PROJECT MANUAL

ROSE ARBOR NO. 3 DRAIN RETENTION BASIN MAINTENANCE

OWNER

ROSE ARBOR NO. 3 DRAIN DRAINAGE DISTRICT
C/O Jason Wiersma,
Kalamazoo County Drain Commissioner
201 W Kalamazoo Ave.
Kalamazoo, MI 49007

PREPARED BY

CIVIL ENGINEERS, INC.
14250 BEADLE LAKE ROAD, SUITE 150
BATTLE CREEK, MICHIGAN 49014
(269) 962-5127 FAX: (269) 962-8310
www.cei-bc.com

PROJECT # 240701

08/07/2025

ADVERTISEMENT FOR BIDS

ROSE ARBOR NO. 3 DRAIN DRAINAGE DISTRICT
KALAMAZOO, MICHIGAN
ROSE ARBOR NO. 3 DRAIN RETENTION MAINTENANCE

General Notice

ROSE ARBOR NO. 3 DRAIN DRAINAGE DISTRICT (Owner) is requesting Bids for the construction of the following Project:

ROSE ARBOR NO. 3 DRAIN RETENTION BASIN MAINTENANCE
#240701

Bids for the construction of the Project will be received at the **Kalamazoo County Drain Commissioner Office** located at **201 W Kalamazoo Ave.**, until **Monday**, **08/25/2025** at **2:00 p.m.** local time. At that time the Bids received will be **publicly** opened and read.

The Project includes the following Work:

Dewatering the existing retention basin and removing accumulated sediment to restore infiltration capacity, and rehabilitating the existing manhole structure using pressure grouting with AV-100 to seal leaks and improve structural integrity.

Obtaining the Bidding Documents

Bidding Documents may be obtained from the Civil Engineers, Inc. (CEI). Bidding Documents are available on compact disc (as portable document format (PDF) files) for a non-refundable charge of $35.00, including shipping via overnight express service. Alternatively, printed Bidding Documents may be obtained from CEI either via in-person pick-up or via mail, upon CEI's receipt of payment for the Bidding Documents. The non-refundable cost of printed Bidding Documents is $25.00 per set, payable to "Civil Engineers, Inc.", plus a non-refundable shipping charge. Upon CEI's receipt of payment, printed Bidding Documents will be sent via the prospective Bidder's delivery method of choice; the shipping charge will depend on the shipping method chosen. The date that the Bidding Documents are transmitted by CEI will be considered the prospective Bidder's date of receipt of the Bidding Documents. Partial sets of Bidding Documents will not be available from CEI. Neither Owner nor Engineer will be responsible for full or partial sets of Bidding Documents, including Addenda if any, obtained from sources other than CEI.

Information and Bidding Documents for the Project can be found at the following designated website:

https://www.cei-bc.com/about/project-bids

Bidding Documents may be downloaded from the designated website. Prospective Bidders are urged to register with the designated website as a plan holder, even if Bidding Documents are obtained from a plan room or source other than the designated website in either electronic or paper format. The designated website will be updated periodically with addenda, lists of registered plan holders, reports, and other information relevant to submitting a Bid for the Project. All official notifications, addenda, and other Bidding Documents will be offered only through the designated website. Neither Owner nor Engineer will be responsible for Bidding Documents, including addenda, if any, obtained from sources other than the designated website.

A mandatory pre-bid conference for the Project will be held on **Tuesday, 8/19/2025** at **2:00 p.m.** at the **Kalamazoo County Drain Commissioner Office** located at **201 W Kalamazoo Ave., Kalamazoo, MI, 49007.** Bids will not be accepted from Bidders that do not attend the mandatory pre-bid conference.

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

For all further requirements regarding bid submittal, qualifications, procedures, and contract award, refer to the Instructions to Bidders that are included in the Bidding Documents.

This Advertisement is issued by:

Owner: **Rose Arbor No. 3 Drain Drainage District**
By: **Jason Wiersma**
Title: **Drain Commissioner**
Date: **08/07/2025**

TABLE OF CONTENTS

DIVISION H. CONCRETE – N/A

DIVISION J. MISCELLANEOUS

Section		
	J.01	Turf Establishment
	J.02	Chain Link Fences and Gates
	J.05	Dewatering
	J.06	Site Data Collection
	J.07	N/A
	J.08	N/A
	J.16	N/A
	J.20	N/A

Division A

Agreement and Conditions

TABLE OF CONTENTS

Division A

Section III – Documents for the Competitive Bidding Process

INSTRUCTIONS TO BIDDERS FOR CONSTRUCTION CONTRACT

TABLE OF CONTENTS

ARTICLE 1—DEFINED TERMS

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

A. *Issuing Office*—The office from which the Bidding Documents are to be issued, and which registers plan holders. Civil Engineers, Inc. (CEI) is the Issuing Office for this project.

ARTICLE 2—BIDDING DOCUMENTS

2.01 Bidder shall obtain a complete set of Bidding Requirements and proposed Contract Documents (together, the Bidding Documents). See the Agreement for a list of the Contract Documents. It is Bidder's responsibility to determine that it is using a complete set of documents in the preparation of a Bid. Bidder assumes sole responsibility for errors or misinterpretations resulting from the use of incomplete documents, by Bidder itself or by its prospective Subcontractors and Suppliers.

2.02 Bidding Documents are made available for the sole purpose of obtaining Bids for completion of the Project and permission to download or distribution of the Bidding Documents does not confer a license or grant permission or authorization for any other use. Authorization to download documents, or other distribution, includes the right for plan holders to print documents solely for their use, and the use of their prospective Subcontractors and Suppliers, provided the plan holder pays all costs associated with printing or reproduction. Printed documents may not be re-sold under any circumstances.

2.03 Bidder may register as a plan holder and obtain complete sets of Bidding Documents, in the number and format stated in the Advertisement or invitation to bid, from the Issuing Office. Bidders may rely that sets of Bidding Documents obtained from the Issuing Office are complete, unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner.

2.04 Plan rooms (including construction information subscription services, and electronic and virtual plan rooms) may distribute the Bidding Documents, or make them available for examination. Those prospective bidders that obtain an electronic (digital) copy of the Bidding Documents from a plan room are encouraged to register as plan holders from the Bidding Documents Website or Issuing Office. Owner is not responsible for omissions in Bidding Documents or other documents obtained from plan rooms, or for a Bidder's failure to obtain Addenda from a plan room.

2.05 *Electronic Documents*

A. When the Bidding Requirements indicate that electronic (digital) copies of the Bidding Documents are available, such documents will be made available to the Bidders as Electronic Documents in the manner specified.

1. Bidding Documents will be provided in Adobe PDF (Portable Document Format) (.pdf) that is readable by Adobe Acrobat Reader. It is the intent of the Engineer and Owner that such Electronic Documents are to be exactly representative of the paper copies of the documents. However, because the Owner and Engineer cannot totally control the transmission and receipt of Electronic Documents nor the Contractor's means of reproduction of such documents, the Owner and Engineer cannot and do not

guarantee that Electronic Documents and reproductions prepared from those versions are identical in every manner to the paper copies.

B. Unless otherwise stated in the Bidding Documents, the Bidder may use and rely upon complete sets of Electronic Documents of the Bidding Documents, described in Paragraph 2.06.A above. However, Bidder assumes all risks associated with differences arising from transmission/receipt of Electronic Documents versions of Bidding Documents and reproductions prepared from those versions and, further, assumes all risks, costs, and responsibility associated with use of the Electronic Documents versions to derive information that is not explicitly contained in printed paper versions of the documents, and for Bidder's reliance upon such derived information.

ARTICLE 3—QUALIFICATIONS OF BIDDERS

3.01 To demonstrate Bidder's qualifications to perform the Work, after submitting its Bid and within **three** days of Owner's request, Bidder must submit the following information:

A. Written evidence establishing its qualifications such as financial data, previous experience, and present commitments.

B. A written statement that Bidder is authorized to do business in the state where the Project is located, or a written certification that Bidder will obtain such authority prior to the Effective Date of the Contract.

C. Bidder's state or other contractor license number, if applicable.

D. Subcontractor and Supplier qualification information.

E. Other required information regarding qualifications.

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

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

ARTICLE 4—PRE-BID CONFERENCE

4.01 A mandatory pre-bid conference will be held at the time and location indicated in the Advertisement or invitation to bid. Representatives of Owner and Engineer will be present to discuss the Project. Proposals will not be accepted from Bidders who do not attend the conference. It is each Bidder's responsibility to sign in at the pre-bid conference to verify its participation. Bidders must sign in using the name of the organization that will be submitting a Bid. A list of qualified Bidders that attended the pre-bid conference and are eligible to submit a Bid for this Project will be issued in an Addendum.

4.02 Information presented at the pre-Bid conference does not alter the Contract Documents. Owner will issue Addenda to make any changes to the Contract Documents that result from discussions at the pre-Bid conference. Information presented, and statements made at the pre-bid conference will not be binding or legally effective unless incorporated in an Addendum.

ARTICLE 5—SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT THE SITE

5.01 *Site and Other Areas*

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

5.02 *Existing Site Conditions*

A. *Subsurface and Physical Conditions; Hazardous Environmental Conditions*

1. The Supplementary Conditions identify the following regarding existing conditions at or adjacent to the Site:

a. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data.

b. Those drawings known to Owner of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data.

c. Reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.

d. Technical Data contained in such reports and drawings.

2. Owner will make copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract

Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.

4. *Geotechnical Baseline Report/Geotechnical Data Report:* The Bidding Documents contain a Geotechnical Baseline Report (GBR) and Geotechnical Data Report (GDR).

   a. As set forth in the Supplementary Conditions, the GBR describes certain select subsurface conditions that are anticipated to be encountered by Contractor during construction in specified locations ("Baseline Conditions"). The GBR is a Contract Document.

   b. The Baseline Conditions in the GBR are intended to reduce uncertainty and the degree of contingency in submitted Bids. However, Bidders cannot rely solely on the Baseline Conditions. Bids should be based on a comprehensive approach that includes an independent review and analysis of the GBR, all other Contract Documents, Technical Data, other available information, and observable surface conditions. Not all potential subsurface conditions are baselined.

   c. Nothing in the GBR is intended to relieve Bidders of the responsibility to make their own determinations regarding construction costs, bidding strategies, and Bid prices, nor of the responsibility to select and be responsible for the means, methods, techniques, sequences, and procedures of construction, and for safety precautions and programs incident thereto.

   d. As set forth in the Supplementary Conditions, the GDR is a Contract Document containing data prepared by or for the Owner in support of the GBR.

B. *Underground Facilities:* Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05 of the General Conditions, and not in the drawings referred to in Paragraph 5.02.A of these Instructions to Bidders. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

5.03 *Other Site-related Documents*

A. In addition to the documents regarding existing Site conditions referred to in Paragraph 5.02.A, the following other documents relating to conditions at or adjacent to the Site are known to Owner and made available to Bidders for reference:

   1. **SME Geotechnical Report (See Division A, Section VIII)**

   2. **SME Sediment and Stormwater Environmental Testing (See Division A, Section VIII)**

   Owner will make copies of these other Site-related documents available to any Bidder on request.

B. Owner has not verified the contents of these other Site-related documents, and Bidder may not rely on the accuracy of any data or information in such documents. Bidder is

responsible for any interpretation or conclusion Bidder draws from the other Site-related documents.

C. The other Site-related documents are not part of the Contract Documents.

D. Bidders are encouraged to review the other Site-related documents, but Bidders will not be held accountable for any data or information in such documents. The requirement to review and take responsibility for documentary Site information is limited to information in (1) the Contract Documents and (2) the Technical Data.

E. No other Site-related documents are available.

5.04 *Site Visit and Testing by Bidders*

A. Bidder is required to visit the Site and conduct a thorough visual examination of the Site and adjacent areas. During the visit the Bidder must not disturb any ongoing operations at the Site.

B. A Site visit is scheduled following the pre-bid conference. Maps to the Site will be available at the pre-Bid conference.

C. Bidders visiting the Site are required to arrange their own transportation to the Site.

D. All access to the Site other than during a regularly scheduled Site visit must be coordinated through the following Owner or Engineer contact for visiting the Site:

Civil Engineers, Inc. (CEI) 269-962-5127. Bidder must conduct the required Site visit during normal working hours.

E. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.

F. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder general access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site. Bidder is responsible for establishing access needed to reach specific selected test sites.

G. Bidder must comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.

H. Bidder must fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

5.05 *Owner's Safety Program*

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

5.06 *Other Work at the Site*

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

ARTICLE 6—BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Express Representations and Certifications in Bid Form, Agreement*

A. The Bid Form that each Bidder will submit contains express representations regarding the Bidder's examination of Project documentation, Site visit, and preparation of the Bid, and certifications regarding lack of collusion or fraud in connection with the Bid. Bidder should review these representations and certifications, and assure that Bidder can make the representations and certifications in good faith, before executing and submitting its Bid.

B. If Bidder is awarded the Contract, Bidder (as Contractor) will make similar express representations and certifications when it executes the Agreement.

ARTICLE 7—INTERPRETATIONS AND ADDENDA

7.01 Owner on its own initiative may issue Addenda to clarify, correct, supplement, or change the Bidding Documents.

7.02 Bidder shall submit all questions about the meaning or intent of the Bidding Documents to Engineer in writing. Contact information and submittal procedures for such questions are as follows:

A. In writing or by email to the Engineer within the timeframe given below.

7.03 Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all registered plan holders. Questions received less than seven days prior to the date for opening of Bids may not be answered.

7.04 Only responses set forth in an Addendum will be binding. Oral and other interpretations or clarifications will be without legal effect. Responses to questions are not part of the Contract Documents unless set forth in an Addendum that expressly modifies or supplements the Contract Documents.

ARTICLE 8—BID SECURITY

8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of **five (5)** percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a Bid bond issued by a surety meeting the requirements of Paragraph 6.01 of the General Conditions. Such Bid bond will be issued in the form included in the Bidding Documents.

8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract, furnished the required

Contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract and furnish the required Contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited, in whole in the case of a penal sum bid bond, and to the extent of Owner's damages in the case of a damages-form bond. Such forfeiture will be Owner's exclusive remedy if Bidder defaults.

8.03 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of 7 days after the Effective Date of the Contract or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.

8.04 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within 7 days after the Bid opening.

ARTICLE 9—CONTRACT TIMES

9.01 The number of days within which, or the dates by which, the Work is to be (a) substantially completed and (b) ready for final payment, and (c) Milestones (if any) are to be achieved, are set forth in the Agreement.

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

ARTICLE 10—SUBSTITUTE AND "OR EQUAL" ITEMS

10.01 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration during the bidding and Contract award process of possible substitute or "or-equal" items. In cases in which the Contract allows the Contractor to request that Engineer authorize the use of a substitute or "or-equal" item of material or equipment, application for such acceptance may not be made to and will not be considered by Engineer until after the Effective Date of the Contract.

10.02 All prices that Bidder sets forth in its Bid will be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of "or-equal" or substitution requests are made at Bidder's sole risk.

ARTICLE 11—SUBCONTRACTORS, SUPPLIERS, AND OTHERS (SEE PARAGRAPH 7.07 OF THE GENERAL CONDITIONS)

ARTICLE 12—PREPARATION OF BID

12.01 The Bid Form is included with the Bidding Documents.

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

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

12.02 If Bidder has obtained the Bidding Documents as Electronic Documents, then Bidder shall prepare its Bid on a paper copy of the Bid Form printed from the Electronic Documents version of the Bidding Documents. The printed copy of the Bid Form must be clearly legible, printed on 8½ inch by 11-inch paper and as closely identical in appearance to the Electronic Document version of the Bid Form as may be practical. The Owner reserves the right to accept Bid Forms which nominally vary in appearance from the original paper version of the Bid Form, providing that all required information and submittals are included with the Bid.

12.03 A Bid by a corporation must be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation must be shown.

12.04 A Bid by a partnership must be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership must be shown.

12.05 A Bid by a limited liability company must be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm must be shown.

12.06 A Bid by an individual must show the Bidder's name and official address.

12.07 A Bid by a joint venture must be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The joint venture must have been formally established prior to submittal of a Bid, and the official address of the joint venture must be shown.

12.08 All names must be printed in ink below the signatures.

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

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

12.11 If Bidder is required to be licensed to submit a Bid or perform the Work in the state where the Project is located, the Bid must contain evidence of Bidder's licensure, or Bidder must certify in writing that it will obtain such licensure within the time for acceptance of Bids and attach such certification to the Bid. Bidder's state contractor license number, if any, must also be shown on the Bid Form.

ARTICLE 13—BASIS OF BID

13.01 *Unit Price*

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

B. The "Bid Price" (sometimes referred to as the extended price) for each unit price Bid item will be the product of the "Estimated Quantity", which Owner or its representative has set forth in the Bid Form, for the item and the corresponding "Bid Unit Price" offered by the

Bidder. The total of all unit price Bid items will be the sum of these "Bid Prices"; such total will be used by Owner for Bid comparison purposes. The final quantities and Contract Price will be determined in accordance with Paragraph 13.03 of the General Conditions.

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

ARTICLE 14—SUBMITTAL OF BID

14.01 The Bidding Documents include one separate unbound copy of the Bid Form, and, if required, the Bid Bond Form. The unbound copy of the Bid Form is to be completed and submitted with the Bid security and the other documents required to be submitted under the terms of Article 2 of the Bid Form.

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

14.03 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

ARTICLE 15—MODIFICATION AND WITHDRAWAL OF BID

15.01 An unopened Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.

15.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 15.01 and submit a new Bid prior to the date and time for the opening of Bids.

15.03 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, the Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, the Bidder will be disqualified from further bidding on the Work.

ARTICLE 16—OPENING OF BIDS

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

ARTICLE 17—BIDS TO REMAIN SUBJECT TO ACCEPTANCE

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

ARTICLE 18—EVALUATION OF BIDS AND AWARD OF CONTRACT

18.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner also reserves the right to waive all minor Bid informalities not involving price, time, or changes in the Work.

18.02 Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible.

18.03 If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, whether in the Bid itself or in a separate communication to Owner or Engineer, then Owner will reject the Bid as nonresponsive.

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

18.05 *Evaluation of Bids*

A. In evaluating Bids, Owner will consider whether the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.

B. For the determination of the apparent low Bidder when unit price bids are submitted, Bids will be compared on the basis of the total of the products of the estimated quantity of each item and unit price Bid for that item, together with any lump sum items.

18.06 In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.

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

ARTICLE 19—BONDS AND INSURANCE

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

19.02 Article 8, Bid Security, of these Instructions, addresses any requirements for providing bid bonds as part of the bidding process.

ARTICLE 20—SIGNING OF AGREEMENT

20.01 When Owner issues a Notice of Award to the Successful Bidder, it will be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder must execute and deliver the required number of counterparts of the Agreement and any bonds and insurance documentation required to be delivered by the Contract Documents to Owner. Within 10 days thereafter, Owner will deliver one fully executed counterpart of the Agreement to Successful Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.

BID FORM FOR CONSTRUCTION CONTRACT

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

ARTICLE 1—OWNER AND BIDDER

1.01 This Bid is submitted to: **Rose Arbor No. 3 Drain Drainage District (C/O Jason Wiersma), 201 W Kalamazoo Ave., Room 108, Kalamazoo, MI 49007**

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

ARTICLE 2—ATTACHMENTS TO THIS BID

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

A. Required Bid security;

ARTICLE 3—BASIS OF BID—UNIT PRICES

3.01 *Unit Price Bids*

A. Bidder will perform the following Work at the indicated unit prices:

PAY ITEM #	Description	Units	Estimated Quantity	Bid Unit Price	Bid Amount
1000	*General*				
1010	Mobilization	LS			
1041	Soil Erosion & Sedimentation Control	LS			
2000	*Earthwork*				
2010	Clearing	ACRE			
2011	Tree Removal, 6 inch–18 inch	EA			
2064	Removal of Saturated Soil	CYD			
2081	Sediment Disposal	TON			

2100	Site Grading	ACRE			
4000	*Stormwater Management*				
4356	Riprap, d50 = 6 inch	SYD			
4920	MH Rehabilitation	EA			
9000	*Miscellaneous*				
9002	Dewatering Stormwater Basin	LS			
9010	Turf Establishment	SYD			
9206	Chain Link Fence, 6 feet (Remove & Replace)	FT			

B. Bidder acknowledges that:

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

ARTICLE 4—TIME OF COMPLETION

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

4.02 Bidder agrees that the Work will be substantially complete on or before **Friday, 10/03/2025** and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before **Friday, 10/17/2025**.

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

ARTICLE 5—BIDDER'S ACKNOWLEDGEMENTS: ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA

5.01 *Bid Acceptance Period*

A. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

5.02 *Instructions to Bidders*

A. Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security.

5.03 *Receipt of Addenda*

A. Bidder hereby acknowledges receipt of the following Addenda: **[Add rows as needed. Bidder is to complete table.]**

Addendum Number	Addendum Date

ARTICLE 6—BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Bidder's Representations*

A. In submitting this Bid, Bidder represents the following:

1. Bidder has examined and carefully studied the Bidding Documents, including Addenda.
2. Bidder has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
3. Bidder is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.
4. Bidder has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.
5. Bidder has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.
6. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, if selected as Contractor; and (c) Bidder's (Contractor's) safety precautions and programs.
7. Based on the information and observations referred to in the preceding paragraph, Bidder agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.

8. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
9. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
10. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
11. The submission of this Bid constitutes an incontrovertible representation by Bidder that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

BIDDER hereby submits this Bid as set forth above:

Bidder:

_____

(typed or printed name of organization)

By: _____

(individual's signature)

Name: _____

(typed or printed)

Title: _____

(typed or printed)

Date: _____

(typed or printed)

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

Attest: _____

(individual's signature)

Name: _____

(typed or printed)

Title: _____

(typed or printed)

Date: _____

(typed or printed)

Address for giving notices:

_____

_____

Bidder's Contact:

Name: _____

(typed or printed)

Title: _____

(typed or printed)

Phone: _____

Email: _____

Address:

_____

_____

_____

Bidder's Contractor License No.: (if applicable) _____

BID BOND (PENAL SUM FORM)

Bidder	**Surety**
Name: **[Full formal name of Bidder]** Address *(principal place of business)*: **[Address of Bidder's principal place of business]**	Name: **[Full formal name of Surety]** Address *(principal place of business)*: **[Address of Surety's principal place of business]**
Owner Name: **Rose Arbor No. 3 Drain Drainage District (C/O Jason Wiersma)** Address *(principal place of business)*: **201 W Kalamazoo Ave., Room 108** **Kalamazoo, MI 49007**	**Bid** Project *(name and location)*: **[Owner project/contract name, and location of the project]** Bid Due Date: **[Enter date bid is due]**

Bond

Penal Sum: **[Amount]**

Date of Bond: **[Date]**

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

Bidder	Surety
_____ *(Full formal name of Bidder)*	_____ *(Full formal name of Surety) (corporate seal)*
By: _____ *(Signature)*	By: _____ *(Signature) (Attach Power of Attorney)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____
Attest: _____ *(Signature)*	Attest: _____ *(Signature)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title:	Title:

Notes: (1) Note: Addresses are to be used for giving any required notice. (2) Provide execution by any additional parties, such as joint venturers, if necessary.

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

NOTICE OF AWARD

Date of Issuance:

Owner:	Rose Arbor No. 3 Drain Drainage District	Owner's Project No.:	
Engineer:	Civil Engineers, Inc. (CEI)	Engineer's Project No.:	240701
Project:	Rose Arbor No. 3 Drain Retention Basin Maintenance		
Contract Name:			
Bidder:			

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

Dewatering the existing retention basin and removing accumulated sediment to restore infiltration capacity, and rehabilitating the existing manhole structure using pressure grouting with AV-100 to seal leaks and improve structural integrity.

The Contract Price of the awarded Contract is $**[Contract Price]**. Contract Price is subject to adjustment based on the provisions of the Contract, including but not limited to those governing changes, Unit Price Work, and Work performed on a cost-plus-fee basis, as applicable.

Three unexecuted counterparts of the Agreement accompany this Notice of Award, and one copy of the Contract Documents accompanies this Notice of Award, or has been transmitted or made available to Bidder electronically.

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

1. Deliver to Owner **three** counterparts of the Agreement, signed by Bidder (as Contractor).
2. Deliver with the signed Agreements the Contract security (such as required performance and payment bonds) and insurance documentation, as specified in the Instructions to Bidders and in the General Conditions, Articles 2 and 6.
3. Other conditions precedent (if any): **[Describe other conditions that require Successful Bidder's compliance]**

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

Within 10 days after you comply with the above conditions, Owner will return to you one fully signed counterpart of the Agreement, together with any additional copies of the Contract Documents as indicated in Paragraph 2.02 of the General Conditions.

Owner: **Rose Arbor No. 3 Drain Drainage District**

By *(signature)*: _____

Name *(printed)*: _____

Title: _____

Copy: Engineer

Division A

Section IV – Agreement Forms

AGREEMENT BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)

This Agreement is by and between **Rose Arbor No. 3 Drain Drainage District** ("Owner") and **[name of contracting entity]** ("Contractor").

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

Owner and Contractor hereby agree as follows:

ARTICLE 1—WORK

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows: **Dewatering the existing retention basin and removing accumulated sediment to restore infiltration capacity, and rehabilitating the existing manhole structure using pressure grouting with AV-100 to seal leaks and improve structural integrity.**

ARTICLE 2—THE PROJECT

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: **Dewatering the existing retention basin and removing accumulated sediment to restore infiltration capacity, and rehabilitating the existing manhole structure using pressure grouting with AV-100 to seal leaks and improve structural integrity.**

ARTICLE 3—ENGINEER

3.01 The Owner has retained **Civil Engineers, Inc. (CEI)** ("Engineer") to act as Owner's representative, assume all duties and responsibilities of Engineer, and have the rights and authority assigned to Engineer in the Contract.

ARTICLE 4—CONTRACT TIMES

4.01 *Time is of the Essence*

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

4.02 *Contract Times: Dates*

A. The Work will be substantially complete on or before **Friday, 10/03/2025**, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before **Friday, 10/17/2025.**

4.05 *Liquidated Damages*

A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the Contract Times, as duly modified. The parties also recognize the delays, expense, and difficulties involved in proving, in a legal or arbitration proceeding, the actual loss suffered by Owner if the Work is not completed on time.

Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):

1. *Substantial Completion:* Contractor shall pay Owner **$200.00** for each day that expires after the time (as duly adjusted pursuant to the Contract) specified above for Substantial Completion, until the Work is substantially complete.

2. *Completion of Remaining Work:* After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner **$200.00** for each day that expires after such time until the Work is completed and ready for final payment.

4. Liquidated damages for failing to timely attain Milestones, Substantial Completion, and final completion are not additive, and will not be imposed concurrently.

B. If Owner recovers liquidated damages for a delay in completion by Contractor, then such liquidated damages are Owner's sole and exclusive remedy for such delay, and Owner is precluded from recovering any other damages, whether actual, direct, excess, or consequential, for such delay, except for special damages (if any) specified in this Agreement.

ARTICLE 5—CONTRACT PRICE

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

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

Unit Price Work					
Pay Item No.	**Description**	**Unit**	**Estimated Quantity**	**Unit Price**	**Extended Price**
1000	*General*				
1010	Mobilization (5% Max)	LS	1	$	$
1041	Soil Erosion & Sedimentation Control	LS		$	$
2000	*Earthwork*				
2010	Clearing	ACRE		$	$
2011	Tree Removal, 6 inch to 18 inch	EA		$	$
2064	Removal of Saturated Sediment	LS		$	$
2081	Sediment Disposal	TON		$	$
2100	Site Grading	ACRE			
4000	*Stormwater Management*				
4356	Riprap, d50 = 6 inch	SYD			

Unit Price Work					
Pay Item No.	**Description**	**Unit**	**Estimated Quantity**	**Unit Price**	**Extended Price**
4920	MH Rehabilitation	EA	1	$	$
9000	*Miscellaneous*				
9002	Dewatering Stormwater Basin	LS		$	$
9010	Turf Establishment	SYD		$	$
9206	Remove & Replace Chain Link Fence	FT		$	$
Total of all Extended Prices for Unit Price Work (subject to final adjustment based on actual quantities)					$

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

B. For all Work, at the prices stated in Contractor's Bid, attached hereto as an exhibit.

ARTICLE 6—PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

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

6.02 *Progress Payments; Retainage*

A. Owner shall make progress payments on the basis of Contractor's Applications for Payment on or about the **5th** day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.

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

a. **90** percent of the value of the Work completed (with the balance being retainage).

1) If 50 percent or more of the Work has been completed, as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work

remain satisfactory to Owner and Engineer, there will be no additional retainage; and

b. **75** percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

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

6.03 *Final Payment*

A. Upon final completion and acceptance of the Work, Owner shall pay the remainder of the Contract Price in accordance with Paragraph 15.06 of the General Conditions.

6.04 *Consent of Surety*

A. Owner will not make final payment, or return or release retainage at Substantial Completion or any other time, unless Contractor submits written consent of the surety to such payment, return, or release.

6.05 *Interest*

A. All amounts not paid when due will bear interest at the rate of **12** percent per annum.

ARTICLE 7—CONTRACT DOCUMENTS

7.01 *Contents*

A. The Contract Documents consist of all of the following:

1. This Agreement.
2. Bonds:
    a. Performance bond (together with power of attorney).
    b. Payment bond (together with power of attorney).
3. General Conditions.
4. Supplementary Conditions.
5. Specifications as listed in the table of contents of the project manual.
6. Drawings (not attached but incorporated by reference) consisting of **4** sheets with each sheet bearing the following general title: **Rose Arbor No. 3 Drain Retention Basin Maintenance**.
7. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
    a. Notice to Proceed.
    b. Work Change Directives.
    c. Change Orders.

d. Field Orders.

e. Warranty Bond, if any.

B. The Contract Documents listed in Paragraph 7.01.A are attached to this Agreement (except as expressly noted otherwise above).

C. There are no Contract Documents other than those listed above in this Article 7.

D. The Contract Documents may only be amended, modified, or supplemented as provided in the Contract.

ARTICLE 8—REPRESENTATIONS, CERTIFICATIONS, AND STIPULATIONS

8.01 *Contractor's Representations*

A. In order to induce Owner to enter into this Contract, Contractor makes the following representations:

1. Contractor has examined and carefully studied the Contract Documents, including Addenda.

2. Contractor has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

3. Contractor is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.

4. Contractor has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.

5. Contractor has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.

6. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (c) Contractor's safety precautions and programs.

7. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.

8. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.

9. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

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

11. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

8.02 *Contractor's Certifications*

A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 8.02:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and

4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

8.03 *Standard General Conditions*

A. Owner stipulates that if the General Conditions that are made a part of this Contract are EJCDC® C-700, Standard General Conditions for the Construction Contract (2018), published by the Engineers Joint Contract Documents Committee, and if Owner is the party that has furnished said General Conditions, then Owner has plainly shown all modifications to the standard wording of such published document to the Contractor, through a process such as highlighting or "track changes" (redline/strikeout), or in the Supplementary Conditions.

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

This Agreement will be effective on **[indicate date on which Contract becomes effective]** (which is the Effective Date of the Contract).

