uppermost ½ inch of the soil.

- D. Method:
 - 1. Broadcast:
 - a. Do not seed when wind velocity exceeds 5 miles per hour.
 - 2. Mechanical drills.
 - 3. Hydroseeder:
 - a. Use only equipment specifically designed for hydraulic seeding application.
 - b. Mix seed, fertilizer and pulverized mulch in water until uniformly blended into homogeneous slurry.
 - c. Continue mixing during application.

- E. Inspection:
 - 1. Areas which are sown by hydroseeder or the broadcast method shall be visually inspected for uniformity of application; areas in which visual inspection fails to reveal an average of two seeds per square inch shall be resown at no additional cost to OWNER.

- F. Seed on slopes:
 - 1. Protect seeded slopes against erosion with netting, asphalt emulsion adhesive or other methods acceptable to ENGINEER.
 - 2. Protect seeded slopes against erosion with mulch blanket.

3.05 MULCHING:

- A. Small grain mulch:
 - 1. Application:
 - a. Immediately after seeding.
 - b. Uniform distribution.
 - c. Allow sunlight to penetrate mulch.
 - 2. Application rate: Two tons per acre (2-1/2 bales per 1,000 square feet).
 - 3. Anchoring:
 - a. Mulch anchoring tool.
 - b. Netting.
 - c. Asphalt emulsion adhesive:
 - i. Hold mulch in place with asphalt emulsion or other materials approved by ENGINEER.
 - ii. Apply emulsion uniformly at a rate of 200 gallons per acre.
 - iii. Spray emulsion simultaneously with the mulch on immediately following mulching.
 - iv. Protect all signs, structures, and other objects from being marked or disfigured by adhesive materials.
 - v. Do not apply during freezing weather.
 - d. Latex based adhesive.

- B. Hydromulch:
 - 1. Apply with hydroseed or following seeding by other method.
 - 2. Application rate: 1,250 pounds per acre.

- C. Mulch blankets:
 - 1. Netting on top.
 - 2. Fibers in direct contact with soil.
 - 3. Staple in accordance with Manufacturer's guidelines for slope conditions.
 - 4. Direction of installation:
 - a. Direction of flow of water in intermittent and ephemeral drains.
 - b. Perpendicular to sideslopes above normal water level in perennial drains.

3.06 SOD BED PREPARATION:

- A. Make area to be sodded:
 - 1. Smooth and uniform.
 - 2. Parallel to the finished grade and cross sections indicated on the Drawings.

3.07 LAYING SOD:

- A. General:
 - 1. Moisten sod and place on a moist earth bed.
 - 2. Lay sod within 24 hours after cutting and properly protect it until placed.
 - 3. Carefully place the sod by hand in rows at right angles to the slopes, commencing at the base of the area to be sodded and working upward.
 - 4. Do not use pitch forks to handle sod. Dumping from vehicles will not be permitted.
 - 5. Extend bottom edge of sodded areas at least 2 inches into the ground or ditch bottom.
 - 6. Break transverse joints of sod strips and carefully lay sod to produce tight joints.
 - 7. When the sod may be displaced during sodding operations, work from ladders or treaded planks.
 - 8. Firmly compact the sod by tamping immediately after it is placed.
 - 9. After tamping, the sod shall present a smooth, even surface free from bumps and depressions.
- B. Sod on slopes:
 - 1. On slopes steeper than 1 vertical to 3 horizontal, peg the sod with wooden pegs.
 - 2. Space pegs not over 2 feet apart in any direction.
 - 3. Drive pegs flush with the surface of the sod.
- C. Frozen materials:
 - 1. Do not place frozen sod.
 - 2. Do not place sod on frozen soil.
- D. Watering:
 - 1. After placing sod, water with an initial application of 15 gallons per 100 square feet.

3.08 DUNE GRASS:

- A. General:
 - 1. Keep roots moist and protected from drying until time of planting.
 - 2. Any dune grass growing along the project under construction, outside of grading limits, shall not be disturbed.
- B. Planting:
 - 1. Plant 6" inches on center for complete coverage of areas.
 - 2. Install each plant 6 to 8 inches deep by splitting the soil or boring a hole and placing the plant into the hole.
 - 3. Backfill and foot-tamp moist soil firmly around plant to eliminate air gaps.
 - 4. Take care that dry surface sand does not enter hole.
- C. Limitations:
 - 1. Plant on slopes not steeper than 2:1.
 - 2. Plant between September 15th – November 30th & March 1st – May 15th.
 - 3. Plant when the ground is not frozen.
- D. Protection:
 - 1. Begin maintenance of dune grass immediately after each area is planted and continue for 30 days.
 - 2. Maintenance shall consist of replacing plants which have expired except for defects resulting from neglect by OWNER, abuse, or damage by others or unusual phenomena or incidents which are beyond CONTRACTOR'S control.

3.09 WATERING

- A. CONTRACTOR is responsible for watering at a minimum twice per week recently seeded areas until the grass has thickened and is at least 5" tall. Watering is included in the restoration pay item. If the CONTRACTOR does not water, the OWNER has the right to hire someone to water at CONTRACTOR'S expense, payment will be deducted from restoration pay item.

