

Technical Specifications



Stevenson High School Drain Outfall Erosion Repair

Livonia Public Schools
15125 Farmington Road
Livonia, Michigan 48154

August 2023

NTH Project No. 22000694

NTH Consultants, Ltd.
41780 Six Mile Road, Suite 201
Northville, MI 48168





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AIA Document A105-2007

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END OF DOCUMENT



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LIST OF DRAWINGS

The following drawings dated 8/17/2023, accompany and form a part of the Contract Documents:

<u>Sheet Number</u>	<u>Title</u>
C-100	Cover Sheet
C-101	Topographic Survey (1 of 2)
C-102	Topographic Survey (2 of 2)
C-103	Demolition and SESC Plan
C-104	Proposed Site and Grading Plans (1 of 2)
C-105	Proposed Site and Grading Plans (2 of 2)
C-500	Notes and Details

END OF DOCUMENT



DOCUMENT 00 21 13

INSTRUCTIONS TO BIDDERS

ARTICLE 1 - DEFINITIONS

- 1.1 Bidding Documents include the Bidding Requirements and the proposed Contract Documents. The Bidding Requirements consist of the Livonia Public Schools Bid Advertisement, Invitation to Bid, Instructions to Bidders, Bid Form, and other bidding and contract documents provided in Division 00.
- 1.2 Addenda are written or graphic instruments issued by the Engineer and Livonia Public Schools (LPS) prior to the execution of the Contract and which modify or interpret the Bidding Documents by additions, deletions, clarifications or corrections.
- 1.3 A bid is a complete and properly signed proposal to do the Work for the Lump Sums stipulated therein, submitted in accordance with the Bidding Documents.
- 1.4 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which Work may be added or from which Work may be deleted for sums stated in Alternate Bids.
- 1.5 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.
- 1.6 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment, or services or a portion of the Work as described in the Bidding Documents.
- 1.7 The term “Company”, as used in the Contract Documents, means “Livonia Public Schools”.
- 1.8 The term “Final Completion”, means when the Contractor is 100% complete with the Work and all required post-construction submittals.



ARTICLE 2 - PROJECT INFORMATION

- 2.1 Project Name: Stevenson High School Drain Outfall Erosion Repair
- 2.2 Project Locations: Stevenson High School
33500 Six Mile Road
Livonia, Michigan 48152
- 2.3 Project Description: Stormwater outfall and erosion repair
Site re-grading
- 2.4 Owner's Representative: Mr. Harry C. Lau
Livonia Public Schools
15125 Farmington Road
Livonia, Michigan 48154
Phone: 734.744.2511
Email: hlau@livoniapublicschools.org
- 2.5 Engineer: NTH Consultants, Ltd.
41780 Six Mile Rd.
Northville, Michigan 48168
Project Engineer: Ms. Samantha L. Grant
Phone: 248.662.2035
Email: SGrant@nthconsultants.com

ARTICLE 3 - BIDDER'S REPRESENTATIONS

- 3.1 By making a Bid, the Bidder represents that:
- 3.1.1 The Bidder has read and understands the Bidding Documents and the Bid is made in accordance therewith.
- 3.1.2 The Bidder has visited the site, become familiar with local conditions under which the Work is to be performed and has correlated the Bidder's personal observations with the requirements of the proposed Contract Documents.
- 3.1.3 The Bid is based upon the materials, equipment and systems required by the Bidding Documents without exception.



ARTICLE 4 - BIDDING DOCUMENTS

- 4.1 In making copies of the Bidding Documents available, LPS and the Engineer do so only for the purpose of obtaining Bids on the Work and do not confer a license or grant permission for any other use of the Bidding Documents.
- 4.2 The Bidder shall carefully study and compare the Bidding Documents with each other, and with other work being bid concurrently or presently under construction to the extent that it relates to the Work for which the Bid is submitted, shall examine the site and local conditions, and shall at once report to the Engineer and LPS errors, inconsistencies or ambiguities discovered.
- 4.3 Bidders requiring clarification or interpretation of the Bidding Documents shall make a written request, which shall reach the Engineer and Livonia Public Schools at least four (4) days prior to the date for receipt of Bids. Specifically, general, commercial, and technical questions shall be electronically forwarded to Livonia Public School's Representative and all questions shall be electronically copied to the Engineer.
- 4.4 Interpretations, corrections and changes of the Bidding Documents will be made by Addendum. Interpretations, corrections, and changes of the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely upon them.
- 4.5 The materials, products and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance, and quality to be met by any proposed substitution.
- 4.6 No substitution will be considered prior to receipt of Bids unless written request for approval has been received by the Engineer and LPS at least ten (10) days prior to the date for receipt of Bids. Such requests shall be in the format defined in Specification Section 01 6000. The burden of proof of the proposed substitution's merit is upon the proposer. The Engineer and LPS shall make the decision of approval or disapproval of a proposed substitution, which shall be final.
- 4.7 Substitutions approved prior to receipt of Bids will be identified in an Addendum. Bidders shall not rely upon approvals made in any other manner. No substitutions will be considered after the Contract award unless specifically provided in the Contract Documents.
- 4.8 Addenda will be emailed to all who are known by the issuing office to have received a complete set of Bidding Documents. Addenda will also be posted on Bidnet Direct, and on the Livonia Public Schools website.



- 4.9 No Addenda will be issued later than two (2) days prior to the date for receipt of Bids except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.
- 4.10 Prior to submitting a Bid, each Bidder shall ascertain that all issued Addenda have been received. The Bidder shall acknowledge receipt of the Addenda in the Bid.

ARTICLE 5 - PRE-BID INFORMATION

- 5.1 A pre-bid conference will be held at the project site. At that time, site conditions may be examined and the Engineer and LPS will be available to answer questions.
- 5.2 Bidder must demonstrate to the satisfaction of LPS that he has adequate equipment, personnel, experience, and understanding of the specifications to perform service under the contract.
- 5.3 No contract will be awarded to a bidder who, in the opinion of LPS, is not qualified to perform satisfactorily due to previously unfavorable performance, reputation, or lack of experience, capital, organization, equipment, and/or personnel to conduct and complete the services in accordance with the terms and conditions of the contract.
- 5.4 LPS may make such investigations as they deem necessary to determine the ability of the Bidder to perform the work, and the Bidder shall furnish to LPS all such information and data for this purpose as LPS may request. LPS reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy LPS that such bidder is properly qualified to carry out the obligations of the agreement and to complete the work contemplated therein.

ARTICLE 6 - BIDDING PROCEDURES

- 6.1 Bids shall be submitted on forms identical to the form included with the Bidding Documents. All blanks on the Bid Form shall be filled in ink. Interlineations, alterations, and erasures must be initialed by the signer of the Bid. Submitted bids shall be based solely on the materials and construction described in the Bidding Documents. The bid shall include the premiums or costs for the insurance coverage required in the Contract Documents.
 - 6.1.1 The successful Bidder may be required to furnish a Performance Bond and/or Labor and Material Payment Bond. Include the premiums and other charges for such costs as Alternates in the Bid, complying with the laws of the State of Michigan, for the total Base Bid amount as calculated at the time the bids are



received. Performance Bond and Labor and Material Payment Bond shall be from a surety LPS acceptable to LPS and made payable as follows:

- (1) A bond for the formula amount of the Base Bid running to LPS and guaranteeing the payment of all subcontractors and all indebtedness incurred for labor, materials, or any causes whatsoever on account of the Contractor in accordance with the laws of the State of Michigan relating to such bonds.
 - (2) A bond for the formula amount of the Base Bid running to the Livonia Public Schools to guarantee and insure the completion of work according to the Contract.
- 6.2 All items quoted shall be “F.O.B. Destination”. No additional freight charges will be allowed.
- 6.3 All requested Alternates shall be bid. If no change in the Base Bid is required, enter "No Change".
- 6.4 The bidder may, during the bidding period, be advised by Addendum of changes to the Contract Documents. Such changes are included in the Work and become part of the Contract Documents. List each Addendum by number in the space provided on the Bid Form.
- 6.5 Bidders must satisfy themselves of the accuracy of the estimated quantities in the Bid form by examination of the site and review of the bid documents. After bids have been submitted, the Bidder shall not assert that there was a misunderstanding concerning the quantities of work, or of the nature of the work to be done.
- 6.6 Submitted Bids shall include a Subcontractor Listing (names of persons or entities, including those who are to furnish materials or equipment fabricated to a special design, proposed for the principal portions of the Work). Sub-contractors must adhere to the same requirements as the prime contractors.
- 6.7 LPS is committed to utilizing Michigan based vendors and contractors as sub-vendors and subcontractors to the successful Bidder for this consideration. The vendor or contractor’s W9 must list a Michigan address. This is LPS criterion for determining if a vendor or contractor is a Michigan based company. To that end, the Bid Form shall indicate whether each proposed sub-vendor or subcontractor is a Michigan based company.
- 6.8 Each copy of the Bid shall include the legal name of the Bidder and a statement that the Bidder is a sole proprietor, partnership, corporation, or other legal entity. Each copy shall be signed in ink on the designated signature line by the person or persons



legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further give the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached certifying the agent's authority to bind the Bidder.

- 6.9 Each Bidder shall pledge that the Bidder will enter into a Contract with LPS on the terms stated in the Bid and will, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder.
- 6.10 Submit bids as described in the Livonia Public Schools Invitation to Bid. Submission should include the completed Document 00 4113 – Bid Form.
- 6.11 The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids. Oral, telephonic, or telegraphic Bids are invalid and will not be considered.
- 6.12 A Bid may not be modified, withdrawn, or canceled by the Bidder until after 180 days following the time and date designated for the receipt of Bids, and each Bidder so agrees in submitting a Bid.
- 6.13 Prior to the date and time designated for the receipt of Bids, a Bid submitted may be modified or withdrawn by notice to the party receiving Bids at the place designated for receipt of Bids. Such notice shall be in writing over the signature of the Bidder or by telegram; if by telegram, written confirmation over the signature of the Bidder shall be mailed and postmarked on or before the date and time set for receipt of Bids. A change shall be so worded as not to reveal the amount of the original Bid.
- 6.14 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids, provided that they are fully in conformance with these Instructions to Bidders.
- 6.15 Bidders who are unable or unwilling to submit a bid should complete and return Document 00 4115 to LPS and the Engineer electronically by the bid due date and time.
- 6.16 All Bids and material that accompanies the Bid becomes the property of LPS and will not be returned to the Bidder unless an agreement in writing is secured before the Bid is submitted.
- 6.17 No interpretation of the meaning of the plans, specifications, or other Bid documents will be made to any bidder orally. Every request for such interpretation shall be in writing addressed to the Engineer and LPS. To be given consideration, requests for interpretations must be received at least four (4) days prior to the date fixed for the opening of Bids. Any and all such interpretations and supplemental instructions will be in the form of written Addenda to the Bid Documents. Failure of a Bidder to



receive such Addendum or interpretation shall not relieve such Bidder from any obligation under his/her bid as submitted. All Addenda so issued shall become part of the Contract Documents.

ARTICLE 7 - CONSIDERATION OF BIDS

- 7.1 LPS shall maintain the following rights in its sole and exclusive discretion:
- 7.1.1 To terminate or modify this Request for Proposal (RFP) at any time without liability or obligation to any prospective Bidder or actual Bidder.
 - 7.1.2 To reject any and all Bids; or any portion thereof.
 - 7.1.3 To reject any and all Bids not accompanied by a required bid security or by other data required by the Bidding Documents or reject a Bid that is in any way incomplete or irregular.
 - 7.1.4 To not award any contract subsequent to this RFP.
 - 7.1.5 To enter into any agreement that LPS deems appropriate at any time before, during or after this RFP process is complete.
 - 7.1.6 Alternate Bids will not be considered unless a Base Bid, as specified herein, is submitted.
 - 7.1.7 Partial or incomplete Bids will not be considered.
 - 7.1.8 Bids received later than the date and time listed are normally rejected.
 - 7.1.9 LPS reserves right to award any contract subsequent to this RFP to other than the low bidder based upon LPS' sole discretion.
- 7.2 It is the intent of LPS to award a Contract to the lowest qualified, responsible Bidder provided the Bid has been submitted in accordance with the requirements of the Bidding Documents and does not exceed the funds available. Consideration will be given to several factors, including but not limited to the experience of the Bidder and major subcontractors (if applicable), the Bid amount and schedule.
- 7.3 In the case of a discrepancy in the extension of a unit price, the unit price shall govern the total price.



ARTICLE 8 - POST-BID INFORMATION

- 8.1 The Bidder will be required to establish, to the satisfaction of the Engineer and LPS, the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.
- 8.2 Prior to the award of the Contract, the Engineer and LPS will notify the Bidder in writing if LPS, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. LPS may accept the adjusted bid price or disqualify the Bidder. In the event of withdrawal or disqualification, bid security will not be forfeited.
- 8.3 Persons and entities proposed by the Bidder and to whom LPS have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of LPS.

END OF DOCUMENT



DOCUMENT 00 41 13

BID FORM

PROJECT: 2023 Stevenson High School Drain Outfall Erosion Repair

OWNER'S REPRESENTATIVE:

Mr. Harry C. Lau
Livonia Public School
15125 Farmington Road
Livonia, Michigan 48154
Phone: 734.744.2511

ENGINEER:

Ms. Samantha L. Grant, P.E.
NTH Consultants, Ltd.
41780 Six Mile Road
Northville, Michigan 48168
Phone: 248.662.2035

NAME OF BIDDER:

ADDRESS OF BIDDER:

CONTACT NAME:

CONTACT TELEPHONE:

FAX NO.:

EMAIL ADDRESS:

BID DUE: See the Livonia Public Schools Bid Announcement Documents



1. BID AMOUNTS

The undersigned, having familiarized himself with all local conditions to be encountered affecting the cost of the work and examined the contract documents dated, prepared by NTH Consultants, Ltd., does hereby propose to furnish all labor, materials, equipment, supervision, and necessary services to complete the work for the above project. All work is to be performed in accordance with the contract documents including any addenda noted herein. The cost of all work covered by the following addenda is included in the lump sum price of this proposal.

Addendum No. _____ Date _____

Addendum No. _____ Date _____

Addendum No. _____ Date _____

Quantities indicated in this Bid Form and on the Drawings are for informational purposes. **Contractor is to verify all quantities and complete ALL WORK SHOWN OR DESCRIBED ON THE DRAWINGS UNDER THE LUMP SUM AMOUNT.** Charges for over excavation of pavement sections due to poor subgrade support will be paid on a unit cost basis.

LPS may award each school to different bidders or may award multiple schools to one bidder. Bidders shall include the base bid for each school and the total base bid for all four schools.

A. Base Bid

1. **Stevenson High School:** The scope of work is indicated on the contract drawings and specifications. The scope includes, but is not limited to, the following:
 - a. 2,900 square feet of D₅₀=6" rip-rap.
 - b. 200 cubic yards of soil to be removed in the courtyard area grading.
 - c. 60 cubic yards of compacted clay with a bulking factor of 1.3.
 - d. 1,000 square feet of TerraAqua reno mattress with associated accessories.
 - e. 58,400 square feet of landscape restoration.
 - f. 550 cubic yards of mulch or topsoil.
 - g. 30 cubic feet of flowable fill (allowance).
 - h. Repairs to existing stormwater outlet structure.



- i. Site re-grading and drainage improvements.
- j. All City of Livonia Engineering Permits, Fees, Bonds, Insurance (Public Right-of-Way/Easements) and all Performance and Bid Bonds (All Refundable fees must be credited to Livonia Public Schools).
- k. The contractor is responsible for verifying field measurements associated with the work and all quantities listed above, and ensuring all work shown on the drawings is included in the bid amount.

2. Allowance:

- a. Provide for \$25,000 allowance in Base Bid to be used only with prior written approval of the Owner for unforeseen conditions or field modifications.

Base Bid: The above-named Bidder hereby proposes to perform the entire Base Bid work at Stevenson High School in accordance with the bidding documents for the lump sum (including All City of Livonia Engineering Permits, Fees, Bonds, Insurance, all Bid Bonds, all Performance Bonds, and Allowance) of:

_____dollars

(\$ _____) which constitutes the Base Bid.

Bid Bond: The above-named Bidder hereby proposes to provide bid bonds for base bid work at Stevenson High School in accordance with the bidding documents as follows:

Bid Bond Amount: \$ _____

Performance Bond: The above-named Bidder hereby proposes to provide performance bonds for base bid work at Stevenson High School in accordance with the bidding documents as follows:

Performance Bond Amount: \$ _____

B. Proposed Base Bid Schedule

- 1. The above-named Bidder hereby proposes to perform the entire Base Bid work at Stevenson High School in accordance with the bidding documents from site mobilization to demobilization in:

_____ Calendar Days



2. UNIT PRICES

For repair quantities less than or in excess of ten percent of the quantities listed in part 1.A above, Livonia Public schools may add or deduct from the base bid or alternate based on the unit prices provided below.