Owner:	Contractor:
Rose Arbor No. 3 Drain Drainage District *(typed or printed name of organization)*	_____ *(typed or printed name of organization)*
By: _____ *(individual's signature)*	By: _____ *(individual's signature)*
Date: _____ *(date signed)*	Date: _____ *(date signed)*
Name: Jason Wiersma *(typed or printed)*	Name: _____ *(typed or printed)*
Title: Kalamazoo County Drain Commissioner *(typed or printed)*	Title: _____ *(typed or printed)* *(If **[Type of Entity]** is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)*
Attest: _____ *(individual's signature)*	Attest: _____ *(individual's signature)*
Title: _____ *(typed or printed)*	Title: _____ *(typed or printed)*
Address for giving notices:	Address for giving notices:
_____ _____ _____	_____ _____ _____
Designated Representative:	Designated Representative:
Name: _____ *(typed or printed)*	Name: _____ *(typed or printed)*
Title: _____ *(typed or printed)*	Title: _____ *(typed or printed)*
Address:	Address:
_____ _____ _____	_____ _____ _____
Phone: _____	Phone: _____
Email: _____ *(If **[Type of Entity]** is a corporation, attach evidence of authority to sign. If **[Type of Entity]** is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)*	Email: _____ License No.: _____ *(where applicable)* State: _____

Division A

Section V – Commencement of Construction

NOTICE TO PROCEED

Owner:	Rose Arbor No. 3 Drian Drainage District	Owner's Project No.:	
Engineer:	Civil Engineers, Inc. (CEI)	Engineer's Project No.:	240701
Contractor:		Contractor's Project No.:	
Project:	Rose Arbor No. 3 Drain Retention Basin Maintenance		
Contract Name:			
Effective Date of Contract:			

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on **[date Contract Times are to start]** pursuant to Paragraph 4.01 of the General Conditions.

On that date, Contractor shall start performing its obligations under the Contract Documents. No Work will be done at the Site prior to such date.

In accordance with the Agreement: **[Select one of the following two alternatives, insert dates or number of days, and delete the other alternative.]**

The date by which Substantial Completion must be achieved is **[date for Substantial Completion, from Agreement]**, and the date by which readiness for final payment must be achieved is **[date for readiness, from Agreement]**.

Before starting any Work at the Site, Contractor must comply with the following:

[Note any access limitations, security procedures, or other restrictions]

Owner:	**Rose Arbor No. 3 Drain Drainage District**
By *(signature)*:	
Name *(printed)*:	Jason Wiersma
Title:	Kalamazoo County Drain Commissioner
Date Issued:	

Copy: Engineer

PERFORMANCE BOND

Contractor Name: **[Full formal name of Contractor]** Address *(principal place of business)*: **[Address of Contractor's principal place of business]**	**Surety** Name: **[Full formal name of Surety]** Address *(principal place of business)*: **[Address of Surety's principal place of business]**
Owner Name: **Rose Arbor No. 3 Drain Drainage District (C/O Jason Wiersma)** Mailing address *(principal place of business)*: **201 W Kalamazoo Ave., Room 108** **Kalamazoo, MI 49007**	**Contract** Description *(name and location)*: **[Owner's project/contract name, and location of the project]** Contract Price: **[Amount from Contract]** Effective Date of Contract: **[Date from Contract]**

Bond

Bond Amount: **[Amount]**

Date of Bond: **[Date]**

(Date of Bond cannot be earlier than Effective Date of Contract)

Modifications to this Bond form:

☐ None ☐ See Paragraph 16

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

Contractor as Principal	Surety
_____ *(Full formal name of Contractor)*	_____ *(Full formal name of Surety) (corporate seal)*
By: _____ *(Signature)*	By: _____ *(Signature)(Attach Power of Attorney)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____
Attest: _____ *(Signature)*	Attest: _____ *(Signature)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____

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

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

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

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

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

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

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

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

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

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

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

    5.3. Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

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

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

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

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

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

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

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

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

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

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

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

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

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

13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with

said statutory or legal requirement will be deemed deleted therefrom and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.

14. Definitions

    14.1. *Balance of the Contract Price*—The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

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

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

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

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

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

16. Modifications to this Bond are as follows: **[Describe modification or enter "None"]**

PAYMENT BOND

Contractor Name: **[Full formal name of Contractor]** Address *(principal place of business)*: **[Address of Contractor's principal place of business]**	**Surety** Name: **[Full formal name of Surety]** Address *(principal place of business)*: **[Address of Surety's principal place of business]**
Owner Name: **Rose Arbor No. 3 Drian Drainage District (C/O Jason Wiersma)** Mailing address *(principal place of business)*: **201 W Kalamazoo Ave., Room 108** **Kalamazoo, MI 49007**	**Contract** Description *(name and location)*: **[Owner's project/contract name, and location of the project]** Contract Price: **[Amount, from Contract]** Effective Date of Contract: **[Date, from Contract]**

Bond

Bond Amount: **[Amount]**

Date of Bond: **[Date]**

(Date of Bond cannot be earlier than Effective Date of Contract)

Modifications to this Bond form:

☐ None ☐ See Paragraph 18

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

Contractor as Principal	Surety
_____ *(Full formal name of Contractor)*	_____ *(Full formal name of Surety) (corporate seal)*
By: _____ *(Signature)*	By: _____ *(Signature)(Attach Power of Attorney)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____
Attest: _____ *(Signature)*	Attest: _____ *(Signature)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____

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

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond will arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.

4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.

5. The Surety's obligations to a Claimant under this Bond will arise after the following:

    5.1. Claimants who do not have a direct contract with the Contractor

        5.1.1. have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and

        5.1.2. have sent a Claim to the Surety (at the address described in Paragraph 13).

    5.2. Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).

6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.

7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

    7.1. Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

    7.2. Pay or arrange for payment of any undisputed amounts.

    7.3. The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 will not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

8. The Surety's total obligation will not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond will be credited for any payments made in good faith by the Surety.

9. Amounts owed by the Owner to the Contractor under the Construction Contract will be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfying obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.

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

12. No suit or action will be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit will be applicable.

13. Notice and Claims to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, will be sufficient compliance as of the date received.

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

15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

16. Definitions

    16.1. *Claim*—A written statement by the Claimant including at a minimum:

        16.1.1. The name of the Claimant;

        16.1.2. The name of the person for whom the labor was done, or materials or equipment furnished;

        16.1.3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;

        16.1.4. A brief description of the labor, materials, or equipment furnished;

16.1.5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;

16.1.6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;

16.1.7. The total amount of previous payments received by the Claimant; and

16.1.8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.

16.2. *Claimant*—An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond is to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

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

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

16.5. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.

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

18. Modifications to this Bond are as follows: **[Describe modification or enter "None"]**

Division A

Section VI – General Conditions and Supplementary Conditions

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

TABLE OF CONTENTS

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

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

2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.

3. *Application for Payment*—The document prepared by Contractor, in a form acceptable to Engineer, to request progress or final payments, and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

5. *Bidder*—An individual or entity that submits a Bid to Owner.

6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.

7. *Bidding Requirements*—The Advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.

8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.

9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.

10. *Claim*

a. A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment of Contract Price or Contract Times; contesting an initial decision by

Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract.

b. A demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal, or seeking resolution of a contractual issue that Engineer has declined to address.

c. A demand or assertion by Owner or Contractor, duly submitted in compliance with the procedural requirements set forth herein, made pursuant to Paragraph 12.01.A.4, concerning disputes arising after Engineer has issued a recommendation of final payment.

d. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), lead-based paint (as defined by the HUD/EPA standard), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to Laws and Regulations regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.

12. *Contract*—The entire and integrated written contract between Owner and Contractor concerning the Work.

13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.

14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents.

15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.

16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.

17. *Cost of the Work*—See Paragraph 13.01 for definition.

18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.

19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.

20. *Electronic Document*—Any Project-related correspondence, attachments to correspondence, data, documents, drawings, information, or graphics, including but not limited to Shop Drawings and other Submittals, that are in an electronic or digital format.

21. *Electronic Means*—Electronic mail (email), upload/download from a secure Project website, or other communications methods that allow: (a) the transmission or

communication of Electronic Documents; (b) the documentation of transmissions, including sending and receipt; (c) printing of the transmitted Electronic Document by the recipient; (d) the storage and archiving of the Electronic Document by sender and recipient; and (e) the use by recipient of the Electronic Document for purposes permitted by this Contract. Electronic Means does not include the use of text messaging, or of Facebook, Twitter, Instagram, or similar social media services for transmission of Electronic Documents.

22. *Engineer*—The individual or entity named as such in the Agreement.

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

24. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto.

    a. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated into the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, is not a Hazardous Environmental Condition.

    b. The presence of Constituents of Concern that are to be removed or remediated as part of the Work is not a Hazardous Environmental Condition.

    c. The presence of Constituents of Concern as part of the routine, anticipated, and obvious working conditions at the Site, is not a Hazardous Environmental Condition.

25. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and binding decrees, resolutions, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

26. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.

27. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date, or by a time prior to Substantial Completion of all the Work.

28. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.

29. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.

30. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.

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

32. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.

33. Project Manual—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.

34. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative (RPR) includes any assistants or field staff of Resident Project Representative.

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

36. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals.

37. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

38. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.

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

40. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.

41. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.

42. *Submittal*—A written or graphic document, prepared by or for Contractor, which the Contract Documents require Contractor to submit to Engineer, or that is indicated as a Submittal in the Schedule of Submittals accepted by Engineer. Submittals may include Shop Drawings and Samples; schedules; product data; Owner-delegated designs; sustainable design information; information on special procedures; testing plans; results of tests and evaluations, source quality-control testing and inspections, and field or Site quality-control testing and inspections; warranties and certifications; Suppliers' instructions and reports; records of delivery of spare parts and tools; operations and maintenance data; Project photographic documentation; record documents; and other

such documents required by the Contract Documents. Submittals, whether or not approved or accepted by Engineer, are not Contract Documents. Change Proposals, Change Orders, Claims, notices, Applications for Payment, and requests for interpretation or clarification are not Submittals.

43. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion of such Work.

44. *Successful Bidder*—The Bidder to which the Owner makes an award of contract.

45. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.

46. *Supplier*—A manufacturer, fabricator, supplier, distributor, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.

47. *Technical Data*

    a. Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (1) existing subsurface conditions at or adjacent to the Site, or existing physical conditions at or adjacent to the Site including existing surface or subsurface structures (except Underground Facilities) or (2) Hazardous Environmental Conditions at the Site.

    b. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then Technical Data is defined, with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06, as the data contained in boring logs, recorded measurements of subsurface water levels, assessments of the condition of subsurface facilities, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical, environmental, or other Site or facilities conditions report prepared for the Project and made available to Contractor.

    c. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data, and instead Underground Facilities are shown or indicated on the Drawings.

48. *Underground Facilities*—All active or not-in-service underground lines, pipelines, conduits, ducts, encasements, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems at the Site, including but not limited to those facilities or systems that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude oil products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, or traffic or other control systems. An abandoned facility or system is not an Underground Facility.

49. *Unit Price Work*—Work to be paid for on the basis of unit prices.

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

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

1.02 *Terminology*

A. The words and terms discussed in Paragraphs 1.02.B, C, D, and E are not defined terms that require initial capital letters, but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives*: The Contract Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.

C. *Day*: The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

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

1. does not conform to the Contract Documents;

2. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or

3. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or Paragraph 15.04).

E. *Furnish, Install, Perform, Provide*

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

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

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

4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words "furnish," "install," "perform," or "provide," then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

F. *Contract Price or Contract Times*: References to a change in "Contract Price or Contract Times" or "Contract Times or Contract Price" or similar, indicate that such change applies to (1) Contract Price, (2) Contract Times, or (3) both Contract Price and Contract Times, as warranted, even if the term "or both" is not expressed.

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

ARTICLE 2—PRELIMINARY MATTERS

2.01 *Delivery of Performance and Payment Bonds; Evidence of Insurance*

A. *Performance and Payment Bonds*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner the performance bond and payment bond (if the Contract requires Contractor to furnish such bonds).

B. *Evidence of Contractor's Insurance*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each additional insured (as identified in the Contract), the certificates, endorsements, and other evidence of insurance required to be provided by Contractor in accordance with Article 6, except to the extent the Supplementary Conditions expressly establish other dates for delivery of specific insurance policies.

C. *Evidence of Owner's Insurance*: After receipt of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each additional insured (as identified in the Contract), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.

B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract

available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise required by the Contract Documents), Contractor shall submit to Engineer for timely review:

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

2. a preliminary Schedule of Submittals; and

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

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work, and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other Submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.

B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Acceptance of Schedules*

A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review the schedules submitted in accordance with Paragraph 2.03.A. No progress payment will be made to Contractor until acceptable schedules are submitted to Engineer.

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

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

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

4. If a schedule is not acceptable, Contractor will have an additional 10 days to revise and resubmit the schedule.

2.06 *Electronic Transmittals*

A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may send, and shall accept, Electronic Documents transmitted by Electronic Means.

B. If the Contract does not establish protocols for Electronic Means, then Owner, Engineer, and Contractor shall jointly develop such protocols.

C. Subject to any governing protocols for Electronic Means, when transmitting Electronic Documents by Electronic Means, the transmitting party makes no representations as to long-term compatibility, usability, or readability of the Electronic Documents resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the Electronic Documents.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

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

B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents.

C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic versions of the Contract Documents (including any printed copies derived from such electronic versions) and the printed record version, the printed record version will govern.

D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.

E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

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

G. Nothing in the Contract Documents creates:

1. any contractual relationship between Owner or Engineer and any Subcontractor, Supplier, or other individual or entity performing or furnishing any of the Work, for the benefit of such Subcontractor, Supplier, or other individual or entity; or

2. any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity, except as may otherwise be required by Laws and Regulations.

3.02 *Reference Standards*

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

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

2. No provision of any such standard specification, manual, reference standard, or code, and no instruction of a Supplier, will be effective to change the duties or responsibilities of Owner, Contractor, or Engineer from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner or Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*

1. *Contractor's Verification of Figures and Field Measurements*: Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.

2. *Contractor's Review of Contract Documents*: If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer take

precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:

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

b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer in writing all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work.

B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.

C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly notify Owner and Contractor in writing that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

A. Contractor and its Subcontractors and Suppliers shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media versions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or

2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.

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

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

A. The Contract Times will commence to run on the 30th day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the 60th day after the day of Bid opening or the 30th day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

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

4.03 *Reference Points*

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

4.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times must be submitted in accordance with the requirements of Article 11.

B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work will be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times.

B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.

C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Such an adjustment will be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:

1. Severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
2. Abnormal weather conditions;
3. Acts or failures to act of third-party utility owners or other third-party entities (other than those third-party utility owners or other third-party entities performing other work at or adjacent to the Site as arranged by or under contract with Owner, as contemplated in Article 8); and
4. Acts of war or terrorism.

D. Contractor's entitlement to an adjustment of Contract Times or Contract Price is limited as follows:

1. Contractor's entitlement to an adjustment of the Contract Times is conditioned on the delay, disruption, or interference adversely affecting an activity on the critical path to completion of the Work, as of the time of the delay, disruption, or interference.
2. Contractor shall not be entitled to an adjustment in Contract Price for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor. Such a concurrent delay by Contractor shall not preclude an adjustment of Contract Times to which Contractor is otherwise entitled.
3. Adjustments of Contract Times or Contract Price are subject to the provisions of Article 11.

E. Each Contractor request or Change Proposal seeking an increase in Contract Times or Contract Price must be supplemented by supporting data that sets forth in detail the following:

1. The circumstances that form the basis for the requested adjustment;
2. The date upon which each cause of delay, disruption, or interference began to affect the progress of the Work;
3. The date upon which each cause of delay, disruption, or interference ceased to affect the progress of the Work;
4. The number of days' increase in Contract Times claimed as a consequence of each such cause of delay, disruption, or interference; and
5. The impact on Contract Price, in accordance with the provisions of Paragraph 11.07.

Contractor shall also furnish such additional supporting documentation as Owner or Engineer may require including, where appropriate, a revised progress schedule indicating all the activities affected by the delay, disruption, or interference, and an explanation of the

effect of the delay, disruption, or interference on the critical path to completion of the Work.

F. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5, together with the provisions of Paragraphs 4.05.D and 4.05.E.

G. Paragraph 8.03 addresses delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

ARTICLE 5—SITE; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor in writing of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.

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

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

5.02 *Use of Site and Other Areas*

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

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas, or to improvements, structures, utilities, or similar facilities located at such adjacent lands or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.

2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.13, or otherwise;

(b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or in a court of competent jurisdiction; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

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

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

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

5.03 *Subsurface and Physical Conditions*

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

1. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data;

2. Those drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data; and

3. Technical Data contained in such reports and drawings.

B. *Underground Facilities*: Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05, and not in the drawings referred to in Paragraph 5.03.A. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

C. *Reliance by Contractor on Technical Data*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b.

D. *Limitations of Other Data and Documents*: Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

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

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

3. the contents of other Site-related documents made available to Contractor, such as record drawings from other projects at or adjacent to the Site, or Owner's archival documents concerning the Site; or

4. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 *Differing Subsurface or Physical Conditions*

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

1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate;

2. is of such a nature as to require a change in the Drawings or Specifications;

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

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

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

B. *Engineer's Review*: After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine whether it is necessary for Owner to obtain additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.

C. *Owner's Statement to Contractor Regarding Site Condition*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement

to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

D. *Early Resumption of Work*: If at any time Engineer determines that Work in connection with the subsurface or physical condition in question may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the condition in question has been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.

E. *Possible Price and Times Adjustments*

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

    a. Such condition must fall within any one or more of the categories described in Paragraph 5.04.A;

    b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,

    c. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:

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

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

    c. Contractor failed to give the written notice required by Paragraph 5.04.A.

3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.

4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

F. *Underground Facilities; Hazardous Environmental Conditions*: Paragraph 5.05 governs rights and responsibilities regarding the presence or location of Underground Facilities.

Paragraph 5.06 governs rights and responsibilities regarding Hazardous Environmental Conditions. The provisions of Paragraphs 5.03 and 5.04 are not applicable to the presence or location of Underground Facilities, or to Hazardous Environmental Conditions.

5.05 *Underground Facilities*

A. *Contractor's Responsibilities*: Unless it is otherwise expressly provided in the Supplementary Conditions, the cost of all of the following are included in the Contract Price, and Contractor shall have full responsibility for:

1. reviewing and checking all information and data regarding existing Underground Facilities at the Site;

2. complying with applicable state and local utility damage prevention Laws and Regulations;

3. verifying the actual location of those Underground Facilities shown or indicated in the Contract Documents as being within the area affected by the Work, by exposing such Underground Facilities during the course of construction;

4. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and

5. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.

B. *Notice by Contractor*: If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated on the Drawings, or was not shown or indicated on the Drawings with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing regarding such Underground Facility.

C. *Engineer's Review*: Engineer will:

1. promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy;

2. identify and communicate with the owner of the Underground Facility; prepare recommendations to Owner (and if necessary issue any preliminary instructions to Contractor) regarding the Contractor's resumption of Work in connection with the Underground Facility in question;

3. obtain any pertinent cost or schedule information from Contractor; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and

4. advise Owner in writing of Engineer's findings, conclusions, and recommendations.

During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

D. *Owner's Statement to Contractor Regarding Underground Facility*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written

statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.

E. *Early Resumption of Work*: If at any time Engineer determines that Work in connection with the Underground Facility may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the Underground Facility in question and conditions affected by its presence have been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.

F. *Possible Price and Times Adjustments*

1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, to the extent that any existing Underground Facility at the Site that was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

   a. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;

   b. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E; and

   c. Contractor gave the notice required in Paragraph 5.05.B.

2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.

3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

4. The information and data shown or indicated on the Drawings with respect to existing Underground Facilities at the Site is based on information and data (a) furnished by the owners of such Underground Facilities, or by others, (b) obtained from available records, or (c) gathered in an investigation conducted in accordance with the current edition of ASCE 38, Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, by the American Society of Civil Engineers. If such information or data is incorrect or incomplete, Contractor's remedies are limited to those set forth in this Paragraph 5.05.F.

5.06 *Hazardous Environmental Conditions at Site*

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

1. those reports known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site;

2. drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and

3. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

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

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

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

C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.

D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.

E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.

G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, as a result of such Work stoppage, such special conditions under which Work is agreed to be resumed by Contractor, or any costs or expenses incurred in response to the Hazardous Environmental Condition, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off. Entitlement to any such adjustment is subject to the provisions of Paragraphs 4.05.D, 4.05.E, 11.07, and 11.08.

H. If, after receipt of such written notice, Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.

I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court, arbitration, or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I obligates Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J obligates Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of Contractor's obligations under the Contract. These bonds must remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the terms of a prescribed bond form, the Supplementary Conditions, or other provisions of the Contract.

B. Contractor shall also furnish such other bonds (if any) as are required by the Supplementary Conditions or other provisions of the Contract.

C. All bonds must be in the form included in the Bidding Documents or otherwise specified by Owner prior to execution of the Contract, except as provided otherwise by Laws or Regulations, and must be issued and signed by a surety named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Department Circular 570 (as amended and supplemented) by the Bureau of the Fiscal Service, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority must show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

D. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue bonds in the required amounts.

E. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer in writing and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which must comply with the bond and surety requirements above.

F. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.

G. Upon request to Owner from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Owner shall provide a copy of the payment bond to such person or entity.

H. Upon request to Contractor from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Contractor shall provide a copy of the payment bond to such person or entity.

6.02 *Insurance—General Provisions*

A. Owner and Contractor shall obtain and maintain insurance as required in this article and in the Supplementary Conditions.

B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized in the state or jurisdiction in which the Project is located to issue insurance policies for the

required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.

C. Alternative forms of insurance coverage, including but not limited to self-insurance and "Occupational Accident and Excess Employer's Indemnity Policies," are not sufficient to meet the insurance requirements of this Contract, unless expressly allowed in the Supplementary Conditions.

D. Contractor shall deliver to Owner, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Contractor has obtained and is maintaining the policies and coverages required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, full disclosure of all relevant exclusions, and evidence of insurance required to be purchased and maintained by Subcontractors or Suppliers. In any documentation furnished under this provision, Contractor, Subcontractors, and Suppliers may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those applicable to this Contract.

E. Owner shall deliver to Contractor, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Owner has obtained and is maintaining the policies and coverages required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, and full disclosure of all relevant exclusions. In any documentation furnished under this provision, Owner may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those relevant to this Contract.

F. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, will not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.

G. In addition to the liability insurance required to be provided by Contractor, the Owner, at Owner's option, may purchase and maintain Owner's own liability insurance. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

H. Contractor shall require:

1. Subcontractors to purchase and maintain worker's compensation, commercial general liability, and other insurance that is appropriate for their participation in the Project, and to name as additional insureds Owner and Engineer (and any other individuals or entities identified in the Supplementary Conditions as additional insureds on Contractor's liability policies) on each Subcontractor's commercial general liability insurance policy; and

2. Suppliers to purchase and maintain insurance that is appropriate for their participation in the Project.

I. If either party does not purchase or maintain the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.

J. If Contractor has failed to obtain and maintain required insurance, Contractor's entitlement to enter or remain at the Site will end immediately, and Owner may impose an appropriate set-off against payment for any associated costs (including but not limited to the cost of purchasing necessary insurance coverage), and exercise Owner's termination rights under Article 16.

K. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect (but is in no way obligated) to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price will be adjusted accordingly.

L. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests. Contractor is responsible for determining whether such coverage and limits are adequate to protect its interests, and for obtaining and maintaining any additional insurance that Contractor deems necessary.

M. The insurance and insurance limits required herein will not be deemed as a limitation on Contractor's liability, or that of its Subcontractors or Suppliers, under the indemnities granted to Owner and other individuals and entities in the Contract or otherwise.

N. All the policies of insurance required to be purchased and maintained under this Contract will contain a provision or endorsement that the coverage afforded will not be canceled, or renewal refused, until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured and Engineer.

6.03 *Contractor's Insurance*

A. *Required Insurance*: Contractor shall purchase and maintain Worker's Compensation, Commercial General Liability, and other insurance pursuant to the specific requirements of the Supplementary Conditions.

B. *General Provisions*: The policies of insurance required by this Paragraph 6.03 as supplemented must:

1. include at least the specific coverages required;

2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;

3. remain in effect at least until the Work is complete (as set forth in Paragraph 15.06.D), and longer if expressly required elsewhere in this Contract, and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract;

4. apply with respect to the performance of the Work, whether such performance is by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable; and

5. include all necessary endorsements to support the stated requirements.

C. *Additional Insureds*: The Contractor's commercial general liability, automobile liability, employer's liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Contract, must:

1. include and list as additional insureds Owner and Engineer, and any individuals or entities identified as additional insureds in the Supplementary Conditions;

2. include coverage for the respective officers, directors, members, partners, employees, and consultants of all such additional insureds;

3. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);

4. not seek contribution from insurance maintained by the additional insured; and

5. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Contractor's acts or omissions, or the acts and omissions of those working on Contractor's behalf, in the performance of Contractor's operations.

6.04 *Builder's Risk and Other Property Insurance*

A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the Supplementary Conditions.

B. *Property Insurance for Facilities of Owner Where Work Will Occur*: Owner is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Paragraph 15.06.D.

C. *Property Insurance for Substantially Complete Facilities*: Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Owner will obtain property insurance for such substantially completed Work, and maintain such property insurance at least until the Work is complete, as set forth in Paragraph 15.06.D. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Owner's procurement of such property insurance.

D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide advance notice of such occupancy or use to the builder's risk insurer, and obtain an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.

E. *Insurance of Other Property; Additional Insurance*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.04, it may do so at Contractor's expense.

6.05 *Property Losses; Subrogation*

A. The builder's risk insurance policy purchased and maintained in accordance with Paragraph 6.04 (or an installation floater policy if authorized by the Supplementary Conditions), will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors.

1. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils, risks, or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all individuals or entities identified in the Supplementary Conditions as builder's risk or installation floater insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused.

2. None of the above waivers extends to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.

B. Any property insurance policy maintained by Owner covering any loss, damage, or consequential loss to Owner's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent structures, buildings, or facilities of Owner; or to part or all of the completed or substantially completed Work, during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written contract executed prior to the loss, damage, or consequential loss.

1. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from fire or any of the perils, risks, or causes of loss covered by such policies.

C. The waivers in this Paragraph 6.05 include the waiver of rights due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other insured peril, risk, or cause of loss.

D. Contractor shall be responsible for assuring that each Subcontract contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from fire or other peril, risk, or cause of loss covered by builder's risk insurance, installation floater, and any other property insurance applicable to the Work.

6.06 *Receipt and Application of Property Insurance Proceeds*

A. Any insured loss under the builder's risk and other policies of property insurance required by Paragraph 6.04 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.04 shall maintain such proceeds in a segregated account, and distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.

C. If no other special agreement is reached, Contractor shall repair or replace the damaged Work, using allocated insurance proceeds.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.01 *Contractor's Means and Methods of Construction*

A. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.

B. If the Contract Documents note, or Contractor determines, that professional engineering or other design services are needed to carry out Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures, or for Site safety, then Contractor shall cause such services to be provided by a properly licensed design professional, at

Contractor's expense. Such services are not Owner-delegated professional design services under this Contract, and neither Owner nor Engineer has any responsibility with respect to (1) Contractor's determination of the need for such services, (2) the qualifications or licensing of the design professionals retained or employed by Contractor, (3) the performance of such services, or (4) any errors, omissions, or defects in such services.

7.02 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who will not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.03 *Labor; Working Hours*

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

B. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of Contractor's employees; of Suppliers and Subcontractors, and their employees; and of any other individuals or entities performing or furnishing any of the Work, just as Contractor is responsible for Contractor's own acts and omissions.

C. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site will be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.04 *Services, Materials, and Equipment*

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

B. All materials and equipment incorporated into the Work must be new and of good quality, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications will expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

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

7.05 *"Or Equals"*

A. *Contractor's Request; Governing Criteria*: Whenever an item of equipment or material is specified or described in the Contract Documents by using the names of one or more proprietary items or specific Suppliers, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material, or items from other proposed Suppliers, under the circumstances described below.

1. If Engineer in its sole discretion determines that an item of equipment or material proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer will deem it an "or equal" item. For the purposes of this paragraph, a proposed item of equipment or material will be considered functionally equal to an item so named if:

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

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

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

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

        4) is not objectionable to Owner.

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

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

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

B. *Contractor's Expense*: Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.

C. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal," which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.

D. *Effect of Engineer's Determination*: Neither approval nor denial of an "or-equal" request will result in any change in Contract Price. The Engineer's denial of an "or-equal" request will be final and binding, and may not be reversed through an appeal under any provision of the Contract.

E. *Treatment as a Substitution Request*: If Engineer determines that an item of equipment or material proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the item a proposed substitute pursuant to Paragraph 7.06.

7.06 *Substitutes*

A. *Contractor's Request; Governing Criteria*: Unless the specification or description of an item of equipment or material required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material under the circumstances described below. To the extent possible such requests must be made before commencement of related construction at the Site.

1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of equipment or material from anyone other than Contractor.

2. The requirements for review by Engineer will be as set forth in Paragraph 7.06.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.

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

   a. will certify that the proposed substitute item will:

      1) perform adequately the functions and achieve the results called for by the general design;

      2) be similar in substance to the item specified; and

      3) be suited to the same use as the item specified.

   b. will state:

      1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times;

      2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and

      3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.

   c. will identify:

      1) all variations of the proposed substitute item from the item specified; and

      2) available engineering, sales, maintenance, repair, and replacement services.

   d. will contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in

Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.

B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.

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

D. *Reimbursement of Engineer's Cost*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.

F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request will be final and binding, and may not be reversed through an appeal under any provision of the Contract. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.06.D, by timely submittal of a Change Proposal.

7.07 *Concerning Subcontractors and Suppliers*

A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner. The Contractor's retention of a Subcontractor or Supplier for the performance of parts of the Work will not relieve Contractor's obligation to Owner to perform and complete the Work in accordance with the Contract Documents.

B. Contractor shall retain specific Subcontractors and Suppliers for the performance of designated parts of the Work if required by the Contract to do so.

C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor or Supplier to furnish or perform any of the Work against which Contractor has reasonable objection.

D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable during the bidding process or

otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within 5 days.

E. Owner may require the replacement of any Subcontractor or Supplier. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors or Suppliers for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor or Supplier so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor or Supplier.

F. If Owner requires the replacement of any Subcontractor or Supplier retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.

G. No acceptance by Owner of any such Subcontractor or Supplier, whether initially or as a replacement, will constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

H. On a monthly basis, Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.

I. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors and Suppliers.

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

K. All Work performed for Contractor by a Subcontractor or Supplier must be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract for the benefit of Owner and Engineer.

L. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor for Work performed for Contractor by the Subcontractor or Supplier.

M. Contractor shall restrict all Subcontractors and Suppliers from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed in this Contract.

7.08 *Patent Fees and Royalties*

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

license fee or royalty to others, the existence of such rights will be disclosed in the Contract Documents.

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

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

7.09 *Permits*

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

7.10 *Taxes*

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

7.11 *Laws and Regulations*

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

B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to

such Work or other action. It is not Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this does not relieve Contractor of its obligations under Paragraph 3.03.

C. Owner or Contractor may give written notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such written notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.12 *Record Documents*

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

7.13 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations.

B. Contractor shall designate a qualified and experienced safety representative whose duties and responsibilities are the prevention of Work-related accidents and the maintenance and supervision of safety precautions and programs.

C. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:

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

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

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

D. All damage, injury, or loss to any property referred to in Paragraph 7.13.C.2 or 7.13.C.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any

of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

E. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection.

F. Contractor shall notify Owner; the owners of adjacent property; the owners of Underground Facilities and other utilities (if the identity of such owners is known to Contractor); and other contractors and utility owners performing work at or adjacent to the Site, in writing, when Contractor knows that prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.

G. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. Any Owner's safety programs that are applicable to the Work are identified or included in the Supplementary Conditions or Specifications.

H. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

I. Contractor's duties and responsibilities for safety and protection will continue until all the Work is completed, Engineer has issued a written notice to Owner and Contractor in accordance with Paragraph 15.06.C that the Work is acceptable, and Contractor has left the Site (except as otherwise expressly provided in connection with Substantial Completion).

J. Contractor's duties and responsibilities for safety and protection will resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.14 *Hazard Communication Programs*

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

7.15 *Emergencies*

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

7.16 *Submittals*

A. *Shop Drawing and Sample Requirements*

1. Before submitting a Shop Drawing or Sample, Contractor shall:

a. review and coordinate the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;

b. determine and verify:

1) all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect to the Submittal;

2) the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

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

c. confirm that the Submittal is complete with respect to all related data included in the Submittal.