3.10 MAINTENANCE:

- A. General:
 - 1. CONTRACTOR is responsible for follow-up maintenance.
 - 2. CONTRACTOR is responsible for periodic maintenance for 60 days after completion of any area of seeding or sodding.

- B. Follow-up maintenance:
 - 1. Inspect materials planted in the spring during the summer or early fall, and take corrective action during the fall planting season.
 - 2. Inspect materials planted in the fall during the spring and take corrective action during this spring planting season.
 - 3. Reseed, sod, plant, fertilize, mulch, topsoil, grade and roll as necessary to achieve a uniform lawn free from eroded or bare areas.
 - 4. Water sodded and seeded areas as required to maintain the viability of the Product.

- C. Periodic maintenance:
 - 1. Mow turf grass at 3 inch to 3½ inch height and subsequent mowing as required to maintain 1½ inch to 2 inch height. The dune grass shall not be mowed.
 - 2. Spot seed or replant areas damaged by traffic or other means.

END OF SECTION

SECTION 02950

TREES, PLANTS AND GROUNDCOVERS

PART 1 - GENERAL

1.01 GENERAL:

- A. The CONTRACTOR's attention is directed to the GENERAL CONDITIONS OF THE CONTRACT, as well as DIVISION 1 – GENERAL REQUIREMENTS. They shall apply to all work of this Section as if herein repeated in full.

1.02 DESCRIPTION:

- A. Related Work specified elsewhere:
 1. Section 02210: Site Grading.
 2. Section 02920: Soil Preparation.
 3. Section 02930: Lawns and Grass.

1.03 TIME OF PLANTING:

- A. Planting shall be performed as other construction allows. Winter planting shall be done only with approval by ENGINEER.

1.04 LAYOUT OF WORK:

- A. It shall be the responsibility of this CONTRACTOR to stake out plant locations in close conformity with the locations which are designated on the Drawings. After the staking has been completed, the CONTRACTOR shall contact the ENGINEER for approval and/or adjustment of the staked locations.

1.05 INSPECTION OF SUBGRADE:

- A. CONTRACTOR to examine subgrade, verify the elevations, observe the conditions under which work is to be performed, and notify the General CONTRACTOR of unsatisfactory conditions. Do not proceed until corrected.

1.06 MAINTENANCE:

- A. The CONTRACTOR shall assume that the OWNER will give his planting NO care during the construction period. Care and maintenance deemed necessary by the CONTRACTOR to ensure the survival of his plant material shall be furnished by him and shall include watering, cultivating, spraying and all other work required for the satisfactory growth and development of the plant.

1.07 GUARANTEE:

- A. For a period of one year after notice of substantial completion and at no additional cost to the OWNER, the CONTRACTOR shall replace any plant materials that are dead or that are, in the opinion of the ENGINEER, in an unhealthy or unsightly condition, or that have lost their natural shape due to dead branches, excessive pruning or inadequate or improper maintenance. All plant materials rejected by the ENGINEER shall be removed from the Site and legally disposed of by the CONTRACTOR at no additional cost to the OWNER.
- B. Replacement plants and planting operations shall be in accordance with the original specifications. All costs for such replacements shall be considered to be included in the Bid price. Replacement planting guarantees shall also be for a one year period from date of replacement. All areas damaged by replacement operations shall be fully restored by the CONTRACTOR to their original and/or specified condition.
- C. The CONTRACTOR shall not assume responsibility during the guarantee period for damages resulting from natural causes such as floods, lightning storms, freezing rains or winds over 60 miles per hour, nor will be held responsible for damages resulting from acts of negligence the part of the OWNER or others occupying the site; fires or vandalism.

PART 2 - PRODUCTS

2.01 TOPSOIL FOR PLANTING:

- A. Topsoil shall be as specified under Section 02920, Part 2.1. It shall be free of stones 2 inches in diameter or larger, roots, sticks and other extraneous material.

2.02 PLANTING MIXTURE:

- A. The material which is used for tamping around the balls and roots in the process of planting shall be prepared on the site by mixing 4 parts topsoil to 1 part peat, adding 5 lbs. of superphosphate to each cubic yard of the mixture. Planting mixture shall also include 4 parts of native subsoils.

2.03 PEAT:

- A. Shall be granulated raw peat or baled peat, containing not more than 9 percent mineral on a dry basis.

2.04 SUPERPHOSPATE:

- A. Shall contain 20 percent of phosphoric acid.

2.05 GUYING, STAKING AND WRAPPING MATERIAL:

- A. Stakes for staking shall be sound uniform pieces of wood, 2 inches x 2 inches x 120 inches long or steel posts. Staking wire shall be 12 to 14 gauge annealed galvanized steel. Hose for covering wire shall be new or used, black or red, 2 ply fiber reinforced garden hose, not less than ½ inch inside diameter. Seconds rejected by factory are acceptable. Tree wrap shall be first quality, heavy, waterproof crepe paper manufactured for this purpose. All materials shall conform to MDOT 917.

2.06 MULCH:

- A. To be 100 percent shredded bark fiber.

2.07 ANTI-DESICCANT:

- A. Anti-desiccant shall be “Wilt Pruf” or equal, delivered in manufacturer’s containers and used according to the Manufacturer’s instructions.

2.08 WATER:

- A. Suitable water for the execution of this work and maintenance shall be provided by the CONTRACTOR. The CONTRACTOR shall, however, be required to furnish his own hose and hose connections from the outlets where the water will be furnished.