Item No.	Unit Price Description	Drawing Reference	Unit	Unit Cost
1	Silt Fence	Detail 1	LF	\$
2	Filter Fabric	Detail 2	EA	\$
3	Bollard and Sleeve	Detail 4	EA	\$
4	Riprap	Detail 5	CY	\$
5	Reno Mattress	Detail 5	SF	\$
6	Geotextile	Detail 5	SY	\$
7	Compacted Clay	Detail 5	CY	\$
8	Flowable Fill	Detail 6	CY	\$
9	Vegetative Growth Layer (Topsoil)	Detail 3	SF	\$

3. SUBCONTRACTORS

The Bidder agrees to subcontract only for the following work and only to those Subcontractors named below:

Work Description	Subcontractor Name
_____	_____
_____	_____
_____	_____
_____	_____



4. SCHEDULE

A. **The anticipated construction schedule is as follows:**

a. **The Owner will provide a finalized time frame.**

B. The Owner may utilize the parking areas to carry on normal business operations during construction. The Bidder shall schedule work with the Owner to minimize interference with these operations. Contractor bids shall include evening and weekend work to minimize operations.

5. INSURANCE

A. The Bidder agrees to furnish insurance coverage in the amounts indicated in the Contract Documents.

6. GENERAL AGREEMENTS

A. All employees (excluding material/equipment delivery personnel) on the project from the Contractor and all subcontractors must attend an on-site orientation and safety training meeting prior to the start of work. Estimated meeting time is 1 to 2 hours and shall be included in the lump sum Base Bid for each site.

B. The Bidder understands that all removed materials, including but not limited to asphalt, concrete, stone base, and soils are to be disposed of in accordance with City, State, and Federal requirements.

C. The Bidder understands that suspected contaminated/hazardous materials will be verified and tested by designated LPS staff. Contractor to coordinate with LPS staff on site. Materials found to be contaminated / hazardous are to be stockpiled on site and covered with visqueen in an area approved by the Company, unless requested to dispose offsite using contract unit prices. Stockpile location shall not interfere with existing traffic patterns or proposed detour routes.

D. The Bidder agrees that he has had an opportunity to examine the site and has examined the Contract documents, and that he has carefully prepared his Proposal upon the basis thereof, and that he has carefully examined and checked this Proposal and the materials, equipment, and labor required thereunder, and cost thereof, and his figures therefor, and hereby states that the amount or amounts set forth in this Proposal is, or are, correct and that no mistake or error has occurred in this proposal or in the Bidder's computations upon which this Bid is based.



- E. The Bidder acknowledges that this bid was developed without any collusion, undertaking, or agreement, either directly or indirectly, with any other Bidder or Bidders to maintain the prices of indicated work or prevent any other Bidder or Bidders from bidding the Work.
- F. The Bid will remain subject to acceptance for 90 days after the day of Bid opening. Bidder agrees to execute a contract, contingent upon receiving notification of selection of the Bid within 90 days of the date set for the opening thereof.
- G. The Bidder understands that LPS will not be liable for amounts in excess of the lump sum Bid, except as expressly stated in written Change Orders duly executed and delivered by the Company.
- H. The Bidder declares that in preparing this bid, he has assured himself of the availability of all labor, materials, and products to meet the completion date.
- I. LPS has the right to reject the Bid.
- J. Bidder will sign and submit the Purchase Order with the Bonds (if required) and other documents required by the Bidding Requirements within 10 days after receipt.

7. OTHER REQUIREMENTS

- A. Bidder Experience Modification Rate (EMR) is: _____
- B. Provide T & M rates as an attachment to this Bid Form. In the event of “additional emerging work”, LPS will consider these rates. The provided T & M rates must be firm for the period of the agreement.
- C. The Bidder understands that underground utilities may be present at the location of the Work. The Contractor shall take all necessary precautions to work around existing utilities. Should an underground utility be hit, the Contractor is responsible for coordinating the relocation with the Owner or Owner's representative, at no additional cost to the Owner.
- D. Contractor must perform all work in accordance with the City of Livonia and Wayne County work requirements.
- E. Contractor will provide the full-time services of a competent superintendent to monitor all work from the start of the work to the date of final completion of the contract.



- F. Bidder proposed Superintendent: _____
- G. Proposed Superintendent years of experience in this role on similar projects:

- H. When directed by the Owner/Engineer, meetings will be held for the purpose of coordinating and expediting the work. The invited contractors or subcontractors will be required to have qualified representatives at these meetings, empowered to act in their behalf.
- I. Provide a staff adequate to coordinate and expedite the work properly. At all times, maintain competent supervision over all work activities to ensure compliance with contract requirements.
- J. The Contractor is solely responsible for all construction means, methods, techniques, sequences, and procedures and for coordinating all portions of the work under the Contract.
- K. Coordinate all area closings with the Owner.
- L. Tenant access to sidewalks and buildings must be maintained at all times. Coordinate work location, staging areas, contractor parking, and any other contractor or work-related areas to not block tenant access.



ADDRESS, LEGAL STATUS AND SIGNATURE OF BIDDER

The undersigned Bidder does hereby designate the address given below as the legal address to which all notices, directions, or other communications may be served or mailed:

Name of Company _____
Street _____
City _____ State _____ Zip Code _____
Phone No. _____

The undersigned Bidder does hereby declare that the Bidder has the legal status checked below:

_____ Sole Proprietorship
_____ Partnership
_____ Corporation incorporated under the
laws of the State of _____

The names and addresses of all persons indicated as Partners or as President, Secretary and Treasurer of a Corporation in this Bid are as follows:

Table with 2 columns: Name, Address. Multiple rows for listing names and addresses.

This Bid is submitted in the name of:

_____ Name of Contractor
Signed By: _____
Title: _____

Signed and sealed this _____ day of _____ 2023.

END OF DOCUMENT



DOCUMENT 00 41 15

“NO BID” RESPONSE FORM

Request for Proposal: Livonia Stevenson High School Drain Outfall Erosion Repair

Owner: Livonia Public Schools

Project: Drain Outfall Erosion Repair
Stevenson High School

To submit a “No Bid” response for this project, complete this form and submit electronically to hlau@livoniapublicschools.com by the bid due date and time. Copy candrews@nthconsultants.com on the electronic submission.

Please check statement(s) applicable to your “No Bid” response:

- ___ Insufficient time to respond to this RFP.
___ Our schedule would not allow us to perform.
___ We are unable to meet bond requirements.
___ We are unable to meet insurance requirements.
___ We are unable to meet other contract requirements (explain below).
___ Specifications are restrictive (i.e. geared toward one brand or manufacturer only (explain below).
___ Specifications are ambiguous (explain below).
___ We are unable to meet specifications.
___ We do not offer this service.
___ Remove us from your vendor list for this service.
___ Other (explain below).

Comments: _____

Form fields for Firm Name, Firm Address, City, State, Zip, Date, Authorized Signature, Printed Name, Title, Telephone, Fax, and E-Mail Address.



SECTION 01 11 00

SUMMARY OF WORK

PART 1 - GENERAL

1.01 PROJECT DESCRIPTION

- A. The Contractor's scope of work consists of furnishing all labor, materials, supervision, equipment, and services necessary to complete repairs of the drain outfall and grading improvements at Stevenson High School as presented in these specifications and drawings. The Contractor will also be responsible for the construction, maintenance, and, at the Owner's option, removal of all access roads suitable for the traffic anticipated, and any safety equipment, such as barricades, flashers, and signage. The Contractor will be responsible for maintenance and protection of the work, including stormwater management and controls.

The scope of work includes the site preparation activities, excavation, grading, stormwater management controls, structural fill placement, reno mattress installation, and all other activities required to complete the work shown on the drawings and included in the specifications.

It is the responsibility of the Contractor to develop and implement a health and safety plan that meets all applicable federal, state and local regulations. Refer to Owner for additional requirements.

Any deviations from the Drawings or Specifications require prior approval of the Owner and must be documented by "as-built" revisions to the Drawings. During all phases of the construction, the work will be tested, inspected, and evaluated by the Owner or its representative prior to approval.

The Owner will provide the required survey controls for layout of the project. The Contractor is responsible for the initial layout and final as-built survey of each component. Controls lost through carelessness of the Contractor or his Subcontractors will be replaced by the Contractor with no additional cost to the Owner. Any additional controls which may be required during the Work will be the responsibility of the Contractor. The Contractor will be responsible for all temporary construction staking needed to control the Work, which will be referenced to the survey controls provided by the Owner.

- B. Major items of Work specifically included in this Contract includes the following:
1. Section 31 1000 – Site Preparation
 2. Section 31 2200 – Grading



3. Section 31 2313 – Subgrade Preparation
4. Section 31 2316 – Excavation
5. Section 31 2323 – Fill
6. Section 31 2323.23 – Compacting
7. Section 31 2323.33 – Flowable Fill
8. Section 31 3526.18 – Geotextile
9. Section 31 3619 – Gabion Mattresses
10. Section 31 3700 - Riprap
11. Section 32 9000 – Site Restoration

All other work items described in these project specifications are considered incidental to the project and included in the unit prices.

1.02 FORM OF SPECIFICATIONS

- A. Some Work described in these Specifications use systems approach to identify systems of structure or facility. System components are either specified in system specification or by reference to another section.
- B. Term "provide" or "provided" means "furnish and install in-place."

1.03 CONTRACTS

- A. Perform Work under unit price Contract with Owner to be full compensation for labor, equipment, materials, personnel, and other items (not specifically mentioned) required to complete each bid item of the work as shown on the Plans and Specifications.

1.04 WORK SEQUENCE

- A. Coordinate construction schedule and operations with Owner.
- B. Observe that the Owner reserves the right to do other work in connection with the project or adjacent thereto by contract or otherwise, and at all times, conduct work so as to impose no hardship on the Owner or others engaged in the work, nor cause any unreasonable delay or hindrance thereto.

1.05 CONTRACTOR'S USE OF PREMISES

- A. Satisfy themselves by personal examination of the site as to all local conditions affecting the performance of this contract. The Contractor is deemed to accept such conditions as found to exist.
- B. Confine operations to areas within Contract limits indicated. Portions of site beyond areas in which construction operations are indicated are not to be disturbed.



- C. Owner will occupy site and existing buildings during entire period of construction for conduct of normal operations. Cooperate with Owner during construction operations to minimize conflict and facilitate Owner's operations. Construction traffic must yield right-of-way to public, unless approved otherwise by Owner. Contractor may utilize flag personnel at Contractor's expense to control traffic as necessary to cross on-site traffic without delaying Owner's traffic. Contractor to address traffic control within Contractor's health and safety plan.
- D. At all times, conduct operations to ensure least inconvenience to Owner, Owner's Subcontractor, and operation of existing school facilities.
- E. Coordinate use of premises under direction of Owner.
- F. Assume full responsibility for protection and safekeeping of materials and equipment under this Contract.
- G. Protection and repair of existing facilities and utilities: Perform operations carefully and in such a manner as to protect existing facilities and utilities. Utility locations shown on drawings are approximate. Ensure charted utilities are properly marked, prior to commencing work. The Contractor is advised that the exact location and type of existing underground utilities are not known and employing an underground utility locator is recommended and is the responsibility of the Contractor. Expose obstructions which may exist and are not shown on the Drawings, without damage. Damage to existing facilities and utilities resulting from Contractor's operations, are the responsibility of the Contractor and are to be repaired or replaced under the Owner's direction.

1.06 SAFETY PRECAUTIONS AND PROGRAMS

- A. Initiate, maintain, and supervise all safety precautions and programs in connection with the performance of the Contract.
- B. Take reasonable precautions for safety of, and provide reasonable protection to prevent damage, injury or loss to:
 - 1. Employees on the Work and other persons who may be affected thereby;
 - 2. The Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-contractors; and
 - 3. Other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.



- C. Give notices and comply with applicable laws, ordinances, rules, regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury, or loss.
- D. Erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations, and notifying owners and users of adjacent sites and utilities.

PART 2 – PRODUCTS - NOT USED

PART 3 – EXECUTION - NOT USED

END OF SECTION



SECTION 01 20 00

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes descriptions of the measurement and payment methods for each bid item including directing the Contractor which work items has their prices merged and which are considered incidental to the project.

1.02 RELATED SECTIONS

- Section 01 1100 – Summary of Work
- Section 01 3300 – Administrative Requirements
- Section 01 4000 – Quality Requirements
- Section 01 5000 – Temporary Facilities and Controls
- Section 01 5100 – Temporary Utilities
- Section 01 5713 – Temporary Erosion and Sediment Controls
- Section 01 5719 – Temporary Environmental Controls
- Section 01 6000 - Product Requirements
- Section 01 7000 – Execution and Closeout Requirements
- Section 01 7419 – Construction Waste Management and Disposal
- Section 01 7800 - Contract Closeout
- Section 31 1000 – Site Preparation
- Section 31 2200 – Grading
- Section 31 2313 – Subgrade Preparation
- Section 31 2316 – Excavation
- Section 31 2319 – Ground Water Control
- Section 31 2323 – Fill
- Section 31 2323.23 – Compacting
- Section 31 2323.33 – Flowable Fill
- Section 31 3526.18 – Geotextile
- Section 31 3619 – Gabion Mattresses
- Section 31 3700 – Riprap
- Section 32 9000 – Site Restoration



1.03 MEASUREMENT AND PAYMENT

A. General

1. Work under the following specification sections is considered incidental to the project and no further compensation will be made.

Section 01 1100 – Summary of Work

Section 01 3300 – Administrative Requirements

Section 01 4000 – Quality Requirements

Section 01 5000 – Temporary Facilities and Controls

Section 01 5100 – Temporary Utilities

Section 01 5713 – Temporary Erosion and Sedimentation Controls

Section 01 5719 – Temporary Environmental Controls

Section 01 6000 – Product Requirements

Section 01 7000 – Execution and Closeout Requirements

Section 01 7419 – Construction Waste Management and Disposal

Section 01 7800 – Contract Closeout

2. Measurement and payment criteria applicable to portions of the work performed.
3. Include a sworn statement with all payment requests that each Subcontractor, supplier, and laborer with whom the Contractor subcontracts for performance of work under this Contract is paid in full.
4. Payment will not be made for defective or rejected work until such work is made satisfactory to the Owner.
5. Unit Quantities Specified.
 - a. Quantities and measurements indicated in the Bid Form are for bidding and contract purposes. It is the contractor's responsibility to verify all quantities prior to bid. No adjustment in price will be made for quantity adjustments during construction, without prior approval from the Owner.
 - b. A Change Order may be submitted if the scope of work changes. Change Order approval will be required from the Owner prior to execution of work outside of the contract scope.



6. Measurement of Quantities

- a. Measurement of quantities expressed as volume are based upon a neat plan line projection to the work limits as determined on the Bid Form for each item with no additional allowances for shrinkage, swelling or creep.
 - i. In computing volumes of excavation and fill, the average end area method or other methods, is used.
- b. Base measurement of quantities expressed as area upon square dimensions using mean length and width or radius with no additional allowance for scrap, overlap, or wastage.
- c. Base measurement of quantities expressed as linear foot on the length projected in plan view based on survey points (i.e., slopes projected flat) with no additional allowance for scrap, overlap, or wastage.

7. Payment

- a. Payment for each unit price item stated in the itemized bill constitutes full compensation for all required labor, products, tools, equipment, transportation, services, and incidentals: erections, application or installation of an item of the work required to complete all work specified under that particular item including cleanup, and all costs for doing related work as set forth in these specifications and/or on the Drawings or implied in carrying out their intent. Include an allowance in the price bid sum stated in the itemized bid for overhead and profit.
- b. Make requests for payment in accordance with the Construction Services Contract using American Institute of Architect (AIA) form.
- c. Installation of items that have not been tested and approved will not receive partial payments.
- d. Material delivered to the site and stored will not receive partial payments until installation.



8. Defect Assessment

- a. Replace the work, or portions of the work, not conforming to specified requirements.
- b. If, in the opinion of Owner, it is not practical to remove and replace the work, Owner will direct one of the following remedies:
 - i. The defective work may remain, but the unit/price will be adjusted to a new sum/price at the discretion of Owner.
 - ii. The defective work will be partially repaired to the instructions of Owner, and the unit/sum price will be adjusted to a new sum/price at the discretion of the Owner.
- c. The individual specification sections may modify these options or may identify a specific formula or percentage sum/price reduction.
- d. The authority of Owner to assess the defect and identify payment adjustment, is final.