2. Each Shop Drawing or Sample must bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that Submittal, and that Contractor approves the Submittal.

3. With each Shop Drawing or Sample, Contractor shall give Engineer specific written notice of any variations that the Submittal may have from the requirements of the Contract Documents. This notice must be set forth in a written communication separate from the Submittal; and, in addition, in the case of a Shop Drawing by a specific notation made on the Shop Drawing itself.

B. *Submittal Procedures for Shop Drawings and Samples*: Contractor shall label and submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals.

1. *Shop Drawings*

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

b. Data shown on the Shop Drawings must be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide, and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.C.

2. *Samples*

a. Contractor shall submit the number of Samples required in the Specifications.

b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer

may require to enable Engineer to review the Submittal for the limited purposes required by Paragraph 7.16.C.

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

C. *Engineer's Review of Shop Drawings and Samples*

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

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction, or to safety precautions or programs incident thereto.

3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

4. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order or other appropriate Contract modification.

5. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for complying with the requirements of Paragraphs 7.16.A and B.

6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, will not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.

7. Neither Engineer's receipt, review, acceptance, or approval of a Shop Drawing or Sample will result in such item becoming a Contract Document.

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

D. *Resubmittal Procedures for Shop Drawings and Samples*

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

2. Contractor shall furnish required Shop Drawing and Sample submittals with sufficient information and accuracy to obtain required approval of an item with no more than two

resubmittals. Engineer will record Engineer's time for reviewing a third or subsequent resubmittal of a Shop Drawing or Sample, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges.

3. If Contractor requests a change of a previously approved Shop Drawing or Sample, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

E. *Submittals Other than Shop Drawings, Samples, and Owner-Delegated Designs*

1. The following provisions apply to all Submittals other than Shop Drawings, Samples, and Owner-delegated designs:

a. Contractor shall submit all such Submittals to the Engineer in accordance with the Schedule of Submittals and pursuant to the applicable terms of the Contract Documents.

b. Engineer will provide timely review of all such Submittals in accordance with the Schedule of Submittals and return such Submittals with a notation of either Accepted or Not Accepted. Any such Submittal that is not returned within the time established in the Schedule of Submittals will be deemed accepted.

c. Engineer's review will be only to determine if the Submittal is acceptable under the requirements of the Contract Documents as to general form and content of the Submittal.

d. If any such Submittal is not accepted, Contractor shall confer with Engineer regarding the reason for the non-acceptance, and resubmit an acceptable document.

2. Procedures for the submittal and acceptance of the Progress Schedule, the Schedule of Submittals, and the Schedule of Values are set forth in Paragraphs 2.03. 2.04, and 2.05.

F. Owner-delegated Designs: Submittals pursuant to Owner-delegated designs are governed by the provisions of Paragraph 7.19.

7.17 *Contractor's General Warranty and Guarantee*

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

B. Owner's rights under this warranty and guarantee are in addition to, and are not limited by, Owner's rights under the correction period provisions of Paragraph 15.08. The time in which Owner may enforce its warranty and guarantee rights under this Paragraph 7.17 is limited only by applicable Laws and Regulations restricting actions to enforce such rights; provided, however, that after the end of the correction period under Paragraph 15.08:

1. Owner shall give Contractor written notice of any defective Work within 60 days of the discovery that such Work is defective; and

2. Such notice will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the notice.

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

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

2. normal wear and tear under normal usage.

D. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents, a release of Contractor's obligation to perform the Work in accordance with the Contract Documents, or a release of Owner's warranty and guarantee rights under this Paragraph 7.17:

1. Observations by Engineer;

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

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

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

5. Any review and approval of a Shop Drawing or Sample submittal;

6. The issuance of a notice of acceptability by Engineer;

7. The end of the correction period established in Paragraph 15.08;

8. Any inspection, test, or approval by others; or

9. Any correction of defective Work by Owner.

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

7.18 *Indemnification*

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

directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable.

B. In any and all claims against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A will not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

7.19 *Delegation of Professional Design Services*

A. Owner may require Contractor to provide professional design services for a portion of the Work by express delegation in the Contract Documents. Such delegation will specify the performance and design criteria that such services must satisfy, and the Submittals that Contractor must furnish to Engineer with respect to the Owner-delegated design.

B. Contractor shall cause such Owner-delegated professional design services to be provided pursuant to the professional standard of care by a properly licensed design professional, whose signature and seal must appear on all drawings, calculations, specifications, certifications, and Submittals prepared by such design professional. Such design professional must issue all certifications of design required by Laws and Regulations.

C. If a Shop Drawing or other Submittal related to the Owner-delegated design is prepared by Contractor, a Subcontractor, or others for submittal to Engineer, then such Shop Drawing or other Submittal must bear the written approval of Contractor's design professional when submitted by Contractor to Engineer.

D. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, and approvals performed or provided by the design professionals retained or employed by Contractor under an Owner-delegated design, subject to the professional standard of care and the performance and design criteria stated in the Contract Documents.

E. Pursuant to this Paragraph 7.19, Engineer's review, approval, and other determinations regarding design drawings, calculations, specifications, certifications, and other Submittals furnished by Contractor pursuant to an Owner-delegated design will be only for the following limited purposes:

1. Checking for conformance with the requirements of this Paragraph 7.19;

2. Confirming that Contractor (through its design professionals) has used the performance and design criteria specified in the Contract Documents; and

3. Establishing that the design furnished by Contractor is consistent with the design concept expressed in the Contract Documents.

F. Contractor shall not be responsible for the adequacy of performance or design criteria specified by Owner or Engineer.

G. Contractor is not required to provide professional services in violation of applicable Laws and Regulations.

ARTICLE 8—OTHER WORK AT THE SITE

8.01 *Other Work*

A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.

B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any third-party utility work that Owner has arranged to take place at or adjacent to the Site, Owner shall provide such information to Contractor.

C. Contractor shall afford proper and safe access to the Site to each contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work.

D. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.

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

F. The provisions of this article are not applicable to work that is performed by third-party utilities or other third-party entities without a contract with Owner, or that is performed without having been arranged by Owner. If such work occurs, then any related delay, disruption, or interference incurred by Contractor is governed by the provisions of Paragraph 4.05.C.3.

8.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be

set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:

1. The identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
2. An itemization of the specific matters to be covered by such authority and responsibility; and
3. The extent of such authority and responsibilities.

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

8.03 *Legal Relationships*

A. If, in the course of performing other work for Owner at or adjacent to the Site, the Owner's employees, any other contractor working for Owner, or any utility owner that Owner has arranged to perform work, causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment will take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract, and any remedies available to Contractor under Laws or Regulations concerning utility action or inaction. When applicable, any such equitable adjustment in Contract Price will be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times or Contract Price is subject to the provisions of Paragraphs 4.05.D and 4.05.E.

B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site.

1. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this Paragraph 8.03.B.
2. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due Contractor.

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

ARTICLE 9—OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

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

9.02 *Replacement of Engineer*

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

9.03 *Furnish Data*

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

9.04 *Pay When Due*

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

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

A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.

B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.

C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

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

9.07 *Change Orders*

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

9.08 *Inspections, Tests, and Approvals*

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

9.09 *Limitations on Owner's Responsibilities*

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

9.10 *Undisclosed Hazardous Environmental Condition*

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

9.11 *Evidence of Financial Arrangements*

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

9.12 *Safety Programs*

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

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

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

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

10.02 *Visits to Site*

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

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.07. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Resident Project Representative*

A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in the Supplementary Conditions and in Paragraph 10.07.

B. If Owner designates an individual or entity who is not Engineer's consultant, agent, or employee to represent Owner at the Site, then the responsibilities and authority of such individual or entity will be as provided in the Supplementary Conditions.

10.04 *Engineer's Authority*

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

B. Engineer's authority as to Submittals is set forth in Paragraph 7.16.

C. Engineer's authority as to design drawings, calculations, specifications, certifications and other Submittals from Contractor in response to Owner's delegation (if any) to Contractor of professional design services, is set forth in Paragraph 7.19.

D. Engineer's authority as to changes in the Work is set forth in Article 11.

E. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.05 *Determinations for Unit Price Work*

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

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

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

10.07 *Limitations on Engineer's Authority and Responsibilities*

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

Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

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

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

D. Engineer's review of the final Application for Payment and accompanying documentation, and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Contractor under Paragraph 15.06.A, will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 10.07 also apply to the Resident Project Representative, if any.

10.08 *Compliance with Safety Program*

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

ARTICLE 11—CHANGES TO THE CONTRACT

11.01 *Amending and Supplementing the Contract*

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

B. If an amendment or supplement to the Contract includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order.

C. All changes to the Contract that involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, must be supported by Engineer's recommendation. Owner and Contractor may amend other terms and conditions of the Contract without the recommendation of the Engineer.

11.02 *Change Orders*

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

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

2. Changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;

3. Changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.05, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters; and

4. Changes that embody the substance of any final and binding results under: Paragraph 11.03.B, resolving the impact of a Work Change Directive; Paragraph 11.09, concerning Change Proposals; Article 12, Claims; Paragraph 13.02.D, final adjustments resulting from allowances; Paragraph 13.03.D, final adjustments relating to determination of quantities for Unit Price Work; and similar provisions.

B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of Paragraph 11.02.A, it will be deemed to be of full force and effect, as if fully executed.

11.03 *Work Change Directives*

A. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.07 regarding change of Contract Price.

B. If Owner has issued a Work Change Directive and:

1. Contractor believes that an adjustment in Contract Times or Contract Price is necessary, then Contractor shall submit any Change Proposal seeking such an adjustment no later than 30 days after the completion of the Work set out in the Work Change Directive.

2. Owner believes that an adjustment in Contract Times or Contract Price is necessary, then Owner shall submit any Claim seeking such an adjustment no later than 60 days after issuance of the Work Change Directive.

11.04 *Field Orders*

A. Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly.

B. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.05 *Owner-Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Changes involving

the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters will be supported by Engineer's recommendation.

B. Such changes in the Work may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work must be performed under the applicable conditions of the Contract Documents.

C. Nothing in this Paragraph 11.05 obligates Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.06 *Unauthorized Changes in the Work*

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.C.2.

11.07 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment of Contract Price must comply with the provisions of Article 12.

B. An adjustment in the Contract Price will be determined as follows:

1. Where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03);

2. Where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.07.C.2); or

3. Where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.07.C).

C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit will be determined as follows:

1. A mutually acceptable fixed fee; or

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

a. For costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee will be 15 percent;

b. For costs incurred under Paragraph 13.01.B.3, the Contractor's fee will be 5 percent;

c. Where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.07.C.2.a and 11.07.C.2.b is that the Contractor's fee will be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of 5 percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted Work the maximum total fee to be paid by Owner will be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the Work;

d. No fee will be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;

e. The amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in Cost of the Work will be the amount of the actual net decrease in Cost of the Work and a deduction of an additional amount equal to 5 percent of such actual net decrease in Cost of the Work; and

f. When both additions and credits are involved in any one change or Change Proposal, the adjustment in Contractor's fee will be computed by determining the sum of the costs in each of the cost categories in Paragraph 13.01.B (specifically, payroll costs, Paragraph 13.01.B.1; incorporated materials and equipment costs, Paragraph 13.01.B.2; Subcontract costs, Paragraph 13.01.B.3; special consultants costs, Paragraph 13.01.B.4; and other costs, Paragraph 13.01.B.5) and applying to each such cost category sum the appropriate fee from Paragraphs 11.07.C.2.a through 11.07.C.2.e, inclusive.

11.08 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment in the Contract Times must comply with the provisions of Article 12.

B. Delay, disruption, and interference in the Work, and any related changes in Contract Times, are addressed in and governed by Paragraph 4.05.

11.09 *Change Proposals*

A. *Purpose and Content*: Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; contest an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; challenge a set-off against payment due; or seek other relief under the Contract. The Change Proposal will specify any proposed change in Contract Times or Contract Price, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents. Each Change Proposal will address only one issue, or a set of closely related issues.

B. *Change Proposal Procedures*

1. *Submittal*: Contractor shall submit each Change Proposal to Engineer within 30 days after the start of the event giving rise thereto, or after such initial decision.

2. *Supporting Data*: The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal.

    a. Change Proposals based on or related to delay, interruption, or interference must comply with the provisions of Paragraphs 4.05.D and 4.05.E.

    b. Change proposals related to a change of Contract Price must include full and detailed accounts of materials incorporated into the Work and labor and equipment used for the subject Work.

    The supporting data must be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event.

3. *Engineer's Initial Review*: Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal. If in its discretion Engineer concludes that additional supporting data is needed before conducting a full review and making a decision regarding the Change Proposal, then Engineer may request that Contractor submit such additional supporting data by a date specified by Engineer, prior to Engineer beginning its full review of the Change Proposal.

4. *Engineer's Full Review and Action on the Change Proposal*: Upon receipt of Contractor's supporting data (including any additional data requested by Engineer), Engineer will conduct a full review of each Change Proposal and, within 30 days after such receipt of the Contractor's supporting data, either approve the Change Proposal in whole, deny it in whole, or approve it in part and deny it in part. Such actions must be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

5. *Binding Decision*: Engineer's decision is final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.

C. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties in writing that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice will be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

D. *Post-Completion*: Contractor shall not submit any Change Proposals after Engineer issues a written recommendation of final payment pursuant to Paragraph 15.06.B.

11.10 *Notification to Surety*

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

ARTICLE 12—CLAIMS

12.01 *Claims*

A. *Claims Process*: The following disputes between Owner and Contractor are subject to the Claims process set forth in this article:

1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;

2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents;

3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters; and

4. Subject to the waiver provisions of Paragraph 15.07, any dispute arising after Engineer has issued a written recommendation of final payment pursuant to Paragraph 15.06.B.

B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim rests with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim will be stated in writing and submitted to the other party, with a copy to Engineer.

D. *Mediation*

1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate will stay the Claim submittal and response process.

2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process will resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal

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

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.

E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action will be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.

F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim will be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.

G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim will be incorporated in a Change Order or other written document to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

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

13.01 *Cost of the Work*

A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:

1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or

2. When needed to determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.

B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work will be in amounts no higher than those commonly incurred in the locality of the Project, will not include any of the costs itemized in Paragraph 13.01.C, and will include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor in advance of the subject Work. Such employees include, without limitation, superintendents, foremen, safety managers, safety representatives, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work will be apportioned on the basis of their time spent on the Work. Payroll costs include, but are not limited to, salaries and wages plus the cost of fringe

benefits, which include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, will be included in the above to the extent authorized by Owner.

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

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, which will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee will be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.

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

5. Other costs consisting of the following:

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

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

        1) In establishing included costs for materials such as scaffolding, plating, or sheeting, consideration will be given to the actual or the estimated life of the material for use on other projects; or rental rates may be established on the basis of purchase or salvage value of such items, whichever is less. Contractor will not be eligible for compensation for such items in an amount that exceeds the purchase cost of such item.

    c. *Construction Equipment Rental*

        1) Rentals of all construction equipment and machinery, and the parts thereof, in accordance with rental agreements approved by Owner as to price (including any surcharge or special rates applicable to overtime use of the construction equipment or machinery), and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs will be in accordance with the terms of said rental agreements. The rental of any such equipment,

machinery, or parts must cease when the use thereof is no longer necessary for the Work.

2) Costs for equipment and machinery owned by Contractor or a Contractor-related entity will be paid at a rate shown for such equipment in the equipment rental rate book specified in the Supplementary Conditions. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs.

3) With respect to Work that is the result of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price ("changed Work"), included costs will be based on the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, must cease to accrue when the use thereof is no longer necessary for the changed Work.

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

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

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of builder's risk or other property insurance established in accordance with Paragraph 6.04), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses will be included in the Cost of the Work for the purpose of determining Contractor's fee.

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

h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.

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

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

1. Payroll costs and other compensation of Contractor's officers, executives, principals, general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.

2. The cost of purchasing, renting, or furnishing small tools and hand tools.

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

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

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

6. Expenses incurred in preparing and advancing Claims.

7. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee*

1. When the Work as a whole is performed on the basis of cost-plus-a-fee, then:

a. Contractor's fee for the Work set forth in the Contract Documents as of the Effective Date of the Contract will be determined as set forth in the Agreement.

b. for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work, Contractor's fee will be determined as follows:

1) When the fee for the Work as a whole is a percentage of the Cost of the Work, the fee will automatically adjust as the Cost of the Work changes.

2) When the fee for the Work as a whole is a fixed fee, the fee for any additions or deletions will be determined in accordance with Paragraph 11.07.C.2.

2. When the Work as a whole is performed on the basis of a stipulated sum, or any other basis other than cost-plus-a-fee, then Contractor's fee for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work will be determined in accordance with Paragraph 11.07.C.2.

E. *Documentation and Audit*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor and pertinent Subcontractors will establish and maintain records of the costs in accordance with generally accepted accounting practices. Subject to prior written notice, Owner will be afforded reasonable access, during normal business hours, to all Contractor's accounts, records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda, and similar data relating to the Cost of the Work and Contractor's fee. Contractor shall preserve all such documents for a period of three years after the final payment by Owner. Pertinent Subcontractors will afford such access to Owner, and preserve such documents, to the same extent required of Contractor.

13.02 *Allowances*

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

B. *Cash Allowances*: Contractor agrees that:

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

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

C. *Owner's Contingency Allowance*: Contractor agrees that an Owner's contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

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

13.03 *Unit Price Work*

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

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.

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

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

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:

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

b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.

2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.

3. Adjusted unit prices will apply to all units of that item.

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

14.01 *Access to Work*

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

14.02 *Tests, Inspections, and Approvals*

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

B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work will be governed by the provisions of Paragraph 14.05.

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

D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:

1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;

2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;

3. by manufacturers of equipment furnished under the Contract Documents;

4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and

5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

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

E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.

F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering will be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

A. *Contractor's Obligation*: It is Contractor's obligation to assure that the Work is not defective.

B. *Engineer's Authority*: Engineer has the authority to determine whether Work is defective, and to reject defective Work.

C. *Notice of Defects*: Prompt written notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.

D. *Correction, or Removal and Replacement*: Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.

E. *Preservation of Warranties*: When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

F. *Costs and Damages*: In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved

by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work will be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

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

B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.

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

1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.

2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

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

14.07 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace defective Work as required by Engineer, then

Owner may, after 7 days' written notice to Contractor, correct or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.

C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

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

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

15.01 *Progress Payments*

A. *Basis for Progress Payments*: The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments for Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.

B. *Applications for Payments*

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents.

2. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment must also be accompanied by: (a) a bill of sale, invoice, copies of subcontract or purchase order payments, or other documentation establishing full payment by Contractor for the materials and equipment; (b) at Owner's request, documentation warranting that Owner has received the materials and equipment free and clear of all Liens; and (c) evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

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

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

C. *Review of Applications*

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

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

   a. the Work has progressed to the point indicated;

   b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and

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

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

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

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

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

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

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

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

d. to make any examination to ascertain how or for what purposes Contractor has used the money paid by Owner; or

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

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.

6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:

a. the Work is defective, requiring correction or replacement;

b. the Contract Price has been reduced by Change Orders;

c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or

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

D. *Payment Becomes Due*

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

E. *Reductions in Payment by Owner*

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:

a. Claims have been made against Owner based on Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages resulting from Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;

c. Contractor has failed to provide and maintain required bonds or insurance;

d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;

e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;

f. The Work is defective, requiring correction or replacement;

g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

h. The Contract Price has been reduced by Change Orders;

i. An event has occurred that would constitute a default by Contractor and therefore justify a termination for cause;

j. Liquidated or other damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;

k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens; or

l. Other items entitle Owner to a set-off against the amount recommended.

2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed will be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

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

15.02 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than 7 days after the time of payment by Owner.

15.03 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

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

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which will fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have 7 days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

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

F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

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

1. At any time, Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through 15.03.E for that part of the Work.

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

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.04 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

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

15.06 *Final Payment*

A. *Application for Payment*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.12), and other documents, Contractor may make application for final payment.

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

a. all documentation called for in the Contract Documents;

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

c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.

d. a list of all duly pending Change Proposals and Claims; and

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

3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment

bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

B. *Engineer's Review of Final Application and Recommendation of Payment*: If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within 10 days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the final Application for Payment to Owner for payment. Such recommendation will account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Notice of Acceptability*: In support of its recommendation of payment of the final Application for Payment, Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to stated limitations in the notice and to the provisions of Paragraph 15.07.

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

E. *Final Payment Becomes Due*: Upon receipt from Engineer of the final Application for Payment and accompanying documentation, Owner shall set off against the amount recommended by Engineer for final payment any further sum to which Owner is entitled, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions of this Contract with respect to progress payments. Owner shall pay the resulting balance due to Contractor within 30 days of Owner's receipt of the final Application for Payment from Engineer.

15.07 *Waiver of Claims*

A. By making final payment, Owner waives its claim or right to liquidated damages or other damages for late completion by Contractor, except as set forth in an outstanding Claim, appeal under the provisions of Article 17, set-off, or express reservation of rights by Owner. Owner reserves all other claims or rights after final payment.

B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted as a Claim, or appealed under the provisions of Article 17.

15.08 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the Supplementary Conditions or the terms of any applicable special guarantee required by the Contract Documents), Owner gives Contractor written notice that any Work has been found to be defective, or that Contractor's repair of any damages to the Site or adjacent areas has been found to be defective, then after receipt of such notice of defect Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

   1. correct the defective repairs to the Site or such adjacent areas;

   2. correct such defective Work;

   3. remove the defective Work from the Project and replace it with Work that is not defective, if the defective Work has been rejected by Owner, and

   4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting from the corrective measures.

B. Owner shall give any such notice of defect within 60 days of the discovery that such Work or repairs is defective. If such notice is given within such 60 days but after the end of the correction period, the notice will be deemed a notice of defective Work under Paragraph 7.17.B.

C. If, after receipt of a notice of defect within 60 days and within the correction period, Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others). Contractor's failure to pay such costs, losses, and damages within 10 days of invoice from Owner will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the failure to pay.

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

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

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

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

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

16.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment, or failure to adhere to the Progress Schedule);

2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;

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

4. Contractor's repeated disregard of the authority of Owner or Engineer.

B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) 10 days' written notice that Owner is considering a declaration that Contractor is in default and termination of the Contract, Owner may proceed to:

1. declare Contractor to be in default, and give Contractor (and any surety) written notice that the Contract is terminated; and

2. enforce the rights available to Owner under any applicable performance bond.

C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.

D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within 7 days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.

E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as

to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

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

G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond will govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate for Convenience*

A. Upon 7 days' written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

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

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

3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.

B. Contractor shall not be paid for any loss of anticipated profits or revenue, post-termination overhead costs, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon 7 days' written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, 7 days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17—FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

A. *Disputes Subject to Final Resolution*: The following disputed matters are subject to final resolution under the provisions of this article:

1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full, pursuant to Article 12; and

2. Disputes between Owner and Contractor concerning the Work, or obligations under the Contract Documents, that arise after final payment has been made.

B. *Final Resolution of Disputes*: For any dispute subject to resolution under this article, Owner or Contractor may:

1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions;

2. agree with the other party to submit the dispute to another dispute resolution process; or

3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18—MISCELLANEOUS

18.01 *Giving Notice*

A. Whenever any provision of the Contract requires the giving of written notice to Owner, Engineer, or Contractor, it will be deemed to have been validly given only if delivered:

1. in person, by a commercial courier service or otherwise, to the recipient's place of business;

2. by registered or certified mail, postage prepaid, to the recipient's place of business; or

3. by e-mail to the recipient, with the words "Formal Notice" or similar in the e-mail's subject line.

18.02 *Computation of Times*

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

18.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be

as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

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

18.05 *No Waiver*

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

18.06 *Survival of Obligations*

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

18.07 *Controlling Law*

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

18.08 *Assignment of Contract*

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

18.09 *Successors and Assigns*

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

18.10 *Headings*

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

SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT

TABLE OF CONTENTS

SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT

These Supplementary Conditions amend or supplement EJCDC® C-700, Standard General Conditions of the Construction Contract (2018). The General Conditions remain in full force and effect except as amended.

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

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added—for example, “Paragraph SC-4.05.”

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

No suggested Supplementary Conditions in this Article.

ARTICLE 2—PRELIMINARY MATTERS

2.02 *Copies of Documents*

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

A. Owner shall furnish to Contractor **four (4)** printed copies of conformed Contract Documents incorporating and integrating all Addenda and any amendments negotiated prior to the Effective Date of the Contract (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies of the conformed Contract Documents will be furnished upon request at the cost of reproduction.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

No Supplementary Conditions for this Article.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

SC-4.05 Amend Paragraph 4.05.C by adding the following subparagraphs:

5. *Weather-Related Delays*

a. If “abnormal weather conditions” as set forth in Paragraph 4.05.C.2 of the General Conditions are the basis for a request for an equitable adjustment in the Contract Times, such request must be documented by data substantiating each of the following: 1) that weather conditions were abnormal for the period of time in which the delay occurred, 2) that such weather conditions could not have been reasonably anticipated, and 3) that such weather conditions had an adverse effect on the Work as scheduled.

ARTICLE 5—SITE, SUBSURFACE AND PHYSICAL CONDITIONS, HAZARDOUS ENVIRONMENTAL CONDITIONS

5.03 *Subsurface and Physical Conditions*

SC-5.03 Add the following new paragraphs immediately after Paragraph 5.03.D:

E. The following table lists the reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data, and specifically identifies the Technical Data in the report upon which Contractor may rely: **[If there are no such reports, so indicate in the table.]**

Report Title	Date of Report	Technical Data
097512.00_SEP042024_GEL	9/4/2024	**Geotechnical Borings**

F. The following table lists the drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data, and specifically identifies the Technical Data upon which Contractor may rely: **[If there are no such drawings, so indicate in the table.]**

Drawings Title	Date of Drawings	Technical Data
N/A		

G. Contractor may examine copies of reports and drawings identified in SC-5.03.E and SC-5.03.F that were not included with the Bidding Documents at **the Engineer's office** during regular business hours, or may request copies from Engineer.

5.06 *Hazardous Environmental Conditions*

SC-5.06 Add the following new paragraphs immediately after Paragraph 5.06.A.3:

4. The following table lists the reports known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and the Technical Data (if any) upon which Contractor may rely: **[If there are no such reports, so indicate in the table]**

Report Title	Date of Report	Technical Data
097512.00_FEB282025_LTR	2/28/2025	**Sediment and Stormwater Environmental Testing (Contaminants)**

5. The following table lists the drawings known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and Technical Data (if any) contained in such Drawings upon which Contractor may rely: **[If there are no such drawings, so indicate in the table]**

Drawings Title	Date of Drawings	Technical Data
		[Identify Technical Data]

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

SC-6.01 Add the following paragraphs immediately after Paragraph 6.01.A:

1. *Required Performance Bond Form:* The performance bond that Contractor furnishes will be in the form of EJCDC® C-610, Performance Bond (2010, 2013, or 2018 edition).

2. *Required Payment Bond Form:* The payment bond that Contractor furnishes will be in the form of EJCDC® C-615, Payment Bond (2010, 2013, or 2018 edition).

6.02 *Insurance—General Provisions*

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

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

6.03 *Contractor's Insurance*

SC-6.03 Supplement Paragraph 6.03 with the following provisions after Paragraph 6.03.C:

E. *Workers' Compensation and Employer's Liability:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance, including, as applicable, United States Longshoreman and Harbor Workers' Compensation Act, Jones Act, stop-gap employer's liability coverage for monopolistic states, and foreign voluntary workers' compensation (from available sources, notwithstanding the jurisdictional requirement of Paragraph 6.02.B of the General Conditions).

Workers' Compensation and Related Policies	Policy limits of not less than:
Workers' Compensation	
State	Statutory
Applicable Federal (e.g., Longshoreman's)	Statutory
Foreign voluntary workers' compensation (employer's responsibility coverage), if applicable	Statutory
Jones Act (if applicable)	

Workers' Compensation and Related Policies	Policy limits of not less than:
Bodily injury by accident—each accident	Statutory
Bodily injury by disease—aggregate	Statutory
Employer's Liability	
Each accident	$1,000,000
Each employee	$1,000,000
Policy limit	$2,000,000
Stop-gap Liability Coverage	
For work performed in monopolistic states, stop-gap liability coverage must be endorsed to either the worker's compensation or commercial general liability policy with a minimum limit of:	$

F. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against claims for:

1. damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees,
2. damages insured by reasonably available personal injury liability coverage, and
3. damages because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.

G. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy must be written on a 1996 (or later) Insurance Services Organization, Inc. (ISO) commercial general liability form (occurrence form) and include the following coverages and endorsements:

1. Products and completed operations coverage.
    a. Such insurance must be maintained for three years after final payment.
    b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
2. Blanket contractual liability coverage, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
3. Severability of interests and no insured-versus-insured or cross-liability exclusions.
4. Underground, explosion, and collapse coverage.
5. Personal injury coverage.
6. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together). If Contractor demonstrates to Owner that the specified ISO endorsements are not commercially available, then Contractor may satisfy this requirement by providing equivalent endorsements.

7. For design professional additional insureds, ISO Endorsement CG 20 32 07 04 "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.

H. *Commercial General Liability—Excluded Content:* The commercial general liability insurance policy, including its coverages, endorsements, and incorporated provisions, must not include any of the following:

1. Any modification of the standard definition of "insured contract" (except to delete the railroad protective liability exclusion if Contractor is required to indemnify a railroad or others with respect to Work within 50 feet of railroad property).
2. Any exclusion for water intrusion or water damage.
3. Any provisions resulting in the erosion of insurance limits by defense costs other than those already incorporated in ISO form CG 00 01.
4. Any exclusion of coverage relating to earth subsidence or movement.
5. Any exclusion for the insured's vicarious liability, strict liability, or statutory liability (other than worker's compensation).
6. Any limitation or exclusion based on the nature of Contractor's work.
7. Any professional liability exclusion broader in effect than the most recent edition of ISO form CG 22 79.

I. *Commercial General Liability—Minimum Policy Limits*

Commercial General Liability	**Policy limits of not less than:**
General Aggregate	$2,000,000
Products—Completed Operations Aggregate	$2,000,000
Personal and Advertising Injury	$1,000,000
Bodily Injury and Property Damage—Each Occurrence	$1,000,000

J. *Automobile Liability:* Contractor shall purchase and maintain automobile liability insurance for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy must be written on an occurrence basis.

Automobile Liability	**Policy limits of not less than:**
Bodily Injury	
Each Person	$1,000,000
Each Accident	$1,000,000
Combined Single Limit	
Combined Single Limit (Bodily Injury and Property Damage)	$1,000,000

K. *Umbrella or Excess Liability:* Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the Paragraphs above. The

coverage afforded must be at least as broad as that of each and every one of the underlying policies.

Excess or Umbrella Liability	Policy limits of not less than:
Each Occurrence	$5,000,000
General Aggregate	$5,000,000

L. *Using Umbrella or Excess Liability Insurance to Meet CGL and Other Policy Limit Requirements:* Contractor may meet the policy limits specified for employer's liability, commercial general liability, and automobile liability through the primary policies alone, or through combinations of the primary insurance policy's policy limits and partial attribution of the policy limits of an umbrella or excess liability policy that is at least as broad in coverage as that of the underlying policy, as specified herein. If such umbrella or excess liability policy was required under this Contract, at a specified minimum policy limit, such umbrella or excess policy must retain a minimum limit of $1,000,000 after accounting for partial attribution of its limits to underlying policies, as allowed above.

M. *Contractor's Pollution Liability Insurance:* Contractor shall purchase and maintain a policy covering third-party injury and property damage, including cleanup costs, as a result of pollution conditions arising from Contractor's operations and completed operations. This insurance must be maintained for no less than three years after final completion.