2.09 PLANT MATERIALS:

- A. **Quality and Size.** Plant materials shall conform to the sizes given in the list of Drawings and shall be sound, healthy, vigorous and free from plant diseases and insect pests or their eggs and shall have healthy root systems. All measurements such as spread, ball size, number of cones, quality designations, etc., shall be in accordance with the latest edition of AMERICAN STANDARDS FOR NURSERY STOCK, by the American Association of Nurserymen. Trees shall be calipered SIX INCHES above the ground. Trees planted in rows shall be uniform in size and shape.
- B. **Substitutions.** These will be permitted only upon submission of proof that specified plants are not obtainable, and with the authorization of the ENGINEER, provide for the use of the nearest equivalent, size and variety of plants. All requests for price adjustments due to substitutions will be submitted in writing to the ENGINEER for approval along with a request for use of the substitution.
- C. **Root Protection.** Plants which are balled and burlapped shall be dug with firm, natural balls of earth of sufficient diameter and depth to encompass the fibrous and feeding systems necessary for full recovery of the plant. Balls shall be securely wrapped with burlap and bound with cord. No balled and burlapped plant shall be planted if the ball is cracked or broken. All balled and burlapped plants which cannot be planted immediately upon delivery shall be set on the ground and shall be well protected with soil, wet moss, or other acceptable material. Container Grown Stock shall have well established roots in the soil mass and shall have grown in the container for at least one growing season. Over-established plants, as evidenced by “pot bound” root ends, will not be accepted. Bare root plants shall be handled in a manner that the roots are protected at all times.

- D. Protection During and After Delivery. ALL PLANT MATERIAL is to be delivered in closed vehicles or in open vehicles with the entire load properly covered in transit for protection from drying winds. They shall be planted immediately upon delivery. No plant shall be bound with rope or wire in a manner that would damage the bark or break the branches. If deciduous trees and shrubs are moved in full leaf, spray with anti-desiccant at the nursery BEFORE transporting and again two weeks after planting.

PART 3 - EXECUTION

3.01 PREPARATION:

- A. Tree pits shall be excavated as shown in details. Excess subsoil dug from pits, trenches and beds shall be disposed of by the CONTRACTOR.

3.02 PLANTING:

- A. Plant trees and shrubs after final grades are established and prior to lawn installation. The CONTRACTOR is responsible for planting to correct grades and alignment and all plants shall be set so that, when settled, they will bear the same relation to finish grade as they did before being transplanted. No filling will be permitted around trunks or stems. When the plant is set, the pit shall be backfilled with planting mixture, gradually filling, tamping and settling with water. No soil in a frozen or muddy condition shall be used for backfilling. A ring of soil, or saucer, shall be formed around the edge of each plant to hold water.
1. Balled and burlapped stock shall be set plumb. Care should be exercised to prevent damaging the rot ball during the tamping operation. When the plant hole has been backfilled and compacted to one-half depth, the burlap and lacing shall be removed from the upper half of the ball. The backfilling of the hole with prepared soil should then continue to an elevation which, after compaction, will be flush with the ground line.
 2. Container grown stock. When plants are furnished in non-plantable containers, the containers shall be removed at the time of planting. When plants are furnished in plantable type containers, the sides of each container shall be severed in several places, and during planting, the upper half of the container shall be removed, leaving the root and soil mass intact.
 3. Bare root stock. Roots which have been broken or frayed shall be cleanly cut back. During planting, roots shall not be allowed to mat together, but shall be spread and arranged in their natural position and planting mixture shall be worked in among them.

3.03 SHRUBS:

- A. Plant on centers indicated, using specified quantity of plants. Hedge plants may be planted in a continuous trench, rather than in separate pits.

3.04 MULCHING AND WATERING:

- A. All planting shall be mulched with bark mulch. Plant pits and beds shall be completely covered with a 4-inch layer of mulch. All plants shall be thoroughly soaked after planting. After each watering, all beds shall be raked and left in a complete finished manner. Ground cover beds shall be mulched and then plants placed in the soil at spacing as indicated on the Drawings.

3.05 PRUNING AND REPAIR:

- A. Upon completion of planting, all trees and shrubs shall be pruned, limited to the minimum necessary to remove dead or injured twigs and branches and to compensate for the loss of roots from transplanting. Pruning shall be done in such a manner as not to change the natural habit or shape of the plant. All cuts shall be made flush, leaving no stubs. Paint all cuts over ¾ inch in diameter with tree paint. All pruning shall be done by workmen experienced in this type of work. Hedge shears will not be permitted for pruning.

3.06 STAKING AND WRAPPING TREES:

- A. Staking shall be completed immediately after planting, stake all trees as indicated in the planting details. The trunks of all deciduous trees larger than the 6-foot to 8-foot grade shall be wrapped with standard tree wrap immediately after planting. WRAPPING: The trunks shall be wrapped spirally from bottom to top with material as specified and shall be adequately secured. The wrapping shall overlap and entirely cover the trunk from the ground to height of the second branch and shall be neat and snug. Overlap shall be approximately 2 inches.

3.07 WATERING AND MAINTENANCE:

- A. The CONTRACTOR shall assume responsibility for maintaining his work to the completion of planting and acceptance by OWNER.