9. Non-Payment for Rejected Products

- a. Payment will not be made for any of the following:
 - i. Products wasted or disposed of in a manner that is not acceptable.
 - ii. Products determined as unacceptable before or after placement.
 - iii. Products placed beyond the lines and levels of the required work.
 - iv. Products remaining on hand after completion of the work.
 - v. Loading, hauling, and disposing of rejected products.

END OF SECTION



SECTION 01 33 00

ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes requirements for work related submittals including Construction Progress Schedules, shop drawings, product data, samples, and other miscellaneous work-related submittals.

1.02 PROJECT COORDINATION

- A. Project Coordinator: Owner's Designated Representative
- B. Cooperate with the Owner in allocation of mobilization areas of site; for field offices and sheds, for vehicular and pedestrian access, traffic, and parking facilities.
- C. During construction, coordinate use of site and facilities through the Owner.
- D. Comply with Owner's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
- E. Comply with instructions of the Owner for use of temporary utilities and construction facilities.
- F. Coordinate field engineering and layout work with the Owner's Designated Representative.
- G. Make the following types of submittals to Engineer and/or Owner's Designated Representative:
 - 1. Requests for interpretation.
 - 2. Requests for substitution.
 - 3. Shop drawings, product data, and samples.
 - 4. Test and inspection reports.



5. Applications for payment and change order requests.
6. Progress schedules.
7. Coordination drawings.
8. Closeout submittals.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 CONSTRUCTION PROGRESS SCHEDULES

- A. Prepare and submit Construction Progress Schedule to Owner with bid.
 1. Prepare schedules in form of horizontal bar chart.
 - a. Provide separate horizontal bar for each operation.
 - b. Horizontal Time Scale: Identify first Workday of each week.
 - c. Scale and spacings to allow space for notations and future revisions.
 - d. Arrange listings in order of start of each item of Work.
 2. Construction Progress Schedule:
 - a. Show complete sequence of construction by activity.
 - b. Show dates for beginning and completion of each major element of construction and installation dates for major items. Elements include, but are not limited to the following:
 - i. Start of work for each major activity and assumed daily production rate.
 - ii. Performance tests and supervisory services activity.
 - iii. Subcontractor's items of Work.
 - iv. Restoration.



- v. Final cleanup.
- vi. Allowance for inclement weather.
- B. No Work is to be done between 9:00 p.m. and 6:00 a.m., nor on Sundays or legal holidays without written permission of Owner. Emergency work may be done without prior permission.
- C. Night work may be established by Contractor as regular procedure with written permission of Owner. Such permission may be revoked at any time by Owner.
- D. Schedule Revisions (presented at weekly construction meetings):
 - 1. Every 7 days to reflect changes in progress of Work.
 - 2. Indicate progress of each activity at date of submittal.
 - 3. Show changes occurring since previous submittal of schedule.
 - 4. Show projected percentage of completion for each item as of first day of week.
 - 5. Show projected percentage of quantity placement to date as of initial construction progress schedule quantity placement.
 - 6. Provide narrative report as needed to define following:
 - a. Problem areas, anticipated delays, and impact on schedule.
 - b. Corrective action recommended and its effect.
 - c. Effect of changes on schedules of other Contractors.

3.02 WORK PLANS/PRE-TASK ANALYSIS

- A. Submit detailed written work plans describing methodologies for performing all Work-related tasks.
- B. Submit work plans for Owner's review prior to initiating work in the field.
- C. Perform pre-task analysis to identify all safety-related issues associated with each work activity.

3.03 TEST RESULTS AND CERTIFICATIONS

- A. Submit tests results and certifications required in specification sections.



- B. Submit tests results upon completion of test or submittal of results from testing laboratory.
- C. Test results and certifications are submitted for review of conformance with specified requirements and information.

3.04 SUBMITTALS FOR REVIEW

- A. When the following are specified in individual sections or the engineering plans, submit them for review:
 - 1. Product data.
 - 2. Shop drawings.
- B. Submit to Engineer for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
- C. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 7000.

3.05 SUBMITTALS FOR INFORMATION

- A. When the following are specified in individual sections, submit them for information:
 - 1. Design data.
 - 2. Certificates.
 - 3. Test reports.
 - 4. Inspection reports.
 - 5. Other types indicated.

3.06 SUBMITTALS FOR PROJECT CLOSEOUT

- A. When the following are specified in individual sections, submit them at project closeout:
 - 1. Project record documents.



2. Operation and maintenance data.
3. Warranties.
4. As-built record drawings.
5. Other types as indicated.

3.07 NUMBER OF COPIES OF SUBMITTALS

- A. Documents for Review:
 1. Submit the number of copies which the Contractor requires, plus two copies which will be retained by the Engineer, and one copy for the Owner.
- B. Documents for Information: Submit two copies.
- C. Documents for Project Closeout: Make one reproduction of submittal originally reviewed. Submit one extra copy of submittals for information.
- D. Or as indicated in specific sections of these specifications.

3.08 SUBMITTAL PROCEDURES

- A. Transmit each submittal with a submittal form to the Engineer and Owner.
- B. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.
- C. Identify Project, Contractor, Subcontractor or supplier, pertinent drawing and detail number, and specification section number, as appropriate on each copy.
- D. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.
- E. Deliver submittals to Engineer at business address.
- F. Schedule submittals to expedite the Project, and coordinate submission of related items.



- G. For each submittal for review, allow 5 business days excluding delivery time to and from the Contractor.
- H. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.
- I. Provide space for Contractor and Engineer review stamps.
- J. When revised for resubmission, identify all changes made since previous submission.
- K. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.
- L. Submittals not requested will not be recognized or processed.

3.09 SUBMITTAL REQUIREMENTS

- A. Submittals by the Contractor after successful bid award:
 - a. Insurance Coverage – Instructions to Bidders (1 copy)
 - b. Progress Schedule – General Conditions (1 copy)
 - c. Soil Erosion and Sedimentation Control Plan – Section 01 5719 (1 copy)
 - d. Project Record Documents – Section 01 7000 (2 copies)
 - e. Dust Control Plan – Section 01 5719 (1 copy)
 - f. Site Plan and Health and Safety Plan – Section 31 1000 (1 copy)
- B. Submittals by the Contractor during construction activities:
 - a. Weekly Construction Project Schedule, including weekly quantity evaluation – Section 01 3300 (2 copies)
 - b. Work Plans / Pre-Task Analysis – Section 01 3300 (2 copies)
 - c. Test Results and Certifications – Section 01 4000 (2 copies)



- d. Fueling Operations Plan – Section 01 5000 (1 copy)
- e. Contract Close Out Certification – Section 01 7000 (1 copy)
- f. Excavation and Stockpiling Plan – Section 31 2316 (1 copy)
- g. Product Submittals – Sections 31 2323, 31 2323.33, 31 3526.18, 31 3619, 31 3700, 32 9000 (2 copies)
- h. Site Restoration Work Plan – Section 32 9000 (1 copy)

END OF SECTION



SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section specifies administrative and procedural requirements for quality control services, including inspections and tests and related actions including reports performed by the independent agencies, governing authorities, and the Contractor. They do not include Contract enforcement activities performed by the Owner.
- B. Requirements of this section relate to customized fabrication and installation procedures, not production of standard products. Specific quality control requirements for individual construction activities are specified in the Sections related to those activities. Those requirements, including inspections and tests, cover production of standard products as well as customized fabrication and installation procedures.

1.02 TESTING AGENCY

- A. The Owner will, at their expense, employ a testing agency to conduct various on-site tests on delivered and installed materials. Copies of the test results will be furnished to the Contractor and Owner as soon as they are prepared for release.
- B. Employment of agency in no way relieves Contractor of obligation to perform Work and tests in accordance with requirements of Contract Documents and are not intended to limit the quality control procedures employed by the Contractor.

1.03 SUBMITTALS

- A. Test Reports: After each test/inspection, test reports will be completed and assembled. At a minimum, these reports should include:
 - a. Date issued.
 - b. Project title and number.
 - c. Name, address and telephone number of testing agency.



- d. Name of inspector.
 - e. Date, time, and weather conditions of sampling or inspection.
 - f. Identification of product and specifications section.
 - g. Location in the Project.
 - h. Type of test/inspection.
 - i. Date of test/inspection.
 - j. Results of test/inspection.
 - k. Conformance with Contract Documents.
 - l. When requested by Engineer, provide interpretation of results.
 - m. Name and signature of laboratory inspector
 - n. Recommendation on retesting, if required
1. Include reports prepared by representatives of suppliers and manufacturers who have performed field services.
- B. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Engineer.
1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

1.04 REFERENCES AND STANDARDS

- A. For products and workmanship specified by reference to a document or documents not included in these specifications, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes or this specification.
- B. Conform to reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.



- C. Obtain copies of standards where required by product specification sections.
- D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.
- E. Should specified reference standards conflict with Contract Documents, request clarification from Engineer before proceeding.
- F. Do not alter either the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Engineer from the Contract Documents by mention or inference otherwise in any reference document.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 CONTROL OF INSTALLATION

- A. Observe quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturers' instructions, including each step-in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Have Work performed by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.



3.02 TOLERANCES

- A. Observe fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances and the tolerances specified in these Contract Documents. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

3.03 TESTING AND INSPECTION

- A. Testing/Inspection Agency Duties:
 - 1. Provide qualified personnel at site. Cooperate with Engineer and Contractor in performance of services.
 - 2. Perform specified sampling and testing of products in accordance with specified standards and these specifications.
 - 3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 4. Promptly notify Engineer and Contractor of observed irregularities or non-conformance of Work or products.
 - 5. Perform additional tests and inspections required by Engineer.
 - 6. Attend pre-construction meetings and progress meetings.
 - 7. Submit reports of all tests/inspections specified.
- B. Limits on Testing/Inspection Agency Authority:
 - 1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 - 2. Agency may not approve or accept any portion of the Work.
 - 3. Agency may not assume any duties of Contractor. Agency is not responsible for Contractors means, methods, techniques, or safety.



4. Agency has no authority to stop the Work.
- C. Contractor Responsibilities:
1. Deliver to agency at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs.
 2. Cooperate with laboratory personnel and provide access to the Work and to manufacturers' facilities.
 3. Provide incidental labor and facilities:
 - a. To provide access to Work to be tested/inspected.
 - b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
 - c. To facilitate tests/inspections.
 - d. To provide storage and curing of test samples.
 4. Schedule and coordinate sequence of activities and tests to accommodate required tests with minimal delay. Avoid unnecessary removing and replacing construction to accommodate inspections and tests.
 5. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
- D. Re-testing required because of non-conformance to specified requirements are to be performed by the same agency on instructions by Engineer.
- E. Re-testing required because of non-conformance to specified requirements or revised/replaced Work are to be paid for by the Contractor, regardless of whether the original test was the Contractor's responsibility.
- F. Scope: Comply with all the applicable governing standards, codes, and authorities for required testing and inspections. Additional testing and inspections may be required for this project, as specified in these specifications, if applicable.



3.04 DEFECT ASSESSMENT

- A. Upon completion of inspection, testing, sample taking, and similar services, repair damaged construction and restore substrates and finish to eliminate deficiencies, including deficiencies in visual qualities of exposed finish.
- B. Replace and protect Work or portions of the Work not conforming to specified requirements.
- C. If, in the opinion of Owner, it is not practical to remove and replace the Work, submit an appropriate remedy and/or offer a price adjustment to the Owner for approval.
- D. Expedite correction and replacement of Work found to be not-in-compliance to meet interim, substantial, and final completion dates.

END OF SECTION



SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes the requirements for temporary facilities and security control.
- B. Stage equipment in Owner designated location.

1.02 TEMPORARY UTILITIES

- A. Provide and pay for all electrical power, lighting, water, heating and cooling, and ventilation required for construction purposes.
- B. Use trigger-operated nozzles for water hoses, to avoid waste of water.

1.03 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization. Locations of portable toilet facilities will need to be approved by Owner. All must be secured properly so they will not blow over. Service contractor to be approved by owner.
- B. Maintain daily in clean and sanitary condition.
- C. At end of construction, return facilities to same or better condition as originally found.

1.04 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas, to allow for owner's use of site and to protect existing facilities from damage from construction operations and demolition.
- B. Provide protection for vegetation designated to remain. Replace damaged vegetation.
- C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.



1.05 SECURITY

- A. Coordinate with Owner's security program.

1.06 VEHICULAR ACCESS AND PARKING

- A. Coordinate access and haul routes with governing authorities and Owner.
- B. Provide and maintain access to fire hydrants, free of obstructions.
- C. Provide means of removing mud from vehicle wheels before leaving site.
- D. Designated existing on-site roads may be used for construction traffic.
- E. Construction personnel to park in designated areas only.
- F. Coordinate with Owner to maintain site traffic during construction.

1.07 VEHICLE FUELING

- A. Fueling Operations Plan must be submitted to the Owner for approval. Plan shall include use of fuel truck, storage tanks, spill protection, spill controls, spill clean-up procedures, and any other pertinent information regarding equipment re-fueling operations.

1.08 WASTE REMOVAL

- A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- B. Provide containers with lids. Remove trash from site periodically.
- C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

1.09 PROJECT IDENTIFICATION

- A. No signs are allowed without Owner permission except those required by law.



1.10 FIELD OFFICES

- A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack and drawing display table.
- B. Coordinate with Owner if Contractor elects to use a Field office for this Project.

1.11 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials, prior to Substantial Completion inspection.
- B. Clean and repair damage caused by installation or use of temporary work.
- C. Restore existing facilities used during construction to their original condition.
- D. Prior to demobilization, the requirements of Section 01 7000 are to be met.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION



SECTION 01 51 00

TEMPORARY UTILITIES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Temporary Utilities: Electricity, lighting, heat, ventilation, and water.

1.02 RELATED SECTIONS

- A. Section 01 5000 - Temporary Facilities and Controls

1.03 TEMPORARY ELECTRICITY

- A. Cost: By Contractor.
- B. Provide power service as required.
- C. Provide main service disconnect and over-current protection at convenient location and meter.
- D. Provide adequate distribution equipment, wiring, and outlets to provide single phase branch circuits for power and lighting.

1.04 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

- A. Provide and maintain incandescent lighting for construction operations to achieve a minimum lighting level of 2 watt/sq ft for nighttime work.
- B. Provide and maintain 1 watt/sq ft lighting to exterior staging and storage areas after dark for security purposes.
- C. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.
- D. Maintain lighting and provide routine repairs.
- E. Permanent building lighting may be utilized during construction.



1.05 TEMPORARY WATER SERVICE

- A. Cost of Water Used: By Contractor.
- B. Provide and maintain suitable quality water service for construction operations at time of project mobilization.
- C. Connect to existing water source. Exercise measures to conserve water.
- D. Extend branch piping with outlets located so water is available by hoses with threaded connections. Provide temporary pipe insulation to prevent freezing.

1.06 REMOVAL OF TEMPORARY UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials, prior to Substantial Completion inspection.
- B. Remove temporary underground installations to a minimum depth of 2 feet and grade site as indicated.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION



SECTION 01 57 13

TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Contractor to obtain Soil Erosion and Sediment Control Permit from The City of Livonia. The Soil Erosion Plan is included in the Design Drawings.
- B. Prevention of erosion due to demolition/construction activities.
- C. Prevention of sedimentation of storm and sanitary sewers due to construction activities.
- D. Restoration of areas eroded and cleaning of storm and sanitary sewers due to inadequate preventive measures.
- E. Compensation of Owner for fines levied by authorities having jurisdiction due to non-compliance by Contractor.

1.02 RELATED SECTIONS

- A. Other sections of the specifications, not referenced below, shall also apply to the extent required for proper performance of this Work.
- B. Section 01 33 00 - Administrative Requirements
- C. Section 01 50 00 - Temporary Facilities and Controls
- D. Section 31 10 00 – Site Preparation
- E. Section 31 22 00 - Grading
- F. Section 32 90 00 - Site Restoration



1.03 REFERENCES

- A. Part 91 of Act 451 of 1994 Soil Erosion and Sedimentation Control Act formerly P.A. 347 of 1972, as amended).
- B. ASTM D 4355 - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc Type Apparatus.
- C. ASTM D 4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
- D. ASTM D 4533 - Standard Test Method for Trapezoid Tearing Strength of Geotextiles.
- E. ASTM D 4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
- F. ASTM D 4751- Standard Test Method for Determining Apparent Opening Size of a Geotextile.
- G. ASTM D 4833 – Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.
- H. ASTM D 4873 - Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples.
- I. ASTM D6462 - Standard Practice for Silt Fence Installation.
- J. Environmental Protection Agency (EPA), National Pollutant Discharge Elimination System (NPDES), Construction General Permit; current edition; <http://cfpub.epa.gov/npdes/stormwater/cgp.cfm>.
- K. FHWA FLP-94-005, “Best Management Practices for Erosion and Sediment Control,” Federal Highway Administration.
- L. Permits issued or required by governmental agencies.