Contractor's Pollution Liability	Policy limits of not less than:
Each Occurrence/Claim	$1,000,000
General Aggregate	$1,000,000

6.04 *Builder's Risk and Other Property Insurance*

SC-6.04 Supplement Paragraph 6.04 of the General Conditions with the following provisions:

F. *Builder's Risk Requirements:* The builder's risk insurance must:

1. be written on a builder's risk "all risk" policy form that at a minimum includes insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment stored and in transit, and must not exclude the coverage of the following risks: fire; windstorm; hail; flood; earthquake, volcanic activity, and other earth movement; lightning; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; and water damage (other than that caused by flood).

    a. Such policy will include an exception that results in coverage for ensuing losses from physical damage or loss with respect to any defective workmanship, methods, design, or materials exclusions.

    b. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake, volcanic activity, and other earth

movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance will be provided through other insurance policies acceptable to Owner and Contractor.

2. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.
3. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of contractors, engineers, and architects).
4. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier). If this coverage is subject to a sublimit, such sublimit will be a minimum of $1,000,000.
5. extend to cover damage or loss to insured property while in transit. If this coverage is subject to a sublimit, such sublimit will be a minimum of $1,000,000.
6. allow for the waiver of the insurer's subrogation rights, as set forth in this Contract.
7. allow for partial occupancy or use by Owner by endorsement, and without cancellation or lapse of coverage.
8. include performance/hot testing and start-up, if applicable.
9. be maintained in effect until the Work is complete, as set forth in Paragraph 15.06.D of the General Conditions.
10. include as named insureds the Owner, Contractor, Subcontractors (of every tier), and any other individuals or entities required by this Contract to be insured under such builder's risk policy.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.03 *Labor; Working Hours*

SC-7.03 Add the following new subparagraphs immediately after Paragraph 7.03.C:

1. Regular working hours will be sunrise to sunset local time.
2. Owner's legal holidays are New Year's Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, and Christmas Day.

ARTICLE 8—OTHER WORK AT THE SITE

No Supplementary Conditions in this Article.

ARTICLE 9—OWNER'S RESPONSIBILITIES

No Supplementary Conditions in this Article.

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

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

C. The Resident Project Representative (RPR) will be Engineer's representative at the Site. RPR's dealings in matters pertaining to the Work in general will be with Engineer and Contractor. RPR's dealings with Subcontractors will only be through or with the full knowledge or approval of Contractor. The RPR will:

1. *Conferences and Meetings:* Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings (but not including Contractor's safety meetings), and as appropriate prepare and circulate copies of minutes thereof.

2. *Safety Compliance:* Comply with Site safety programs, as they apply to RPR, and if required to do so by such safety programs, receive safety training specifically related to RPR's own personal safety while at the Site.

3. *Liaison*

    a. Serve as Engineer's liaison with Contractor. Working principally through Contractor's authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.

    b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.

    c. Assist in obtaining from Owner additional details or information, when required for Contractor's proper execution of the Work.

4. *Review of Work; Defective Work*

    a. Conduct on-Site observations of the Work to assist Engineer in determining, to the extent set forth in Paragraph 10.02, if the Work is in general proceeding in accordance with the Contract Documents.

    b. Observe whether any Work in place appears to be defective.

    c. Observe whether any Work in place should be uncovered for observation, or requires special testing, inspection or approval.

5. *Inspections and Tests*

a. Observe Contractor-arranged inspections required by Laws and Regulations, including but not limited to those performed by public or other agencies having jurisdiction over the Work.

b. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Work.

6. *Payment Requests:* Review Applications for Payment with Contractor.

7. *Completion*

a. Participate in Engineer's visits regarding Substantial Completion.

b. Assist in the preparation of a punch list of items to be completed or corrected.

c. Participate in Engineer's visit to the Site in the company of Owner and Contractor regarding completion of the Work, and prepare a final punch list of items to be completed or corrected by Contractor.

d. Observe whether items on the final punch list have been completed or corrected.

D. The RPR will not:

1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items).

2. Exceed limitations of Engineer's authority as set forth in the Contract Documents.

3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.

4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of construction.

5 Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.

6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.

7. Authorize Owner to occupy the Project in whole or in part.

ARTICLE 11—CHANGES TO THE CONTRACT

No suggested Supplementary Conditions in this Article.

ARTICLE 12—CLAIMS

No suggested Supplementary Conditions in this Article.

ARTICLE 13—COST OF WORK; ALLOWANCES, UNIT PRICE WORK

13.03 *Unit Price Work*

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

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:

   a. the extended price of a particular item of Unit Price Work amounts to **ten** (**10)** percent or more of the Contract Price (based on estimated quantities at the time of Contract formation) and the variation in the quantity of that particular item of Unit Price Work actually furnished or performed by Contractor differs by more than **twenty five (25)** percent from the estimated quantity of such item indicated in the Agreement; and

   b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.

2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.

3. Adjusted unit prices will apply to all units of that item.

ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCCEPTANCE OF DEFECTIVE WORK

No suggested Supplementary Conditions in this Article.

ARTICLE 15—PAYMENTS TO CONTRACTOR, SET OFFS; COMPLETIONS; CORRECTION PERIOD

No Supplementary Conditions for this Article.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

No suggested Supplementary Conditions in this Article.

ARTICLE 17—FINAL RESOLUTIONS OF DISPUTES

17.02 *Arbitration*

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

17.02 *Arbitration*

A. All matters subject to final resolution under this Article will be settled by arbitration administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules (subject to the conditions and limitations of this Paragraph SC-17.02). Any controversy or claim in the amount of $100,000 or less will be settled in accordance with the American Arbitration Association's supplemental rules for Fixed Time and Cost Construction Arbitration. This agreement to arbitrate will be specifically enforceable under the prevailing law of any court having jurisdiction.

B. The demand for arbitration will be filed in writing with the other party to the Contract and with the selected arbitration administrator, and a copy will be sent to Engineer for information. The demand for arbitration will be made within the specific time required in Article 17, or if no specified time is applicable within a reasonable time after the matter in question has arisen, and in no event will any such demand be made after the date when institution of legal or equitable proceedings based on such matter in question would be barred by the applicable statute of limitations.

C. The arbitrator(s) must be licensed engineers, contractors, attorneys, or construction managers. Hearings will take place pursuant to the standard procedures of the Construction Arbitration Rules that contemplate in-person hearings. The arbitrators will have no authority to award punitive or other damages not measured by the prevailing party's actual damages, except as may be required by statute or the Contract. Any award in an arbitration initiated under this clause will be limited to monetary damages and include no injunction or direction to any party other than the direction to pay a monetary amount.

D. The Arbitrators will have the authority to allocate the costs of the arbitration process among the parties, but will only have the authority to allocate attorneys' fees if a specific Law or Regulation or this Contract permits them to do so.

E. The award of the arbitrators must be accompanied by a reasoned written opinion and a concise breakdown of the award. The written opinion will cite the Contract provisions deemed applicable and relied on in making the award.

F. The parties agree that failure or refusal of a party to pay its required share of the deposits for arbitrator compensation or administrative charges will constitute a waiver by that party to present evidence or cross-examine witness. In such event, the other party shall be required to present evidence and legal argument as the arbitrator(s) may require for the making of an award. Such waiver will not allow for a default judgment against the non-paying party in the absence of evidence presented as provided for above.

G. No arbitration arising out of or relating to the Contract will include by consolidation, joinder, or in any other manner any other individual or entity (including Engineer, and Engineer’s consultants and the officers, directors, partners, agents, employees or consultants of any of them) who is not a party to this Contract unless:

   1. the inclusion of such other individual or entity will allow complete relief to be afforded among those who are already parties to the arbitration;

   2. such other individual or entity is substantially involved in a question of law or fact which is common to those who are already parties to the arbitration, and which will arise in such proceedings;

   3. such other individual or entity is subject to arbitration under a contract with either Owner or Contractor, or consents to being joined in the arbitration; and

   4. the consolidation or joinder is in compliance with the arbitration administrator’s procedural rules.

H. The award will be final. Judgment may be entered upon it in any court having jurisdiction thereof, and it will not be subject to modification or appeal, subject to provisions of the Laws and Regulations relating to vacating or modifying an arbitral award.

I. Except as may be required by Laws or Regulations, neither party nor an arbitrator may disclose the existence, content, or results of any arbitration hereunder without the prior written consent of both parties, with the exception of any disclosure required by Laws and Regulations or the Contract. To the extent any disclosure is allowed pursuant to the exception, the disclosure must be strictly and narrowly limited to maintain confidentiality to the extent possible.

17.03 *Attorneys' Fees*

SC-17.03 Add the following new paragraph immediately after Paragraph 17.02.

17.03 *Attorneys' Fees*

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

ARTICLE 18—MISCELLANEOUS

No Supplementary Conditions for this Article

Division A

Section VII – Contract Administration Forms

Contractor's Application for Payment

Owner:	Rose Arbor No. 3 Drain Drainage District	**Owner's Project No.:**	
Engineer:	Civil Engineers, Inc.	**Engineer's Project No.:**	240701
Contractor:		**Contractor's Project No.:**	
Project:	Rose Arbor No. 3 Drain Retention Basin Maintenance		
Contract:			
Application No.:		**Application Date:**	
Application Period:	**From**	**to**	

1. Original Contract Price				$ -
2. Net change by Change Orders				$ -
3. Current Contract Price (Line 1 + Line 2)				$ -
4. Total Work completed and materials stored to date (Sum of Column G Lump Sum Total and Column J Unit Price Total)				$ -
5. Retainage				
a.	5%	X $ -	Work Completed	$ -
b.	25`%	X $ -	Stored Materials	#VALUE!
c. Total Retainage (Line 5.a + Line 5.b)				#VALUE!
6. Amount eligible to date (Line 4 - Line 5.c)				#VALUE!
7. Less previous payments (Line 6 from prior application)				
8. Amount due this application				#VALUE!
9. Balance to finish (Line 3 - Line 4)				$ -

Contractor's Certification

The undersigned Contractor certifies, to the best of its knowledge, the following:

(1) All previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with the Work covered by prior Applications for Payment;

(2) Title to all Work, materials and equipment incorporated in said Work, or otherwise listed in or covered by this Application for Payment, will pass to Owner at time of payment free and clear of all liens, security interests, and encumbrances (except such as are covered by a bond acceptable to Owner indemnifying Owner against any such liens, security interest, or encumbrances); and

(3) All the Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

Contractor:

Signature: **Date:**

Recommended by Engineer		**Approved by Owner**	
By:		**By:**	
Title:		**Title:**	
Date:		**Date:**	
Approved by Funding Agency			
By:		**By:**	
Title:		**Title:**	
Date:		**Date:**	

Progress Estimate - Unit Price Work

Contractor's Application for Payment

Owner: Rose Arbor No. 3 Drain Drainage District
Engineer: Civil Engineers, Inc.
Contractor:
Project: Rose Arbor No. 3 Drain Retention Basin Maintenance
Contract:

Owner's Project No.:
Engineer's Project No.: 240701
Contractor's Project No.:

Application No.: **Application Period:** From to **Application Date:**

A	B	C	D	E	F	G	H	I	J	K	L
		Contract Information				Work Completed					
Bid Item No.	Description	Item Quantity	Units	Unit Price ($)	Value of Bid Item (C X E) ($)	Estimated Quantity Incorporated in the Work	Value of Work Completed to Date (E X G) ($)	Materials Currently Stored (not in G) ($)	Work Completed and Materials Stored to Date (H + I) ($)	% of Value of Item (J / F) (%)	Balance to Finish (F - J) ($)
Original Contract											
1010	Mobilization, Max 5%		LSUM		-		-		-		-
1041	Soil Erosion & Sedimentation Control		LSUM		-		-		-		-
2010	Clearing		ACRE		-		-		-		-
2011	Tree Removal, 6 inch to 18 inch		EA		-		-		-		-
2064	Removal of Saturated Sediment		LSUM		-		-		-		-
2081	Sediment Disposal		TON		-		-		-		-
2100	Site Grading		ACRE								
4356	Riprap, d50 = 6 inch		SYD								
4920	MH Rehabilitation		EA		-		-		-		-
9002	Dewatering Stormwater Basin		LSUM		-		-		-		-
9010	Turf Establishment		SYD		-		-		-		-
9206	Remove & Replace Chain Link Fence		FT		-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
				Original Contract Totals	$ -		$ -	$ -	$ -		$ -

Progress Estimate - Unit Price Work **Contractor's Application for Payment**

Owner:	Rose Arbor No. 3 Drain Drainage District	**Owner's Project No.:**	
Engineer:	Civil Engineers, Inc.	**Engineer's Project No.:**	240701
Contractor:		**Contractor's Project No.:**	
Project:	Rose Arbor No. 3 Drain Retention Basin Maintenance		
Contract:			

Application No.: ______ **Application Period:** From ______ to ______ **Application Date:** ______

A	B	C	D	E	F	G	H	I	J	K	L
		Contract Information				Work Completed					
Bid Item No.	Description	Item Quantity	Units	Unit Price ($)	Value of Bid Item (C X E) ($)	Estimated Quantity Incorporated in the Work	Value of Work Completed to Date (E X G) ($)	Materials Currently Stored (not in G) ($)	Work Completed and Materials Stored to Date (H + I) ($)	% of Value of Item (J / F) (%)	Balance to Finish (F - J) ($)
					Change Orders						
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
				Change Order Totals	$ -		$ -	$ -	$ -		$ -
					Original Contract and Change Orders						
				Project Totals	$ -		$ -	$ -	$ -		$ -

Stored Materials Summary **Contractor's Application for Payment**

Owner:	Rose Arbor No. 3 Drain Drainage District	**Owner's Project No.:**	
Engineer:	Civil Engineers, Inc.	**Engineer's Project No.:**	240701
Contractor:		**Contractor's Project No.:**	
Project:	Rose Arbor No. 3 Drain Retention Basin Maintenance		
Contract:			

Application No.: ______ **Application Period:** **From** ______ **to** ______ **Application Date:** ______

A	B	C	D	E	F	G	H	I	J	K	L	M
						Materials Stored			Incorporated in Work			
Item No. (Lump Sum Tab) or Bid Item No. (Unit Price Tab)	Supplier Invoice No.	Submittal No. (with Specification Section No.)	Description of Materials or Equipment Stored	Storage Location	Application No. When Materials Placed in Storage	Previous Amount Stored ($)	Amount Stored this Period ($)	Amount Stored to Date (G+H) ($)	Amount Previously Incorporated in the Work ($)	Amount Incorporated in the Work this Period ($)	Total Amount Incorporated in the Work (J+K) ($)	Materials Remaining in Storage (I-L) ($)
								-			-	-
								-			-	-
								-			-	-
								-			-	-
								-			-	-
								-			-	-
								-			-	-
								-			-	-
								-			-	-
								-			-	-
								-			-	-
								-			-	-
								-			-	-
								-			-	-
								-			-	-
								-			-	-
								-			-	-
								-			-	-
								-			-	-
								-			-	-
					Totals	$ -	$ -	$ -	$ -	$ -	$ -	$ -

EJCDC C-620 Contractor's Application for Payment

CERTIFICATE OF SUBSTANTIAL COMPLETION

Owner:	Rose Arbor No. 3 Drain Drainage District	Owner's Project No.:	
Engineer:	Civil Engineers, Inc. (CEI)	Engineer's Project No.:	240701
Contractor:		Contractor's Project No.:	
Project:	Rose Arbor No. 3 Drain Retention Basin Maintenance		
Contract Name:			

This Certificate of Substantial Completion applies to:

☐ All Work ☐ The following specified portions of the Work:

Dewatering the existing retention basin and removing accumulated sediment to restore infiltration capacity, and rehabilitating the existing manhole structure using pressure grouting with AV-100 to seal leaks and improve structural integrity.

Date of Substantial Completion: **Friday, 10/03/2025**

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

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

Amendments of contractual responsibilities recorded in this Certificate should be the product of mutual agreement of Owner and Contractor; see Paragraph 15.03.D of the General Conditions.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance, and warranties upon Owner's use or occupancy of the Work must be as provided in the Contract, except as amended as follows:

Amendments to Owner's Responsibilities: ☐ None ☐ As follows:

Amendments to Contractor's Responsibilities: ☐ None ☐ As follows:

The following documents are attached to and made a part of this Certificate:

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

Engineer

By *(signature)*: _____

Name *(printed)*: _____

Title: _____

WORK CHANGE DIRECTIVE NO.: [Number of Work Change Directive]

Owner:	Rose Arbor No. 3 Drain Drainage District	Owner's Project No.:	
Engineer:	Civil Engineers, Inc.	Engineer's Project No.:	240701
Contractor:		Contractor's Project No.:	
Project:	Rose Arbor No. 3 Drain Retention Basin Maintenance		
Contract Name:			
Date Issued:		Effective Date of Work Change Directive:	

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

Description:

[Description of the change to the Work]

Attachments:

[List documents related to the change to the Work]

Purpose for the Work Change Directive:

[Describe the purpose for the change to the Work]

Directive to proceed promptly with the Work described herein, prior to agreeing to change in Contract Price and Contract Time, is issued due to:

Notes to User—Check one or both of the following

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

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

Contract Price: $ _____ **[increase] [decrease] [not yet estimated]**.

Contract Time: _____ days **[increase] [decrease] [not yet estimated]**.

Basis of estimated change in Contract Price:

☐ Lump Sum ☐ Unit Price ☐ Cost of the Work ☐ Other

	Recommended by Engineer	Authorized by Owner
By:		
Title:		
Date:		

CHANGE ORDER NO.: [Number of Change Order]

Owner:	Rose Arbor No. 3 Drain Drainage District	Owner's Project No.:	
Engineer:	Civil Engineers, Inc.	Engineer's Project No.:	240701
Contractor:		Contractor's Project No.:	
Project:	Rose Arbor No. 3 Drain Retention Basin Maintenance		
Date Issued:			

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

Description:

[Description of the change]

Attachments:

[List documents related to the change]

Change in Contract Price	**Change in Contract Times [State Contract Times as either a specific date or a number of days]**
Original Contract Price: $ _____	Original Contract Times: Substantial Completion: _____ Ready for final payment: _____
[Increase] [Decrease] from previously approved Change Orders No. 1 to No. **[Number of previous Change Order]**: $ _____	**[Increase] [Decrease]** from previously approved Change Orders No.1 to No. **[Number of previous Change Order]**: Substantial Completion: _____ Ready for final payment: _____
Contract Price prior to this Change Order: $ _____	Contract Times prior to this Change Order: Substantial Completion: _____ Ready for final payment: _____
[Increase] [Decrease] this Change Order: $ _____	**[Increase] [Decrease]** this Change Order: Substantial Completion: _____ Ready for final payment: _____
Contract Price incorporating this Change Order: $ _____	Contract Times with all approved Change Orders: Substantial Completion: _____ Ready for final payment: _____

	Recommended by Engineer (if required)	Accepted by Contractor
By:	_____	_____
Title:	_____	_____
Date:	_____	_____
	Authorized by Owner	Approved by Funding Agency (if applicable)
By:	_____	_____
Title:	Kalamazoo County Drain Commissioner	_____
Date:	_____	_____

FIELD ORDER NO.: [Number of Field Order]

Owner:	Rose Arbor No. 3 Drain Drainage District	Owner's Project No.:
Engineer:	Civil Engineers, Inc.	Engineer's Project No.: 240701
Contractor:		Contractor's Project No.:
Project:	Rose Arbor No. 3 Drain Retention Basin Maintenance	
Contract Name:		
Date Issued:		Effective Date of Field Order:

Contractor is hereby directed to promptly perform the Work described in this Field Order, issued in accordance with Paragraph 11.04 of the General Conditions, for minor changes in the Work without changes in Contract Price or Contract Times. If Contractor considers that a change in Contract Price or Contract Times is required, submit a Change Proposal before proceeding with this Work.

Reference:

Specification Section(s):

Drawing(s) / Details (s):

Description:

[Description of the change to the Work]

Attachments:

[List documents supporting change]

Issued by Engineer

By: _____

Title: _____

Date: _____

Division A

Section VIII – Reports

3301 Tech Circle Drive
Kalamazoo, MI 49008-5611

T (269) 323-3555

www.sme-usa.com

September 4, 2024

Mr. Andrew Smolarz
Assistant Project Engineer
Civil Engineers, Inc.
14250 Beadle Lake Road, Suite 150
Battle Creek, Michigan 49014

Via E-mail: asmolarz@cei-bc.com

RE: Geotechnical Borings
Rose Arbor & Mystic Estates Soil Borings
Texas Charter Township & Oshtemo Township
Kalamazoo County, Michigan
SME Project No. 097512.00

Dear Mr. Smolarz:

SME has completed the requested geotechnical borings at each basin located in the residential neighborhoods of Texas Charter Township and Oshtemo Township, Michigan. This report describes the field exploration and laboratory testing procedures and transmits the boring log and a diagram depicting the location of the boring.

SME conducted services in general accordance with the scope outlined in our confirmation proposal dated August 13, 2024. Civil Engineers, Inc. (CEI) authorized our services for this project.

To assist with the field exploration and the preparation of this report, CEI provided SME with two PDF files of drawings depicting the location of the requested borings in an e-mail on July 22, 2024.

PROJECT AND SITE DESCRIPTION

The project sites consist of two separate basins that service residential neighborhoods in Texas Charter Township and Oshtemo Township, Michigan. One basin is located directly south of the residential parcel with an address of 5938 Rocky Mountain Street, Kalamazoo, Michigan (Mystic). The other basin is located directly behind (east) of the residential parcel with an address of 4651 Fountain Square Drive, Kalamazoo, Michigan (Rose). The location of the project sites are depicted on the Location Map insets on the Boring Location Diagrams (Figure Nos. 1 and No. 2) attached to this report.

The existing basins are not performing as intended and are having to be pumped to provide sufficient volume for storm events. The anticipated project will consist of improvements to the existing basins.

FIELD EXPLORATION

SME performed a total of four borings. Borings Mystic B1 and Mystic B2, were drilled at the Texas Charter Township site on August 13 and 16, 2024. Borings Rose B1, and Rose B2, were drilled at the Oshtemo Township site on August 20, 2024. Each boring extended to 20 feet below the existing ground surface. The approximate as-drilled location of each boring is depicted on Figure Nos. 1 and No. 2.

The planned number, locations, and depth of the borings was determined by CEI. SME staked the borings in the field and collected the existing ground surface elevations at the boring locations after completion of the field exploration using a GPS unit with a horizontal and vertical accuracy of ±0.1 feet.

The borings were drilled using rotary drill rigs and were advanced to the sampling depths using continuous-flight, hollow-stem augers. The borings included soil sampling based upon the Split-Barrel Sampling procedure. For each boring, SME collected samples at continuous, 2-foot intervals to the boring termination depths. Split-barrel samples recovered from the borings were sealed in glass jars by the driller.

Groundwater observations in the borehole were recorded during and immediately after completion of sampling. The borehole was backfilled with auger cuttings up to the existing ground surface after completion of sampling and collection of groundwater observations. Therefore, long-term groundwater levels were not obtained from the borings.

Soil samples recovered from the field exploration were delivered to the SME laboratory for further observation and testing.

LABORATORY TESTING

The laboratory testing program consisted of performing visual soil classification on recovered soil samples in general accordance with ASTM D-2488 and USDA. A moisture content and hand penetrometer test was performed on a portion of a recovered cohesive sample from boring Mystic B1. The attached Laboratory Testing Procedures provides general descriptions of the laboratory tests. Based on the laboratory testing, we prepared a soil description and assigned a Unified Soil Classification System (USCS) group symbol and a USDA textural soil classification to each of the soil strata encountered.

Upon completion of the laboratory testing, boring logs were prepared that includes the soil descriptions, penetration resistances, pertinent field observations made during the sampling operations, and the results of the laboratory tests. The boring logs are attached to this report. Explanations of symbols and terms used on the logs are provided on the Boring Log Terminology sheet attached to this report.

Soil samples retained over a long time, even sealed in jars, are subject to moisture loss and are no longer representative of the conditions initially encountered in the field. Therefore, soil samples are normally retained in our laboratory for 60 days and are then disposed of, unless instructed otherwise.

LIMITATIONS

The subsurface profiles and groundwater observations included on the attached boring logs are generalized descriptions of the conditions encountered at the borehole locations. The stratification depths shown on the boring logs are intended to indicate a zone of transition from one soil type to another. They are not intended to show exact depths of change from one soil type to another. The soil descriptions are based on visual classification and the results of laboratory testing performed on the soils encountered. Soil conditions may vary between or away from the boring locations. Please refer to the boring logs for the subsurface conditions at the boring locations.

It is sometimes difficult to distinguish between fill and natural soils based on samples from small-diameter borings, especially when portions of the fill do not contain man-made materials, debris, topsoil, or organic layers, and when the fill appears similar in composition to the local natural soils. Therefore, the delineation of fill described on the boring logs, or lack thereof, should be considered approximate only.

Hydrostatic groundwater levels and the elevations and volumes of perched groundwater encountered in excavations should be expected to fluctuate throughout the year, based on variations in precipitation, evaporation, run-off, and other factors. The groundwater observations recorded on the boring log represent conditions at the time the readings were taken. The groundwater levels in the future may vary from those conditions noted on the log.

Engineering recommendations for the project were not requested by CEI. Therefore, SME is not responsible for the interpretation by others of our boring logs or other information in this report. If geotechnical engineering services are desired at a later date, we would be pleased to assist you.

We appreciate the opportunity to be of service. If you have any questions regarding the attached logs and the information provided in this report, or if we can be of further assistance, please call.

Sincerely,

SME

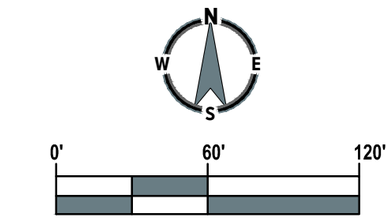
PREPARED BY:

Quinten C. Prieur, EIT
Senior Staff Engineer

REVIEWED BY:

Aaron J. Reed, PE
Senior Consultant

Attachments: Boring Location Diagrams (Figure Nos. 1 and No. 2)
Boring Log Terminology
Boring Logs (Mystic B1, Mystic B2, Rose B1, and Rose B2)
Laboratory Testing Procedures
General Comments
Important Information about This Geotechnical-Engineering Report



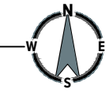
GRAPHIC SCALE: 1" = 60'

LEGEND

APPROXIMATE BORING LOCATION

LOCATION MAP

NOT TO SCALE



NOTE:
1. AERIAL IMAGE TAKEN FROM GOOGLE EARTH PRO WITH AN IMAGE DATE OF 03-31-2024.

SME
www.sme-usa.com

Project
ROSE ARBOR & MYSTIC ESTATES SOIL BORINGS

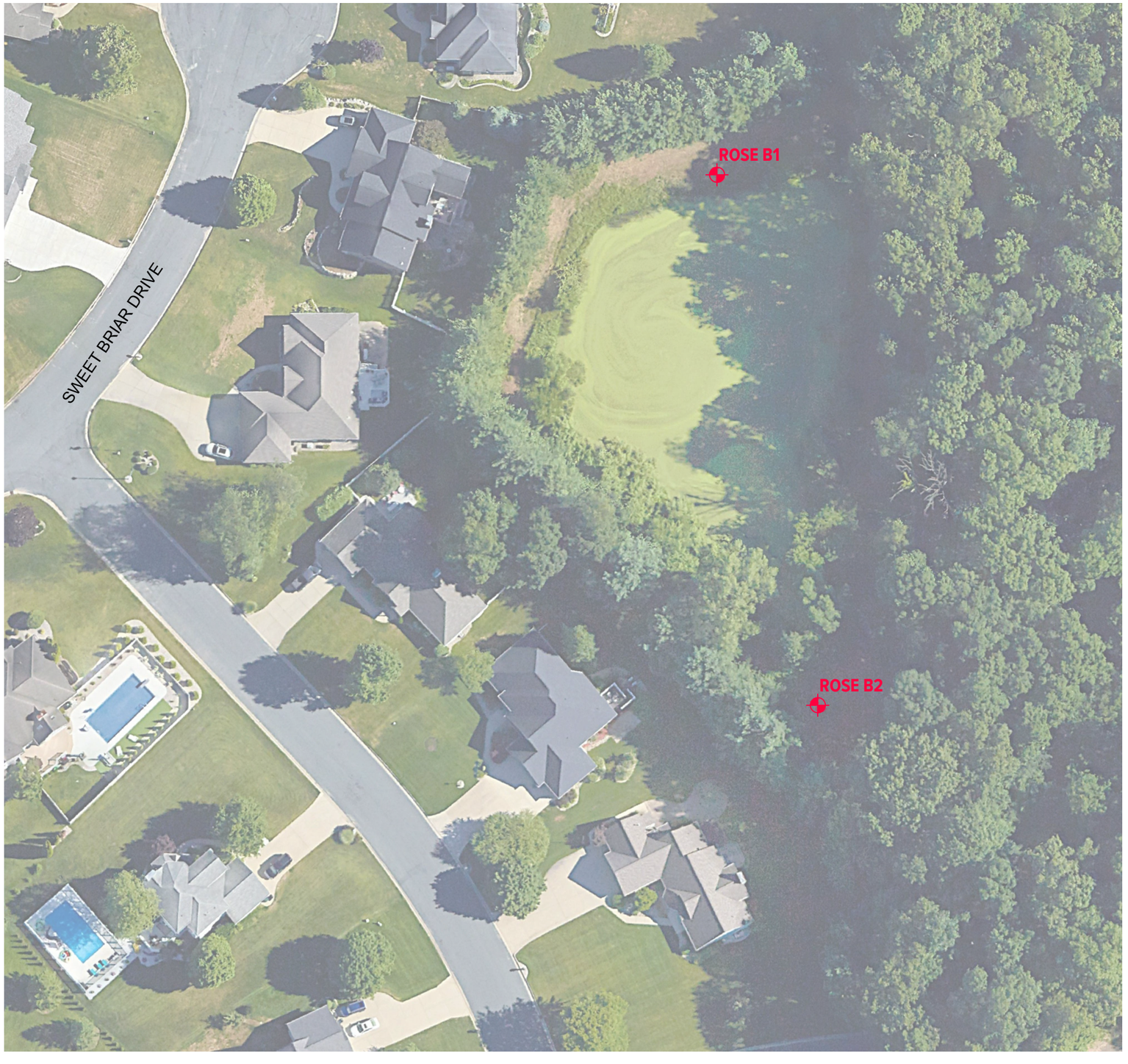
Project Location
TEXAS CHARTER TOWNSHIP, KALAMAZOO COUNTY, MICHIGAN

Sheet Name
BORING LOCATION DIAGRAM

No.	Revision Date

Date 08-21-2024
CADD CRC
Designer QCP
Scale AS NOTED
Project 097512.00
Figure No. 1

PLOT DATE: Aug 23, 2024 - 1:55pm - cindy.rocha-ceron \\sme-inc\pz\WIP\097512.00\CAD\Design Files\BLD\Rev1\097512.00-BLD.dwg



N
W E
S

0' 60' 120'

GRAPHIC SCALE: 1" = 60'

LEGEND

APPROXIMATE BORING LOCATION

LOCATION MAP

NOT TO SCALE

N
W E
S

NOTE:
1. AERIAL IMAGE TAKEN FROM GOOGLE EARTH PRO WITH AN IMAGE DATE OF 03-31-2024.

SME
www.sme-usa.com

Project
ROSE ARBOR & MYSTIC ESTATES SOIL BORINGS

Project Location
OSHTEMO TOWNSHIP, KALAMAZOO COUNTY, MICHIGAN

Sheet Name
BORING LOCATION DIAGRAM

No.	Revision Date

Date	08-21-2024
CADD	CRC
Designer	QCP
Scale	AS NOTED
Project	097512.00
Figure No.	2

PLOT DATE: Aug 23, 2024 - 1:53pm - cindy.rocha-ceron \\sme-inc\pz\WIP\097512.00\CAD\Design Files\BLD\Rev1\097512.00-BLD.dwg

BORING LOG TERMINOLOGY

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

COARSE-GRAINED SOIL
(more than 50% of material is larger than No. 200 sieve size.)