3.08 PLANT PROTECTION:

- A. Coniferous trees, shade trees and ornamental trees shall be fully protected by applying an anti-desiccant per Manufacturer's directions.

3.09 PROTECTION:

- A. CONTRACTOR shall protect all plants and lawns from damage at all times during planting and until acceptance by OWNER. If plants or lawns are damaged, they shall be replaced or repaired by the CONTRACTOR at his own expense.

3.10 ACCEPTANCE:

- A. At the completion of planting, final acceptance will be made by the ENGINEER provided all requirements of the Specifications have been fulfilled.
- B. Inspection of planting will be made jointly by the CONTRACTOR, ENGINEER and OWNER representative at the COMPLETION OF PLANTING. All plants not in a healthy, growing condition shall be removed and replaced with plants of like kind, size and quality as originally specified before the close of the next planting season.

END OF SECTION

SECTION 03300

CONCRETE

PART 1 - GENERAL

1.01 SECTION INCLUDES:

- A. Formwork, shoring (as required), bracing and anchorage.
- B. Concrete reinforcement accessories.
- C. Cast-in-place concrete for slabs on grade, fence posts, and light pole bases, foundation walls, retaining walls and footings.

1.02 REFERENCES:

- A. ACI 301 – Specifications of Structural Concrete for Buildings.
- B. ANSI/ASTM A185 – Welded Steel Wire Fabric for Concrete Reinforcement.
- C. ASTM A615 – Deformed and Plain Billet-Steel for Concrete Reinforcement, Grade 60.
- D. ASTM C33 – Concrete Aggregates.
- E. ASTM C94 – Ready-Mixed Concrete.
- F. ASTM C150 – Portland Cement.
- G. ASTM C260 – Air Entraining Admixtures for Concrete.
- H. ASTM C309 – Liquid Membrane-Forming Compounds for Curing Concrete.
- I. ASTM D2103 – Polyethylene Film and Sheeting.
- J. FS TT-C-800 – Curing Compound, Concrete, for New and Existing Surfaces.

1.03 QUALITY ASSURANCE:

- A. Perform work in accordance with ACI 301.
- B. Independent Testing Laboratory.
- C. Surface finish standards by Cresset Chemical Company (CCS); ie: CSS-2.

1.04 REGULATORY REQUIREMENTS:

- A. Conform to applicable codes.
- B. Conform to criteria set herein and monitored by the testing laboratory.

1.05 TESTS:

- A. Testing and analysis of concrete will be performed under provisions of this Section.
- B. Submit proposed mix design of each class of concrete to appointed firm for review prior to commencement of work.
- C. Testing firm will take cylinders and perform slump and air entrainment tests in accordance with ACI 301.
- D. Tests of cement and aggregates will be performed to ensure conformance with requirements stated herein.
- E. Three concrete test cylinders will be taken for every 50 or less cu yards of each class of concrete placed each day. Minimum of one set of cylinders for slabs on grade and one set for walls.

- F. One additional test cylinder for exterior work will be taken during cold weather and be cured on-site under same conditions as concrete it represents.
 - G. One slump test will be taken for each set of test cylinders taken.
- 1.06 SHOP DRAWINGS:
- A. Submit Shop Drawings of reinforcing steel under provisions of Section 01300.
 - B. Indicate reinforcement sizes, spacings, locations and quantities of reinforcing steel, and wire fabric, bending and cutting schedules, splicing, and supporting and spacing devices.
 - C. Indicate formwork dimensioning, materials, arrangement of joints and ties.

PART 2 - PRODUCTS

- 2.01 FORM MATERIALS:
- A. Conform to ACI 301.
 - B. Plywood forms: Douglas Fir or Southern Pine species; high density overlaid, one side B-C grade; sound undamaged sheets.
 - C. Lumber: Douglas Fir or Southern Pine species; Structural No. 2 grade; with grade stamp clearly visible.
 - D. Steel forms: Minimum 16 gage thick stiffened to support weight of concrete with minimum deflection.
 - E. Form ties: Removable Snap-off metal, of fixed adjustable length, cone ends.
- 2.02 REINFORCING STEEL:
- A. Reinforcing steel: ASTM A615, grade 60 ksi; deformed bars; uncoated finish.
 - B. Welded steel wire fabric: Plain type, ANSI/ASTM A185; uncoated finish.
- 2.03 CONCRETE MATERIALS:
- A. Cement: ASTM C150, normal – Type I or I/II Portland, grey color.
 - B. Fine and Coarse Aggregates: ASTM C33.
 - C. Water: Clean potable type, and not detrimental to concrete.
- 2.04 ADMIXTURES:
- A. Color admixture: Not required.
 - B. Air-entrainment admixture: ASTM C260; 5 percent, +/- 1 percent; similar to “Micro-Air” by Master Builders; “Daravair” by Grace; or, an approved equivalent.
 - C. Superplasticizers: Water reducing, per ASTM C494, Type A; similar to “Pozzolith 220-N”, “322-N” series, or “555-Accelerator” by Master Builders; “Daracem-100” or “WRDA-19” by W.R. Grace; or, an approved equivalent.
 - D. Pumping admixture: Water soluble, high molecular weight polyethylene oxide polymer; similar to “Darex-Pumping Aid” by W.R. Grace, or, an approved equivalent.
- 2.05 ACCESSORIES:
- A. Bonding agent: Two component epoxy resin meeting ASTM 881 per project demands, as manufactured by Burke, Euclid Chemical, L & M Construction Chemicals, Inc., Permagine, or W.R. Meadows, Inc.
 - B. Vapor retarder: ASTM D2103, minimum 6 mil thick clear polyethylene film.