1.04 PERFORMANCE REQUIREMENTS

- A. Comply with all requirements and conditions of permits issued and required by any governmental agencies.
- B. Comply with the requirements of the approved Soil Erosion and Sedimentation Control Plan and submit periodic inspection reports to the Authority Having Jurisdiction.
- C. Install preventive measures in place prior to start of the Work. Do not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained; furnish all documentation required to obtain applicable permits.
- D. Storm Water Runoff: Control increased storm water runoff due to disturbance of surface cover due to construction activities for this project.
 - 1. Prevent runoff into storm and sanitary sewer systems, including open drainage channels, in excess of actual capacity or amount allowed by authorities having jurisdiction, whichever is less.
 - 2. Anticipate runoff volume due to the most extreme short term and 24-hour rainfall events that might occur in 25 years
- E. Erosion On-Site: Minimize wind, water, and vehicular erosion of soil on Site due to demolition activities for this Project.
 - 1. Control movement of sediment and soil from temporary stockpiles of soil.
 - 2. Prevent development of ruts due to equipment and vehicular traffic.
 - 3. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.
- F. Erosion Off-Site: Prevent erosion of soil and deposition of sediment on other properties caused by water leaving the Site due to demolition activities for this Project.



1. Prevent windblown soil from leaving the Site.
2. Prevent tracking of mud onto public roads outside Site.
3. Prevent mud and sediment from flowing onto sidewalks and pavements.
4. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to the Owner.

G. Sedimentation of Waterways on Site: Prevent sedimentation of waterways on the Site, including storm and sanitary sewers.

1. If sedimentation occurs, install or correct preventive measures immediately at no cost to the Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.

H. Maintenance: Maintain temporary preventive measures until permanent measures have been established.

1.05 SUBMITTALS

A. See Section 01 3300 for submittal procedures.

B. Erosion and Sedimentation Control Plan:

1. Acknowledge intent to implement the approved Soil Erosion and Sedimentation Control Plan and provide the planned date not less than 7 days prior to anticipated start of clearing, grading, or other work involving disturbance of ground surface cover.
2. Include:
 - a. The approved Soil Erosion and Sedimentation Control Plan.
 - b. Indicate any additional measures and associated costs that may be deemed necessary for Soil Erosion and Sedimentation Control. Additional measures must be approved by the Owner and Engineer, prior to implementation.



- c. Where extensive areas of soil will be disturbed, include storm water flow and volume calculations, soil loss predictions, and proposed preventive measures.
 - d. Schedule of temporary preventive measures, in relation to ground disturbing activities.
 - e. Other information required by law.
 - f. Format required by law is acceptable, provided any additional information specified is also included.
3. Do not begin work without the approval of the Demolition and Soil Erosion and Sedimentation Control Plan by the City.
- C. Certificate: Mill certificate for silt fence fabric attesting that fabric and factory seams comply with specified requirements, signed by legally authorized official of manufacturer; indicate actual minimum average roll values; identify fabric by roll identification numbers.
 - D. Identify a responsible person employed by the Contractor who will oversee the implementation of the Soil Erosion and Sedimentation Control Plan. A state-certified storm water control officer (CSWO) is required for this project. Submit CSWO certificate of responsible person.
 - E. Inspection Reports: Submit report of each inspection; identify each preventive measure, indicate condition, and specify maintenance or repair required and accomplished. Inspection reports shall comply with all requirements of authority having jurisdiction. Submit monthly, or more frequent if requested, to Owner for record. Comply with all authority having jurisdiction inspections and correct identified deficiencies to their satisfaction and the satisfaction of the Owner and no additional cost.
 - F. Maintenance Instructions: Provide instructions covering inspection and maintenance for temporary measures that must remain after Substantial Completion.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Mulch: Use one of the following:



1. Straw or hay.
 2. Erosion control matting or netting.
- B. Silt Fence Fabric: Polypropylene geotextile resistant to common soil chemicals, mildew, and insects; non-biodegradable; in longest lengths possible; Comply with ASTM D6461.
- C. Silt Fence Posts: subject to compliance with ASTM D6461.
- D. Erosion Control Blankets: Blanket constructed of 100 percent agricultural straw matrix with jute and cotton netting on top and bottom, and a typical functional longevity of 12 months.
- E. Provide filter fabric for use at catch basin inlets: Catch-all by Hanes Geo Components or engineer approved equal.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine Site and identify existing features that contribute to erosion resistance; maintain such existing features to greatest extent possible.

3.02 PREPARATION

- A. Schedule work so that soil surfaces are left exposed for the minimum amount of time.

3.03 SCOPE OF PREVENTIVE MEASURES

- A. Do not discharge excavation ground water to the sanitary sewer, storm sewer, river, stream or similar natural or constructed feature. Prevent construction runoff from entering the sewer system or similar natural or constructed feature by using silt fences or other suitable methods.
- B. Protect surrounding soils from erosion.



- C. Install sedimentation control devices prior to beginning Work. Maintain effective soil erosion and sedimentation control devices at all times during the course of the Work.

- D. Dust Control
 - 1. Keep dust down at all times, including non-working periods.
 - 2. Sprinkle water on soil at the Site, haul roads, and other areas disturbed by operations.
 - 3. Do not permit dry power brooming.

- E. Construction Entrances:
 - 1. Provide vehicle track-out mat: Comply with Soil Erosion and Sediment Control Plan.
 - 2. A “vehicle decontamination area” will be constructed at the Site exit, to provide a zone through which loose soils can dislodge from truck tires. The area will be constructed on the existing pavement or 1 to 3 inches of crushed concrete and will be a minimum of 50 feet long. Should soils be tracked out onto the roadway, provisions for cleaning the street, such as a wet sweeper, will be initiated immediately.
 - 3. Remove and properly handle soils or contaminants in accordance with applicable state or federal regulations.

- F. Linear Sediment Barriers: Made of silt fences.
 - 1. Provide linear sediment barriers as may be necessary based on grading, construction operations and the Site conditions.

- G. Storm Drain Curb Inlet Sediment Trap: Protect each curb inlet using one of the following measures:
 - 1. Install filter fabric over entire inlet face area and secured to prevent dislodging.



2. Straw bale row blocking entire inlet face area; anchor into pavement.

H. Storm Drain Drop Inlet Sediment Traps: Cover with filter fabric.

1. Install filter fabric over entire inlet face area and secured to prevent dislodging.
2. Straw bale row blocking entire inlet face area; anchor into ground surface.

I. Soil Stockpiles: Protect using following measures:

1. Cover with polyethylene film, secured by placing soil on outer edges.
2. Encompass all exposed soil stockpiles with silt fence until exposed soil has temporary vegetate cover measures applied or exposed soil is removed form the site.

J. Temporary Seeding and mulching: Use where temporary vegetated cover is required.

3.04 INSTALLATION

A. General: Install soil erosion and sedimentation control devices in accordance with manufacturer's recommendations, and in conformance with these specifications. Refer discrepancies to Owner's Representative for resolution.

B. Silt Fences:

1. Store and handle fabric in accordance with ASTM D4873.
2. Install in accordance with ASTM D6462.
3. Install with top of fabric at nominal height.
4. Embed bottom of fabric in a trench on the upslope side of fence, with 2 inches of fabric laid flat on bottom of trench facing upslope; backfill trench and compact.



5. Do not splice fabric width; minimize splices in fabric length; splice at post only, overlapping at least 18 inches, with extra post.

C. Mulching Over Large Areas:

1. Dry Straw and Hay: Apply 2-1/2 tons per acre; anchor using dull disc harrow.

D. Mulching Over Small and Medium Areas:

1. Dry Straw and Hay: Apply 4 to 6 inches depth.
2. Erosion Control Matting: Comply with manufacturer's instructions.

E. Erosion Control Blankets: Peg at the pattern and rate recommended by the manufacturer, but not less than 1.75 pegs per square yard.

3.05 MAINTENANCE

- A. Inspect preventive measures weekly, within 24 hours after the end of any storm, and daily during prolonged rainfall.

- B. Repair deficiencies immediately.

C. Silt Fences:

1. Promptly replace fabric that deteriorates.
2. Remove silt deposits that exceed one-third of the height of the fence.
3. Repair fences that are undercut by runoff or otherwise damaged, whether by runoff or other causes.

- D. Clean out temporary sediment control structures weekly and relocate soil on Site.



3.06 CLEAN UP

- A. Remove temporary measures after permanent measures have been installed, unless permitted to remain by Owner's Representative.
- B. Clean out temporary sediment control structures that are to remain as permanent measures.
- C. Where removal of temporary measures would leave exposed soil, shape surface to an acceptable grade and finish to match adjacent ground surfaces.

END OF SECTION



SECTION 01 57 19

TEMPORARY ENVIRONMENTAL CONTROLS

PART 1- GENERAL

1.01 SUMMARY

- A. Section includes Contractor responsibility in protecting the environment. Maintain work areas on-site and off-site in accordance with all applicable federal, state, or local regulations.

1.02 REFERENCES

- A. "Guidance for Erosion and Sedimentation Control Planning and Implementation," Manual EPA-R2-72-015.
- B. "Processes, Procedures, and Methods to Control Pollution Resulting from all Construction Activity," Manual EPA 43019-73-007.
- C. Guidebook of Best Management Practices for Michigan Watersheds, Reprinted October 1998, Michigan Department of Natural Resources, Surface Water Quality Division.

1.03 PROTECTION OF WATERWAYS AND WETLANDS

- A. Observed rules and regulations of State of Michigan, Wayne County, and agencies of U.S. government prohibiting pollution of any lake, stream, river or wetland by dumping of refuse, rubbish, dredge material, or debris therein.
- B. Contractor specifically cautioned that disposal of materials into waters of state must conform to requirements of U.S. Army Corps. of Engineers.
- C. Provide holding ponds or approved method which will divert flows, including storm flows and flows created by construction activity, to prevent excessive silting of waterways or flooding damage to property.
- D. Comply with procedures outlined in U.S. EPA manuals entitled, "Guidelines for Erosion and Sedimentation Control Planning and Implementation," Manual EPA-72-015 and "Processes, Procedures, and Methods to Control Pollution Resulting from All Construction Activity," Manual EPA 43019-73-007 and Guidebook of Best Management Practices for Michigan Watersheds,



Reprinted October, 1998, Michigan Department of Natural Resources, Surface Water Quality Division.

1.04 EROSION AND SEDIMENT CONTROL

- A. Provide erosion and sedimentation control, as specified in Section 01 5713.

1.05 DISPOSAL OF EXCESS WASTE AND OTHER WASTE MATERIALS.

- A. Excess excavated soil material not required or suitable for backfill will become the property of the Contractor and will be removed from the project site at no additional cost to the Owner, unless noted otherwise on the Drawings or in these specifications.

1. Unacceptable disposal sites include, but are not limited to, sites within wetland or critical habitat and sites where disposal will have detrimental effect on surface water or groundwater quality.
2. Make arrangements for excess waste disposal subject to submission of proof that Owner(s) of proposed site(s) have valid landfill permit issued by appropriate governmental agency and submission of haul route plan including map of proposed route(s).
3. Provide watertight conveyance for liquid, semi-liquid, or saturated solids which tend to bleed during transport. Liquid loss from transported materials is not permitted, whether being delivered to construction site or hauled away for disposal. Fluid materials hauled for disposal must be specifically acceptable at selected disposal site.
4. Report any and all fuel or oil spills immediately to Owner. Contractor shall remediate fuel or oil spills due to the construction activities for this project. Remove all contaminated soils from the site at Contractor's expense and comply with applicable State and Federal regulations.

1.06 PROTECTION OF AIR QUALITY

- A. Minimize air pollution by requiring use of properly operating combustion emission control devices on construction vehicles and equipment used by Contractors and encouraging shutdown of motorized equipment not actually in use.
- B. Trash burning not permitted on construction site.



- C. Temporary heating devices necessary for protection of Work, cannot cause air pollution.

1.07 NOISE CONTROL

- A. Conduct operations to cause least annoyance to residents in vicinity of Work and comply with applicable local ordinances.
- B. Equip compressors, hoists, and other apparatus with mechanical devices necessary to minimize noise and dust. Equip compressors with silencers on intake lines.
- C. Equip gasoline or oil-operated equipment with silencers or mufflers on intake and exhaust lines.
- D. Line storage bins and hoppers with material that will deaden sounds.
- E. Conduct operation of dumping rock and of carrying rock away in trucks so as to cause minimum of noise and dust.

1.08 DUST CONTROL

- A. Comply with local environmental regulations for dust control and direction of the Owner. If Contractor's dust control measures are considered inadequate, the Owner will require Contractor to take additional dust control measures at Contractor's expense.
- B. Use Owner-approved dust suppressant.

PART 2 – PRODUCTS-NOT USED

PART 3 - EXECUTION-NOT USED

END OF SECTION



SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. General product requirements.
- B. Transportation, handling, storage, and protection.
- C. Product option requirements.
- D. Substitution limitations and procedures.
- E. Spare parts and maintenance materials.

1.02 RELATED SECTIONS

- A. Section 01 4000 - Quality Requirements: Product quality monitoring.

1.03 SUBMITTALS

- A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
 - 1. Submit within 3 days after date of Agreement.
 - 2. For products specified only by reference standards, list applicable reference standards.
- B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- C. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.



- D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
 - 1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.
- E. Submittals must include a coversheet indicating the date, the submittal number, the specification section and title, the school impacted by the submittal, the product, and the submittal type. Specific product types, colors, and other attributes are to be clearly marked on the product data by the Contractor.

PART 2 - PRODUCTS

2.01 NEW PRODUCTS

- A. Provide new products unless specifically required or permitted by the Contract Documents.

2.02 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.03 SPARE PARTS AND MAINTENANCE PRODUCTS

- A. Provide spare parts, maintenance, and extra products of types and in quantities specified in individual specification sections.
- B. Deliver to Project site; obtain receipt prior to final payment.



PART 3 - EXECUTION

3.01 SUBSTITUTION PROCEDURES

- A. Instructions to Bidders specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements specified in this section.
- B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
- C. A request for substitution constitutes a representation that the submitter:
 - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
 - 2. Will provide the same warranty for the substitution as for the specified product.
 - 3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
 - 4. Waives claims for additional costs or time extension which may subsequently become apparent.
 - 5. Will reimburse Owner and Engineer for review or redesign services associated with re-approval by authorities.
- D. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.
- E. Substitution Submittal Procedure:
 - 1. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution. Submit with the substitution request form at the end of this section.
 - 2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
 - 3. The Engineer will notify Contractor in writing of decision to accept or reject request. The decision of the Engineer will be final.



3.02 TRANSPORTATION AND HANDLING

- A. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- B. Transport and handle products in accordance with manufacturer's instructions.
- C. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- D. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- E. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.
- F. Properly dispose of packing materials off site.

3.03 STORAGE AND PROTECTION

- A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.
- B. Store and protect products in accordance with manufacturers' instructions.
- C. Store with seals and labels intact and legible.
- D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
- E. For exterior storage of fabricated products, place on sloped supports above ground.
- F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products. Do not allow covering material to touch the ground.
- G. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.



- H. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION



SECTION 01 06 00 PRODUCT REQUIREMENTS
Substitution Request Form

DATE	SECTION #	PARA #	SPECIFIED PRODUCT	PROPOSED SUBSTITUTION
_____	_____	_____	_____	_____

NOTE: Complete technical data and literature for the proposed substitution must be included with the submission of this form.

- A. Does substitution exceed, in any respect, the specified product/process? _Y _N
- B. Does substitution affect dimensions shown on Plans? _Y _N
- C. Does substitution affect other trades more than original product? _Y _N
- D. Does warranty differ from that specified? _Y _N
- E. Does substitution affect cost to OWNER? _Y _N
- F. Does substitution affect the project schedule? _Y _N
- G. Has substituted product/process been implemented on the site? _Y _N

If you indicated "Yes" to any of the items above, attach thorough explanation on your Company letterhead, as follows:

1. Explain any differences between proposed substitution and specified product.
2. Summarize experience with product and manufacturer in Project area.
3. If dimensions are affected by substitution, provide drawings and/or marked up project drawings indicating the dimensional changes.
4. If substitution affects structural design, submit stamped calculations.