GRAVEL More than 50% of coarse fraction larger than No. 4 sieve size	Clean Gravel (Less than 5% fines)	GW	Well-graded gravel; gravel-sand mixtures, little or no fines
		GP	Poorly-graded gravel; gravel-sand mixtures, little or no fines
	Gravel with fines (More than 12% fines)	GM	Silty gravel; gravel-sand-silt mixtures
		GC	Clayey gravel; gravel-sand-clay mixtures
SAND 50% or more of coarse fraction smaller than No. 4 sieve size	Clean Sand (Less than 5% fines)	SW	Well-graded sand; sand-gravel mixtures, little or no fines
		SP	Poorly graded sand; sand-gravel mixtures, little or no fines
	Sand with fines (More than 12% fines)	SM	Silty sand; sand-silt-gravel mixtures
		SC	Clayey sand; sand–clay-gravel mixtures

FINE-GRAINED SOIL
(50% or more of material is smaller than No. 200 sieve size)

SILT AND CLAY Liquid limit less than 50%		ML	Inorganic silt; sandy silt or gravelly silt with slight plasticity
		CL	Inorganic clay of low plasticity; lean clay, sandy clay, gravelly clay
		OL	Organic silt and organic clay of low plasticity
SILT AND CLAY Liquid limit 50% or greater		MH	Inorganic silt of high plasticity, elastic silt
		CH	Inorganic clay of high plasticity, fat clay
		OH	Organic silt and organic clay of high plasticity
HIGHLY ORGANIC SOIL		PT	Peat and other highly organic soil

OTHER MATERIAL SYMBOLS

Topsoil, Void, Sandstone, Asphalt Concrete, Glacial Till, Siltstone, Aggregate Base, Coal, Limestone, Portland Cement Concrete, Shale, Fill

LABORATORY CLASSIFICATION CRITERIA

GW	$C_U = \frac{D_{60}}{D_{10}}$ greater than 4; $C_C = \frac{D_{30}^2}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limits below "A" line or PI less than 4	Above "A" line with PI between 4 and 7 are borderline cases requiring use of dual symbols
GC	Atterberg limits above "A" line with PI greater than 7	
SW	$C_U = \frac{D_{60}}{D_{10}}$ greater than 6; $C_C = \frac{D_{30}^2}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for SW	
SM	Atterberg limits below "A" line or PI less than 4	Above "A" line with PI between 4 and 7 are borderline cases requiring use of dual symbols
SC	Atterberg limits above "A" line with PI greater than 7	

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than 5 percent……GW, GP, SW, SP
More than 12 percent……GM, GC, SM, SC
5 to 12 percent……Cases requiring dual symbols

- SP-SM or SW-SM (SAND with Silt or SAND with Silt and Gravel)
- SP-SC or SW-SC (SAND with Clay or SAND with Clay and Gravel)
- GP-GM or GW-GM (GRAVEL with Silt or GRAVEL with Silt and Sand)
- GP-GC or GW-GC (GRAVEL with Clay or GRAVEL with Clay and Sand)

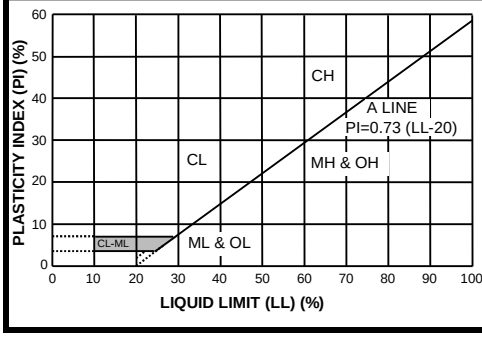
If the fines are CL-ML:

- SC-SM (SILTY CLAYEY SAND or SILTY CLAYEY SAND with Gravel)
- SM-SC (CLAYEY SILTY SAND or CLAYEY SILTY SAND with Gravel)
- GC-GM (SILTY CLAYEY GRAVEL or SILTY CLAYEY GRAVEL with Sand)

PARTICLE SIZES

Boulders	-	Greater than 12 inches
Cobbles	-	3 inches to 12 inches
Gravel- Coarse	-	3/4 inches to 3 inches
Fine	-	No. 4 to 3/4 inches
Sand- Coarse	-	No. 10 to No. 4
Medium	-	No. 40 to No. 10
Fine	-	No. 200 to No. 40
Silt and Clay	-	Less than (0.074 mm)

PLASTICITY CHART



VISUAL MANUAL PROCEDURE

When laboratory tests are not performed to confirm the classification of soils exhibiting borderline classifications, the two possible classifications would be separated with a slash, as follows:

For soils where it is difficult to distinguish if it is a coarse or fine-grained soil:

- SC/CL (CLAYEY SAND to Sandy LEAN CLAY)
- SM/ML (SILTY SAND to SANDY SILT)
- GC/CL (CLAYEY GRAVEL to Gravelly LEAN CLAY)
- GM/ML (SILTY GRAVEL to Gravelly SILT)

For soils where it is difficult to distinguish if it is sand or gravel, poorly or well-graded sand or gravel; silt or clay; or plastic or non-plastic silt or clay:

- SP/GP or SW/GW (SAND with Gravel to GRAVEL with Sand)
- SC/GC (CLAYEY SAND with Gravel to CLAYEY GRAVEL with Sand)
- SM/GM (SILTY SAND with Gravel to SILTY GRAVEL with Sand)
- SW/SP (SAND or SAND with Gravel)
- GP/GW (GRAVEL or GRAVEL with Sand)
- SC/SM (CLAYEY to SILTY SAND)
- GM/GC (SILTY to CLAYEY GRAVEL)
- CL/ML (SILTY CLAY)
- ML/CL (CLAYEY SILT)
- CH/MH (FAT CLAY to ELASTIC SILT)
- CL/CH (LEAN to FAT CLAY)
- MH/ML (ELASTIC SILT to SILT)

DRILLING AND SAMPLING ABBREVIATIONS

2ST	–	Shelby Tube – 2" O.D.
3ST	–	Shelby Tube – 3" O.D.
AS	–	Auger Sample
GS	–	Grab Sample
LS	–	Liner Sample
NR	–	No Recovery
PM	–	Pressuremeter
RC	–	Rock Core diamond bit. NX size, except where noted
SB	–	Split Barrel Sample 1-3/8" I.D., 2" O.D., except where noted
VS	–	Vane Shear
WS	–	Wash Sample

OTHER ABBREVIATIONS

WOH	–	Weight of Hammer
WOR	–	Weight of Rods
SP	–	Soil Probe
PID	–	Photo Ionization Device
FID	–	Flame Ionization Device

DEPOSITIONAL FEATURES

Parting	–	as much as 1/16 inch thick
Seam	–	1/16 inch to 1/2 inch thick
Layer	–	1/2 inch to 12 inches thick
Stratum	–	greater than 12 inches thick
Pocket	–	deposit of limited lateral extent
Lens	–	lenticular deposit
Hardpan/Till	–	an unstratified, consolidated or cemented mixture of clay, silt, sand and/or gravel, the size/shape of the constituents vary widely
Lacustrine	–	soil deposited by lake water
Mottled	–	soil irregularly marked with spots of different colors that vary in number and size
Varved	–	alternating partings or seams of silt and/or clay
Occasional	–	one or less per foot of thickness
Frequent	–	more than one per foot of thickness
Interbedded	–	strata of soil or beds of rock lying between or alternating with other strata of a different nature

DESCRIPTION OF RELATIVE QUANTITIES

The visual-manual procedure uses the following terms to describe the relative quantities of notable foreign materials, gravel, sand or fines:

Trace	–	particles are present but estimated to be less than 5%
Few	–	5 to 10%
Little	–	15 to 25%
Some	–	30 to 45%
Mostly	–	50 to 100%

CLASSIFICATION TERMINOLOGY AND CORRELATIONS

Cohesionless Soils

Relative Density	N_{60} (N-Value) (Blows per foot)
Very Loose	0 to 4
Loose	5 to 10
Medium Dense	11 to 30
Dense	31 to 50
Very Dense	51 to 80
Extremely Dense	Over 81

Cohesive Soils

Consistency	N_{60} (N-Value) (Blows per foot)	Undrained Shear Strength (kips/ft^2)
Very Soft	<2	0.25 or less
Soft	2 - 4	> 0.25 to 0.50
Medium	5 - 8	> 0.50 to 1.0
Stiff	9 - 15	> 1.0 to 2.0
Very Stiff	16 - 30	> 2.0 to 4.0
Hard	> 30	> 4.0 or greater

Standard Penetration 'N-Value' = Blows per foot of a 140-pound hammer falling 30 inches on a 2-inch O.D. split barrel sampler, except where noted. N60 values as reported on boring logs represent raw N-values corrected for hammer efficiency only.

SME

BORING Mystic B1

BORING DEPTH: 20 FEET

PROJECT NAME: Rose Arbor & Mystic Estates
PROJECT NUMBER: 097512.00
CLIENT: Civil Engineers, Inc.
PROJECT LOCATION: Texas Charter Township, Michigan

DATE STARTED: 8/13/24 **COMPLETED:** 8/13/24 **BORING METHOD:** Hollow-stem Augers

DRILLER: AK **RIG NO.:** 524 (CME55-ATV) **LOGGED BY:** TAG **CHECKED BY:** QCP/AJR

LATITUDE: 42.23832
LONGITUDE: -85.73916
ELEVATION: 918.2 FT NAVD88

DEPTH (FEET)	ELEVATION (FEET)	PROFILE DESCRIPTION	SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	SPT BLOWS PER SIX INCHES
0.3	917.9	3 Inches of TOPSOIL	SB1	24	8 7 6 6
		FILL- Fine to Medium SAND with Silt- Frequent Clay Seams- Occasional Root and Wood Pieces- Grayish Brown- Medium Dense to Loose (SP-SM/Loamy Sand)	SB2	24	2 2 4 6
			SB3	24	5 6 6 7
6.0	912.2	Fine to Medium SILTY SAND- Occasional Clay Layers- Gray- Wet- Loose (SM/Loamy Sand)	SB4	24	3 4 3 2
			SB5	24	3 2 2 1
10.0	908.2	Fine to Medium CLAYEY SAND- Brown- Wet- Very Loose (SC/Sandy Clay Loam)	SB6	24	1 1 0 1
12.0	906.2	Fine to Medium SILTY SAND- Gray- Wet- Medium Dense (SM/Loamy Sand)	SB7	24	3 4 5 5
			SB8	24	2 3 6 7
			SB9	24	10 6 11 11
18.0	900.2	Sandy LEAN CLAY- Gray- Very Stiff (CL/Clay)	SB10	24	2 4 10 11
19.0	899.2	Fine to Medium SAND with Silt and Gravel- Brown- Wet- Medium Dense (SP-SM/Loamy Sand)			
20.0	898.2	END OF BORING AT 20.0 FEET.			

HAMMER EFFICIENCY: 85%
DATE: 1/14/2024
N_{60} -- ○

DRY DENSITY (pcf) -- ■ (90 100 110 120)
MOISTURE & ATTERBERG LIMITS (%) (PL MC LL)
SHEAR STRENGTH (KSF) (1 2 3 4)
▽ HAND PENE.
⊠ TORVANE SHEAR
● UNC. COMP.
⊡ VANE SHEAR (PK)
× VANE SHEAR (REM)
⊕ TRIAXIAL (UU)

REMARKS:
- Cobbles encountered from 2 feet to 6 feet below the ground surface.
- Cobbles encountered from 10 feet to 12 feet below the ground surface.

GROUNDWATER & BACKFILL INFORMATION

	DEPTH (FT)	ELEV (FT)
▽ **DURING BORING:**	6.0	912.2
▼ **AT END OF BORING:**	12.0	906.2

BACKFILL METHOD: Auger Cuttings

NOTES:
1. The indicated stratification lines are approximate. The in-situ transitions between materials may be gradual.
2. The colors depicted on the symbolic profile are solely for visualization purposes and do not necessarily represent the in-situ colors encountered.

SME

BORING Mystic B2

BORING DEPTH: 20 FEET

PROJECT NAME: Rose Arbor & Mystic Estates
PROJECT NUMBER: 097512.00
CLIENT: Civil Engineers, Inc.
PROJECT LOCATION: Texas Charter Township, Michigan

DATE STARTED: 8/16/24 **COMPLETED:** 8/16/24 **BORING METHOD:** Hollow-stem Augers

DRILLER: AK **RIG NO.:** 526 (CME55) **LOGGED BY:** TAG **CHECKED BY:** QCP/AJR

LATITUDE: 42.23819
LONGITUDE: -85.73889
ELEVATION: 920.5 FT NAVD88

ELEVATION (FEET)	DEPTH (FEET)	PROFILE DESCRIPTION		SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	SPT BLOWS PER SIX INCHES
920	0	8 Inches of TOPSOIL	0.7 / 919.8	SB1	24	2 2 3 4
		Fine to Medium CLAYEY SAND- Brown- Moist- Loose to Medium Dense (SC/Loamy Sand)		SB2	24	3 3 5 5
	4.0		916.5	SB3	24	3 3 3 3
915	5	Fine to Medium SAND with Silt- Brown- Wet- Loose (SP-SM/Sand)	6.0 / 914.5	SB4	24	2 1 2 4
		Fine to Medium SAND with Silt- Frequent Silty Sand Seams- Brown- Wet- Very Loose (SP-SM/Sand)	8.0 / 912.5	SB5	24	2 2 4 9
910	10	Fine to Coarse SAND with Silt and Gravel- Brown- Wet- Loose (SP-SM/Sand)	12.0 / 908.5	SB6	24	3 3 4 8
		Fine to Medium SILTY SAND- Brown- Wet- Medium Dense to Loose (SM/Loamy Sand)	16.0 / 904.5	SB7	10	3 4 7 8
905	15			SB8	24	3 3 4 5
		Fine to Coarse CLAYEY SAND- Occasional Sandy Clay Seams- Brown- Wet- Medium Dense (SC/Sandy Clay Loam)	20.0 / 900.5	SB9	24	3 4 5 8
	20			SB10	24	4 5 7 8
900		END OF BORING AT 20.0 FEET.				
895	25					
	30					

HAMMER EFFICIENCY: 85%
DATE: 1/15/2024
N_{60} -- ○

DRY DENSITY (pcf) -- ■ (90 100 110 120)
MOISTURE & ATTERBERG LIMITS (%) (PL MC LL) (10 20 30 40)
SHEAR STRENGTH (KSF) (1 2 3 4)
▽ HAND PENE.
⊠ TORVANE SHEAR
● UNC. COMP.
⊡ VANE SHEAR (PK)
× VANE SHEAR (REM)
⊕ TRIAXIAL (UU)

REMARKS

GROUNDWATER & BACKFILL INFORMATION

	DEPTH (FT)	ELEV (FT)
▽ **DURING BORING:**	4.0	916.5
CAVE-IN OF BOREHOLE AT:	6.0	914.5

BACKFILL METHOD: Auger Cuttings

NOTES:
1. The indicated stratification lines are approximate. The in-situ transitions between materials may be gradual.
2. The colors depicted on the symbolic profile are solely for visualization purposes and do not necessarily represent the in-situ colors encountered.
3. Groundwater was not encountered above cave-in depth at completion of drilling.

SME

BORING Rose B1

BORING DEPTH: 20 FEET

PROJECT NAME: Rose Arbor & Mystic Estates
PROJECT NUMBER: 097512.00
CLIENT: Civil Engineers, Inc.
PROJECT LOCATION: Oshtemo Township, Michigan

DATE STARTED: 8/20/24 **COMPLETED:** 8/20/24 **BORING METHOD:** Hollow-stem Augers
DRILLER: AK **RIG NO.:** 524 (CME55-ATV) **LOGGED BY:** TAG **CHECKED BY:** QCP/AJR

LATITUDE: 42.24875
LONGITUDE: -85.65370
ELEVATION: 936.3 FT NAVD88

PROFILE DESCRIPTION

- 0.5 — 6 Inches of TOPSOIL — 935.8
- 2.0 — Fine to Medium SAND with Silt- Brown- Moist- Medium Dense (SP-SM/Sand) — 934.3
- Fine to Coarse SAND with Silt and Gravel- Brown- Medium Dense (SP-SM/Sand)
- 6.0 — 930.3
- Fine to Medium SAND- Light Brown- Moist- Loose to Medium Dense (SP/Sand)
- 20.0 — 916.3
- END OF BORING AT 20.0 FEET.

SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	SPT BLOWS PER SIX INCHES
SB1	18	3 4 5 5
SB2	18	12 9 9 9
SB3	18	9 10 7 7
SB4	18	4 2 4 4
SB5	18	5 7 5 6
SB6	18	5 4 6 5
SB7	18	10 10 10 14
SB8	18	9 8 10 11
SB9	18	9 9 11 15
SB10	18	7 9 10 11

HAMMER EFFICIENCY: 85%
DATE: 1/14/2024
N_{60} -- ○

DRY DENSITY (pcf) -- ■
MOISTURE & ATTERBERG LIMITS (%)
SHEAR STRENGTH (KSF)
▽ HAND PENE.
⊠ TORVANE SHEAR
● UNC. COMP.
⊡ VANE SHEAR (PK)
× VANE SHEAR (REM)
⊕ TRIAXIAL (UU)

REMARKS

Cobbles encountered from 0.5 feet to 2 feet below the ground surface.

GROUNDWATER & BACKFILL INFORMATION

GROUNDWATER WAS NOT ENCOUNTERED

BACKFILL METHOD: Auger Cuttings

NOTES:
1. The indicated stratification lines are approximate. The in-situ transitions between materials may be gradual.
2. The colors depicted on the symbolic profile are solely for visualization purposes and do not necessarily represent the in-situ colors encountered.

SME

BORING Rose B2

BORING DEPTH: 20 FEET

PROJECT NAME: Rose Arbor & Mystic Estates

PROJECT NUMBER: 097512.00

CLIENT: Civil Engineers, Inc.

PROJECT LOCATION: Oshtemo Township, Michigan

DATE STARTED: 8/20/24 **COMPLETED:** 8/20/24 **BORING METHOD:** Hollow-stem Augers

DRILLER: AK **RIG NO.:** 524 (CME55-ATV) **LOGGED BY:** TAG **CHECKED BY:** QCP/AJR

LATITUDE: 42.24792
LONGITUDE: -85.65346
ELEVATION: 935.7 FT NAVD88

PROFILE DESCRIPTION

- 0.5 — 6 Inches of TOPSOIL — 935.2
- Fine to Medium CLAYEY SAND- Brown- Moist- Medium Dense (SC/Sandy Loam)
- 4.0 — 931.7
- Fine to Medium SAND with Gravel- Light Brown- Moist- Loose to Medium Dense (SP/Sand)
- 8.0 — 927.7
- Fine to Medium SAND- Light Brown- Moist- Medium Dense (SP/Sand)
- 20.0 — 915.7
- END OF BORING AT 20.0 FEET.

SAMPLE TYPE/NO. INTERVAL	RECOVERY LENGTH (INCHES)	SPT BLOWS PER SIX INCHES
SB1	18	6 8 8 10
SB2	18	4 4 4 4
SB3	18	2 2 3 4
SB4	18	5 4 6 5
SB5	18	5 5 6 7
SB6	18	5 6 7 7
SB7	18	5 7 8 8
SB8	18	5 6 7 8
SB9	18	5 5 6 8
SB10	18	6 7 9 11

HAMMER EFFICIENCY: 85%
DATE: 1/14/2024
N_{60} -- ○

DRY DENSITY (pcf) -- ■ (90 100 110 120)
MOISTURE & ATTERBERG LIMITS (%) (PL MC LL)

HAND PENE. ▽
TORVANE SHEAR ☒
UNC. COMP. ●
VANE SHEAR (PK) ⊡
VANE SHEAR (REM) ×
TRIAXIAL (UU) ⊕
SHEAR STRENGTH (KSF)

REMARKS

Cobbles encountered from 0.5 feet to 2 feet below the ground surface.

GROUNDWATER & BACKFILL INFORMATION

GROUNDWATER WAS NOT ENCOUNTERED

BACKFILL METHOD: Auger Cuttings

NOTES:
1. The indicated stratification lines are approximate. The in-situ transitions between materials may be gradual.
2. The colors depicted on the symbolic profile are solely for visualization purposes and do not necessarily represent the in-situ colors encountered.

LABORATORY TESTING PROCEDURES

VISUAL ENGINEERING CLASSIFICATION

Visual classification was performed on recovered samples. The appended General Notes and Unified Soil Classification System (USCS) sheets include a brief summary of the general method used visually classify the soil and assign an appropriate USCS group symbol. The estimated group symbol, according to the USCS, is shown in parentheses following the textural description of the various strata on the boring logs appended to this report. The soil descriptions developed from visual classifications are sometimes modified to reflect the results of laboratory testing.

MOISTURE CONTENT

Moisture content tests were performed by weighing samples from the field at their in-situ moisture condition. These samples were then dried at a constant temperature (approximately 110º C) overnight in an oven. After drying, the samples were weighed to determine the dry weight of the sample and the weight of the water that was expelled during drying. The moisture content of the specimen is expressed as a percent and is the weight of the water compared to the dry weight of the specimen.

HAND PENETROMETER TESTS

In the hand penetrometer test, the unconfined compressive strength of a cohesive soil sample is estimated by measuring the resistance of the sample to the penetration of a small calibrated, spring-loaded cylinder. The maximum capacity of the penetrometer is 4.5 tons per square-foot (tsf). Theoretically, the undrained shear strength of the cohesive sample is one-half the unconfined compressive strength. The undrained shear strength (based on the hand penetrometer test) presented on the boring logs is reported in units of kips per square-foot (ksf).

TORVANE SHEAR TESTS

In the Torvane test, the shear strength of a low strength, cohesive soil sample is estimated by measuring the resistance of the sample to a torque applied through vanes inserted into the sample. The undrained shear strength of the samples is measured from the maximum torque required to shear the sample and is reported in units of kips per square-foot (ksf).

LOSS-ON-IGNITION (ORGANIC CONTENT) TESTS

Loss-on-ignition (LOI) tests are conducted by first weighing the sample and then heating the sample to dry the moisture from the sample (in the same manner as determining the moisture content of the soil). The sample is then re-weighed to determine the dry weight and then heated for 4 hours in a muffle furnace at a high temperature (approximately 440º C). After cooling, the sample is re-weighed to calculate the amount of ash remaining, which in turn is used to determine the amount of organic matter burned from the original dry sample. The organic matter content of the specimen is expressed as a percent compared to the dry weight of the sample.

ATTERBERG LIMITS TESTS

Atterberg limits tests consist of two components. The plastic limit of a cohesive sample is determined by rolling the sample into a thread and the plastic limit is the moisture content where a 1/8-inch thread begins to crumble. The liquid limit is determined by placing a ½-inch thick soil pat into the liquid limits cup and using a grooving tool to divide the soil pat in half. The cup is then tapped on the base of the liquid limits device using a crank handle. The number of drops of the cup to close the gap formed by the grooving tool ½ inch is recorded along with the corresponding moisture content of the sample. This procedure is repeated several times at different moisture contents and a graph of moisture content and the corresponding number of blows is plotted. The liquid limit is defined as the moisture content at a nominal 25 drops of the cup. From this test, the plasticity index can be determined by subtracting the plastic limit from the liquid limit.

GENERAL COMMENTS

BASIS OF GEOTECHNICAL REPORT

This report has been prepared in accordance with generally accepted geotechnical engineering practices to assist in the design and/or evaluation of this project. If the project plans, design criteria, and/or other project information referenced in this report and utilized by SME to prepare our recommendations are changed, the conclusions and recommendations contained in this report are not considered valid unless the changes are reviewed, and the conclusions and recommendations of this report are modified or approved in writing.

The discussions and recommendations contained in this report are based on the available project information, described in this report, and the geotechnical data obtained from the field exploration at the locations indicated in the report. Variations in soil and groundwater conditions commonly occur between or away from sampling locations. The nature and extent of the variations may not become evident until the time of construction. If significant variations are observed during construction, SME must be contacted to reevaluate the recommendations of this report.

In the process of obtaining and testing samples and preparing this report, procedures are followed that represent reasonable and accepted practice in the field of geotechnical engineering. Specifically, field logs are prepared during the field exploration that describe field occurrences, sampling locations, and other information. Samples obtained in the field are frequently subjected to additional testing and reclassification in the laboratory and differences may exist between the field logs and the report logs.
The engineer preparing the report reviews the field logs, laboratory classifications, and test data and then prepares the report logs. Our recommendations are based on the contents of the report logs and the information contained therein.

REVIEW OF DESIGN DETAILS, PLANS, AND SPECIFICATIONS

Retain SME to review the design details, project plans, and specifications to verify those documents are consistent with the recommendations contained in this report.

REVIEW OF REPORT INFORMATION WITH PROJECT TEAM

Implementation of our recommendations may affect the design, construction, and performance of the proposed improvements, along with the potential inherent risks involved with the proposed construction. The client and key members of the design team, including SME, should discuss the issues covered in this report so the issues are understood and applied in a manner consistent with the owner's budget, tolerance of risk, and expectations for performance and maintenance.

FIELD VERIFICATION OF GEOTECHNICAL CONDITIONS

SME needs to be retained to continue our services through construction so we may observe and evaluate the actual subsurface conditions relative to the recommendations made in this report, and so we can verify the recommendations of this report are properly implemented during construction. This may avoid misinterpretation of our recommendations by other parties and will allow us to review and modify our recommendations if variations in the site subsurface conditions are encountered.

PROJECT INFORMATION FOR CONTRACTOR

This report and any future addenda or other reports regarding this site needs to be made available to prospective contractors prior to submitting their proposals for their information only and to supply them with facts relative to the subsurface evaluation and laboratory test results. If the selected contractor encounters subsurface conditions during construction, which differ from those presented in this report, the contractor needs to promptly describe the nature and extent of the differing conditions in writing and SME needs to be notified so we can verify those conditions. The construction contract needs to include provisions for dealing with differing conditions, and contingency funds for potential problems during earthwork and foundation construction. We would be pleased to assist with the development of contract provisions based on our experience.

The contractor needs to be prepared to handle environmental conditions encountered at this site, which may affect the excavation, removal, or disposal of soil; dewatering of excavations; and health and safety of workers. Any Environmental Assessment reports prepared for this site need to be made available for review by bidders and the successful contractor.

THIRD PARTY RELIANCE/REUSE OF THIS REPORT

This report has been prepared solely for the use of our Client for the project specifically described in this report. This report cannot be relied upon by other parties not involved in the project, unless specifically allowed by SME in writing. SME also is not responsible for the interpretation by other parties of the geotechnical data and the recommendations provided herein.

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept*

responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are <u>not</u> final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals' plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for information purposes only.* To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are <u>Not</u> Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer's services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will <u>not</u> of itself be sufficient to prevent moisture infiltration. Confront the risk of moisture infiltration*** by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are <u>not</u> building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org

3301 Tech Circle Drive
Kalamazoo, MI 49008-5611

T (269) 323-3555

www.sme-usa.com

February 28, 2025

Mr. Andrew Smolarz
Assistant Project Engineer
Civil Engineers, Inc.
14250 Beadle Lake Road, Suite 150
Battle Creek, Michigan 49014

Via E-mail: asmolarz@cei-bc.com

RE: Rose Arbor Retention Pond Sediment and Stormwater Environmental Testing
Rose Arbor & Mystic Estates Soil Borings
Oshtemo Township, Michigan
SME Project No. 097512.00

Dear Mr. Smolarz:

SME has completed the sediment and stormwater sampling for the referenced project. This report summarizes the sampling and laboratory analysis procedures and transmits the results of the laboratory analysis.

SME performed our services in general accordance with the scope outlined in SME Change Order Request (COR) No. 1, dated January 10, 2025. Our services for this evaluation were authorized by Civil Engineers, Inc.

PROJECT DESCRIPTION

CEI requested SME collect a sample of the stormwater and sediment located within the Rose Arbor retention pond located behind 4641 Fountain Square Dr in Kalamazoo, Michigan. We understand the stormwater located within the basin will be dewatered onto an adjoining property and the sediment will be dredged and disposed at a landfill. The location of the basin is depicted in the image below.

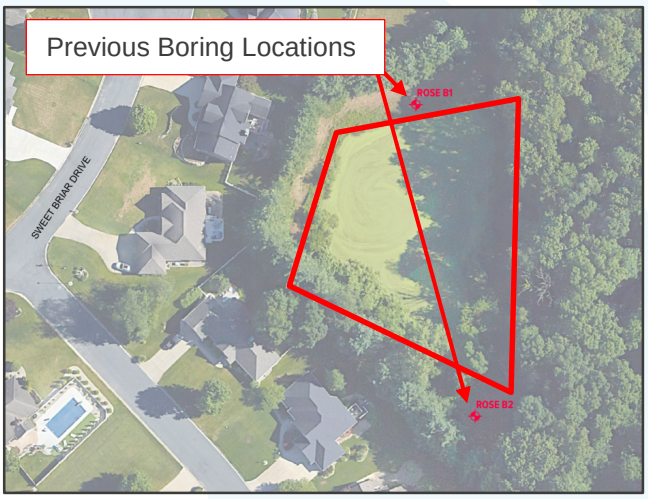


IMAGE 1: Approximate limits of Rose Arbor retention basin

It is our understanding that the removed sediment is to be disposed at a Republic Services landfill. Republic Services requested that the collected sediment sample be submitted for laboratory analysis of the following:

- TCLP RCRA-8 Metals
- TCLP Volatiles
- TCLP Semi-volatiles
- TNORM
- pH
- Paint Filter
  - If the material passes the paint filter test, test for the following additional items:
    - Total PCBs on a dry weight basis
  - If the material fails the paint filter test, test for the following additional items:
    - Flash Point
    - Total PCB's on a wet weight basis

The existing stormwater located in the basin was submitted for laboratory analysis of the parameters listed in the attached "City of Kalamazoo Dewatering Projects – Sampling Parameters" guidelines.

SAMPLE COLLECTION

SME advanced three borings using a hand-operated bucket auger within the interior of the basin. Each boring extended to a depth of about 1 foot below the existing bottom of the basin surface. Samples collected from each boring were placed within Ziploc bags and then composited into a single sample (Sediment 1) that was transferred directly into the analytical laboratory supplied, preserved (as applicable), pre-cleaned containers for sample collection. A sample of stormwater present in the basin at the time of sampling was transferred directly into an analytical laboratory supplied, preserved (as applicable), pre-cleaned container for sample collection.

SME's field representative wore a new pair of disposable nitrile sampling gloves during collection of each sample to minimize cross-contamination. Soil sampling equipment was decontaminated prior to sample collection with a laboratory-grade detergent/distilled water solution wash followed by a distilled water rinse. SME's field representative followed chain-of-custody procedures to document the sample handling sequence. Sample handling and custody requirements and QA/QC procedures were in general accordance with our standard operating procedures.

LABORATORY ANALYSES

SME submitted the composite sediment sample and stormwater sample to Metiri Group (Metiri) of Holt, Michigan for the laboratory analyses. The sediment and stormwater samples were analyzed for the above-listed constituents. The paint filter test of the sediment did fail, so flash point and PCB's on wet weight basis were also completed.

RESULTS

The results of the analysis of the sediment and stormwater samples are included in the attached laboratory data reports. The complete list of specific analytical reference methods, reporting limits, and chain-of-custody documentation for the collected sample are included with the report. We compared the

results of the stormwater sample to the City of Kalamazoo dewatering parameters as shown in the attached table. Analytical results of the stormwater sample did not exceed the discharge limits established by the City of Kalamazoo.

We appreciate the opportunity to be of service. If you have any questions regarding the attached laboratory reports and the information in this report, or if we can be of further assistance, please call.