- C. Non-shrink grout: Premixed non-gaseous non-metallic aggregate; capable of minimum compressive strength of 8000 psi at fluid consistency for 45 to 60 minutes at 77°F in compliance with CRD-C 621 and ASTM C-1107 Specifications; similar to “Easy-Flow” and “Multipurpose” by the Symons Corp.; and. “Masterflow 928” by Master Builders; “Crystex” by L & M Chemical Co.; and “TammsgROUT 621” by Euclid Chemical.
- D. Construction joints: Galvanized steel, keyed, full slab thickness.
- E. Expansion joints: Will-Seal expanding gasket material as manufactured by Illbruck/USA.
- F. Form release agent: Colorless, VOC compliant, fuel oil free material which will not stain concrete, absorb moisture or impair natural bonding or color characteristics of coating intended for use of concrete; “Debond” as manufactured by L & M Construction Chemicals, Inc.; or “Crete-Lease 880 VOC” as manufactured by Cresset Chemical Co.; or, other VOC compliant products from the Symons Corp.

2.06 CURING MATERIALS:

- A. Water: Clean and drinkable.
- B. Membrane curing/sealer compound: ASTM C309; water retention of .39 kg/m² minimum.
- C. Membrane curing/sealer compound: Water based type, clear for interior and white pigmented finish for exterior work; No. 1100 Clear, No. 1200 White pigmented as manufactured by W.R. Meadows; and, white pigmented “Safe-Cure As” and clear “Safe-Cure Seal 309” by the Spray-Cure Co.; “Aqua Resin Cure” by Burke; “Rsei-ChemM148” by the Symons Corp.: or, an approved equivalent.

2.07 CONCRETE MIX:

- A. Mix concrete in accordance with ASTM C94.
- B. Foundation concrete (footings, piers, and grade beams):
 - 1. Compressive strength (28 days): 4500 psi
 - 2. Slump: 4 inches.
 - 3. Total Air Content: 6% +/- 1.5%
- C. Supported concrete slab:
 - 1. Compressive strength (28 days): 4500 psi
 - 2. Maximum water to cement ratio, including fly ash: 0.40
 - 3. Slump: 7 inches (with a plasticizer).
4 inches (without additive)
 - 4. Total Air Content: 6% +/- 1.5%
- D. Concrete Pavement:
 - 1. Compressive strength (28 days): 3500 psi
 - 2. Slump: Max 3 inches
 - 3. Total Air Content: 5.5% - 8%
- E. Use non-chloride type admixtures.

PART 3 - EXECUTION

3.01 FORMWORK ERECTION

- A. Verify lines, levels, and measurement before proceeding with formwork.
- B. Hand trim sides and bottom of earth forms; remove loose dirt.
- C. Align form joints.
- D. Do not apply form release agent where concrete surfaces received special finishes or applied coatings which may be affected by agent.

- E. Coordinate work of other Sections in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors, and other inserts.

3.02 REINFORCEMENT:

- A. Place, support, and secure reinforcement against displacement.
- B. Locate reinforcing splices as shown on Drawings.

3.03 PLACING CONCRETE:

- A. Notify ENGINEER minimum 24 hours prior to commencement of concreting operations. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Do not add water to concrete during delivery, at Project Site, or during placement, unless approved by ENGINEER.
- C. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete in manner to avoid segregation.
- D. Deposit concrete in forms in horizontal layers no deeper than 24 inches and in a manner to avoid inclined construction joints. Place each layer while preceding layer is still plastic, to avoid cold joints.
 - 1. Consolidate placed concrete with mechanical vibrating equipment. Use equipment and procedures for consolidating concrete recommended by ACI 309R.
 - 2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the vibrator. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mix constituents to segregate.
- E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
 - 1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 2. Maintain reinforcement in position on chairs during concrete placement.
 - 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 - 4. Slope surfaces uniformly to drains where required.
 - 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, free of humps or hollows, before excess moisture or bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
- F. Cold-weather placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures:
 - 1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
 - 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemicals accelerators, unless otherwise specified and approved in mix designs.
- G. Hot-weather placement: Place concrete according to recommendations in ACI 305R and as follows, when hot-weather conditions exist:
 - 1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is CONTRACTOR's option.
 - 2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
 - 3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.04 FINISHING FORMED SURFACES:

- A. Rough-formed finish: As-cast concrete texture imparted by form-facing material with tie holes and defective areas repaired and patched. Remove fins and other projections exceeding ACI 347R limits for class or surface specified.
- B. Smooth-formed finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Remove fins and other projections exceeding 1/8 inch in height.
 - 1. Apply to concrete surfaces exposed to public view or to be covered with a coating or covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, or painting.
 - 2. Do not apply rubbed finish to smooth-formed finish.
- C. Related unformed surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.
- D. Concrete to be broom finished if no texture from forms is to be matched. No unformed surface shall be finished with steel trowel.