The undersigned states that the function, appearance, and quality of the proposed substitution is equivalent or superior to the specified item, and that all information above and attached is true and correct.

Name: _____
 Position: _____
 Company: _____

 Telephone: _____
 Signature: _____
 Date: _____

For use by ENGINEER:
Engineer's Determination:
 No Exceptions Taken Address:
 Furnish as Corrected
 Rejected
 Returned Without Action

Response Required:
 Revise and Resubmit
 Resubmission Not Required



SECTION 01 70 00

EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes examination, preparation, and general installation procedures, surveying for laying out the work, cleaning and protection and closeout procedures, except payment procedures.

1.02 SUBMITTALS

- A. Layout Survey work: Submit name, address, and telephone number of Surveyor before starting layout survey work.
 - 1. On request, submit documentation verifying accuracy of survey work.
 - 2. Coordinate with Site Surveyor for the project record survey.
- B. Project Record Documents: Maintain on site, one set of the following record documents; record actual revisions to the Work:
 - 1. Contract Documents
 - 2. Specifications
 - 3. Addenda
 - 4. Change Orders and other Modifications to the Contract
 - 5. Reviewed product data, and samples
 - 6. Store Record Documentation separate from documents used for construction
 - 7. Record information concurrent with construction progress
 - 8. Specifications: Legibly mark and record at each Product section description of actual products installed, including the following:



- a. Manufacturer's name and product model and number
- b. Product substitutions or alternates utilized
- c. Changes made by Addenda and Modifications
- d. Submit documents to Owner with claim for final Application for Payment identifying total adjusted contract sum, previous payments, and sum remaining due.

1.03 QUALIFICATIONS

- A. For survey work, employ a land surveyor registered in Michigan and acceptable to Engineer and Owner. Submit evidence of Surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate.

1.04 PROJECT CONDITIONS

- A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion. Do not stockpile material so as to restrict surface drainage.
- C. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
 1. Minimize amount of bare soil exposed at one time.
 2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
 3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
 4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures at no additional cost to the Owner.



- D. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations.

1.05 COORDINATION

- A. Coordinate scheduling, submittals, and work of the various sections of the Specifications to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Notify affected utility companies and comply with their requirements.
- C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- D. Coordinate space requirements with the site to ensure continued existing site operations at all times during construction.
- E. Coordinate completion and clean-up of work of separate sections.
- F. After Owner occupancy, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Comply with individual specifications for each work item.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.



- B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
- E. Verify that utility services are available, of the correct characteristics, and in the correct locations.
- F. Prior to Removal or Excavation: Examine existing conditions prior to commencing work, including elements subject to damage or movement during removal or excavation. After uncovering existing work, assess conditions affecting performance of work. Contractor is responsible to use appropriate construction methods and take necessary measures to prevent damage to structures or pavement to remain.

3.02 PREPARATION

- A. Comply with individual specifications for each work item.

3.03 LAYING OUT THE WORK

- A. Verify locations of survey control points prior to starting work.
- B. Promptly notify Engineer of any discrepancies discovered.
- C. Locate and protect survey control and reference points. Establish necessary survey control points prior to starting work.
- D. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
- E. Promptly report to Engineer the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- F. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Engineer.
- G. Utilize recognized engineering survey practices.



- H. Establish a minimum of two permanent benchmarks on-site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.
- I. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
 - 1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
 - 2. Grid or axis for structures.
- J. Periodically verify layouts by same means.
- K. Maintain a complete and accurate log of control and survey work as it progresses.

3.04 GENERAL INSTALLATION REQUIREMENTS

- A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and to avoid waste due to necessity for replacement.
- B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.05 ALTERATIONS

- A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
 - 1. Verify that construction and utility arrangements are as shown.
 - 2. Report discrepancies to Engineer before disturbing existing installation.



3. Beginning of alterations work constitutes acceptance of existing conditions.
- B. Remove existing work as indicated and as required to accomplish new work.
 1. Remove/ Relocate items indicated on drawings.
- C. Protect existing work to remain.
 1. Prevent movement of structure; provide shoring and bracing if necessary.
 2. Repair adjacent construction damaged during removal work.
- D. Comply with all other applicable requirements of this section.

3.06 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.07 PROTECTION OF INSTALLED WORK

- A. Protect installed work from damage by construction operations.
- B. Provide special protection where specified in individual specification sections.
- C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- D. Prohibit traffic from landscaped areas.

3.08 FINAL CLEANING

- A. Use cleaning materials that are nonhazardous.
- B. Clean site; sweep paved areas, rake clean landscaped surfaces.
- C. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.



3.09 CLOSEOUT PROCEDURES

- A. Make submittals that are required by governing or other authorities. Provide copies to Engineer and Owner.
- B. Accompany Engineer on preliminary inspection to determine items to be listed for completion or correction in Contractor's Notice of Substantial Completion.
- C. Notify Engineer when work is considered ready for Substantial Completion.
- D. Submit written certification that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Engineer's review.
- E. Correct items of work listed in executed Certificates of Substantial Completion and comply with requirements for access to Owner-occupied areas.
- F. Notify Engineer when work is considered finally complete.
- G. Complete items of work determined by Engineer's final inspection.

END OF SECTION



SECTION 01 74 19

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 – GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

- A. Owner requires that this project generate the least amount of trash and waste possible.
- B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.
- C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.
- D. Contractor shall submit periodic Waste Disposal Reports; all landfill disposal, incineration, recycling, salvage, and reuse must be reported regardless of to whom the cost or savings accrues; use the same units of measure on all reports.
- E. Methods of trash/waste disposal that are not acceptable are:
 - 1. Burning on the project site.
 - 2. Burying on the project site.
 - 3. Dumping or burying on other property, public or private.
 - 4. Other illegal dumping or burying.
- F. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, State, and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 DEFINITIONS

- A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.
- B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair, and demolition operations.



- C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.
- D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.
- E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.
- F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.
- G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.
- H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- I. Return: To give back reusable items or unused products to vendors for credit.
- J. Reuse: To reuse a construction waste material in some manner on the project site.
- K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.
- L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.
- M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.
- N. Toxic: Poisonous to humans either immediately or after a long period of exposure.
- O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.
- P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.03 SUBMITTALS

- A. See Section 01 3300 - Administrative Requirements, for submittal procedures.



- B. Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report.
1. Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.
 2. Submit Report on a form acceptable to Owner.
 3. Landfill Disposal: Include the following information:
 - a. Identification of material.
 - b. Amount, in tons or cubic yards, of trash/waste material from the project disposed of in landfills.
 - c. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.
 - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
 4. Incinerator Disposal: Include the following information:
 - a. Identification of material.
 - b. Amount, in tons or cubic yards, of trash/waste material from the project delivered to incinerators.
 - c. State the identity of incinerators, total amount of fees paid to incinerator, and total disposal cost.
 - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
 5. Recycled and Salvaged Materials: Include the following information for each:
 - a. Identification of material, including those retrieved by installer for use on other projects.
 - b. Amount, in tons or cubic yards, date removed from the project site, and receiving party.
 - c. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material.



- d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
 - e. Certification by receiving party that, materials will not be disposed of in landfills or by incineration.
6. Material Reused on Project: Include the following information for each:
- a. Identification of material and how it was used in the project.
 - b. Amount, in tons or cubic yards.
 - c. Include weight tickets as evidence of quantity.
7. Other Disposal Methods: Include information similar to that described above, as appropriate to disposal method.

PART 2 - PRODUCTS

NOT USED

PART 3 – EXECUTION

3.01 WASTE MANAGEMENT PROCEDURES

- A. See Section 01 7000 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

3.02 WASTE MANAGEMENT PLAN IMPLEMENTATION

- A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.
- B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Engineer.
- C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.
- D. Meetings: Discuss trash/waste management goals and issues at project meetings.
 1. Pre-bid meeting.
 2. Pre-construction meeting.



3. Regular job-site meetings.
- E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
1. Provide containers as required.
 2. Provide adequate space for pick-up and delivery and convenience to subcontractors.
 3. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.
- F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.
- G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility to prevent contamination of recyclable materials.
- H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.
- I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION



SECTION 01 78 00

CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes requirements for project closeout.

1.02 GENERAL

- A. Upon completion of all work detailed in the Contract Documents, schedule a meeting with the Owner and the Owner's Representative at the Site to close out the Project. Conduct a walk-through of the Site.
- B. Upon review of the completed Site, the Owner's Representative will provide a punch list of items to be completed. Address the punch list items immediately to the Owner's and the Owner's Representative satisfaction.
- C. Provide the Owner's Representative with a final Project Report that includes, but is not necessarily limited to, the following:
 - 1. As-Built drawings, indicating all work completed; final construction limits, quantities, and amounts; installation variations from the contract documents; etc.
 - 2. Warranties and Guarantees as described in these Specifications and Contract.
 - 3. Permitting, Bond, Plan Review, and Inspection documentation, including payment and close-out documentation.
 - 4. Operation and maintenance manuals.
 - 5. Provide copies of the records of inspections and tests and records of any corrective action taken to address any problem encountered.
 - 6. Provide copies of all licenses, certifications, permits, agreements, manifests, chain of custody records, weigh tickets, meter recordings, delivery tickets, and receipts required or issued for the disposal of materials, the methods used, and the disposal areas and facilities.



7. Provide copies of the results of tests performed to comply with the requirements of each disposal facility.
8. Submit copies of the official manifests to prove the delivery of the materials to an approved licensed disposal facility for each shipment of removed materials including, but not limited to:
 - a. Building and structure debris.
 - b. Concrete and brick debris.
 - c. Contaminated soils and liquids.
 - d. Hazardous and non-hazardous materials.
 - e. Miscellaneous debris and solid waste.
- D. Manifests to comply with the requirements of ALL the applicable federal, state, and local regulations.
- E. Air / Dust monitoring results.
- F. Final request for payment in accordance with the Contract Documents.
- G. Provide the Owner's Representative with Waivers of Lien from all subcontractors and suppliers employed on this Project.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION



SECTION 31 10 00

SITE PREPARATION

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes requirements for site preparation activities as shown on the drawings including clearing/ grubbing and protection of vegetation, and removal of existing debris.

1.02 REFERENCES

- A. Michigan Department of Transportation (MDOT), Standard Specifications for Construction; 2020.

1.03 SUBMITTALS

- A. Site Plan: Showing:
 - 1. Areas for temporary construction and field offices.
- B. Written permission to use disposal sites.
- C. Written evidence that proper arrangements have been made with the Owner of the utility line, structure or pole that must be disturbed in order to accomplish the contracted Work that is not owned by the Owner.
- D. Site Specific Health and Safety Plan developed by the Contractor.
- E. Copy of the Soil Erosion and Sedimentation Control permit.

1.04 QUALITY ASSURANCE

- A. Secure all permits and post all bonds and deposits required to comply with this Contract.
- B. Prior to commencing earthwork, CALL MISS DIG three days in advance of work and receive clearance.
- C. Develop and implement a site-specific Health and Safety Plan that meets all applicable federal, state, and local regulations. Describe the potential hazards associated with completion of this project, including potential contact with waste.



Consult Owner's site health and safety plan during development and implementation.

1.05 PROJECT CONDITIONS

- A. Minimize production of dust due to clearing operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
- B. Protect trees, shrubs, and other vegetation that are outside the limits of the Work and those that are within the limits of the Work but not designated to be removed. Repair or replace trees, shrubs, and vegetation that are designated to be protected but are damaged by Contractor operations at no cost to Owner.
- C. Protect existing culverts, sewers, drainage structures, manholes, water gate wells, hydrants, water mains, utility poles, overhead lines, underground conduits, underground cables, pavement, and other improvements that are outside the limits of the Work and those that are within the limits of the Work but are not designated to be removed. Repair or replace, to the satisfaction of the Owner, structures and improvements that are designated to be protected but are damaged by Contractor operations.
- D. Maintain existing open drains, field and roadway ditches, drainage tile, sewers, enclosed drains, natural and artificial watercourses, surface drainage and other types of drainage within the limits of the Work free to discharge during excavating, backfilling, and compacting operations. Immediately repair, replace, or clear drainage facilities that are not designated to be abandoned but are damaged or whose drainage function is impaired by Contractor operations.
- E. Available information regarding underground and overhead utilities is shown on the Drawings. Contractor bears sole responsibility for damage to any underground and overhead utilities, or any associated damages and claims caused as a result of damaging utilities. The Contractor will be responsible for repair and bear all costs if damage is caused to on-site utilities.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Fill Material: As specified in Section 31 22 00 – Grading and Section 31 23 23-Fill.



PART 3 - EXECUTION

3.01 PREPARATION

- A. When required to permit the Work to be performed in a dry condition, provide construction dewatering, as necessary.

3.02 EXISTING STOCKPILES ON-SITE

- A. Existing vegetative growth layer may be pushed back and preserved for use in restoration following completion of the Project. Stockpile preserved vegetative growth layer separately from other stockpiles as indicated on the drawings. Protect stockpiles from soil erosion and sedimentation loss with silt fence or other appropriate means and provide permanent soil erosion protection measures for stockpiles to remain on site at completion of construction.

3.03 EXISTING UTILITIES AND BUILT ELEMENTS

- A. Locations of existing utilities shown on the Drawings are approximate; coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits. Ensure the utilities have been marked prior to commencement of construction.
- B. Protect existing utilities to remain from damage.
- C. Do not disrupt public utilities without permit from authority having jurisdiction. Unless otherwise indicated, maintain flow in existing utilities by diversion, pumping, fluming, relocation, or by other methods. At the conclusion of construction, return and reinstall diverted and relocated utilities to their original condition.
- D. Protect existing structures and other elements that are not to be removed.
- E. Remove existing signs, posts, fences, and utility structures as designated by construction documents, as noted. Store these items on the site, where designated by Owner, in reusable condition.
- F. Expose utility lines prior to excavation to determine if conflicts with the proposed improvements exist. Be responsible for the cost of relocating items as required to resolve conflicts. Contact the Owner of the utility for relocation.
- G. Protect existing buildings and structures within the limits of construction. If it becomes necessary to move an existing building or structure in order to proceed with construction, perform the move without damaging the building or structure. Assume that existing structures that must be moved have a 6-inch thick base.



Limit the distance of the move to the minimum that will allow for construction of the improvement.

- H. Unless otherwise indicated, remove abandoned culvert, pipe, sewer, structure or part of a structure that is to be replaced or that will be rendered useless by the new construction.
 - 1. Unless otherwise indicated, break down structures being removed to twelve inches below the subgrade. Plug pipes connected to the structure with a masonry or concrete bulkhead as approved by the Engineer. Backfill in accordance with Section 31 2200 and Section 31 2323.
 - 2. If a structure is removed from a system that is to remain in service, provide and maintain an Engineer-approved bypass system for the duration of the rebuilding.
 - 3. Salvaged materials are the property of the Contractor. Promptly and properly dispose of these materials.
- I. If uncharted utilities are encountered during excavation, notify Owner's designated representative and await instructions before proceeding. Repair, at Contractor's expense, damage to utilities encountered when work is continued without notifying Owner's designated representative.

3.04 VEGETATION

- A. Remove trees, shrubs, brush, and stumps in work areas as indicated on the construction plans and specifications. Protect trees and vegetation that are scheduled to remain.
- B. Do not begin clearing until vegetation to be relocated has been removed.
- C. Do not remove or damage vegetation beyond the construction limits.
- D. Install fences to prevent inadvertent damage to vegetation to remain.
- E. In areas where vegetation must be removed but no construction will occur, remove vegetation with minimum disturbance of the subsoil.
- F. In areas where cutting of minor trees is permitted by the Drawings, exercise care to avoid damage to adjacent trees to remain.
- G. Chip, grind, crush, or shred vegetation for mulching, composting, or other purposes; preference should be given to on-site uses.
- H. Remove stumps and roots to depth of 18 inches.



- I. Fill holes left by removal of stumps and roots, using suitable fill material, with top surface neat in appearance and smooth enough not to constitute a hazard to pedestrians.
- J. Restoration: If vegetation outside removal limits or within specified protective fences is damaged or destroyed due to subsequent construction operations, replace at no cost to Owner. Prune tree limbs, branches and roots that exhibit minor damage caused by Contractor operations to the satisfaction of the Engineer.

3.05 RESTORATION IN GRASS AREAS

- A. Restore grass areas, not paved or aggregate-surfaced, with vegetative growth layer, seed, and mulch in compliance with Section 32 9000, unless indicated otherwise on the Drawings.
- B. Properly dispose of excess material from the restoration operation.
- C. Furnish, place, and compact additional fill, in compliance with Section 31 2323, as needed to restore the disturbed areas to the cross sections called for on the Drawings or as determined by the Engineer.