Sincerely,

SME

PREPARED BY:

Aaron J. Reed, PE
Senior Consultant

REVIEWED BY:

Sara Bals, EIT
Senior Consultant

Attachments: City of Kalamazoo Dewatering Projects – Sampling Parameters
Table 1: Summary of Stormwater Analytical Results
Metiri Laboratory Data Reports (dated January 24, 2025, and February 12, 2025)
Eurofins Analytical Report (dated February 19, 2025)

Department of Public Services
WastewaterDivision
Harrison Street Facility
1415 North Harrison Street
Kalamazoo, Michigan 49007-2565
Ph. 269-337-8667
Fx. 269-337-8765
Email drzickm@Kalamazoocity.org

City of Kalamazoo

Dewatering Projects - Sampling Parameters

The following parameters are required to be sampled and analyzed by Approved EPA 136 methods. The sample results shall be submitted to this office before approval will be granted to discharge to the Kalamazoo Water Reclamation Plant.

Sanitary Sewer Parameters	Local Discharge Limits - Comments		Method Quantification Levels	40 CFR Part 136 Approved Analytical Methods
METALS				
Arsenic, total	270 ug/L	Local Discharge Limit	1 ug/L	EPA 200.8 Rev. 5.4; SM 3125 B–2011; ASTM D5673–16
Cadmium, total	75 ug/L	Local Discharge Limit	0.2 ug/L	EPA 200.8 Rev. 5.4; SM 3125 B–2011; ASTM D5673–16
Chromium, total	4,900 ug/L	Local Discharge Limit	10 ug/L	EPA 200.8 Rev. 5.4; SM 3125 B–2011; ASTM D5673–16
Copper, total	1,900 ug/L	Local Discharge Limit	1 ug/L	EPA 200.8 Rev. 5.4; SM 3125 B–2011; ASTM D5673–16
Lead, total	360 ug/L	Local Discharge Limit	1 ug/L	EPA 200.8 Rev. 5.4; SM 3125 B–2011; ASTM D5673–16
Nickel, total	920 ug/L	Local Discharge Limit	5 ug/L	EPA 200.8 Rev. 5.4; SM 3125 B–2011; ASTM D5673–16
Selenium, total	56 ug/L	Local Discharge Limit	1 ug/L	EPA 200.8 Rev. 5.4; SM 3125 B–2011; ASTM D5673–16
Silver, total	25 ug/L	Local Discharge Limit	<0.1 mg/L	EPA 200.8 Rev. 5.4; SM 3125 B–2011; ASTM D5673–16
Zinc, total	7,200 ug/L	Local Discharge Limit	10 ug/L	EPA 200.8 Rev. 5.4; SM 3125 B–2011; ASTM D5673–16
Lithium, total	2400 ug/L	Local Discharge Limit	10 ug/L	EPA 200.7 Rev. 4.4; SM 3120 B–2011; ASTM D1976–12
Molybdenum	650 ug/L	Local Discharge Limit	0.6 ng/L	EPA 200.8 Rev. 5.4; SM 3125 B–2011; ASTM D5673–16
Mercury, total	<0.2 ug/L	Prohibited Discharge	0.5 ng/L	EPA 1631E; EPA 245.1, Rev. 3.0; SM 3112 B–2011; ASTM D3223–17
Volatile Organic Carbon (VOCs)				
Acetone	1,900,000 ug/L	Local Discharge Limit	0.001 mg/L	EPA 624.1; 1624B; SM 6200 B–2011
Benzene	1,800 ug/L	Local Discharge Limit	0.001 mg/L	EPA 624.1; 1624B; SM 6200 B–2011
Toluene	3,500 ug/L	Local Discharge Limit	0.001 mg/L	EPA 624.1; 1624B; SM 6200 B–2011
Ethylbenzene	280 ug/L	Local Discharge Limit	0.001 mg/L	EPA 624.1; 1624B; SM 6200 B–2011
Methylene Chloride	16,000 ug/L	Local Discharge Limit	0.005 mg/L	EPA 624.1; 1624B; SM 6200 B–2011
Xylene	510 ug/L	Local Discharge Limit	0.001 mg/L	EPA 624.1; 1624B; SM 6200 B–2011
Methanol	2,200,000 ug/L	Local Discharge Limit		EPA 624.1; EPA 1666; EPA 1671; ASTM D3695
COMPATIBLES - surcharge parameters				
COD	495 mg/L	Domestic Strength	20 mg/L	EPA 410.4, Rev. 2.0; SM 5220 D–2011; ASTM D1252–06(12)B
TSS	259 mg/L	Domestic Strength	2.0 mg/L	SM 2540 B–2015
NH3	18.3 mg/L	Domestic Strength	<0.1 mg/L	EPA 350.1,30 Rev. 2.0; SM 4500–NH3 G; SM4500–NH3 H
Phosphorus, Total	8.13 mg/L	Domestic Strength	<0.1 mg/L	EPA 365.1 Rev. 2.0; EPA 365.4; SM 4500–P (F–H)–2011
Other Pollutants				
CBOD5	239 mg/L	Local Discharge Limit	<0.1 mg/L	See Footnotes*
Cyanide, available	100 ug/L	Local Discharge Limit	5 ug/L	EPA 335.4, Rev. 1.0; SM 4500–CN- N–2016; ASTM D7511-12
pH	6.1-10.0 su	Local Discharge Limit	0.1 su	SM 4500–H+ B–2011; ASTM D1293–99 (A or B)
SGT-HEM Non-Polar FOG	100 mg/L	Local Discharge Limit	1.4 mg/L	EPA 1664 Rev. A-B; SM 5520 B–2011; SM 5520 F–2011
FOG, total	220 mg/L	Local Discharge Limit	1.4 mg/L	EPA 1664 Rev. A-B; SM 5520 B–2011; SM 5520 F–2011
ADDITIONAL PARAMETERS				
PCBs, total	<0.1 ug/L	Prohibited Discharge	0.1 ug/L	EPA 608.3
Hexachlorobenzene	<0.01 ng/L	Prohibited Discharge	0.01 ug/L	EPA 612; EPA 625.1; SM 1625B; SM 6410 B–2000
PFAS - PFOS*	12 ng/L	Water Quality Standard	2.0 ng/L	EPA 537 Modified; ASTM D7979
PFAS - PFOA*	12,000 ng/L	Water Quality Standard	0.002 ug/L	EPA 537 Modified; ASTM D7979
Pollutant of Concern - Known pollutants not listed		Review for potential impact		

* In-Situ Method 1004-8-2009, Carbonaceous Biochemical Oxygen Demand (CBOD) Measurement by Optical Probe. 2009. In-Situ Incorporated.
Hach Method 10360, Luminescence Measurement of Dissolved Oxygen in Water and Wastewater and for Use in the Determination of BOD5 and CBOD5. Revision 1.2, October 2011. Hach Company. This method may be used to measure dissolved oxygen when performing the methods approved in this table IB for measurement of biochemical oxygen demand (BOD) and carbonaceous biochemical oxygen demand (CBOD).

If you have any questions about this issue, please feel free to contact me.

Revised: 7/23/2024

Collin Freeman
Environmental Complinace Manager

TABLE 1

SUMMARY OF STORMWATER ANALYTICAL RESULTS
SME PROJECT NO.: 097512.00

Constituent		City of Kalamazoo Dewatering Projects Sampling Parameters Local Discharge Limits	Chemical Analysis Results Sample Identification Date Collected
			WS1
			1/13/2025
Volatile Organic Compounds (VOCs)	**CAS #**		
Acetone	67-64-1	1,900,000	<50
Benzene	71-43-2	1,800	<1.0
Ethylbenzene	100-41-4	280	<1.0
Methanol	67-56-1	2,200,000	**11,000**
Methylene chloride	75-09-2	16,000	<5.0
Toluene	108-88-3	3,500	<1.0
Xylenes	1330-20-7	510	<3.0
Polychlorinated Biphenyls (PCBs)			
Total PCBs	1336-36-3	<0.1	<0.17
Metals			
Arsenic	7440-38-2	270	<1.0
Cadmium	7440-43-9	75	<0.10
Chromium, Total	7440-47-3	4,900	<2.0
Copper	7440-50-8	1,900	**3.8**
Lead	7439-92-1	360	<2.0
Lithium	7439-93-2	2,400	**2.3**
Molybdenum	7439-98-7	650	<2.00
Nickel	7440-02-0	920	**2.3**
Selenium	7782-49-2	56	<2.0
Silver	7440-22-4	25	<0.10
Zinc	7440-66-6	7,200	**13**
Mercury			
Mercury	7439-97-6	<0.2	<0.20
Other Compounds			
Cyanide, Available	57-12-5	100	<5.0
Chemical Oxygen Demand (COD)	NA	495,000	**31,000**
Total Suspended Solids (TSS)	NA	259,000	**110,000**
Ammonia (as Nitrogen)	7664-41-7	18,300	**200**
Phosphorous, total	7723-14-0	8,130	**270**
Carbonaceous Biochemical Oxygen Demand (CBOD5)	75-99-0	239,000	**8,600**
pH	NA	6.1 - 10	**7**
Non-Polar FOG	NA	100,000	<5,200
FOG, total	NA	220,000	<5,200
Additional Parameters			
Perfluorooctanoic acid (PFOA)	335-67-1	12	<0.00080
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	0.012	<0.00080
Hexachlorobenzene	2706-90-3	<0.01	<0.010

Notes:

- Concentrations reported in micrograms per liter (µg/L).
- Analytical results were compared to July 23, 2024 City of Kalamazoo Dewatering Projects Sampling Parameters - Local Discharge Limits.
- Analytical results above laboratory reporting limits are bolded.
- Analytical results exceeding the discharge limits are shaded, as is the limit exceeded.
- Refer to the analytical report for the full list of analytes.

Metiri Group - Holt
1914 Holloway Dr, Holt, MI 48842 - Phone (517) 699-0345 - www.metirigroup.com

January 24, 2025

Aaron Reed
Soil and Materials Engineers, Inc. - Kalamazoo
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611

RE: Rose Arbor Basin / 097512.00
25A0123

Thank you for selecting Metiri Group - Holt as your analytical laboratory. The samples submitted have been analyzed in accordance with all method and NELAC standards, as applicable. Any exceptions to compliance are noted in the report.

Please note that TO-15 samples will be disposed of 7 calendar days after the reporting date. All other samples will be disposed of 30 days after the reporting date.

If you have any questions regarding these results, or if we may be of further assistance to you, please contact us at (517) 699-0345.

Sincerely,

Katherine Jones For Jacob Sutherlund
Project Manager
jacob.sutherlund@metirigroup.com
517-273-4922

Table of Contents

Metiri Group - Holt - 1914 Holloway Dr, Holt, MI 48842

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 01/24/2025 15:01

Work Order Case Narrative

Tenorm analysis was performed by Eurofins (Brighton, MI). Their report 190-36146-1 will be forwarded once received.

TCLP (EPA 1311) - Semi-Volatiles Organic Compounds Method: EPA 3546/EPA 8270E:

The surrogate recoveries were below acceptance criteria in sample -01 as listed. This may indicate a potential low bias for all compounds.

1-Fluoronphthalene: 16% recovery with criteria being 44-103%
2,4,6-Tribromophenol: 17.8% recovery with criteria being 38-138%
2-Fluorobiphenyl: 16% recovery with criteria being 44-109%
2-Fluorobiphenol: 17.9% recovery with criteria being 22-85%
4-Terphenyl-d14: 20.4% recovery with criteria being 44-124%
Phenol-d6: 14.1% recovery with criteria being 11-60%

Sample -01 was qualified for the listed compounds due to low Laboratory Control Sample (LCS) and/or Laboratory Control Sample Duplicate (LCSD). Results may be biased low.

Hexachlorobutadiene: LCS 13.2% and LCSD 23.2% recovery, with criteria being 38-116%
Hexachloroethane: LCS 15.1% and LCSD 22.8% recovery, with criteria being 55-113%

Sample -01 was qualified for Pyridine due to high Laboratory Control Sample and/or the Laboratory Control Sample Duplicate. Results may be biased high. But were non-detect.

Sample -01 was qualified for Pyridine as the spiked sample recovery was high for the Matrix Spike (96% recovery) with criteria being 15-68%. Results may be biased high. But were non-detect.

The Laboratory Control Sample and Laboratory Control Sample Duplicate (LCS/LCSD) pair exhibited an RPD for the following compounds associated with samples -01. This indicates increased variability with the results.

Hexachlorobutadiene (55.3%) exceeding criteria (RPD ≤30%)
Hexachloroethane (40.6%) exceeding criteria (RPD ≤30%)

TCLP ZHE (EPA 1311 ZHE) - Volatiles Organic Compounds Method: EPA 5030C/EPA 8260D:

Sample -01 was qualified for 1,1-Dichloroethene due to high Laboratory Control Sample and/or the Laboratory Control Sample Duplicate. Results may be biased high. But were non-detect.

Corrosivity (pH): SW-846 9045D:

Sample -01 was qualified as having estimated results for pH due to exceeding the recommended hold time (time from sampling to analysis must be within 15 minutes and was 3 days.)

Metiri Group - Holt - 1914 Holloway Dr, Holt, MI 48842

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 01/24/2025 15:01

Samples in this Report

Lab ID	Sample	Matrix	Date Sampled	Date Received
25A0123-01	Sediment 1	Solid	01/13/2025 11:30	01/14/2025

Metiri Group - Holt - 1914 Holloway Dr, Holt, MI 48842

Soil and Materials Engineers, Inc. - Kalamazoo
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611

Project: Rose Arbor Basin / 097512.00
Project Number: 097512.00
Project Manager: Aaron Reed

Reported: 01/24/2025 15:01

Sample Results

Sample: Sediment 1

25A0123-01 (Solid)

	Analyte	Result	/Qual	PQL	Units	Date Analyzed	DF	Method	Prep Batch
TCLP Semivolatiles - Prep EPA 1311/3510C									
	1 2,4,5-Trichlorophenol	ND	, G-	0.10	mg/L	01/17/25	1	EPA 8270E	BEA0379
	2 2,4,6-Trichlorophenol	ND	, G-	0.10	mg/L	01/17/25	1	EPA 8270E	BEA0379
	3 2,4-Dinitrotoluene	ND	, G-	0.025	mg/L	01/17/25	1	EPA 8270E	BEA0379
	4 2-Methylphenol	ND	, G-	0.10	mg/L	01/17/25	1	EPA 8270E	BEA0379
	5 3&4-Methylphenol	ND	, G-	0.10	mg/L	01/17/25	1	EPA 8270E	BEA0379
	6 Hexachlorobenzene	ND	G-,	0.025	mg/L	01/17/25	1	EPA 8270E	BEA0379
	7 Hexachlorobutadiene	ND	*, G-, L-,	0.10	mg/L	01/17/25	1	EPA 8270E	BEA0379
	8 Hexachloroethane	ND	*, G-, L-,	0.10	mg/L	01/17/25	1	EPA 8270E	BEA0379
‡	9 Nitrobenzene	ND	G-,	0.10	mg/L	01/17/25	1	EPA 8270E	BEA0379
	10 Pentachlorophenol	ND	G-,	0.10	mg/L	01/17/25	1	EPA 8270E	BEA0379
	11 Pyridine	ND	F+, G-, L+,	0.10	mg/L	01/17/25	1	EPA 8270E	BEA0379
	Surrogate: 1-Fluoronaphthalene(S)	*16.0%*	G-	*44-103*		*01/17/25*	*1*	*EPA 8270E*	
	Surrogate: 2,4,6-Tribromophenol(S)	*17.8%*	G-	*38-138*		*01/17/25*	*1*	*EPA 8270E*	
	Surrogate: 2-Fluorobiphenyl(S)	*16.0%*	G-	*44-109*		*01/17/25*	*1*	*EPA 8270E*	
	Surrogate: 2-Fluorophenol(S)	*17.9%*	G-	*22-85*		*01/17/25*	*1*	*EPA 8270E*	
	Surrogate: 4-Terphenyl-d14(S)	*20.4%*	G-	*44-124*		*01/17/25*	*1*	*EPA 8270E*	
	Surrogate: Phenol-d6(S)	*14.1%*	G-	*11-60*		*01/17/25*	*1*	*EPA 8270E*	

	Analyte	Result	/Qual	PQL	Units	Date Analyzed	DF	Method	Prep Batch
Polychlorinated Biphenyls (PCBs)									
	1 Aroclor-1016	ND		13	ug/kg	01/24/25	5	EPA 8082A	BEA0429
	2 Aroclor-1221	ND		13	ug/kg	01/24/25	5	EPA 8082A	BEA0429
	3 Aroclor-1232	ND		13	ug/kg	01/24/25	5	EPA 8082A	BEA0429
	4 Aroclor-1242	ND		13	ug/kg	01/24/25	5	EPA 8082A	BEA0429
	5 Aroclor-1248	ND		13	ug/kg	01/24/25	5	EPA 8082A	BEA0429
	6 Aroclor-1254	ND		13	ug/kg	01/24/25	5	EPA 8082A	BEA0429
	7 Aroclor-1260	35		13	ug/kg	01/24/25	5	EPA 8082A	BEA0429
	8 Aroclor-1262	ND		13	ug/kg	01/24/25	5	EPA 8082A	BEA0429
	9 Aroclor-1268	ND		13	ug/kg	01/24/25	5	EPA 8082A	BEA0429
	Surrogate: Decachlorobiphenyl(S)	*55.0%*		*40-143*		*01/24/25*	*5*	*EPA 8082A*	
	Surrogate: 2,4,5,6-Tetrachloro-m-xylene(S)	*60.8%*		*42-133*		*01/24/25*	*5*	*EPA 8082A*	

Analyte	Result	/Qual	PQL	Units	Date Analyzed	DF	Method	Prep Batch
TCLP Volatiles - Prep EPA 1311/5030B								

Metiri Group - Holt - 1914 Holloway Dr, Holt, MI 48842

Soil and Materials Engineers, Inc. - Kalamazoo
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611

Project: Rose Arbor Basin / 097512.00
Project Number: 097512.00
Project Manager: Aaron Reed

Reported: 01/24/2025 15:01

Sample Results
(Continued)

Sample: Sediment 1 (Continued)
25A0123-01 (Solid)

		Analyte	Result	/Qual	PQL	Units	Date Analyzed	DF	Method	Prep Batch
TCLP Volatiles - Prep EPA 1311/5030B (Continued)										
	1	1,1-Dichloroethene	ND	L+,	0.14	mg/L	01/21/25	20	EPA 8260D	BEA0425
	2	1,2-Dichloroethane	ND		0.10	mg/L	01/21/25	20	EPA 8260D	BEA0425
	3	1,4-Dichlorobenzene	ND		1.5	mg/L	01/21/25	20	EPA 8260D	BEA0425
‡	4	2-Butanone	ND		40	mg/L	01/21/25	20	EPA 8260D	BEA0425
	5	Benzene	ND		0.10	mg/L	01/21/25	20	EPA 8260D	BEA0425
	6	Carbon Tetrachloride	ND		0.10	mg/L	01/21/25	20	EPA 8260D	BEA0425
	7	Chlorobenzene	ND		20	mg/L	01/21/25	20	EPA 8260D	BEA0425
	8	Chloroform	ND		1.2	mg/L	01/21/25	20	EPA 8260D	BEA0425
	9	Tetrachloroethene	ND		0.14	mg/L	01/21/25	20	EPA 8260D	BEA0425
	10	Trichloroethene	ND		0.10	mg/L	01/21/25	20	EPA 8260D	BEA0425
	11	Vinyl Chloride	ND		0.040	mg/L	01/21/25	20	EPA 8260D	BEA0425
Surrogate: Dibromofluoromethane(S)			*99%*		*80-120*		*01/21/25*	*20*	*EPA 8260D*	
Surrogate: Toluene-d8(S)			*99%*		*80-120*		*01/21/25*	*20*	*EPA 8260D*	
Surrogate: 1,2-Dichloroethane-d4(S)			*98%*		*80-120*		*01/21/25*	*20*	*EPA 8260D*	
Surrogate: 4-Bromofluorobenzene(S)			*101%*		*80-120*		*01/21/25*	*20*	*EPA 8260D*	

		Analyte	Result	/Qual	PQL	Units	Date Analyzed	DF	Method	Prep Batch
Metals										
‡	1	Paint Filter	Fail		1.00	[blank]	01/16/25	1	EPA 6020B	BEA0336

		Analyte	Result	/Qual	PQL	Units	Date Analyzed	DF	Method	Prep Batch
TCLP Metals - Prep EPA 1311										
‡	1	ARSENIC (AS)	ND		2.0	mg/L	01/17/25	20	EPA 6020B	BEA0381
‡	1	BARIUM (BA)	ND		2.0	mg/L	01/17/25	20	EPA 6020B	BEA0381
	1	CADMIUM (CD)	ND		0.20	mg/L	01/17/25	20	EPA 6020B	BEA0381
	1	CHROMIUM (CR)	ND		4.0	mg/L	01/17/25	20	EPA 6020B	BEA0381
	1	LEAD (PB)	ND		4.0	mg/L	01/17/25	20	EPA 6020B	BEA0381
	1	Mercury	ND		0.05	mg/L	01/21/25	1	EPA 7470A	BEA0418
	1	SELENIUM (SE)	0.025		0.0011	mg/L	01/17/25	20	EPA 6020B	BEA0381
	1	SILVER (AG)	ND		0.048	mg/L	01/17/25	20	EPA 6020B	BEA0381

Analyte	Result	/Qual	PQL	Units	Date Analyzed	DF	Method	Prep Batch

Wet Chemistry

Metiri Group - Holt - 1914 Holloway Dr, Holt, MI 48842

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 01/24/2025 15:01

Sample Results

(Continued)

Sample: Sediment 1 (Continued)

25A0123-01 (Solid)

		Analyte	Result	/Qual	PQL	Units	Date Analyzed	DF	Method	Prep Batch
Wet Chemistry (Continued)										
‡	1	IGNITABILITY	210			°F	01/22/25	1	SM 4500 NH3 G	BEA0446
	1	PH	6.0	H	1.0	S.U.	01/16/25	1	SW-846 9045D	BEA0341
	2	Temperature C	20		1.0		01/16/25	1	SW-846 9045D	BEA0341

Metiri Group - Holt - 1914 Holloway Dr, Holt, MI 48842

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 01/24/2025 15:01

PREPARATION BATCH SUMMARY

EPA 6020B

Laboratory: Metiri Group - Holt

Client:

Batch: BEA0336 Batch Matrix: Solid Preparation: Wet Chem No Prep

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT g	FINAL VOL. ml
Sediment 1	25A0123-01	01/16/25 09:34	100.0000	100
Sediment 1	BEA0336-DUP1	01/16/25 09:34	100.0000	100

Metiri Group - Holt - 1914 Holloway Dr, Holt, MI 48842

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 01/24/2025 15:01

PREPARATION BATCH SUMMARY

SW-846 9045D

Laboratory: Metiri Group - Holt

Client:

Batch: BEA0341 Batch Matrix: Solid Preparation: Wet Chem No Prep

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT g	FINAL VOL. ml
Sediment 1	25A0123-01RE1	01/16/25 09:33	20.0000	20
Sediment 1	BEA0341-DUP1	01/16/25 09:33	20.0000	20

Metiri Group - Holt - 1914 Holloway Dr, Holt, MI 48842

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 01/24/2025 15:01

PREPARATION BATCH SUMMARY

EPA 8270E

Laboratory: Metiri Group - Holt

Client:

Batch: BEA0379 Batch Matrix: Water Preparation: EPA 3510C

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT mL	FINAL VOL. mL
Sediment 1	25A0123-01	01/17/25 12:53	440.0000	2
Blank	BEA0379-BLK1	01/17/25 12:53	1,000.0000	2
LCS	BEA0379-BS1	01/17/25 12:53	1,000.0000	2
LCS Dup	BEA0379-BSD1	01/17/25 12:53	1,000.0000	2
Leach Fluid Blank	BEA0379-LBK1	01/17/25 12:53	830.0000	2
Leach Fluid Blank	BEA0379-LBK2	01/17/25 12:53	730.0000	2
Sediment 1	BEA0379-MS1	01/17/25 12:53	420.0000	2

Metiri Group - Holt - 1914 Holloway Dr, Holt, MI 48842

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 01/24/2025 15:01

PREPARATION BATCH SUMMARY

EPA 6020B

Laboratory: Metiri Group - Holt

Client:

Batch: BEA0381 Batch Matrix: Solid Preparation: EPA 200.2

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT g	FINAL VOL. mL
Sediment 1	25A0123-01	01/17/25 13:10	1.0000	50
Blank	BEA0381-BLK1	01/17/25 13:10	1.0000	50
LCS	BEA0381-BS1	01/17/25 13:10	1.0000	50
Sediment 1	BEA0381-MS1	01/17/25 13:10	1.0000	50

Metiri Group - Holt - 1914 Holloway Dr, Holt, MI 48842

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 01/24/2025 15:01

PREPARATION BATCH SUMMARY

EPA 7470A

Laboratory: Metiri Group - Holt

Client:

Batch: BEA0418 Batch Matrix: Water Preparation: EPA 7470A/EPA 245.1

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT mL	FINAL VOL. mL
Sediment 1	25A0123-01	01/21/25 06:56	5.0000	40
Blank	BEA0418-BLK1	01/21/25 06:56	40.0000	40
LCS	BEA0418-BS1	01/21/25 06:56	40.0000	40
Sediment 1	BEA0418-MS2	01/21/25 06:56	5.0000	40

Metiri Group - Holt - 1914 Holloway Dr, Holt, MI 48842

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 01/24/2025 15:01

PREPARATION BATCH SUMMARY

EPA 8260D

Laboratory: Metiri Group - Holt

Client:

Batch: BEA0425 Batch Matrix: Water Preparation: EPA 5030B

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT mL	FINAL VOL. mL
Sediment 1	25A0123-01	01/21/25 13:55	42.0000	42
Blank	BEA0425-BLK1	01/21/25 12:27	42.0000	42
LCS	BEA0425-BS1	01/21/25 11:00	100.0000	100
LCS Dup	BEA0425-BSD1	01/21/25 11:29	100.0000	100

Metiri Group - Holt - 1914 Holloway Dr, Holt, MI 48842

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 01/24/2025 15:01

PREPARATION BATCH SUMMARY

EPA 8082A

Laboratory: Metiri Group - Holt

Client:

Batch: BEA0429 Batch Matrix: Solid Preparation: EPA 3546 MC

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT g	FINAL VOL. mL
Sediment 1	25A0123-01	01/21/25 09:48	15.0000	2
Blank	BEA0429-BLK1	01/21/25 09:48	15.0000	2
LCS	BEA0429-BS1	01/21/25 09:48	15.0000	2
LCS Dup	BEA0429-BSD1	01/21/25 09:48	15.0000	2

Metiri Group - Holt - 1914 Holloway Dr, Holt, MI 48842

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 01/24/2025 15:01

PREPARATION BATCH SUMMARY

SM 4500 NH3 G

Laboratory: Metiri Group - Holt

Client:

Batch: BEA0446 Batch Matrix: Water Preparation: Wet Chem No Prep

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT mL	FINAL VOL. mL
Sediment 1	25A0123-01	01/22/25 09:19	70.0000	70
LCS	BEA0446-BS1	01/22/25 09:18	70.0000	70

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 01/24/2025 15:01

Quality Control

TCLP Semivolatiles - Prep EPA 1311/3510C

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Method: EPA 8270E									
Batch: BEA0379 - EPA 3510C									
Blank (BEA0379-BLK1)				Prepared & Analyzed: 01/17/25 16:18					
1 2,4,5-Trichlorophenol	ND	0.10	mg/L						
2 2,4,6-Trichlorophenol	ND	0.10	mg/L						
3 2,4-Dinitrotoluene	ND	0.025	mg/L						
4 2-Methylphenol	ND	0.10	mg/L						
5 3&4-Methylphenol	ND	0.10	mg/L						
6 Hexachlorobenzene	ND	0.025	mg/L						
7 Hexachlorobutadiene	ND	0.10	mg/L						
8 Hexachloroethane	ND	0.10	mg/L						
9 Nitrobenzene	ND	0.10	mg/L						
10 Pentachlorophenol	ND	0.10	mg/L						
11 Pyridine	ND	0.10	mg/L						
Surrogate: 1-Fluoronaphthalene(S)	*0.0617*		*mg/L*	*0.0800*		*77.1*	*44-103*		
Surrogate: 2,4,6-Tribromophenol(S)	*0.145*		*mg/L*	*0.160*		*90.4*	*38-138*		
Surrogate: 2-Fluorobiphenyl(S)	*0.0668*		*mg/L*	*0.0800*		*83.5*	*44-109*		
Surrogate: 2-Fluorophenol(S)	*0.107*		*mg/L*	*0.160*		*66.7*	*22-85*		
Surrogate: 4-Terphenyl-d14(S)	*0.0793*		*mg/L*	*0.0800*		*99.1*	*44-124*		
Surrogate: Phenol-d6(S)	*0.0700*		*mg/L*	*0.160*		*43.8*	*11-60*		
LCS (BEA0379-BS1)				Prepared & Analyzed: 01/17/25 16:54					
1 2,4,5-Trichlorophenol	0.0843	0.10	mg/L	0.0800		105	55-112		
2 2,4,6-Trichlorophenol	0.0817	0.10	mg/L	0.0800		102	60-115		
3 2,4-Dinitrotoluene	0.0850	0.025	mg/L	0.0800		106	68-119		
4 2-Methylphenol	0.0704	0.10	mg/L	0.0800		88.0	39-103		
5 3&4-Methylphenol	0.0661	0.10	mg/L	0.0800		82.6	70-130		
6 Hexachlorobenzene	0.0669	0.025	mg/L	0.0800		83.6	60-113		
7 Hexachlorobutadiene	0.0105 L-,	0.10	mg/L	0.0800		13.2	38-116		
8 Hexachloroethane	0.0121 L-,	0.10	mg/L	0.0800		15.1	55-113		
9 Nitrobenzene	0.0686	0.10	mg/L	0.0800		85.8	56-111		
10 Pentachlorophenol	0.0542	0.10	mg/L	0.0800		67.7	46-115		
11 Pyridine	0.0557 L+,	0.10	mg/L	0.0800		69.6	15-68		
Surrogate: 1-Fluoronaphthalene(S)	*0.0511*		*mg/L*	*0.0800*		*63.9*	*44-103*		
Surrogate: 2,4,6-Tribromophenol(S)	*0.134*		*mg/L*	*0.160*		*84.0*	*38-138*		
Surrogate: 2-Fluorobiphenyl(S)	*0.0598*		*mg/L*	*0.0800*		*74.8*	*44-109*		
Surrogate: 2-Fluorophenol(S)	*0.106*		*mg/L*	*0.160*		*66.0*	*22-85*		
Surrogate: 4-Terphenyl-d14(S)	*0.0807*		*mg/L*	*0.0800*		*101*	*44-124*		
Surrogate: Phenol-d6(S)	*0.0697*		*mg/L*	*0.160*		*43.6*	*11-60*		

Metiri Group - Holt - 1914 Holloway Dr, Holt, MI 48842

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 01/24/2025 15:01

Quality Control
(Continued)

TCLP Semivolatiles - Prep EPA 1311/3510C (Continued)