END OF SECTION

SECTION 15012

DUCTILE IRON PIPING

PART 1 GENERAL

1.01 WORK INCLUDED

- A. The work covered by this section consists of furnishing and installing watermain of raw water, valves, fittings, and other connections, of the type and size specified and at the locations shown on the Drawings. The work shall also include the necessary excavation, pipe bedding, backfill, testing, and flushing. Disinfection is not required.
- B. Provide all tools, labor, materials, equipment and supervision to perform all operations involved in the construction of watermain and appurtenances as required by this contract in strict accordance with the provisions of the Specifications and Drawings and subject to the terms and conditions of the contract.

1.02 RELATED SECTIONS

- A. General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.
- B. Section 02222: Excavating, Backfilling, and Compacting for Utilities.

1.03 REFERENCES

- A. Unless otherwise specified herein, materials and methods of the construction of the watermain will conform to the standards set forth by the American Water Works Association (AWWA) and the American National Standards Institute (ANSI), including the latest revision of those standards.

1.04 GENERAL REQUIREMENTS

- A. This work will be subject to the General Requirements and Covenants of the Contracts, requirements contained herein, and details shown on the Drawings. The Contractor shall provide all the labor, materials, tools, equipment, accessories and services necessary to install the items called for on the contract documents and will be responsible for producing a complete and workable installation in keeping with the intent of the contract.

1.05 SUBMITTALS FOR REVIEW

- A. The Contractor shall furnish shop drawing and product data in accordance with the General Conditions.
- B. Shop drawings shall indicate design details of the item to be furnished, their locations and function in the project, finish, operating details, and other such information.
- C. Submit manufacturer's qualifications, product data, and shop drawings in sufficient detail to confirm compliance with requirements of this section.
- D. Submit product data and shop drawings in one complete submittal package. Partial submittals are unacceptable.
- E. Submit in accordance with Section 01300.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Store materials off the ground in enclosures or under protective covers.
- B. Store plastic piping and rubber gaskets out of direct sunlight.
- C. Keep insides of pipes and fittings clean.
- D. Protect pipe, fittings and accessories from damage.

1.07 CERTIFICATION AND INSPECTION

- A. The manufacturer of pipe and other such items shall furnish statement that all materials provided by him have been inspected and tested in accordance with the applicable standards. Each piece of pipe and each fitting

shall have its weight and class designation conspicuously cast or painted on it. All other pipe materials shall have the class designation painted thereon. Where required, other designation marks shall be painted on pipe and fittings to indicate correct location in the pipeline to conform to a detailed layout. Upon delivery of pipe and other materials to the job site, it will be inspected and approved by the Engineer or his representative, at which time the Engineer will receive a copy of the manufacturer's certified statement. No cracked, broken, damaged or otherwise defective pipe or fittings will be incorporated into the work. Any item that is found to be defective after it has been laid in the work shall be removed by the Contractor and replaced with a perfect piece at no additional cost to the Owner.

- B. All testing of ductile iron pipe required by AWWA A21.51 shall be conducted in testing and laboratory facilities located in the United States and under the auspices of United States laws and regulations. Such test results shall be certified by a Professional Engineer registered in the state of the source manufacturing facility.
- C. PVC Pipe used for water distribution must be ANSI/NSF Standard 14 approved.

1.08 MEASUREMENT AND PAYMENT

- A. Measurement and payment will be in accordance with Section 01028.

PART 2 PRODUCTS

2.01 PIPE MATERIAL

- A. Ductile Iron Pipe (DIP):
 - 1. Ductile iron pipe for water main construction shall be Pressure Class 350 and shall meet all the requirements of the American National Standards Institute (ANSI) Specification A21.50 and A21.51 and the American Water Works Association Specification C150 and C151, or the latest revisions thereof.
 - 2. The rated working pressure shall include a safety factor of 2.0. Pipe shall be coated on the outside with a coating of coal tar varnish or asphalt base paint one mil thick applied at the point of manufacture in accordance with AWWA specifications.
 - 3. The inside of all ductile iron pipe shall be cement lined in accordance with ANSI Specification A21.4 (AWWA C104), or the latest revision thereof.
 - 4. All ductile iron pipe shall be cast, cleaned, cement lined, coated, tested, and certified at a single manufacturing facility with all manufacturing units contiguous to one another.
 - 5. The country where cast shall be marked on the barrel of the pipe in letters not smaller than 2-inches for 3-inch through 8-inch diameter pipe, not smaller than 3-inches for 10-inch through 16-inch diameter pipe, and not smaller than 4-inches for 18-inch through 64-inch diameter pipe.
 - 6. Ductile iron pipe shall be American, Clow, Tyler-Union, U.S. Pipe, Griffin Pipe, or approved equal manufactured in the United States or Canada. No other manufacturers or countries of origin shall be allowed.