3.06 DEBRIS AND CLEAN-UP

- A. Remove debris, junk, and trash from site.
- B. Fill holes due to removal of earth in accordance with Section 31 2200 and Section 31 2323.
- C. Leave site in clean condition, ready for subsequent work.
- D. Clean up spillage and wind-blown debris.

END OF SECTION



SECTION 31 22 00

GRADING

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Removal and salvage of topsoil.
- B. Rough grading the site for site structures and pavements.
- C. Finish grading.

1.02 RELATED SECTIONS

- A. Section 01 5713 - Temporary Erosion and Sedimentation Control.
- B. Section 31 1000 - Site Preparation.

1.03 QUALITY ASSURANCE

- A. Perform Work in accordance with these specifications. Maintain one copy of the specifications on site.

1.04 PROJECT CONDITIONS

- A. Protect above- and below-grade utilities that remain.
- B. Protect plants, lawns, rock outcroppings, and other features to remain as a portion of final landscaping.
- C. Protect benchmarks, survey control points, existing structures, fences, sidewalks, paving, and curbs, designated to remain, from grading equipment and vehicular traffic.
- D. Provide temporary erosion and sediment control in compliance with Section 01 5713.



PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that survey benchmark and intended elevations for the Work are as indicated.

3.02 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. Stake and flag locations of known utilities.
- C. Locate, identify, and protect utilities that remain from damage.
- D. Call Miss Dig three days in advance of work and notify utility company to remove and/or relocate utilities.
- E. Remove and dispose of vegetation, brush, stones, rocks, and other objectionable litter and foreign material before the ground is broken for topsoil removal.

3.03 ROUGH GRADING

- A. Remove existing pavements from areas to be further excavated or re-graded, without mixing with foreign materials.
 - 1. Do not strip pavements if weather conditions are unsuitable.
 - 2. If approved by Engineer, salvage topsoil for reuse.
 - 3. Dispose of salvaged topsoil in excess of that required for the project.
- B. Remove and dispose of material detrimental to site improvement in accordance with Section 31 1000.
- C. Do not remove topsoil when wet.



- D. Remove subsoil from areas to be further excavated, re-landscaped, or re-graded. Remove subsoil parallel to proposed finished grades and to elevations that allow for thickness of pavement section. Do not over-excavate.
- E. Do not remove wet subsoil unless it is subsequently processed to obtain optimum moisture content.
- F. When excavating through roots, perform work by hand and cut roots with sharp axe.
- G. Stability: Replace damaged or displaced subsoil to same requirements as for specified fill.

3.04 SOIL REMOVAL

- A. Stockpile topsoil to be re-used on site; remove remainder from site. Locate stockpiles as near the original location as possible.
- B. Stockpile subsoil to be re-used on site in an approved area and remove remainder from site. Segregate contaminated fill suitable for reuse as backfill from native uncontaminated soil and from imported engineered fill.
- C. Stockpiles: Use areas designated on site; pile depth not to exceed 10 feet; protect from erosion; avoid diversion of storm water runoff, creating standing water, and interference of controlled irrigation.
 - 1. Do not stockpile around trunks and roots of trees to be preserved.
 - 2. Maintain stockpiled topsoil separate from stockpiled subsoil.
 - 3. Locate and retain soil materials at least 100 feet away from edge of excavations and at least 50 feet from the top of the slope of a shoreline.

3.05 FINISH GRADING

- A. Before Finish Grading:
 - 1. Verify subgrade has been contoured to grades and elevations shown on the Drawings and has been compacted.
- B. Remove debris, roots, branches, stones, in excess of 1/2 inch in size. Remove soil contaminated with petroleum products.
- C. Perform finished grading when the ground is frost-free and weather is favorable.



- D. In areas where vehicles or equipment have compacted soil, scarify surface to depth of 3 inches.
- E. Grade areas adjacent to building lines to drain away from structures and to prevent ponding. Finish surfaces free from irregularities.
- F. Lightly compact placed topsoil.

3.06 TOLERANCES

- A. Top Surface of Subgrade: Plus or minus (+/-) 1/10 foot from required elevation.
- B. Top Surface of Finish Grade: Plus or minus (+/-) 1/2 inch.

3.07 CLEANING AND PROTECTION

- A. Remove unused stockpiled topsoil and subsoil. Grade the stockpile area to prevent standing water.
- B. Leave site clean and raked, ready to receive landscaping.

END OF SECTION



SECTION 31 23 13

SUBGRADE PREPARATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Removal and salvage of topsoil.
- B. Proof-rolling subgrade.
- C. Undercutting and backfilling areas that are unstable.

1.02 RELATED SECTIONS

- A. Section 01 5713 - Temporary Erosion and Sedimentation Control.
- B. Section 31 1000 - Site Preparation.

1.03 QUALITY ASSURANCE

- A. Perform Work in accordance with these specifications. Maintain one copy of the specifications on site.

1.04 PROJECT CONDITIONS

- A. Protect above- and below-grade utilities that remain.
- B. Protect plants, lawns, rock outcroppings, and other features to remain as a portion of final landscaping.
- C. Protect benchmarks, survey control points, existing structures, fences, sidewalks, paving, and curbs, designated to remain, from grading equipment and vehicular traffic.
- D. Provide temporary erosion and sediment control in compliance with Section 01 5713.



PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that survey benchmark and intended elevations for the Work are as indicated.

3.02 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. Stake and flag locations of known utilities.
- C. Locate, identify, and protect utilities that remain, from damage.
- D. Call Miss Dig three days in advance of work and notify utility company to remove and/or relocate utilities.
- E. Remove and dispose of vegetation, brush, stones, rocks, and other objectionable litter and foreign material before the ground is broken for topsoil removal.

3.03 ROUGH GRADING

- A. Remove existing pavements from areas to be further excavated, re-landscaped, or re-graded, without mixing with foreign materials.
 - 1. Do not strip pavements if weather conditions are unsuitable.
 - 2. If approved by Engineer, salvage topsoil for reuse.
 - 3. Dispose of salvaged topsoil in excess of that required for the project.
- B. Remove and dispose of material detrimental to site improvement in accordance with Section 31 1000.
- C. Do not remove topsoil when wet.



- D. Remove subsoil from areas to be further excavated, re-landscaped, or re-graded. Remove subsoil parallel to proposed finished grades and to elevations that allow for thickness of pavement section. Do not over-excavate.
- E. Do not remove wet subsoil unless it is subsequently processed to obtain optimum moisture content.
- F. When excavating through roots, perform work by hand and cut roots with sharp axe.
- G. Proof-roll subgrade to receive fill material with a fully loaded tandem dump truck to detect unstable areas.
- H. Stability: Replace damaged, displaced and/or unstable subsoil to same requirements as for specified fill.

3.04 TOLERANCES

- A. Top Surface of Subgrade: Plus or minus (+/-) 1/10 foot from required elevation.

3.05 CLEANING AND PROTECTION

- A. Remove unused stockpiled topsoil and subsoil. Grade the stockpile area to prevent standing water.

END OF SECTION



SECTION 31 23 16

EXCAVATION

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Excavating for site work.

1.02 RELATED SECTIONS

- A. Section 01 4000 - Quality Requirements: General requirements for field inspection and testing.
- B. Section 01 7000 - Execution and Closeout Requirements: General requirements for dewatering of excavations and water control.
- C. Section 31 2200 - Grading: Grading.

1.03 SUBMITTALS

- A. Submit sheeting, shoring, and bracing plans for information only.
- B. Excavation Plan: Prior to the start of excavation work, submit written plan that demonstrates compliance with the Contract Documents and OSHA Standard 29 CFR Part 1926.650. As a minimum, include:
 - 1. Name of competent person responsible for excavation operations.
 - 2. Excavation method(s) and protective system(s) to be used.
 - 3. Manufacturer's data if proprietary protective system(s) are designed on the basis of such data.
- C. Stockpiling Plan: Prior to the start of excavation work, submit temporary soil stockpiling plan. Include provisions for maintaining stockpiles during the Work and removal of stockpiles upon completion of the Work.



1.04 QUALITY ASSURANCE

- A. Obtain necessary permits for work in roads, rights-of-way, railroads, etc. Also obtain permits as required by local, state, and federal agencies for discharging water from excavations.
- B. Perform Work in compliance with applicable requirements of governing authorities having jurisdiction.
- C. Comply with OSHA Standard, Title 29, Code of Federal Regulations, Part 1926, Section 650 (Subpart P - Excavations).

1.05 PROJECT CONDITIONS

- A. Verify that survey benchmark and intended elevations for the Work are as indicated.
- B. Protect plants, lawns, rock outcroppings, and other features to remain.
- C. Protect benchmarks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.
- D. Perform excavations as indicated on the Drawings.
- E. Existing Structures
 - 1. Surface structures and underground structures shown on the Drawings are based on existing records and limited investigation. This information is provided for the convenience of the Contractor and is not guaranteed to be complete or correct.
 - 2. Explore ahead of the required excavation to determine exact locations of structures.
 - 3. Support and protect existing structures from damage. Immediately restore damaged and broken structures at no cost to Owner if damage or breakage was the result of Contractor operations.
- F. Existing Utilities
 - 1. Locate existing underground utilities in the areas of Work. If utilities are to remain in place, provide adequate means of protection.



2. If uncharted or incorrectly charted piping or other utilities are encountered during excavation, consult piping or utility owner and Engineer immediately for direction. Cooperate with Owner and utility owner in keeping services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
 3. In general, service lines to individual businesses are not shown; however, assume that service exists for each utility to each business.
 4. Do not interrupt utilities serving facilities occupied and used by Owner or others, except when permitted in writing by Engineer and then only after acceptable temporary utility services have been provided.
 5. Demolish and completely remove from site underground utilities indicated to be removed. Coordinate with utility companies for shut-off of services if lines are active.
- G. Protection of Persons and Property
1. Barricade open excavations occurring as part of the Work and post with warning lights. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
 2. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- H. Dust Control: Conduct operations and maintain areas of activity to minimize creation and dispersion of dust, including sweeping and sprinkling of roadways. Calcium chloride may be used to control serious or prolonged dust problems, only when explicitly approved in advance by Engineer.
- I. Temporary Fencing: Furnish and install a temporary fence surrounding excavations.

PART 2 - PRODUCTS

NOT USED



PART 3 - EXECUTION

3.01 PREPARATION

- A. Identify required lines, levels, contours, and datum locations.
- B. See Section 31 2200 for additional requirements.
- C. Clear landscaping including trees, brush, roots, stumps, logs, vegetation, sod, topsoil, organic matter, wood, and other materials and debris from areas to be occupied by permanent construction or embankments or excavations as needed.
 - 1. Promptly remove waste materials from the site.
 - 2. Properly dispose of water materials. Burning and/or encapsulating debris is not permitted.
- D. Test pits
 - 1. Where shown on Drawings or where requested by Engineer, excavate and backfill, in advance of construction, test pits to determine conditions or locate existing facilities. Include excavating, stockpiling, maintaining, sheeting, shoring, backfilling, and replacing pavements at test pits.
 - 2. Compensation for test pits ordered by the Engineer will be based on the unit price included on the Bid Form.
 - 3. No compensation will be made for test pits made by the Contractor for his own use.

3.02 SHEETING, SHORING AND BRACING

- A. Furnish, place, and maintain sheeting, shoring, and bracing of the excavation to ensure safety of people in and around the excavation. Protect the new Work, existing construction, and pedestrian and vehicular traffic.
- B. Be responsible for the design of sheeting, shoring, and bracing. Design to provide strength, quality, dimension, and spacing of sheeting, shoring, and bracing of existing soil conditions to prevent caving, loss of ground, and squeezing within the lines of the excavation and effectively restrain movement of the adjacent soil.



1. Design in conformance with current federal, state, and local regulations for safety.
 2. Do not permit sheeting, shoring, and bracing to come into contact with pipes. Install sheeting, shoring, and bracing to prevent concentrated loads and horizontal thrusts from being transmitted to the pipe.
- C. Where indicated on the Drawings and where necessary in the Work, leave sheeting, shoring, and bracing in place.
- D. Provide supports for pipes, conduits, and similar construction that crosses the excavation. If required, leave such supports in place.
- E. Do not remove sheeting, shoring, and bracing until pipes in trenches have been properly bedded and the trench has been backfilled to sufficiently support the external loads.
- F. Do not remove earth material below the bottom of a shield beyond the limits established by ordinances, codes, laws, and regulations.
- G. When removing or moving a shield ahead, take care to prevent movement of pipe or structures and avoid disturbing the bedding for pipes and structures. Remove and reinstall pipes and structures that are disturbed.

3.03 EXCAVATING

- A. Excavate to accommodate construction operations. Excavation is unclassified, and includes contaminated and uncontaminated earth, sand, clay, gravel, hardpan, boulders not requiring drilling and blasting for removal, concrete debris, decomposed rock, pavements, rubbish, and other materials within the excavation limits.
- B. Notify Engineer of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.
- C. Unless otherwise indicated, provide open excavations for structures and pipelines. Utilize protection systems as follows:
1. Excavation Less Than Three Feet Deep: Excavations in soils where there is not potential for a cave-in may be made with vertical sides. For other soils, provide excavations that are sloped and benched, shielded, or shored and braced.



2. Excavation More Than Three Feet Deep: Provide excavations that are sloped and benched, shielded, or shored and braced.
 3. Install and maintain protection system(s) in compliance with the approved Excavation Plan.
- D. Do not interfere with 45 degree bearing splay of foundations.
- E. Cut utility trenches wide enough to allow inspection of installed utilities.
- F. Perform pavement cutting by saw or other methods satisfactory to the authorities having jurisdiction. Do not perform pavement breaking by drop weight or other impact type equipment.
- G. Hand trim excavations. Rounded and undercut edges will not be permitted for footing excavations. Remove loose matter.
- H. Remove lumped subsoil, boulders, and rock up to 1/3 cu yd measured by volume.
- I. Provide subgrade for roadways, structures and trench bottoms that is firm, dense, and thoroughly compacted and consolidated; free from mud, muck, and other soft or unsuitable materials; and firm and intact.
1. Reinforce subgrade that is otherwise solid but becomes soft or mucky on top due to construction operations, with crushed stone or gravel.
 2. Do not permit the finished elevation of stabilized subgrade to be above subgrade elevations shown.
- J. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- K. Remove excavated material that is unsuitable for re-use from site.
- L. Stockpile excavated material to be re-used in area designated on site in accordance with Section 31 2200.
- M. Remove excess excavated material from site.
- N. Dispose of materials removed from the site in compliance with ordinances, codes, laws, and regulations of authorities having jurisdiction.



3.04 EXCESS EXCAVATION

- A. Excess excavation is defined as surplus earth material, free of brush, roots, stumps, broken concrete, pipe, debris, and other extraneous material, that is realized from the construction.
- B. When requested by the Owner, transport excess excavation to a site(s) designated by the Owner. Grade the excess excavation to provide positive surface drainage of the site (and so that adjacent properties are not damaged or affected. Include removal of surface irregularities to provide a smooth surface (± 0.25 foot).
- C. When transportation of excess excavation has not been requested by the Owner, remove and properly dispose of the material.
- D. Brush, roots, stumps, broken concrete, pipe, debris, and other extraneous material from the construction is the property of the Contractor. Properly dispose of this material in accordance with applicable laws, rules, and regulations.

3.05 DRAINAGE AND DEWATERING

- A. Prevent surface and subsurface water from flowing into excavations and from flooding adjacent areas.
- B. Remove water from excavation as fast as it collects.
- C. Maintain the ground water level below the bottom of the excavation to provide a stable surface for construction operations, a stable subgrade for permanent work, and to prevent damage to the Work.

3.06 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection and testing.
- B. Provide for visual inspection of storm basins and pipes.

3.07 PROTECTION

- A. Prevent displacement of banks and keep loose soil from falling into excavation; maintain soil stability.



- B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

END OF SECTION



SECTION 31 23 19

GROUND WATER CONTROL

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes dewatering system and groundwater control requirements associated with utility construction and excavation plan.
- B. Furnish all labor, equipment, and materials necessary to complete the required dewatering operations.
- C. Dewatering shall be maintained at all times to control groundwater infiltration as well as storm water runoff to provide a stable, firm excavation bottom for construction.