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
LCS Dup (BEA0379-BSD1)				Prepared & Analyzed: 01/17/25 17:30					
1 2,4,5-Trichlorophenol	0.0833	0.10	mg/L	0.0800		104	55-112	1.24	30
2 2,4,6-Trichlorophenol	0.0828	0.10	mg/L	0.0800		103	60-115	1.36	30
3 2,4-Dinitrotoluene	0.0843	0.025	mg/L	0.0800		105	68-119	0.803	30
4 2-Methylphenol	0.0730	0.10	mg/L	0.0800		91.2	39-103	3.57	30
5 3&4-Methylphenol	0.0688	0.10	mg/L	0.0800		86.0	70-130	4.03	30
6 Hexachlorobenzene	0.0661	0.025	mg/L	0.0800		82.6	60-113	1.23	30
7 Hexachlorobutadiene	0.0186 *, L-,	0.10	mg/L	0.0800		23.2	38-116	55.3	30
8 Hexachloroethane	0.0182 *, L-,	0.10	mg/L	0.0800		22.8	55-113	40.6	30
9 Nitrobenzene	0.0776	0.10	mg/L	0.0800		97.0	56-111	12.3	30
10 Pentachlorophenol	0.0579	0.10	mg/L	0.0800		72.4	46-115	6.64	30
11 Pyridine	0.0452	0.10	mg/L	0.0800		56.4	15-68	20.9	30
Surrogate: 1-Fluoronaphthalene(S)	*0.0614*		*mg/L*	*0.0800*		*76.8*	*44-103*		
Surrogate: 2,4,6-Tribromophenol(S)	*0.135*		*mg/L*	*0.160*		*84.5*	*38-138*		
Surrogate: 2-Fluorobiphenyl(S)	*0.0684*		*mg/L*	*0.0800*		*85.5*	*44-109*		
Surrogate: 2-Fluorophenol(S)	*0.110*		*mg/L*	*0.160*		*68.5*	*22-85*		
Surrogate: 4-Terphenyl-d14(S)	*0.0795*		*mg/L*	*0.0800*		*99.4*	*44-124*		
Surrogate: Phenol-d6(S)	*0.0733*		*mg/L*	*0.160*		*45.8*	*11-60*		
Leach Fluid Blank (BEA0379-LBK1)				Prepared & Analyzed: 01/17/25 20:28					
1 2,4,5-Trichlorophenol	ND	0.10	mg/L						
2 2,4,6-Trichlorophenol	ND	0.10	mg/L						
3 2,4-Dinitrotoluene	ND	0.025	mg/L						
4 2-Methylphenol	ND	0.10	mg/L						
5 3&4-Methylphenol	ND	0.10	mg/L						
6 Hexachlorobenzene	ND	0.025	mg/L						
7 Hexachlorobutadiene	ND	0.10	mg/L						
8 Hexachloroethane	ND	0.10	mg/L						
9 Nitrobenzene	ND	0.10	mg/L						
10 Pentachlorophenol	ND	0.10	mg/L						
11 Pyridine	ND	0.10	mg/L						
Surrogate: 1-Fluoronaphthalene(S)	*0.0740*		*mg/L*	*0.0964*		*76.8*	*44-103*		
Surrogate: 2,4,6-Tribromophenol(S)	*0.189*		*mg/L*	*0.193*		*98.3*	*38-138*		
Surrogate: 2-Fluorobiphenyl(S)	*0.0796*		*mg/L*	*0.0964*		*82.6*	*44-109*		
Surrogate: 2-Fluorophenol(S)	*0.138*		*mg/L*	*0.193*		*71.6*	*22-85*		
Surrogate: 4-Terphenyl-d14(S)	*0.0942*		*mg/L*	*0.0964*		*97.7*	*44-124*		
Surrogate: Phenol-d6(S)	*0.0936*		*mg/L*	*0.193*		*48.5*	*11-60*		

Metiri Group - Holt - 1914 Holloway Dr, Holt, MI 48842

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 01/24/2025 15:01

Quality Control
(Continued)

TCLP Semivolatiles - Prep EPA 1311/3510C (Continued)

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Leach Fluid Blank (BEA0379-LBK2)				Prepared & Analyzed: 01/17/25 21:05					
1 2,4,5-Trichlorophenol	ND	0.10	mg/L						
2 2,4,6-Trichlorophenol	ND	0.10	mg/L						
3 2,4-Dinitrotoluene	ND	0.025	mg/L						
4 2-Methylphenol	ND	0.10	mg/L						
5 3&4-Methylphenol	ND	0.10	mg/L						
6 Hexachlorobenzene	ND	0.025	mg/L						
7 Hexachlorobutadiene	ND	0.10	mg/L						
8 Hexachloroethane	ND	0.10	mg/L						
9 Nitrobenzene	ND	0.10	mg/L						
10 Pentachlorophenol	ND	0.10	mg/L						
11 Pyridine	ND	0.10	mg/L						
Surrogate: 1-Fluoronaphthalene(S)	*0.0785*		*mg/L*	*0.110*		*71.7*	*44-103*		
Surrogate: 2,4,6-Tribromophenol(S)	*0.222*		*mg/L*	*0.219*		*101*	*38-138*		
Surrogate: 2-Fluorobiphenyl(S)	*0.0843*		*mg/L*	*0.110*		*76.9*	*44-109*		
Surrogate: 2-Fluorophenol(S)	*0.159*		*mg/L*	*0.219*		*72.7*	*22-85*		
Surrogate: 4-Terphenyl-d14(S)	*0.109*		*mg/L*	*0.110*		*99.8*	*44-124*		
Surrogate: Phenol-d6(S)	*0.113*		*mg/L*	*0.219*		*51.4*	*11-60*		
Matrix Spike (BEA0379-MS1)	**Source: 25A0123-01**			Prepared & Analyzed: 01/17/25 18:06					
1 2,4,5-Trichlorophenol	0.207	0.10	mg/L	0.190	ND	108	55-112		
2 2,4,6-Trichlorophenol	0.204	0.10	mg/L	0.190	ND	107	60-115		
3 2,4-Dinitrotoluene	0.207	0.025	mg/L	0.190	ND	108	68-119		
4 2-Methylphenol	0.196	0.10	mg/L	0.190	ND	103	39-103		
5 3&4-Methylphenol	0.194	0.10	mg/L	0.190	ND	102	70-130		
6 Hexachlorobenzene	0.165	0.025	mg/L	0.190	ND	86.5	60-113		
7 Hexachlorobutadiene	0.122	0.10	mg/L	0.190	ND	63.9	38-116		
8 Hexachloroethane	0.107	0.10	mg/L	0.190	ND	56.2	55-113		
9 Nitrobenzene	0.198	0.10	mg/L	0.190	ND	104	56-111		
10 Pentachlorophenol	0.165	0.10	mg/L	0.190	ND	86.6	46-115		
11 Pyridine	0.183 F+	0.10	mg/L	0.190	ND	96.0	15-68		
Surrogate: 1-Fluoronaphthalene(S)	*0.159*		*mg/L*	*0.190*		*83.5*	*44-103*		
Surrogate: 2,4,6-Tribromophenol(S)	*0.324*		*mg/L*	*0.381*		*85.1*	*38-138*		
Surrogate: 2-Fluorobiphenyl(S)	*0.174*		*mg/L*	*0.190*		*91.6*	*44-109*		
Surrogate: 2-Fluorophenol(S)	*0.351*		*mg/L*	*0.381*		*92.2*	*22-85*		
Surrogate: 4-Terphenyl-d14(S)	*0.191*		*mg/L*	*0.190*		*100*	*44-124*		
Surrogate: Phenol-d6(S)	*0.292*		*mg/L*	*0.381*		*76.8*	*11-60*		

Metiri Group - Holt - 1914 Holloway Dr, Holt, MI 48842

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 01/24/2025 15:01

Quality Control
(Continued)

Polychlorinated Biphenyls (PCBs)

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Method: EPA 8082A									
Batch: BEA0429 - EPA 3546 MC									
Blank (BEA0429-BLK1)				Prepared: 01/21/25 09:48 Analyzed: 01/24/25 10:40					
1 Aroclor-1016	ND	13	ug/kg						
2 Aroclor-1221	ND	13	ug/kg						
3 Aroclor-1232	ND	13	ug/kg						
4 Aroclor-1242	ND	13	ug/kg						
5 Aroclor-1248	ND	13	ug/kg						
6 Aroclor-1254	ND	13	ug/kg						
7 Aroclor-1260	ND	13	ug/kg						
8 Aroclor-1262	ND	13	ug/kg						
9 Aroclor-1268	ND	13	ug/kg						
Surrogate: Decachlorobiphenyl(S)	*43.0*		*ug/kg*	*66.7*		*64.5*	*40-143*		
Surrogate: 2,4,5,6-Tetrachloro-m-xylene(S)	*32.5*		*ug/kg*	*66.7*		*48.7*	*42-133*		
LCS (BEA0429-BS1)				Prepared: 01/21/25 09:48 Analyzed: 01/24/25 10:40					
1 Aroclor-1016	411	13	ug/kg	667		61.6	60-120		
2 Aroclor-1260	493	13	ug/kg	667		74.0	60-120		
Surrogate: Decachlorobiphenyl(S)	*42.7*		*ug/kg*	*66.7*		*64.0*	*40-143*		
Surrogate: 2,4,5,6-Tetrachloro-m-xylene(S)	*36.4*		*ug/kg*	*66.7*		*54.6*	*42-133*		
LCS Dup (BEA0429-BSD1)				Prepared: 01/21/25 09:48 Analyzed: 01/24/25 10:40					
1 Aroclor-1016	424	13	ug/kg	667		63.7	60-120	3.28	30
2 Aroclor-1260	546	13	ug/kg	667		81.9	60-120	10.1	30
Surrogate: Decachlorobiphenyl(S)	*39.2*		*ug/kg*	*66.7*		*58.9*	*40-143*		
Surrogate: 2,4,5,6-Tetrachloro-m-xylene(S)	*38.0*		*ug/kg*	*66.7*		*57.0*	*42-133*		

Metiri Group - Holt - 1914 Holloway Dr, Holt, MI 48842

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 01/24/2025 15:01

Quality Control
(Continued)

TCLP Volatiles - Prep EPA 1311/5030B

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Method: EPA 8260D									
Batch: BEA0425 - EPA 5030B									
Blank (BEA0425-BLK1)				Prepared & Analyzed: 01/21/25 12:27					
1 1,1-Dichloroethene	ND	0.14	mg/L						
2 1,2-Dichloroethane	ND	0.10	mg/L						
3 1,4-Dichlorobenzene	ND	1.5	mg/L						
4 2-Butanone	ND	40	mg/L						
5 Benzene	ND	0.10	mg/L						
6 Carbon Tetrachloride	ND	0.10	mg/L						
7 Chlorobenzene	ND	20	mg/L						
8 Chloroform	ND	1.2	mg/L						
9 Tetrachloroethene	ND	0.14	mg/L						
10 Trichloroethene	ND	0.10	mg/L						
11 Vinyl Chloride	ND	0.040	mg/L						
Surrogate: Dibromofluoromethane(S)	*49.6*		*ug/L*	*50.0*		*99*	*80-120*		
Surrogate: Toluene-d8(S)	*49.6*		*ug/L*	*50.0*		*99*	*80-120*		
Surrogate: 1,2-Dichloroethane-d4(S)	*49.1*		*ug/L*	*50.0*		*98*	*80-120*		
Surrogate: 4-Bromofluorobenzene(S)	*49.7*		*ug/L*	*50.0*		*99*	*80-120*		
LCS (BEA0425-BS1)				Prepared & Analyzed: 01/21/25 11:00					
1 1,1-Dichloroethene	0.0651 L+,	0.14	mg/L	0.0500		130	78-128		
2 1,2-Dichloroethane	0.0409	0.10	mg/L	0.0500		82	70-130		
3 1,4-Dichlorobenzene	0.0422	1.5	mg/L	0.0500		84	75-125		
4 2-Butanone	0.0614	40	mg/L	0.0500		123	70-148		
5 Benzene	0.0470	0.10	mg/L	0.0500		94	80-120		
6 Carbon Tetrachloride	0.0583	0.10	mg/L	0.0500		117	70-130		
7 Chlorobenzene	0.0449	20	mg/L	0.0500		90	80-120		
8 Chloroform	0.0444	1.2	mg/L	0.0500		89	80-120		
9 Tetrachloroethene	0.0504	0.14	mg/L	0.0500		101	70-130		
10 Trichloroethene	0.0523	0.10	mg/L	0.0500		105	71-125		
11 Vinyl Chloride	0.0540	0.040	mg/L	0.0500		108	74-125		
Surrogate: Dibromofluoromethane(S)	*48.6*		*ug/L*	*50.0*		*97*	*80-120*		
Surrogate: Toluene-d8(S)	*49.3*		*ug/L*	*50.0*		*99*	*80-120*		
Surrogate: 1,2-Dichloroethane-d4(S)	*51.8*		*ug/L*	*50.0*		*104*	*80-120*		
Surrogate: 4-Bromofluorobenzene(S)	*49.6*		*ug/L*	*50.0*		*99*	*80-120*		

Metiri Group - Holt - 1914 Holloway Dr, Holt, MI 48842

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 01/24/2025 15:01

Quality Control
(Continued)

TCLP Volatiles - Prep EPA 1311/5030B (Continued)

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
LCS Dup (BEA0425-BSD1)				Prepared & Analyzed: 01/21/25 11:29					
1 1,1-Dichloroethene	0.0546	0.14	mg/L	0.0500		109	78-128	18	20
2 1,2-Dichloroethane	0.0434	0.10	mg/L	0.0500		87	70-130	6	20
3 1,4-Dichlorobenzene	0.0429	1.5	mg/L	0.0500		86	75-125	2	20
4 2-Butanone	0.0500	40	mg/L	0.0500		100	70-148	20	20
5 Benzene	0.0449	0.10	mg/L	0.0500		90	80-120	5	20
6 Carbon Tetrachloride	0.0547	0.10	mg/L	0.0500		109	70-130	6	20
7 Chlorobenzene	0.0450	20	mg/L	0.0500		90	80-120	0.09	20
8 Chloroform	0.0432	1.2	mg/L	0.0500		86	80-120	3	20
9 Tetrachloroethene	0.0462	0.14	mg/L	0.0500		92	70-130	9	20
10 Trichloroethene	0.0505	0.10	mg/L	0.0500		101	71-125	4	20
11 Vinyl Chloride	0.0533	0.040	mg/L	0.0500		107	74-125	1	20
Surrogate: Dibromofluoromethane(S)	*48.9*		*ug/L*	*50.0*		*98*	*80-120*		
Surrogate: Toluene-d8(S)	*50.5*		*ug/L*	*50.0*		*101*	*80-120*		
Surrogate: 1,2-Dichloroethane-d4(S)	*51.5*		*ug/L*	*50.0*		*103*	*80-120*		
Surrogate: 4-Bromofluorobenzene(S)	*49.6*		*ug/L*	*50.0*		*99*	*80-120*		

Metiri Group - Holt - 1914 Holloway Dr, Holt, MI 48842

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 01/24/2025 15:01

Quality Control
(Continued)

Metals

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Method: EPA 6020B									
Batch: BEA0336 - Wet Chem No Prep									
Duplicate (BEA0336-DUP1)		**Source: 25A0123-01**		Prepared & Analyzed: 01/16/25 10:25					
1 Paint Filter	Fail	1.00	[blank]		DET			0.00	200

Metiri Group - Holt - 1914 Holloway Dr, Holt, MI 48842

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 01/24/2025 15:01

Quality Control
(Continued)

TCLP Metals - Prep EPA 1311

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Method: EPA 6020B									
Batch: BEA0381 - EPA 200.2									
Blank (BEA0381-BLK1)				Prepared & Analyzed: 01/17/25 14:11					
1 ARSENIC (AS)	ND	2.0	mg/L						
1 BARIUM (BA)	ND	2.0	mg/L						
1 CADMIUM (CD)	ND	0.20	mg/L						
1 CHROMIUM (CR)	ND	4.0	mg/L						
1 LEAD (PB)	ND	4.0	mg/L						
1 SELENIUM (SE)	ND	1.1	mg/L						
1 SILVER (AG)	ND	0.048	mg/L						
LCS (BEA0381-BS1)				Prepared & Analyzed: 01/17/25 14:12					
1 ARSENIC (AS)	10.0	2.0	mg/L	10.0		100	85-115		
1 BARIUM (BA)	51.7	2.0	mg/L	50.0		103	85-115		
1 CADMIUM (CD)	10.7	0.20	mg/L	10.0		107	85-115		
1 CHROMIUM (CR)	20.0	4.0	mg/L	20.0		100	85-115		
1 LEAD (PB)	22.0	4.0	mg/L	20.0		110	85-115		
1 SELENIUM (SE)	10.2	1.1	mg/L	10.0		102	85-115		
1 SILVER (AG)	11.0	0.048	mg/L	10.0		110	85-115		
Matrix Spike (BEA0381-MS1)	**Source: 25A0123-01**			Prepared & Analyzed: 01/17/25 14:26					
1 ARSENIC (AS)	9.80	2.0	mg/L	10.0	ND	98.0	70-130		
1 BARIUM (BA)	53.2	2.0	mg/L	50.0	ND	106	85-115		
1 CADMIUM (CD)	10.4	0.20	mg/L	10.0	ND	104	70-130		
1 CHROMIUM (CR)	19.3	4.0	mg/L	20.0	ND	96.3	70-130		
1 LEAD (PB)	21.8	4.0	mg/L	20.0	ND	109	70-130		
1 SELENIUM (SE)	10.4	1.1	mg/L	10.0	ND	104	70-130		
1 SILVER (AG)	10.9	0.048	mg/L	10.0	ND	109	70-130		

Metiri Group - Holt - 1914 Holloway Dr, Holt, MI 48842

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 01/24/2025 15:01

Quality Control
(Continued)

TCLP Metals - Prep EPA 1311 (Continued)

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Matrix Spike (BEA0381-MS1)	**Source: 25A0123-01**			Prepared & Analyzed: 01/17/25 14:26					

Method: EPA 7470A

Batch: BEA0418 - EPA 7470A/EPA 245.1

Blank (BEA0418-BLK1)				Prepared & Analyzed: 01/21/25 11:12					
1 Mercury	ND	0.05	mg/L						
LCS (BEA0418-BS1)				Prepared & Analyzed: 01/21/25 11:13					
1 Mercury	0.0003	0.05	mg/L	0.000250		102	85-115		
Matrix Spike (BEA0418-MS2)	**Source: 25A0123-01**			Prepared & Analyzed: 01/21/25 11:30					
1 Mercury	0.002	0.05	mg/L	0.00200	0.00004	96.1	70-130		

Metiri Group - Holt - 1914 Holloway Dr, Holt, MI 48842

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 01/24/2025 15:01

Quality Control
(Continued)

Wet Chemistry

Analyte	Result/	Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Method: SW-846 9045D										
Batch: BEA0341 - Wet Chem No Prep										
Duplicate (BEA0341-DUP1)		**Source: 25A0123-01RE1**			Prepared & Analyzed: 01/16/25 10:57					
1 PH	5.99	H	1.0	S.U.		6.01			0.333	200
2 Temperature C	19.9		1.0	S.U.		20.3			1.99	200
Method: SM 4500 NH3 G										
Batch: BEA0446 - Wet Chem No Prep										
LCS (BEA0446-BS1)					Prepared & Analyzed: 01/22/25 10:50					
1 IGNITABILITY	80.0			°F	81.0		98.8	.2963-103.70		

Metiri Group - Holt - 1914 Holloway Dr, Holt, MI 48842

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 01/24/2025 15:01

Notes and Definitions

Item	Definition
*	Duplicate analysis not within control limits.
F+	Recovery from the spiked aliquot exceeds the upper control limit (matrix spike or matrix spike duplicate).
G-	Recovery of the associated Surrogate Compound exceeds the lower control limit. Results may be biased low.
H	Hold time exceeded.
L-	Recovery in the associated laboratory sample (LCS) exceeds the lower control limit. Results may be biased low.
L+	Recovery in the associated laboratory sample (LCS) exceeds the upper control limit. Results may be biased high.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
Dry	Sample results reported on a dry weight basis.
MDL	Method Detection Limit (only displays if reported to the MDL)
ND	Analyte NOT DETECTED at or above the reporting limit.
DF	Dilution Factor
DL	Detection Limit
‡	Parameter not included in NELAC Scope of Analysis.
RPD	Relative Percent Difference
%REC	Percent Recovery
Source	Sample that was matrix spiked or duplicated.

PQL, Practical Quantitation Limit = Method Reporting Limit (MRL).

Accreditation Number(s):
MI001292024-1

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

Metiri Group - Holt - 1914 Holloway Dr, Holt, MI 48842

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 01/24/2025 15:01

WORK ORDER

25A0123

Printed: 01/24/2025 3:01 pm

Project: **Rose Arbor Basin / 097512.00**
Project Number: **097512.00**
Project Manager: **Jacob Sutherlund**
PO Number:

Report To:
Soil and Materials Engineers, Inc. - Kalamazoo
Aaron Reed
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611
Phone: 2693233555
Fax: 2693233553

Invoice To:
Soil and Materials Engineers, Inc. - Kalamazoo
Aaron Reed
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611
Phone: 2693233555
Fax: 2693233553

Date Received: 01/14/2025 10:50 AM
Date Due: 01/21/2025 (5.00 day TAT)

Logged In By: Kalley Keyes
Received By: Alexander Woods

Analysis		Comments
25A0123-01 Sediment 1 [Solid] Sampled 1/13/2025 11:30:00AM		
Arsenic TCLP-MI	NONE	
Barium TCLP-MI	NONE	
Cadmium TCLP-MI	NONE	
Chromium TCLP-MI	NONE	
Ignitability-MI	NONE	
Lead TCLP-MI	NONE	
Mercury TCLP-MI	NONE	
Paint Filter - MI	NONE	
PCB-MI	NONE	on wet weight basis
pH-MI	NONE	
RCRA 8 TCLP Metals-MI	NONE	
Selenium TCLP-MI	NONE	
Silver TCLP-MI	NONE	
SVOC-S-TCLP-MI	NONE	
VOC TCLP-MI	NONE	

Metiri Group - Holt - 1914 Holloway Dr, Holt, MI 48842

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 01/24/2025 15:01

25A0123 **Sample Receipt Log**

Default Cooler

Samples Received at: **5.8°C**

Were Custody Seals present and signed?	No	Container/preservative correct for test requested?	Yes
Received on Ice	Yes	Sufficient amount sent for tests requested?	Yes
Within proper temp	Yes	Required containers sealed in separate bags?	No
Were all TO-15 samples received at ambient?	No	Were all samples inspected and sampled correctly?	Yes
Was a chain of custody received?	Yes	Were bubbles absent in volatile samples?	No
COCs complete/signed in the appropriate places?	Yes	Sufficient remaining holding time for analyses?	Yes
Were all samples listed on COC received?	Yes	If Applicable pH documented for necessary samples?	No
Did all samples/container labels agree with COCs?	Yes	If applicable, was the chlorine test negative?	No
Did all containers arrive in good condition?	Yes	If applicable, samples free of oxidizers?	No
Containers Intact	Yes	Thermometer # : 10003954 used?	Yes

RCRA 8 TCLP Metals-MI

Silver TCLP-MI	Selenium TCLP-MI	Mercury TCLP-MI	Lead TCLP-MI
Chromium TCLP-MI	Cadmium TCLP-MI	Barium TCLP-MI	Arsenic TCLP-MI

Fibertec environmental services

Analytical Laboratory
1914 Holloway Drive
Holt, MI 48842
Phone: 517 699 0345
Fax: 517 699 0388
email: lab@fibertec.us

8660 S. Mackinaw Trail
Cadillac, MI 49601
Phone: 231 775 8368
Fax: 231 775 8584

Geoprobe
11766 E. Grand River Rd.
Brighton, MI 48116
Phone: 810 220 3300
Fax: 810 220 3311

Chain of Custody # 205579
PAGE ___ of ___

Client Name: SME
Contact Person: AARON REED
Project Name/ Number: ROSE ARBOR BASIN / 097512.00
Email distribution list:
Quote#
Purchase Order#

Date	Time	Sample #	Client Sample Descriptor	MATRIX (SEE RIGHT CORNER FOR CODE)	# OF CONTAINERS	TCLP METALS	TCLP VOLATILES	TCLP SEMI VOLATILES	TNRCM	PH	PAINT FILTER *					HOLD SAMPLE
1/13/25	11:30		SEDIMENT 1	X	5	X	X	X	X	X	X					

Matrix Code: S Soil; A Air; O Oil; P Wipe; GW Ground Water; SW Surface Water; WW Waste Water; X Other: Specify

Deliverables: Level 2; Level 3; Level 4; EDD

Remarks:
* PAINT FILTER
IF THE MATERIAL PASSES THE PAINT FILTER TEST, TEST ADDITIONAL ITEMS
- TOTAL PCBs on DRY WEIGHT BASIS

IF THE MATERIAL FAILS THE TEST TEST FOR ADDITIONAL ITEMS
- FLASH POINT
- TOTAL PCBs ON WET WEIGHT BASIS

Received By Lab
JAN 14 2025
In Lab JU

Comments:
MATRIX = SEDIMENT

Sampled/Relinquished By: ANTHONY J. HOSBEIN	Date/ Time 1/13/25 1330	Received By: SME COLD STORAGE
Relinquished By: SME COLD STORAGE	Date/ Time 1/14/25 10:50	Received By:
Relinquished By:	Date/ Time 1-14-25 13:35	Received by Laboratory: 1/14/25 14:27

Turnaround Time ALL RESULTS WILL BE SENT BY THE END OF THE BUSINESS DAY

_____1 bus. day _____2 bus. days _____3 bus. days _____4 bus. days

X 5-7 bus. days (standard) Other (specify time/date requirement): _____

LAB USE ONLY

Fibertec project number: 25A0123

Temperature upon receipt at Lab: 5,8°C

Received On Ice

Please see back for terms and conditions

Metiri Group - Holt
1914 Holloway Dr, Holt, MI 48842 - Phone (517) 699-0345 - www.metirigroup.com

February 12, 2025

Aaron Reed
Soil and Materials Engineers, Inc. - Kalamazoo
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611

RE: Rose Arbor Basin / 097512.00
25A0120

Thank you for selecting Metiri Group - Holt as your analytical laboratory. The samples submitted have been analyzed in accordance with all method and NELAC standards, as applicable. Any exceptions to compliance are noted in the report.

Please note that TO-15 samples will be disposed of 7 calendar days after the reporting date. All other samples will be disposed of 30 days after the reporting date.

If you have any questions regarding these results, or if we may be of further assistance to you, please contact us at (517) 699-0345.

Sincerely,

Lexie Rowe-Lawson For Jacob Sutherlund
Project Manager
jacob.sutherlund@metirigroup.com
517-273-4922

Table of Contents

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 02/12/2025 16:54

Work Order Case Narrative

Hexachlorobenzene analysis was performed by Trace Analytical (Muskegon, Mi). Their report 25A0584 will be included.

One water sample was collected on January 13, 2025 and received by Fibertec, Inc. on January 14, 2025. The shipping cooler temperature was within specifications (0 – 6 °C), and the sample containers arrived without any visible signs of tampering or breakage. Containers were checked for correct pH, where appropriate.

Exceptions are noted below.

Wet Chemistry Method: SM 4500-H+B 2011

Sample -01 was qualified as having estimated results for pH due to exceeding the hold time (time from sampling to analysis should be within 15 minutes).

No further exceptions were observed.

Samples in this Report

Lab ID	Sample	Matrix	Qualifiers	Date Sampled	Date Received
25A0120-01	WS1	Surface Water		01/13/2025 11:00	01/14/2025

Soil and Materials Engineers, Inc. - Kalamazoo
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611

Project: Rose Arbor Basin / 097512.00
Project Number: 097512.00
Project Manager: Aaron Reed

Reported: 02/12/2025 16:54

Sample Results

Sample: WS1

25A0120-01 (Surface Water)

Cyanide, Available : OIA-1677-09

		Analyte	Result	Qual	PQL	Units	Date Analyzed	DF	Method	Prep Batch
‡	1	Cyanide, Available	ND		5.0	ug/L	01/20/25	1	OIA-1677-09	BEA0402

Silica Get Treated - Hexane Extractable Material

		Analyte	Result	Qual	PQL	Units	Date Analyzed	DF	Method	Prep Batch
‡	1	SGT-HEM	0.0			mg/L	02/11/25	1	EPA 1664B	BEB0198

Semivolatiles compounds by GC-FID

		Analyte	Result	Qual	PQL	Units	Date Analyzed	DF	Method	Prep Batch
‡	1	Methyl Alcohol	11000		0.40	ug/L	01/20/25	1	EPA 8015C	BEA0310
		Surrogate: n-Propanol (S)	*90.7%*		*70-130*		*01/20/25*	*1*	*EPA 8015C*	

Polychlorinated Biphenyls (PCBs)

		Analyte	Result	Qual	PQL	Units	Date Analyzed	DF	Method	Prep Batch
	1	AROCLOR 1016	ND		0.17	ug/L	01/21/25	1	EPA 8082A	BEA0346
	2	AROCLOR 1221	ND		0.17	ug/L	01/21/25	1	EPA 8082A	BEA0346
	3	AROCLOR 1232	ND		0.17	ug/L	01/21/25	1	EPA 8082A	BEA0346
	4	AROCLOR 1242	ND		0.17	ug/L	01/21/25	1	EPA 8082A	BEA0346
	5	AROCLOR 1248	ND		0.17	ug/L	01/21/25	1	EPA 8082A	BEA0346
	6	AROCLOR 1254	ND		0.17	ug/L	01/21/25	1	EPA 8082A	BEA0346
	7	AROCLOR 1260	ND		0.17	ug/L	01/21/25	1	EPA 8082A	BEA0346
	8	AROCLOR 1262	ND		0.17	ug/L	01/21/25	1	EPA 8082A	BEA0346
	9	AROCLOR 1268	ND		0.17	ug/L	01/21/25	1	EPA 8082A	BEA0346
		Surrogate: Decachlorobiphenyl(S)	*62.1%*		*14-124*		*01/21/25*	*1*	*EPA 8082A*	
		Surrogate: 2,4,5,6-Tetrachloro-m-xylene(S)	*30.2%*		*26-136*		*01/21/25*	*1*	*EPA 8082A*	

Volatile Organic Compounds (VOCs) by GC/MS, 5030C

		Analyte	Result	Qual	PQL	Units	Date Analyzed	DF	Method	Prep Batch
	1	Acetone	ND		50	ug/L	01/17/25	1	EPA 8260D	BEA0359
	2	Benzene	ND		1.0	ug/L	01/17/25	1	EPA 8260D	BEA0359
	3	Ethylbenzene	ND		1.0	ug/L	01/17/25	1	EPA 8260D	BEA0359
‡	4	m&p-Xylene	ND		2.0	ug/L	01/17/25	1	EPA 8260D	BEA0359
	5	Methylene Chloride	ND		5.0	ug/L	01/17/25	1	EPA 8260D	BEA0359

Soil and Materials Engineers, Inc. - Kalamazoo
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611

Project: Rose Arbor Basin / 097512.00
Project Number: 097512.00
Project Manager: Aaron Reed

Reported: 02/12/2025 16:54

Sample Results
(Continued)

Sample: WS1 (Continued)
25A0120-01 (Surface Water)

Volatile Organic Compounds (VOCs) by GC/MS, 5030C (Continued)

		Analyte	Result	Qual	PQL	Units	Date Analyzed	DF	Method	Prep Batch
	6	o-Xylene	ND		1.0	ug/L	01/17/25	1	EPA 8260D	BEA0359
	7	Toluene	ND		1.0	ug/L	01/17/25	1	EPA 8260D	BEA0359
‡	8	Xylenes	ND		3.0	ug/L	01/17/25	1	EPA 8260D	BEA0359
		Surrogate: 1,2-Dichloroethane-d4(S)	*99.2%*		*80-120*		*01/17/25*	*1*	*EPA 8260D*	
		Surrogate: 4-Bromofluorobenzene(S)	*98.3%*		*80-120*		*01/17/25*	*1*	*EPA 8260D*	
		Surrogate: Dibromofluoromethane(S)	*98.5%*		*80-120*		*01/17/25*	*1*	*EPA 8260D*	
		Surrogate: Toluene-d8(S)	*99.3%*		*80-120*		*01/17/25*	*1*	*EPA 8260D*	