2.02 JOINTS FOR PIPE

- A. Joints shall be of the types enumerated below and shall be furnished with the pipe for use at the locations shown on the Drawings or at locations determined in the field by the Engineer or otherwise listed in the Contract Documents. All necessary joint materials, gaskets, bolts, lubricant, and other such items as are necessary to make a completed joint shall be furnished with pipe or fitting.
 - 1. Ductile Iron Pipe:
 - a. Slip On (Push-On) Joints:
 - b. Slip on joints shall conform to ANSI Specification A21.11. Rubber gaskets and lubricant shall be furnished with the pipe in sufficient quantity to complete all joints in the pipeline.
 - c. Mechanical Joints:

- 1) Mechanical joints shall include all necessary glands (follower rings), rubber gaskets, bolts, nuts, and lubricant.
 - 2) All mechanical joints shall conform to ANSI A21.11 and be installed according to the manufacturer's specifications and instructions.
- d. Flanged Joints:
- 1) Flanged joints will be made using ANSI 125-pound pattern flanges and shall include all necessary bolts, nuts, washers and gaskets in accordance with ANSI B16.1. Flanged joint pipe shall be required for use in all above and below ground structures and buildings.
 - 2) Full Face Flange gaskets specifically manufactured for use with ductile iron flanged joints shall be used.
 - 3) Gaskets shall be 1/8" thick and made of Styrene Butadiene Rubber (SBR) unless otherwise recommended by manufacturer and approved by engineer.
- e. Restrained Joints using Retainer Glands:
- 1) Restrained joints shall include all necessary retainer glands, bolts, nuts, and gaskets required for a proper installation.
 - 2) Restraint devices for mechanical joint fittings and appurtenances shall conform to either ANSI/AWWA C111/A21.11, or ANSI/AWWA C153/A21.53, or the latest revision thereof.
 - 3) Restrained joints for nominal pipe sizes 3 inch through 48" shall consist of multiple gripping wedges incorporated into a follower gland meeting the applicable requirements of ANSI/AWWA C110/A21.10 or the latest revision thereof.
 - 4) Restraint devices shall be listed by Underwriters Laboratories and approved by Factory Mutual.
 - 5) The devices shall have a working pressure rating of 350 psi for 3-16 inch and 250 psi for 18-48 inch. Ratings are for water pressure and must include a safety factor of 2 to 1 in all sizes.
 - 6) Manufacturers:
 - a) EBAA Iron Inc., Megalug® Series 1100.
 - b) Ford Meter Box Co. Inc., Uni-Flange® Series 1400.
 - c) Approved Equal.
 - 7) Restrained joints shall be used when water main pipe is installed in a casing.
- f. Restrained Joints using Locking Gaskets:
- g. The restraint provided shall be an integral restraining system and shall be rated for 350 psi in accordance with the performance requirements of ANSI/AWWA C111/A21.11.

2.03 STANDARD FITTINGS

- A. Fittings to be used for water main construction shall be ductile iron and of a type compatible for use with the type of pipe being used, and shall meet the following requirements:
1. Fittings for ductile iron pipe shall meet the requirements of AWWA/ANSI C153/A21.53. Cement lining and seal coating shall be in accordance with AWWA/ANSI C104/A21.4. Certification and marking shall be as specified herein. This standard shall apply to fittings with push-on or mechanical joints.
 2. Manufacturers:
 - a. Tyler, USA
 - b. Griffin
 - c. Sigma

d. Approved Equal

PART 3 EXECUTION

3.01 CONSTRUCTION METHODS FOR WATERMAINS

- A. General: The Contractor will be responsible for assuring that his methods of construction are in accord with accepted industry practices and standards as set forth by the American Water Works Association, the requirements set forth herein, and determination made by the Engineer.

3.02 HANDLING AND STORAGE OF MATERIALS

- A. Materials delivered to the job site for incorporation into the work shall be handled and stored in such a manner as to prevent damage to the materials. Such materials shall be neatly placed along or near the site so as to minimize inconvenience to the public and property owners, and with due regard to the safety of the general public. Construction materials shall not be placed or stored closer than 20 feet from any fire hydrant, crosswalk, or intersection.
- B. All materials sensitive to UV degradation must be stored in areas protected from sun light. Materials known to be subject to UV degradation include but are not limited to: SBR Gasket materials, and clear or uncoated/unprotected pvc or cpvc.

3.03 SEQUENCE OF OPERATIONS

- A. As a rule, the following sequence will be followed by the Contractor:
1. Pipelaying
 2. Pressure and leakage testing
 3. Electrical continuity test
 4. Cleaning and flushing
 5. Connection to existing system
 6. Put main in service
 7. Deviation from this sequence may be permitted by the Engineer, provided that prior approval is obtained and that such deviation is warranted.

3.04 PIPELAYING

- A. The Contractor shall have adequate and sufficient equipment at the work site for lowering pipe and fitting into the trench and effecting their installation without damage. Under no circumstances will pipe or fittings be dropped into the trench. Any scratches or damage to coatings will be repaired, and all mud or accumulations of dirt will be removed from pipe or fittings prior to their installation. The following items shall be followed in laying pipe:
1. Line and Grade: The pipe shall be laid in the trench in reasonably close conformity to the line and grade shown on the Drawings. The Contractor will be responsible for string line, batter boards, or other methods of measurement as will assure that the pipe is to correct line and grade, based on the Drawings, directions of the Engineer, and layout controls as the Contractor may establish. In general, pipe in the trench will be laid with a tolerance of plus or minus six (3") for grade, and plus or minus one (1') foot for line. At structures or fittings, alignment shall be sufficiently precise to assure that no undue misalignment or stress is placed upon fittings or structures.
 2. Direction of Laying: Unless otherwise directed, the pipe shall be laid with bell ends facing the direction of laying. When the grade exceeds 2 percent, the bell ends shall face upgrade.
 3. Covering Pipe: Once the pipe has been properly laid and jointed, it shall be covered with material meeting the requirements of bedding material. The cover material shall be carefully placed by hand or other means to prevent inclusion of rock, frozen lumps, or other deleterious material, and to ensure that the pipe will not be dislocated in the trench. The cover material will be placed and compacted, free of loose spots, or voids, around the side of the pipe and up to a depth of twelve (12") inches above the top of the pipe. No backfilling of the trench will be done until the pipe is properly covered.