1.02 SITE CONDITIONS

- A. Groundwater observation was performed during the design of this project. The logs of the borings and soil data for this project are provided in the geotechnical reports with the project documents.
- B. Protection of Existing Structures:
 - 1. Determine and verify the location of existing underground utilities before starting excavation or installation operations. If utilities are to remain in place, provide protection from damage during excavation operations. Contractor is responsible to provide all protections for any existing structures during excavation procedures.
 - 2. Do not interrupt existing utilities serving facilities occupied and used by the Owner or others, except when permitted in writing by the Engineer, and then only after acceptable temporary utility services have been provided.

1.03 SUBMITTALS

- A. Submit for Engineer's record a copy of all dewatering discharge permits.
- B. Submit types and sizes of water treatment units and/or storage containers, as necessary.



- C. Submit groundwater disposal plan showing method of discharging and/or disposing of groundwater.
- D. Submit detailed plans of the proposed dewatering system including the following:
 - 1. A detailed description of equipment and materials to be used and the procedures for installation, operation, and maintenance in relation to the construction sequences of associated facilities, including but not limited to the size of pumps, water discharge lines and their location relative to water discharge points, location of sumps, details of sump construction, bottom grading plans, means to limit pumping of soil fines, locations of french drains, and details of construction including fabrics and stones.
 - 2. Locations and depths of all dewatering components points of disposal for pumped water.
 - 3. The plan for power supply for dewatering system.
 - 4. Required standby equipment if power is lost during dewatering operations.
 - 5. Groundwater disposal plan showing the groundwater discharging or disposing method.
 - 6. Monitor and report weekly the volumetric flow rate (gpm) at each installed sump well. Contractor is required to monitor and report weekly the flow volume (gpm). Contractor will be required to monitor overall volume (gpm) of complete groundwater control system at the final discharge point.
- E. Submit resume and qualifications of dewatering superintendent and/or foreman.
- F. Submit proposed surface water control plan (i.e. cutoff wall, dikes, ditches, sump, etc.) for both outside and inside the excavation.
- G. Submit a contingency plan to continue groundwater control in the event of a failure of the primary groundwater control system including such items as pumps, primary electric, and treatment units.
- H. Submit a quality control and quality assurance plan for the work of this section. At a minimum provides all testing procedures, limits of acceptability, and methodology to prove that the completed work is as specified in the Contract Documents.



PART 2 - PRODUCTS

2.01 MATERIALS

- A. Provide materials and equipment suitable to meet the dewatering requirements.
- B. Provide materials and equipment for soil erosion and sedimentation control per the requirements of Section 01 57 13.

PART 3 - EXECUTION

3.01 GENERAL

- A. Coordinate with the utility owner to obtain and pay for all permits for discharge of temporary dewatering and drainage systems.
- B. Original permits shall be given to the Engineer for records and prominently displayed on the site prior to constructing dewatering and drainage systems.
- C. Collect and analyze water samples as necessary to verify compliance with the requirements of the owner of the system into which the effluent is discharged. Any sample collection, shipping costs, and testing will be paid for by the Contractor and are incidental to the Contract. Obtain special discharge permit from authorities having jurisdiction. Treat water (if required) prior to discharge in accordance with permit requirements. Provide water treatment or storage containers, as necessary to collect/store and treat water (if required) prior to discharge.
- D. Furnish, install, operate, monitor, maintain, and remove temporary dewatering and drainage systems as required to adequately perform the utility installation and excavation work. A dry excavation must be maintained.
- E. Collect and properly dispose of any discharge water from dewatering and drainage systems in accordance with State and local requirements and permits.
- F. Repair damage caused by dewatering and drainage system operations.
- G. Remove temporary dewatering and drainage systems when no longer needed. Restore all disturbed areas.
- H. Control surface water and groundwater such that excavation during construction is made in-the-dry, and bearing soils are maintained undisturbed. Prevent softening, or instability of, or disturbance to the subgrade due to water seepage. Very heavy loads will bear on the subgrade materials; if the Contractor does not



maintain adequate stability or prevent softening, the Contractor will be required to implement an approved subgrade improvement program at no additional cost to the Owner.

- I. Provide protection against floatation for all work.
- J. Coordinate and schedule dewatering activities with the Engineer.
- K. Coordinate construction operations to minimize duration and extent of dewatering required.
- L. Perform construction dewatering in a manner that will protect existing roads, structures, and above ground and underground utilities. The Contractor shall be solely responsible for preventing damage to roads, buildings or structures, sewers and other utility installations, pavements, sidewalks, and other property which may result from Contractor's groundwater control operations.
- M. The Contractor must immediately repair any structure damaged as a result of the dewatering operations at no additional cost to the Owner.
- N. If there are indications of a hydraulic gradient causing uncontrolled flow, seepage, or ground instability, increase the capacity of the groundwater control system, undertake a grouting program to control or limit seepage, or take other supplementary measures to reduce water pressure immediately adjacent to the excavation.
- O. Provide and maintain emergency power and associated items such that the system will function in the event of power failure. Provide automatic switching gear.
- P. Collection and disposal of groundwater discharge shall be performed in accordance with all local, state and federal codes, rules, and regulations.

3.02 SURFACE WATER CONTROL

- A. Control surface water runoff to prevent flow into excavations. Provide temporary measures such as cutoff walls, French drains, dikes, ditches, and sumps.
- B. Control surface water inside the excavation using appropriate measures to divert any groundwater or storm water runoff into collection systems then discharged in accordance with the requirements of the Contract Documents. The Contractor may consider placing mud-mat or appropriate stone material on top of the excavation subgrade to facilitate drainage and collection of water to maintain dry conditions.
- C. Provide plan for Engineer review and approval that details surface water control system for both inside and outside of the excavation.



3.03 DISPOSAL OF DRAINAGE

- A. The effluent must meet the requirements of any permit, regulation, or requirement of the system owner into which the effluent is discharged. The effluent must be tested, and a special discharge permit must be obtained from the governing jurisdiction prior to discharge into the nearby collection system, if applicable.

3.04 REMOVAL

- A. Remove sumps and all other associated dewatering system components upon completion of work.
- B. Remove water storage containers upon completion of work (if used).

END OF SECTION



SECTION 31 23 23

FILL

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes filling, backfilling, and compacting for excavations generated as a result of removal (demolition) operations.
- B. Contractor will provide all equipment, labor, and supplies required to perform the work in accordance with the Contract and Drawings.
- C. The Owner will provide certification testing through designated CQA Officer.
- D. Unsuitable materials include topsoil, peat, roots, organic soils, and materials containing slag, cinders, foundry sand, debris, rubble or frozen soils, and materials not meeting requirements of the Specification.

1.02 REFERENCES

- A. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 2006.
- B. ASTM D422 - Standard Test Method for Particle-Size Analysis of Soils; 2007
- C. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN m/m³)); 2002
- D. ASTM D2434 - Standard Test Method for Permeability of Granular Soils (Constant Head); 2006
- E. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2006
- F. ASTM D2922 – Standard Test Method for Density of Soil and Soil-Aggregate in place by Nuclear Methods (Shallow Depth); 2007
- G. ASTM D3017 – Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth); 2007
- H. ASTM D4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils; 2010



- I. ASTM D5084 - Standard Test Method for Measurement of Hydraulic Conductivity of Saturates Porous Materials Using a Flexible Wall Permeameter; 2010

1.03 DEFINITIONS

- A. Finish Grade Elevations: Indicated on drawings. Match existing surrounding grades. Meet minimum thickness of fill material as specified.
- B. Lift: Constructed segment of layer comprised of like materials spread over contiguous area prior to compaction.
- C. Layer: Contiguous (compacted) stratum of material. Where comprised of several lifts, free of construction joints or lamination between lifts.
- D. Compacted Clay Fill: Low permeability compacted clay.

1.04 SUBMITTALS

- A. Results of laboratory tests on materials to be used in construction as required in these specifications.
- B. Product data for equipment proposed to be used for compaction.

1.05 PROJECT CONDITIONS

- A. Provide sufficient quantities of fill to meet project schedule and requirements. When necessary, store materials on site in advance of need.
- B. When fill materials need to be stored on site, locate stockpiles where indicated.
 - 1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
 - 2. Prevent contamination.
 - 3. Protect stockpiles from erosion and deterioration of materials.
- C. Verify that survey benchmarks and intended elevations for the Work are as indicated.



PART 2 - PRODUCTS

2.01 FILL MATERIALS

- A. General Fill: On-site stockpiled soil or soil designated by the Contractor and permitted by the Owner.
 - 1. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris; free of rubble, wood, and other organic matter.
 - 2. Offsite material confirmed acceptable based on environmental and material testing as required by the Owner.

- B. Compacted Clay Fill: Clay soil designated by the Contractor and permitted by the Owner.
 - 1. Soil Classification: ML, SC, CH or CL (or combination), by Unified Soil Classification System in accordance with ASTM D2487.
 - 2. Compaction: 90% modified Proctor density or greater, as determined by ASTM D1557 and as necessary to meet specified permeability.
 - 3. Moisture: Compacted-in-place moisture content -5% to +5% of optimum if density can be achieved.
 - 4. Environmental: Satisfactorily meet environmental criteria as stipulated by the Owner.

- C. Backfill: On-site stockpiled soil or soil designated by the Contractor and permitted by the Owner
 - 1. Backfill with sound materials, free from waste, organic matter, rubbish, boggy, or other unsuitable materials.
 - 2. General Materials Requirements: Ensure that materials used for backfilling conform to the authority having jurisdiction specified requirements provided on the project drawings. Follow suitable fill requirements whenever drainage or select fill is not specified. Determine and obtain the approval of the appropriate test method where more than one compaction test method is specified.
 - 3. Frozen Materials: Do not use frozen material for backfilling.
 - 4. Stockpiling: Do not stockpile material on top of existing underground structures.



5. More specific requirements may be shown on project drawings.
 6. Backfill all annular spaces near or under pavement and structures with select fill compacted to 95% of the maximum dry density as determined by the Modified Proctor Test (ASTM D1557).
- D. Vegetative Growth Layer: See Section 32 9000.

2.02 SOURCE QUALITY CONTROL

- A. Where fill materials are specified by reference to a specific standard, test and analyze samples for compliance before delivery or installation.
- B. If tests indicate materials do not meet specified requirements, change material and retest.
- C. Provide materials of each type from same source throughout the Work where on-site material is not available.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Identify required lines, levels, contours, and datum locations.
- B. See Section 31 2200 for additional requirements.
- C. Verify that subgrade surface is dry and firm and approved by the Engineer.

3.02 PREPARATION

- A. Perform proof-roll of subgrade soils using a loaded rubber-tired front-end loader or dump truck. Undercut unstable subgrade soil and backfill subsequent fill material.
- B. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.
- C. Notify Engineer in advance of filling operations to permit Engineer to examine areas and conditions.
- D. Do not proceed with filling operations until unsatisfactory conditions have been corrected.



3.03 DUST CONTROL

- A. During progress of work, conduct operations and maintain area of activities, including sweeping and sprinkling of streets or parking lots as necessary, so as to minimize the creation and dispersion of dust; maintain dust control.

3.04 FILLING - GENERAL

- A. Do not place fill material when free water is on the surface of the area to be filled.
- B. Fill to contours and elevations indicated using unfrozen materials. Do not place fill when temperatures are below freezing.
- C. Employ a placement method that does not disturb or damage other work.
- D. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen, or spongy subgrade surfaces.
- E. Remove fill containing organic materials or other unacceptable material and replace with approved fill material.
- F. Maintain optimum moisture content of fill materials to attain required compaction density.
- G. Compaction Density Unless Otherwise Specified or Indicated:
 - 1. Under structures, paving, slabs-on-grade, and similar construction: 95 percent Modified Proctor density or greater, as determined by ASTM D1557.
 - 2. Elsewhere: 90 percent Modified Proctor density or greater, as determined by ASTM D1557.
 - 3. During placement, control the water content of fill material within the range necessary to obtain the specified compaction.
 - 4. Do not compact fill materials when there is free water on any portion of the fill to be compacted.
 - 5. If field and laboratory tests indicate unsatisfactory compaction, perform additional compaction at no additional cost to Owner until specified compaction is achieved.
- H. Compact each layer of fill before placing the next lift.



- I. Correct areas that are over-excavated. Use fill specified in Drawings, flush to required elevation.
- J. Use compaction equipment that is suitable for the type of material placed and that is capable of providing the densities required.
- K. Perform compaction by conducting at least two passes of all portions of the surface of each lift. One pass is defined as the condition obtained when all portions of the fill material surface have been subjected to the direct contact of the compactor.
 - 1. Test the effectiveness of the compaction equipment at the beginning of construction on a section of fill within the area where fill is to be placed.
 - 2. If tests show that the specified compaction is not obtained, increase the number of coverages, decrease the lift thickness, or use a different type of compactor.
 - 3. The effort required to achieve the specified compaction and the equipment used to achieve that compaction is the sole responsibility of the Contractor.

3.05 FILLING – COMPACTED CLAY

- A. Do not place compacted clay material that has not been approved by the engineer.
- B. Place soil in accordance with the following:
 - 1. Leave roughened or scarify each preceding lift to a typical depth of 1 inch to not more than 3 inches prior to successive lift placement.
 - 2. Maximum Loose Lift Thickness: 9 inches, including scarified or roughened depth of previous lift, or as necessary for a 6-inch maximum compacted lift thickness.
 - 3. Maximum Compacted Lift Thickness: 6 inches or depth of foot or tooth on compactor used, whichever is less.
 - 4. Maximum Rock Size: 3 inches.
 - 5. Maximum Soil Clod Size Prior to Compaction: 4 inches.
 - 6. Allowable Soil Moisture Content Range: -5% to+ 5% wet of optimum.



7. Minimum Soil Compaction: 90% of maximum dry density as determined by the modified Proctor ASTM D1557.
- C. Material distribution and gradation throughout soil to remain free from lenses, pockets, streaks, or sections of material differing substantially in texture or gradation from pre-qualified clay material for which prior source testing has been performed. Separate tests are required for each material type as determined by Owner's designated representative.
- D. Place lifts of soil to form one continuous monolithic layer of material. Ensure previous lift is moist and scarify surface of previously placed lifts with disc or other piece of machinery capable of penetrating into previous lift to minimum 1 inch depth or leave previous lift roughened to provide proper bonding between subsequent lifts of compacted clay. Place soils on slopes in a downslope to upslope fashion.
- E. Do not place soil below ambient air temperature of 32°F, unless approved by Owner's designated representative. Inspect material to ensure that it is free of ice, snow, or frozen material when weather conditions warrant.
- F. Control lift thickness using laser-guided equipment or other method approved prior to construction by Owner's designated representative to ensure requirements of the Specifications are met. Owner prefers the use of laser-guided equipment for this construction. No stakes or hubs are to remain in the soil. Contractor should reiterate the removal of damaged stakes to work crew during daily assignments, if Contractor utilizes grade stakes.
- G. Break down soil clods larger than specified maximum in any direction to less than or equivalent to specified maximum prior to lift compaction.
- H. Compact each lift with sheepsfoot roller, or similar kneading-type compactor with minimum 8-inch protruding pads, with a minimum of three (3) passes per lift. Fill sheepsfoot indentations for top lift of compacted clay with additional clay and compact with heavy dozers, or similar equipment. No pumping or excessive rutting of any lift surface is permitted. Any material which, in the opinion of the Owner's designated representative, exhibits pumping or excessive rutting will be removed, or reworked and replaced.
- I. Avoid creating construction joints in clay soil. Where construction joints are necessary (such as tie-in with existing clay soils), keying segments of soil together with "stair-step" techniques is required unless otherwise indicated on the Drawings. Method of keying to be approved by Owner's designated representative prior to keying efforts.
- J. Minimize damage to soil due to rainfall. Precautions include, but are not limited to, grading surface to promote runoff, back-blading with dozer, sealing surface with



smooth drum roller or other means. Take precautions each night prior to anticipated rainfall event, but are generally recommended each night. Augment precautions by placing pump(s) in area(s) likely to collect water. Provide, maintain, and operate pumps; coordinate access to site with Owner's designated representative or Owner.

- K. Remove ice and snow during cold weather construction prior to placing lift. Do not use frozen soil.
- L. Re-compact or rework and retest soil that fails field testing or has been impacted by freeze-thaw cycles during construction activity. Re-compact or rework soil area following a failed test to boundaries of passing test results.
- M. Maintain soil surface until final acceptance by the Owner. Includes reworking or removing and replacing portions of soil softened or tracked by runoff due to rainfall or otherwise determined to be unfit for vegetative growth installation.
- N. Submit detailed written work plans describing methodologies for performing all work-related items.

0.06 FILLING – STRUCTURE BACKFILL

- A. Use of Select Fill: Use select fill adjacent to structures where pipes, connections, are to be located within this fill. Use select fill beneath all pavements, walkways, and extend to the bottom of pavement base course or ballast. Use select fill or aggregate fill where indicated on drawings.
 - 1. Place backfill in uniform layers not greater than 8 inches in loose thickness and thoroughly compact in place with suitable approved mechanical or pneumatic equipment.
 - 2. Compact backfill to not less than 95 percent of the maximum dry density as determined by ASTM D1557.
 - 3. Place base course beneath all concrete and asphalt repairs, to the depths, lines and grades shown on the drawings, and compacted to 95 percent of the maximum dry density as determined by ASTM D1557.
- B. Use of Clay: In unpaved areas adjacent to structures for the top 1 foot of fill directly under lawn subgrades use low cohesive clay (other than wet unstable clay) backfill placed in 6-inch lifts. Clay also to be used under the gabion basket in the outfall structure area to fill erosion voids. Compact clay backfill to not less than 90 percent of the maximum dry density as determined by ASTM D1557.
 - 1. Use clay having a liquid limit less than or equal to 40 and a plasticity index less than or equal to 20.



3.07 TOLERANCES

- A. Top Surface of General Filling: Plus or minus 0.20 foot from required elevations.
- B. Top of Compacted Clay: Plus or minus 0.20 foot from required elevations.

3.08 FIELD QUALITY CONTROL

- A. Perform field density testing on compacted fill in accordance with ASTM D2922/D3017.
- B. If tests indicate work does not meet specified requirements, rework fill and retest.

3.09 CLEAN-UP AND FINISHING

- A. Leave unused materials in a neat, compact stockpile.
- B. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.
- C. Leave borrow areas in a clean and neat condition. Grade to prevent standing surface water.

END OF SECTION



SECTION 31 23 23.23

COMPACTING

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes backfill compaction operations. The work includes, but is not limited to:
 - 1. Proof-rolling, stabilization, and compaction of subgrade.
 - 2. Placement and compaction of backfill.

1.02 RELATED REQUIREMENTS

- A. Section 31 23 23: Fill

1.03 REFERENCE STANDARDS

- A. ASTM (ASTM International)
 - 1. ASTM D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³))

1.04 SITE CONDITIONS

- A. Protect structures and utilities from damage during earthwork/compaction operations.
- B. Repair or replace damage to existing structures caused by earthwork/compaction operations, at no extra cost to the Owner.

1.05 QUALITY ASSURANCE

- A. The Owner will retain the Engineer to provide quality assurance and testing of earthwork operations.
- B. Notify the Engineer at least three days before starting earthwork/compaction operations.
- C. Submit representative samples and Certification of Origin of each material proposed for use for fill to the Engineer for testing. Individual soil samples must contain at least 30 pounds of material. Do not use material for fill until a sample



of that material has been tested and found to comply with the specification requirements.

- D. Allow sufficient time during earthwork/compaction operations for the Engineer to perform the necessary field tests.

PART 2 – PRODUCTS

2.01 EQUIPMENT

- A. Use equipment compatible with the site conditions and backfill material to minimize damage to existing structures and to properly compact material.

PART 3 - EXECUTION

3.01 PLACEMENT AND COMPACTION OF FILL AND BACKFILL

- A. Follow requirements in Section 31 2323.
- B. Place individual lifts in horizontal layers of maximum 9-inches where near existing or installed pipe or structure to prevent the thickness of lift from exceeding the specified values.
- C. Maintain the moisture content of the backfill material during compaction within a range extending from 2 percent below optimum moisture content to 2 percent above optimum moisture content as determined by ASTM D1557.
- D. Compact each lift so as to achieve the maximum dry unit weight defined in Section 31 2323, as determined by ASTM D1557.
- E. Do not place additional backfill until the previous lift has been tested and found to be in compliance with the specification requirements.
- F. Continue filling and compaction operations to the finished levels designated on the plans, so that at completion of compaction operations, the surface of the fill is at all points within one-tenth of a foot of the specified levels.
- G. Do not place backfill on frozen material.
- H. Do not use frozen materials for backfill.
- I. Report to the Engineer and repair any damages to existing structures or other elements caused by construction equipment to the Owner's satisfaction and at the Contractor's expense.



3.02 COMPACTION STANDARDS

- A. The terms "maximum unit weight" and "optimum moisture content" used in these Specifications refer to those values as determined by the test strip method for materials containing more than 40 percent retained on the #4 sieve, including processed aggregates and on-site pulverized materials, and by ASTM D1557 for all other materials.

END OF SECTION



SECTION 31 35 26.18

GEOTEXTILE

PART 1 - GENERAL

1.01 SUMMARY

- A. This section includes furnishing and installation of geotextile as a filter/separation layer.

1.02 SUBMITTALS

- A. Submit geotextile samples and list of minimum property values. Materials properties are to be in conformance with those defined in Part 2.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Deliver only approved geotextile rolls to the project site. Label, ship, store, and handle all geotextile in accordance with ASTM D4873. No hooks, tongs, or other sharp instruments are to be used for handling geotextile.

PART 2 - PRODUCTS

2.01 GEOTEXTILE

- A. The geotextile is to be comprised of polyester or polypropylene. Provide 12 oz/sq. yard nonwoven needle-punched geotextile meeting the requirements listed in MDOT 910.03B for Heavy Geotextile Liner.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Handling of all geotextiles by the Installer in such a manner as to ensure it is not damaged in any way.
- B. At the time of installation, reject the geotextile if it has defects, rips, holes, flaws, deterioration, or damage incurred during manufacture, transportation, or storage.
- C. Place the geotextile with the machine direction parallel to direction of water flow centerline and lay smooth, free of tension, stress, folds, wrinkles, or creases.



- D. The geotextile is to be placed to provide a minimum width of 12 inches of overlap between adjoining panels.
- E. Temporarily secure the geotextile in place until the backfill/ riprap is placed.
- F. Move or remove sandbags, stones, or other securing devices as the backfill/ riprap is placed to relieve high tensile stress which may occur during placement of material on the geotextile.
- G. Protect the geotextile from damage prior to and during the placement of backfill/ riprap.
- H. Perform trimming in such a manner that the geotextile is not damaged in any way.
- I. Protect the geotextile at all times from contamination with sediment; any geotextile so contaminated is to be removed and replaced with uncontaminated geotextile.
- J. Geotextile damaged during installation or during placement of backfill/ riprap is to be replaced by the Contractor at no additional cost to the Owner.
- K. Schedule the work so that covering of the geotextile with backfill/ riprap is accomplished within one (1) calendar day after placement of the geotextile. Failure to comply will require replacement of the geotextile.
- L. Before placement of the backfill/ riprap, demonstrate that the placement technique will not cause damage to the geotextile.
- M. In no case will any type of equipment be allowed directly on the unprotected geotextile.
- N. The overlap seam of the geotextile is to be overlapped or heat bonded.

END OF SECTION



SECTION 31 36 19

GABION MATTRESSES

PART 1 - GENERAL

1.01 SUMMARY

- A. This section includes furnishing and installing gabion/Reno mattresses at the locations shown on the Drawings.

1.02 SUBMITTALS

- A. Submit Reno mattress installation procedure prior to construction.

PART 2 - PRODUCTS

2.01 RENO MATTRESS

- A. A mattress shaped container, incorporating internal diaphragm cells to prevent rock migration, manufactured from heavily galvanized wire mesh woven into a double twisted hexagonal pattern in accordance with ASTM A975-97. The mesh opening shall be hexagonal in shape and uniform in size measuring 2 1/2 inches by 3 1/4 inches. All wire used in the fabrication of the Reno mattress and in the lacing operations conforms to Federal Specification QQ-W-461H, Class 3, Finish 5, soft, and have an average tensile strength in accordance with the current ASTM A641, Table 2, measured before fabrication of the netting. The nominal diameter of the wire used in the fabrication of the netting is 0.0866 inches minimum, subject to diameter tolerance in accordance with the current ASTM A641, Table 3.
- B. All wire used in fabrication and construction of the Reno mattress is to be galvanized in accordance with ASTM A641, Table 1.
- C. All edges of the Reno mattress, including end panels and the diaphragms, shall be mechanically connected in such a way as to prevent unraveling of the mesh and to develop the full strength of the mesh. The wire used for the selvedge shall have a diameter greater than that of the wire used to form the mesh. Sufficient lacing and connecting wire shall be supplied with the mattress for all wiring operations. The nominal diameter of lacing wire shall be 0.0866 inches minimum.
- D. Supplier – Terra Aqua Inc., or engineer approved equal.



2.02 ACCESSORIES

- A. Mattress Fasteners: Tiger-Tite KH11G40 galvanized fasteners conforming to ASTM A641-92 for zinc coatings, ASTM A764-93 for chemical and mechanical specifications, and ASTM E8/MPT 2004 for tensile strength requirements.
- B. Stiffeners: Tact Ties complying with or exceeding Federal Specification QQ-W-461H, possessing a maximum tensile strength of 70 ksi with a Finish 5, Class 3, zinc coating, measured in accordance with the current ASTM A641 (A 90).
- C. Geotextile: See Section 31 3526.18.
- D. Riprap: See Section 31 3700.

PART 3 - EXECUTION

3.01 PLACEMENT

- A. Prepare slope/excavation in accordance with the engineering drawings and project specifications.
- B. Install geotextile underlayment in accordance with the project specifications.
- C. Place Reno mattress on the base of the channel such that the length dimension of the unit is laid parallel to the water flow with the internal diaphragms running perpendicular to the water flow. For placement on the side slope or banks, install the Reno mattress such that the length dimension of the unit is laid perpendicular to the water flow so that the internal diaphragms are running parallel with the water flow.
- D. Install Reno mattress in accordance with manufacturer's specifications and instructions.

END OF SECTION



SECTION 31 37 00

RIPRAP

PART 1 - GENERAL

1.01 SUMMARY

- A. This section includes furnishing and placing riprap in the locations shown on the Drawings.

PART 2 - PRODUCTS

2.01 RIPRAP

- A. Use sound, durable and hard stone meeting the specifications of MDOT 916.01 A or C, as shown on the plans and ASTM C127 and ASTM C131. Use stone free from lamination, cleavages, and weathering, and stone that will not disintegrate from the action of air or water, or from handling and placement.
- B. Use angular stone. Rounded stone or broken concrete is not acceptable.
- C. Use stone gradation diameter and thickness as specified in MDOT 916 or as shown on the drawings.

PART 3 - EXECUTION

3.01 PLACEMENT

- A. Grade the surface upon which the riprap is to be placed and remove debris to provide a smooth, fairly level graded surface. Place geotextile loosely on graded surface, with machine direction parallel to direction of water flow. Overlap seams so the upstream portion of the fabric is on top. A minimum overlap of 12 inches is required. See 31 3526.18 for additional information.
- B. Begin riprap placement at the toe of the slope and proceed upslope.
- C. The height of drop of stone onto the geotextile is to be one (1) foot or less. If a greater height is required, perform field trials at a location other than the project site to determine the maximum height that stone can be dropped without damaging the geotextile. The Owner's representative will be present at the field trial approve the final height of drop.



- D. If grading of slope after stone placement is necessary, perform manually in a manner that does not result in movement of stone on the geotextile.

END OF SECTION



SECTION 32 90 00

SITE RESTORATION

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Provide all labor, equipment, materials, supervision, and incidentals necessary to complete groundcover, topsoil, topsoil amendments, initial maintenance of vegetative growth layer.

1.02 RELATED SECTIONS

- A. Division 31 - Earthwork

1.03 REFERENCES

- A. MDOT Section 816, "Turf Establishment," Michigan Department of Transportation Standard Specifications for Construction
- B. MDOT Section 917, "Turf and Landscaping Materials," Michigan Department of Transportation Standard Specifications for Construction

1.04 SUBMITTALS

- A. Submit under provisions of Section 01 3300 - Administrative Requirements.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations
 - 2. Storage and handling requirements and recommendations
 - 3. Installation methods
- C. Notices: Submit 48-hour written notice prior to turnover to Owner for watering and maintenance.



1.05 WARRANTY

- A. Warrant grass groundcover for a period of one year after date of Substantial Completion, against defects including death and unsatisfactory growth and except for defects resulting from neglect by Owner, abuse by others, or natural phenomena. Replace unsatisfactory plant material at end of warranty period at no additional expense to the Owner. One replacement is required.

1.06 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum 2-year experience installing similar products.
- B. Testing: Laboratory testing for suitable soil amendments and fertilizer.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products as recommended by supplier until ready for installation.
- B. Handling: Handle materials to avoid damage.

1.08 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside supplier's recommended limits.

1.09 SEQUENCING

- A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

PART 2 - PRODUCTS

2.01 VEGETATIVE GROWTH LAYER

- A. Provide earthen material capable of supporting vegetative growth meeting the following requirements:
 - Organic Content: 3% Minimum
 - pH: 6.5-7.5 (Range)
 - Sieve:



- 100 percent passing 1-inch Screen
- 95-100 percent passing ½-inch Screen
- Minimum 40 percent passing No. 100 Screen

B. Contractor to provide a minimum of one (1) test result prior to placement to confirm vegetative growth layer meets the requirements of these specifications.

2.02 SEEDING

A. Provide Seed Mixture per MDOT Table 816-1 Seed Mix Selection Guide compatible with TUF (Turf Urban Freeway) mixture, with a High Salt Tolerance.

B. Substitutions: Not permitted.

2.03 MULCH

A. Meet the requirements of MDOT 816 for mulch.

2.04 FERTILIZER

A. Meet the requirements of MDOT 816 Class A for fertilizer.

2.05 WATER

A. Clean, fresh water, free of substances that could prevent germination/growth of grass seed.

2.06 MATERIALS

A. Provide materials in accordance with MDOT Section 816, 911, and 917.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.



3.02 PREPARATION

- A. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

- A. Install materials in accordance with approved submittals. Install landscape work in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
- B. Provide maintenance and watering until turnover to Owner for maintenance and watering. Replace damaged materials and dead or unhealthy plants prior to turnover to Owner.
- C. Work shall be performed in accordance with MDOT Standard Specifications for Construction 816: Turf Establishment.

3.04 VEGETATIVE GROWTH LAYER PLACEMENT

- A. Screen topsoil as necessary to remove sticks, stones greater than 1-1/2 inches in diameter, paper, plants and roots, and other extraneous matter.
- B. Place soil and restore previous grades.
- C. Do not place soil in a frozen condition, or on frozen subgrade.
- D. Place material to a uniform depth of 3 inches (minimum).

3.05 SEEDING

- A. Perform seeding and mulching as specified in MDOT 816.03.C.
- B. Apply seed mix at a rate of 220 pounds per acre.
- C. Perform seeding after April 15 and before October 10 unless approved by the Owner's Representative.
- D. No seeding shall be permitted within 2 hours after rainfall, when thunderstorms are predicted within 24 hours, or when wind exceeds 10 miles per hour. Roll immediately after seeding to insure compaction of the seed into the seedbed.



- E. Seeding shall not be permitted in periods of excessive heat, dryness or on wet ground.
- F. Place seed to provide a continuous stand of grass. The Owner or Owner's representative will determine compliance with this requirement.

3.06 FERTILIZING

- A. Apply fertilizer at a rate of 176 pounds per acre.
- B. Apply fertilizer by mechanical means and lightly work into the surface, taking care to insure even distribution.

3.07 MULCHING

- A. Apply mulch at a rate of 2 tons per acre within one day after seeding.
- B. Roll mulched area, immediately following mulching.

3.08 WATERING

- A. Apply water immediately after each area has been seeded and saturate soil to a minimum depth of 4 inches.
- B. Provide sufficient watering by means of frequent light watering during seed germination when rainfall is insufficient. At a minimum, apply supplemental water to all seeded areas, daily during germination period so vegetative growth layer remains moist to a minimum depth of 2 inches.

3.09 CLEAN-UP

- A. Remove and properly dispose of excess and waste material off site. Clean adjacent paved areas, and remove materials from gutters, curbs, roadways, and catch basins.

3.10 INCLEMENT WEATHER

- A. Site restoration that cannot be complete due to adverse weather conditions will be completed once the weather improves.



3.11 MAINTENANCE

- A. Provide care and maintenance of vegetation, including any barriers needed to prevent access by pedestrians and vehicles, until vegetation is established and accepted by Project Owner.
- B. Repair vegetative growth and re-seed areas of erosion or poor grass germination as directed by Owner or Owner's representative. Contractor will be responsible for repairing vegetative growth layer and re-seeding areas of erosion or poor grass germination up to one year after construction completion, as originally specified, at no additional cost to the Owner.

END OF SECTION