3.05 JOINING PIPE

- A. The interior of all pipe and fittings will be kept clean during the laying and joining operations. If necessary, the Contractor shall plug or cover the ends of pipe and fitting until they have been lowered into the trench and just before the joint is made. The spigot ends of pipe shall be carefully centered in the bell of the previous piece and forced home. The pipe shall then be brought to line and grade. Every precaution shall be taken to prevent dirt from entering the joint space or damage to gaskets. All joints shall be made in strict accordance with manufacturers recommended practice, with particular attention given to maximum allowable deflections.
- B. After the joint is made and the pipe has been brought to line and grade, it shall be sufficiently anchored with bedding and cover material to prevent its being dislodged by placement of the next piece.

3.06 RESTRAINING JOINTS

- A. All joints with deflections greater than ten (10) degrees, all tees, hydrant leads, end caps, plugs and similar fittings subject to axial thrust from water pressure shall be suitably restrained against movement or blowing off. Joint restraint shall be restrained joints using mechanical joints with retainer glands (“megalugs”) Thrust blocking only if required by owner.
- B. The method of joint restrains shall be designed to withstand, at a minimum, the test pressure to be applied to the water main. The Contractor shall submit details of proposed joint restrains, showing type and location, to the Engineer for approval. When mechanical joint pipe and fittings are used, mechanical joint retainer glands or locking gaskets shall be installed on a sufficient number of joints each side of a bend or fitting (see Pipe Restraint Schedule below) to adequately restrain the pipe. Extreme care shall be used in tightening set screws to assure that they are tightened uniformly and in proper sequence, to the torque specified by the manufacturer. Manufacturer guidelines shall be followed explicitly.

Table 3.10.1 – PIPE RESTRAINT SCHEDULE

Pipe Size	Length of Restraint Required (feet)			Design Strength of Restraint Required (Kips)	
	Deflection Angle			45	90 or Tee
	22-1/2	45	90 or Tee		
6"	3	11	37	2.0	5.0
8"	4	15	50	3.0	9.0
10"	5	18	61	5.0	14.0
12"	6	22	73	6.0	20.0
16"	8	28	95	11.0	36.0

- C. Restraint shall be applied to joints:
 - 1. In each direction from points of deflection.
 - 2. Away from dead ends.
 - 3. On the side “out” for tees.
- D. Thrust Blocking shall be used as follows:
 - 1. Back side of restrained joint fittings used for deflection.
 - 2. At the end of restrained joint caps at dead ends.
 - 3. Back side of tees.
- E. Where polyethylene encasement is installed, the length of restraint shown on the table shall be increased by 25 percent.

3.07 FIELD CUTTING PIPE

- A. When cutting pipe in the field, suitable equipment shall be used which will not damage the pipe, its lining, or coatings. Cuts shall be perpendicular to the pipe, and the end of the cut shall be beveled back about 1/8” at an angle of 30 degrees to the pipe centerline. For PVC pipe, the bevel angle shall be the same as the factory

finished bevel. A joint insertion line shall be marked on the cut pipe at the same distance from the pipe and as the factory-finished pipe.

3.08 PROTECTED OPEN PIPE ENDS

- A. Open ends of all pipe shall be protected against the inclusion of dirt, water, and other contaminants during the pipe laying operation. Pipes which have been filled with dirt or mud shall be cleaned to the satisfaction of the inspector prior to continuation of the pipelaying operation. When pipelaying work is suspended for any period of time, a watertight plug shall be inserted in the end of the last pipe laid.

3.09 GRADE AND DIRECTION CHANGES

- A. By Deflection of Joints: Changes in grade or direction to produce a gradual curve in the pipeline of for minor corrections alignment shall not, in general, exceed 3 degrees at any one joint unless the manufacturer warrants that a larger deflection is permissible.
- B. By Use of Bends and Fittings: Where a large change in direction is required in a short distance, such as to go around or under obstacles, appropriate fittings with the correct angle shall be used. Additional deflection of the pipe at the fitting joint shall not exceed 3 degrees or manufacturer's specifications and instructions. Mechanical joint retainer glands and thrust blocking shall be provided on all bends or fittings for this application.
- C. Obstructions in Line or Grade: When an obstruction is encountered in the path of the water main such as a culvert, manhole, or other utility, the water main shall be deflected around or under the obstruction using a series of four - 45-degree bends. A minimum of 18" of clearance between the water main and its crossing of another utility will be provided, and where the water main must cross under a stream or culvert, 42" minimum of clearance shall be provided. All bends or fittings shall be restrained using mechanical joint retainer glands.

END OF SECTION