Per- and Polyfluoroalkyl Substances

		Analyte	Result	Qual	PQL	Units	Date Analyzed	DF	Method	Prep Batch
	1	PFOA	ND		0.80	ng/L	01/16/25	1	EPA 537M	BEA0327
	2	PFOS	ND		0.80	ng/L	01/16/25	1	EPA 537M	BEA0327

Metals

		Analyte	Result	Qual	PQL	Units	Date Analyzed	DF	Method	Prep Batch
	1	ARSENIC (AS)	ND		1.0	ug/L	01/16/25	10	EPA 6020B	BEA0339
	1	CADMIUM (CD)	ND		0.10	ug/L	01/16/25	10	EPA 6020B	BEA0339
	1	CHROMIUM (CR)	ND		2.0	ug/L	01/16/25	10	EPA 6020B	BEA0339
	1	COPPER (CU)	3.8		2.0	ug/L	01/16/25	10	EPA 6020B	BEA0339
	1	LEAD (PB)	ND		2.0	ug/L	01/16/25	10	EPA 6020B	BEA0339
‡	1	LITHIUM (LI)	2.3		1.0	ug/L	01/16/25	10	EPA 6020B	BEA0339
	1	Mercury	ND		0.20	ug/L	01/16/25	1	EPA 7470A	BEA0326
	1	MOLYBDENUM (MO)	ND		2.00	ug/L	01/16/25	10	EPA 6020B	BEA0339
	1	NICKEL (NI)	2.3		2.0	ug/L	01/16/25	10	EPA 6020B	BEA0339
	1	SELENIUM (SE)	ND		2.0	ug/L	01/16/25	10	EPA 6020B	BEA0339
	1	SILVER (AG)	ND		0.10	ug/L	01/16/25	10	EPA 6020B	BEA0339
	1	ZINC (ZN)	13		5.0	ug/L	01/16/25	10	EPA 6020B	BEA0339

Wet Chemistry

		Analyte	Result	Qual	PQL	Units	Date Analyzed	DF	Method	Prep Batch
	1	AMMONIA AS N	0.20		0.010	mg/L	01/17/25	1	SM 4500 NH3 G	BEA0372
‡	1	Carbonaceous Biochemical Oxygen Demand	8.6		2.0	mg/L	01/15/25	1	SM 5210B-2016	BEA0301
	1	Chemical Oxygen Demand	31		20	mg/L	01/16/25	1	Hach 8000	BEA0331

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 02/12/2025 16:54

Sample Results
(Continued)

Sample: WS1 (Continued)

25A0120-01 (Surface Water)

Analyte		Result	/Qual	PQL	Units	Date Analyzed	DF	Method	Prep Batch
Wet Chemistry (Continued)									**H**
1	Oil and Grease	ND	H	5.2	mg/L	02/11/25	1	EPA 1664B	BEB0198
1	PH	7.0	H,H	1.0	S.U.	01/15/25	1	SM 4500-H+ B 2011	BEA0296
2	Temperature C	19	H	1.0		01/15/25	1	SM 4500-H+ B 2011	BEA0296
1	Phosphorus	0.27		0.010	mg/L	01/16/25	1	EPA 365.3	BEA0332
1	Total Suspended Solids	110		25	mg/L	01/15/25	1	SM2540D	BEA0308

Soil and Materials Engineers, Inc. - Kalamazoo
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611

Project: Rose Arbor Basin / 097512.00
Project Number: 097512.00
Project Manager: Aaron Reed
Reported: 02/12/2025 16:54

PREPARATION BATCH SUMMARY

SM 4500-H+ B 2011

Laboratory: Metiri Group - Holt
Client:
Batch: BEA0296 Batch Matrix: Water Preparation: Wet Chem No Prep

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT mL	FINAL VOL. mL
WS1	25A0120-01	01/15/25 08:26	10.0000	10

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 02/12/2025 16:54

PREPARATION BATCH SUMMARY

SM 5210B-2016

Laboratory: Metiri Group - Holt

Client:

Batch: BEA0301 Batch Matrix: Water Preparation: Wet Chem No Prep

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT mL	FINAL VOL. mL
WS1	25A0120-01	01/15/25 09:16	300.0000	300
Blank	BEA0301-BLK1	01/15/25 09:16	300.0000	300
Blank	BEA0301-BLK2	01/15/25 09:16	300.0000	300
LCS	BEA0301-BS1	01/15/25 09:16	6.0000	300

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 02/12/2025 16:54

PREPARATION BATCH SUMMARY

SM2540D

Laboratory: Metiri Group - Holt

Client:

Batch: BEA0308 Batch Matrix: Water Preparation: Wet Chem No Prep

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT mL	FINAL VOL. mL
WS1	25A0120-01	01/15/25 10:56	100.0000	1,000
Blank	BEA0308-BLK1	01/15/25 10:56	1,000.0000	1,000
Blank	BEA0308-BLK2	01/15/25 10:56	1,000.0000	1,000
LCS	BEA0308-BS1	01/15/25 10:56	100.0000	1,000
WS1	BEA0308-DUP1	01/15/25 10:56	100.0000	1,000

Soil and Materials Engineers, Inc. - Kalamazoo
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611

Project: Rose Arbor Basin / 097512.00
Project Number: 097512.00
Project Manager: Aaron Reed
Reported: 02/12/2025 16:54

PREPARATION BATCH SUMMARY

EPA 8015C

Laboratory: Metiri Group - Holt
Client:
Batch: BEA0310 Batch Matrix: Water Preparation: EPA 8015C

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT mL	FINAL VOL. mL
WS1	25A0120-01	01/15/25 12:31	10.0000	10
Blank	BEA0310-BLK1	01/15/25 12:31	10.0000	10
LCS	BEA0310-BS1	01/15/25 12:31	10.0000	10
LCS Dup	BEA0310-BSD1	01/15/25 12:31	10.0000	10
WS1	BEA0310-MS1	01/15/25 12:31	10.0000	10

Soil and Materials Engineers, Inc. - Kalamazoo
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611

Project: Rose Arbor Basin / 097512.00
Project Number: 097512.00
Project Manager: Aaron Reed
Reported: 02/12/2025 16:54

PREPARATION BATCH SUMMARY

EPA 7470A

Laboratory: Metiri Group - Holt
Client:
Batch: BEA0326 Batch Matrix: Water Preparation: EPA 7470A/EPA 245.1

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT mL	FINAL VOL. mL
WS1	25A0120-01	01/16/25 07:46	40.0000	40
Blank	BEA0326-BLK1	01/16/25 07:46	40.0000	40
LCS	BEA0326-BS1	01/16/25 07:46	40.0000	40

Soil and Materials Engineers, Inc. - Kalamazoo
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611

Project: Rose Arbor Basin / 097512.00
Project Number: 097512.00
Project Manager: Aaron Reed
Reported: 02/12/2025 16:54

PREPARATION BATCH SUMMARY

EPA 537M

Laboratory: Metiri Group - Holt
Client:
Batch: BEA0327 Batch Matrix: Water Preparation: 537M

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT mL	FINAL VOL. mL
WS1	25A0120-01	01/16/25 08:16	250.0000	2
Blank	BEA0327-BLK1	01/16/25 08:16	250.0000	2
LCS	BEA0327-BS1	01/16/25 08:16	250.0000	2
LCS Dup	BEA0327-BSD1	01/16/25 08:16	250.0000	2

Soil and Materials Engineers, Inc. - Kalamazoo
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611

Project: Rose Arbor Basin / 097512.00
Project Number: 097512.00
Project Manager: Aaron Reed
Reported: 02/12/2025 16:54

PREPARATION BATCH SUMMARY

Hach 8000

Laboratory: Metiri Group - Holt
Client:
Batch: BEA0331 Batch Matrix: Water Preparation: Wet Chem No Prep

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT mL	FINAL VOL. mL
WS1	25A0120-01	01/16/25 08:24	2.0000	2
Blank	BEA0331-BLK1	01/16/25 08:24	2.0000	2
LCS	BEA0331-BS1	01/16/25 08:24	2.0000	2
LCS Dup	BEA0331-BSD1	01/16/25 08:24	2.0000	2
WS1	BEA0331-DUP1	01/16/25 08:24	2.0000	2

Soil and Materials Engineers, Inc. - Kalamazoo
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611

Project: Rose Arbor Basin / 097512.00
Project Number: 097512.00
Project Manager: Aaron Reed
Reported: 02/12/2025 16:54

PREPARATION BATCH SUMMARY

EPA 365.3

Laboratory: Metiri Group - Holt
Client:
Batch: BEA0332 Batch Matrix: Water Preparation: Wet Chem No Prep

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT mL	FINAL VOL. mL
WS1	25A0120-01	01/16/25 08:25	50.0000	50
Blank	BEA0332-BLK1	01/16/25 08:25	50.0000	50
LCS	BEA0332-BS1	01/16/25 08:25	50.0000	50
LCS Dup	BEA0332-BSD1	01/16/25 08:25	50.0000	50
WS1	BEA0332-MS1	01/16/25 08:25	25.0000	50
WS1	BEA0332-MSD1	01/16/25 08:25	25.0000	50

Soil and Materials Engineers, Inc. - Kalamazoo
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611

Project: Rose Arbor Basin / 097512.00
Project Number: 097512.00
Project Manager: Aaron Reed
Reported: 02/12/2025 16:54

PREPARATION BATCH SUMMARY

EPA 6020B

Laboratory: Metiri Group - Holt
Client:
Batch: BEA0339 Batch Matrix: Water Preparation: EPA 200.2

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT mL	FINAL VOL. mL
WS1	25A0120-01	01/16/25 10:03	50.0000	50
WS1	25A0120-01	01/16/25 10:03	50.0000	50
Blank	BEA0339-BLK1	01/16/25 10:03	50.0000	50
Blank	BEA0339-BLK1	01/16/25 10:03	50.0000	50
LCS	BEA0339-BS1	01/16/25 10:03	50.0000	50
LCS	BEA0339-BS1	01/16/25 10:03	50.0000	50

Soil and Materials Engineers, Inc. - Kalamazoo
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611

Project: Rose Arbor Basin / 097512.00
Project Number: 097512.00
Project Manager: Aaron Reed
Reported: 02/12/2025 16:54

PREPARATION BATCH SUMMARY

EPA 8082A

Laboratory: Metiri Group - Holt
Client:
Batch: BEA0346 Batch Matrix: Water Preparation: EPA 3510C

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT mL	FINAL VOL. mL
WS1	25A0120-01	01/16/25 12:28	870.0000	2
Blank	BEA0346-BLK1	01/16/25 12:28	1,000.0000	2
LCS	BEA0346-BS1	01/16/25 12:28	1,000.0000	2
LCS Dup	BEA0346-BSD1	01/16/25 12:28	1,000.0000	2

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 02/12/2025 16:54

PREPARATION BATCH SUMMARY

EPA 8260D

Laboratory: Metiri Group - Holt

Client:

Batch: BEA0359 Batch Matrix: Water Preparation: EPA 5030B

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT mL	FINAL VOL. mL
WS1	25A0120-01	01/17/25 10:11	42.0000	42
Blank	BEA0359-BLK1	01/17/25 06:18	42.0000	42
LCS	BEA0359-BS1	01/17/25 04:51	100.0000	100
LCS Dup	BEA0359-BSD1	01/17/25 05:20	100.0000	100

Soil and Materials Engineers, Inc. - Kalamazoo
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611

Project: Rose Arbor Basin / 097512.00
Project Number: 097512.00
Project Manager: Aaron Reed
Reported: 02/12/2025 16:54

PREPARATION BATCH SUMMARY

SM 4500 NH3 G

Laboratory: Metiri Group - Holt
Client:
Batch: BEA0372 Batch Matrix: Water Preparation: Wet Chem No Prep

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT mL	FINAL VOL. mL
WS1	25A0120-01	01/17/25 10:41	50.0000	50
Blank	BEA0372-BLK1	01/17/25 10:41	50.0000	50
LCS	BEA0372-BS1	01/17/25 10:41	50.0000	50
LCS Dup	BEA0372-BSD1	01/17/25 10:41	50.0000	50

Soil and Materials Engineers, Inc. - Kalamazoo
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611

Project: Rose Arbor Basin / 097512.00
Project Number: 097512.00
Project Manager: Aaron Reed
Reported: 02/12/2025 16:54

PREPARATION BATCH SUMMARY

EPA 8260D

Laboratory: Metiri Group - Holt
Client:
Batch: BEA0397 Batch Matrix: Water Preparation: EPA 5030B

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT mL	FINAL VOL. mL
Blank	BEA0397-BLK1	01/21/25 01:32	42.0000	42
LCS	BEA0397-BS1	01/21/25 00:05	100.0000	100
LCS Dup	BEA0397-BSD1	01/21/25 00:34	100.0000	100

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 02/12/2025 16:54

PREPARATION BATCH SUMMARY

OIA-1677-09

Laboratory: Metiri Group - Holt

Client:

Batch: BEA0402 Batch Matrix: Water Preparation: Wet Chem No Prep

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT mL	FINAL VOL. mL
WS1	25A0120-01	01/20/25 10:56	10.0000	10
Blank	BEA0402-BLK1	01/20/25 10:56	10.0000	10
LCS	BEA0402-BS1	01/20/25 10:56	10.0000	10
LCS Dup	BEA0402-BSD1	01/20/25 10:56	10.0000	10

Soil and Materials Engineers, Inc. - Kalamazoo
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611

Project: Rose Arbor Basin / 097512.00
Project Number: 097512.00
Project Manager: Aaron Reed
Reported: 02/12/2025 16:54

PREPARATION BATCH SUMMARY

EPA 8260D

Laboratory: Metiri Group - Holt
Client:
Batch: BEA0448 Batch Matrix: Water Preparation: EPA 5030B

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT mL	FINAL VOL. mL
Blank	BEA0448-BLK1	01/22/25 12:39	42.0000	42
LCS	BEA0448-BS1	01/22/25 11:10	100.0000	100
LCS Dup	BEA0448-BSD1	01/22/25 11:39	100.0000	100

Soil and Materials Engineers, Inc. - Kalamazoo
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611

Project: Rose Arbor Basin / 097512.00
Project Number: 097512.00
Project Manager: Aaron Reed
Reported: 02/12/2025 16:54

PREPARATION BATCH SUMMARY

EPA 1664B

Laboratory: Metiri Group - Holt
Client:
Batch: BEB0198 Batch Matrix: Water Preparation: Wet Chem No Prep

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT mL	FINAL VOL. mL
WS1	25A0120-01	02/11/25 09:50	960.0000	1,000
WS1	25A0120-01	02/11/25 09:50	960.0000	1,000
Blank	BEB0198-BLK1	02/11/25 09:50	1,000.0000	1,000
Blank	BEB0198-BLK2	02/11/25 09:50	1,000.0000	1,000
LCS	BEB0198-BS1	02/11/25 09:50	1,000.0000	1,000

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 02/12/2025 16:54

Quality Control

Cyanide, Available : OIA-1677-09

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Method: OIA-1677-09									
Batch: BEA0402 - Wet Chem No Prep									
Blank (BEA0402-BLK1)					Prepared & Analyzed: 01/20/25 16:55				
1 Cyanide, Available	ND	5.0	ug/L						

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 02/12/2025 16:54

Quality Control
(Continued)

Cyanide, Available : OIA-1677-09 (Continued)

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
LCS (BEA0402-BS1)				Prepared & Analyzed: 01/20/25 16:55					
1 Cyanide, Available	49.2	5.0	ug/L	50.0		98.4	82-132		

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 02/12/2025 16:54

Quality Control
(Continued)

Cyanide, Available : OIA-1677-09 (Continued)

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
LCS Dup (BEA0402-BSD1)				Prepared & Analyzed: 01/20/25 16:55					
1 Cyanide, Available	52.6	5.0	ug/L	50.0		105	82-132	6.74	11

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 02/12/2025 16:54

Quality Control
(Continued)

Cyanide, Available : OIA-1677-09 (Continued)

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit

Quality Control
(Continued)

Semivolatiles compounds by GC-FID

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Method: EPA 8015C									
Batch: BEA0310 - EPA 8015C									
Blank (BEA0310-BLK1)				Prepared: 01/15/25 12:31 Analyzed: 01/20/25 11:09					
1 Methyl Alcohol	ND	0.40	ug/L						
Surrogate: n-Propanol (S)	*20400*		*ug/L*	*25000*		*81.6*	*70-130*		
LCS (BEA0310-BS1)				Prepared: 01/15/25 12:31 Analyzed: 01/20/25 11:09					
Surrogate: n-Propanol (S)	*22100*		*ug/L*	*25000*		*88.4*	*70-130*		
LCS Dup (BEA0310-BSD1)				Prepared: 01/15/25 12:31 Analyzed: 01/20/25 11:09					
Surrogate: n-Propanol (S)	*21500*		*ug/L*	*25000*		*86.1*	*70-130*		
Matrix Spike (BEA0310-MS1)	**Source: 25A0120-01**			Prepared: 01/15/25 12:31 Analyzed: 01/20/25 11:09					
Surrogate: n-Propanol (S)	*22000*		*ug/L*	*25000*		*88.1*	*70-130*		

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 02/12/2025 16:54

Quality Control
(Continued)

Polychlorinated Biphenyls (PCBs)

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Method: EPA 8082A									
Batch: BEA0346 - EPA 3510C									
Blank (BEA0346-BLK1)				Prepared: 01/16/25 12:28 Analyzed: 01/21/25 14:15					
1 AROCLOR 1016	ND	0.15	ug/L						
2 AROCLOR 1221	ND	0.15	ug/L						
3 AROCLOR 1232	ND	0.15	ug/L						
4 AROCLOR 1242	ND	0.15	ug/L						
5 AROCLOR 1248	ND	0.15	ug/L						
6 AROCLOR 1254	ND	0.15	ug/L						
7 AROCLOR 1260	ND	0.15	ug/L						
8 AROCLOR 1262	ND	0.15	ug/L						
9 AROCLOR 1268	ND	0.15	ug/L						
Surrogate: Decachlorobiphenyl(S)	*0.0966*		*ug/L*	*0.100*		*96.6*	*14-124*		
Surrogate: Decachlorobiphenyl(S) [2C]	*0.00*		*ug/L*	*0.100*			*14-124*		
Surrogate: 2,4,5,6-Tetrachloro-m-xylene(S)	*0.00342*		*ug/L*	*0.100*		*3.42*	*26-136*		
Surrogate: 2,4,5,6-Tetrachloro-m-xylene(S) [2C]	*0.00*		*ug/L*	*0.100*			*26-136*		
LCS (BEA0346-BS1)				Prepared: 01/16/25 12:28 Analyzed: 01/21/25 14:15					
1 AROCLOR 1016	1.64	0.15	ug/L	2.00		82.0	60-120		
2 AROCLOR 1260	2.06	0.15	ug/L	2.00		103	60-120		
Surrogate: Decachlorobiphenyl(S)	*0.110*		*ug/L*	*0.100*		*110*	*14-124*		
Surrogate: Decachlorobiphenyl(S) [2C]	*0.00*		*ug/L*	*0.100*			*14-124*		
Surrogate: 2,4,5,6-Tetrachloro-m-xylene(S)	*0.0163*		*ug/L*	*0.100*		*16.3*	*26-136*		
Surrogate: 2,4,5,6-Tetrachloro-m-xylene(S) [2C]	*0.00*		*ug/L*	*0.100*			*26-136*		
LCS Dup (BEA0346-BSD1)				Prepared: 01/16/25 12:28 Analyzed: 01/21/25 14:15					
1 AROCLOR 1016	1.44	0.15	ug/L	2.00		71.8	60-120	13.3	20
2 AROCLOR 1260	2.01	0.15	ug/L	2.00		101	60-120	2.23	20
Surrogate: Decachlorobiphenyl(S)	*0.0824*		*ug/L*	*0.100*		*82.4*	*14-124*		
Surrogate: Decachlorobiphenyl(S) [2C]	*0.00*		*ug/L*	*0.100*			*14-124*		
Surrogate: 2,4,5,6-Tetrachloro-m-xylene(S)	*0.00902*		*ug/L*	*0.100*		*9.02*	*26-136*		
Surrogate: 2,4,5,6-Tetrachloro-m-xylene(S) [2C]	*0.00*		*ug/L*	*0.100*			*26-136*		

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 02/12/2025 16:54

Quality Control
(Continued)

Volatile Organic Compounds (VOCs) by GC/MS, 5030C

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Method: EPA 8260D									
Batch: BEA0359 - EPA 5030B									
Blank (BEA0359-BLK1)				Prepared & Analyzed: 01/17/25 06:18					
1 Acetone	ND	50	ug/L						
2 Benzene	ND	1.0	ug/L						
3 Ethylbenzene	ND	1.0	ug/L						
4 m&p-Xylene	ND	2.0	ug/L						
5 Methylene Chloride	ND	5.0	ug/L						
6 o-Xylene	ND	1.0	ug/L						
7 Toluene	ND	1.0	ug/L						
8 Xylenes	ND	3.0	ug/L						
Surrogate: 1,2-Dichloroethane-d4(S)	*50.1*		*ug/L*	*50.0*		*100*	*80-120*		
Surrogate: 4-Bromofluorobenzene(S)	*49.4*		*ug/L*	*50.0*		*98.8*	*80-120*		
Surrogate: Dibromofluoromethane(S)	*49.0*		*ug/L*	*50.0*		*97.9*	*80-120*		
Surrogate: Toluene-d8(S)	*48.8*		*ug/L*	*50.0*		*97.5*	*80-120*		
LCS (BEA0359-BS1)				Prepared & Analyzed: 01/17/25 04:51					
1 Acetone	31.0	50	ug/L	50.0		62.1	54-140		
2 Benzene	45.8	1.0	ug/L	50.0		91.7	80-120		
3 Ethylbenzene	45.5	1.0	ug/L	50.0		91.0	80-120		
4 m&p-Xylene	90.2	2.0	ug/L	100		90.2	75-130		
5 Methylene Chloride	41.8	5.0	ug/L	50.0		83.7	70-130		
6 o-Xylene	44.1	1.0	ug/L	50.0		88.1	80-120		
7 Toluene	44.9	1.0	ug/L	50.0		89.8	80-120		
8 Xylenes	134	3.0	ug/L	150		89.5	75-130		
Surrogate: 1,2-Dichloroethane-d4(S)	*51.9*		*ug/L*	*50.0*		*104*	*80-120*		
Surrogate: 4-Bromofluorobenzene(S)	*50.4*		*ug/L*	*50.0*		*101*	*80-120*		
Surrogate: Dibromofluoromethane(S)	*50.0*		*ug/L*	*50.0*		*100*	*80-120*		
Surrogate: Toluene-d8(S)	*50.9*		*ug/L*	*50.0*		*102*	*80-120*		
LCS Dup (BEA0359-BSD1)				Prepared & Analyzed: 01/17/25 05:20					
1 Acetone	27.6	50	ug/L	50.0		55.2	54-140	11.8	20
2 Benzene	44.5	1.0	ug/L	50.0		89.0	80-120	2.94	20
3 Ethylbenzene	45.5	1.0	ug/L	50.0		91.0	80-120	0.0659	20
4 m&p-Xylene	88.4	2.0	ug/L	100		88.4	75-130	1.98	20
5 Methylene Chloride	41.9	5.0	ug/L	50.0		83.8	70-130	0.167	20
6 o-Xylene	42.9	1.0	ug/L	50.0		85.8	80-120	2.71	20
7 Toluene	43.4	1.0	ug/L	50.0		86.9	80-120	3.28	20
8 Xylenes	131	3.0	ug/L	150		87.5	75-130	2.22	20
Surrogate: 1,2-Dichloroethane-d4(S)	*50.8*		*ug/L*	*50.0*		*102*	*80-120*		
Surrogate: 4-Bromofluorobenzene(S)	*50.1*		*ug/L*	*50.0*		*100*	*80-120*		

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 02/12/2025 16:54

Quality Control
(Continued)

Volatile Organic Compounds (VOCs) by GC/MS, 5030C (Continued)

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
LCS Dup (BEA0359-BSD1)				Prepared & Analyzed: 01/17/25 05:20					
Surrogate: Dibromofluoromethane(S)	*49.7*		*ug/L*	*50.0*		*99.4*	*80-120*		
Surrogate: Toluene-d8(S)	*51.3*		*ug/L*	*50.0*		*103*	*80-120*		

Method: EPA 8260D

Batch: BEA0397 - EPA 5030B

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Blank (BEA0397-BLK1)				Prepared & Analyzed: 01/21/25 01:32					
1 Acetone	ND	50	ug/L						
2 Benzene	ND	1.0	ug/L						
3 Ethylbenzene	ND	1.0	ug/L						
4 m&p-Xylene	ND	2.0	ug/L						
5 Methylene Chloride	ND	5.0	ug/L						
6 o-Xylene	ND	1.0	ug/L						
7 Toluene	ND	1.0	ug/L						
8 Xylenes	ND	3.0	ug/L						
Surrogate: 1,2-Dichloroethane-d4(S)	*51.0*		*ug/L*	*50.0*		*102*	*80-120*		
Surrogate: 4-Bromofluorobenzene(S)	*49.4*		*ug/L*	*50.0*		*98.8*	*80-120*		
Surrogate: Dibromofluoromethane(S)	*47.9*		*ug/L*	*50.0*		*95.9*	*80-120*		
Surrogate: Toluene-d8(S)	*49.6*		*ug/L*	*50.0*		*99.3*	*80-120*		
LCS (BEA0397-BS1)				Prepared & Analyzed: 01/21/25 00:05					
1 Acetone	38.9	50	ug/L	50.0		77.7	54-140		
2 Benzene	46.6	1.0	ug/L	50.0		93.3	80-120		
3 Ethylbenzene	46.4	1.0	ug/L	50.0		92.8	80-120		
4 m&p-Xylene	91.8	2.0	ug/L	100		91.8	75-130		
5 Methylene Chloride	59.4	5.0	ug/L	50.0		119	70-130		
6 o-Xylene	45.2	1.0	ug/L	50.0		90.3	80-120		
7 Toluene	46.2	1.0	ug/L	50.0		92.5	80-120		
8 Xylenes	137	3.0	ug/L	150		91.3	75-130		
Surrogate: 1,2-Dichloroethane-d4(S)	*51.6*		*ug/L*	*50.0*		*103*	*80-120*		
Surrogate: 4-Bromofluorobenzene(S)	*49.5*		*ug/L*	*50.0*		*98.9*	*80-120*		
Surrogate: Dibromofluoromethane(S)	*47.6*		*ug/L*	*50.0*		*95.1*	*80-120*		
Surrogate: Toluene-d8(S)	*51.0*		*ug/L*	*50.0*		*102*	*80-120*		

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 02/12/2025 16:54

Quality Control
(Continued)

Volatile Organic Compounds (VOCs) by GC/MS, 5030C (Continued)

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
LCS Dup (BEA0397-BSD1)				Prepared & Analyzed: 01/21/25 00:34					
1 Acetone	33.2	50	ug/L	50.0		66.5	54-140	15.6	20
2 Benzene	44.6	1.0	ug/L	50.0		89.3	80-120	4.36	20
3 Ethylbenzene	44.0	1.0	ug/L	50.0		88.0	80-120	5.38	20
4 m&p-Xylene	87.6	2.0	ug/L	100		87.6	75-130	4.71	20
5 Methylene Chloride	43.3	5.0	ug/L	50.0		86.6	70-130	31.3	20
6 o-Xylene	42.7	1.0	ug/L	50.0		85.4	80-120	5.67	20
7 Toluene	43.9	1.0	ug/L	50.0		87.8	80-120	5.19	20
8 Xylenes	130	3.0	ug/L	150		86.8	75-130	5.02	20
Surrogate: 1,2-Dichloroethane-d4(S)	*51.3*		*ug/L*	*50.0*		*103*	*80-120*		
Surrogate: 4-Bromofluorobenzene(S)	*48.7*		*ug/L*	*50.0*		*97.5*	*80-120*		
Surrogate: Dibromofluoromethane(S)	*49.5*		*ug/L*	*50.0*		*99.0*	*80-120*		
Surrogate: Toluene-d8(S)	*49.9*		*ug/L*	*50.0*		*99.9*	*80-120*		

Method: EPA 8260D

Batch: BEA0448 - EPA 5030B

Blank (BEA0448-BLK1)				Prepared & Analyzed: 01/22/25 12:39					
1 Acetone	ND	50	ug/L						
2 Benzene	ND	1.0	ug/L						
3 Ethylbenzene	ND	1.0	ug/L						
4 m&p-Xylene	ND	2.0	ug/L						
5 Methylene Chloride	ND	5.0	ug/L						
6 o-Xylene	ND	1.0	ug/L						
7 Toluene	ND	1.0	ug/L						
8 Xylenes	ND	3.0	ug/L						
Surrogate: 1,2-Dichloroethane-d4(S)	*50.1*		*ug/L*	*50.0*		*100*	*80-120*		
Surrogate: 4-Bromofluorobenzene(S)	*50.0*		*ug/L*	*50.0*		*100*	*80-120*		
Surrogate: Dibromofluoromethane(S)	*51.7*		*ug/L*	*50.0*		*103*	*80-120*		
Surrogate: Toluene-d8(S)	*50.3*		*ug/L*	*50.0*		*101*	*80-120*		

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 02/12/2025 16:54

Quality Control
(Continued)

Volatile Organic Compounds (VOCs) by GC/MS, 5030C (Continued)

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
LCS (BEA0448-BS1)				Prepared & Analyzed: 01/22/25 11:10					
1 Acetone	33.4	50	ug/L	50.0		66.7	54-140		
2 Benzene	48.6	1.0	ug/L	50.0		97.2	80-120		
3 Ethylbenzene	49.0	1.0	ug/L	50.0		98.0	80-120		
4 m&p-Xylene	97.9	2.0	ug/L	100		97.9	75-130		
5 Methylene Chloride	54.4	5.0	ug/L	50.0		109	70-130		
6 o-Xylene	46.7	1.0	ug/L	50.0		93.5	80-120		
7 Toluene	46.9	1.0	ug/L	50.0		93.8	80-120		
8 Xylenes	145	3.0	ug/L	150		96.4	75-130		
Surrogate: 1,2-Dichloroethane-d4(S)	*52.4*		*ug/L*	*50.0*		*105*	*80-120*		
Surrogate: 4-Bromofluorobenzene(S)	*51.2*		*ug/L*	*50.0*		*102*	*80-120*		
Surrogate: Dibromofluoromethane(S)	*49.7*		*ug/L*	*50.0*		*99.5*	*80-120*		
Surrogate: Toluene-d8(S)	*50.1*		*ug/L*	*50.0*		*100*	*80-120*		
LCS Dup (BEA0448-BSD1)				Prepared & Analyzed: 01/22/25 11:39					
1 Acetone	32.5	50	ug/L	50.0		64.9	54-140	2.73	20
2 Benzene	46.5	1.0	ug/L	50.0		93.0	80-120	4.33	20
3 Ethylbenzene	47.0	1.0	ug/L	50.0		93.9	80-120	4.21	20
4 m&p-Xylene	93.0	2.0	ug/L	100		93.0	75-130	5.15	20
5 Methylene Chloride	48.9	5.0	ug/L	50.0		97.8	70-130	10.7	20
6 o-Xylene	44.9	1.0	ug/L	50.0		89.7	80-120	4.08	20
7 Toluene	45.8	1.0	ug/L	50.0		91.6	80-120	2.37	20
8 Xylenes	138	3.0	ug/L	150		91.9	75-130	4.80	20
Surrogate: 1,2-Dichloroethane-d4(S)	*53.0*		*ug/L*	*50.0*		*106*	*80-120*		
Surrogate: 4-Bromofluorobenzene(S)	*50.0*		*ug/L*	*50.0*		*99.9*	*80-120*		
Surrogate: Dibromofluoromethane(S)	*49.7*		*ug/L*	*50.0*		*99.4*	*80-120*		
Surrogate: Toluene-d8(S)	*50.0*		*ug/L*	*50.0*		*99.9*	*80-120*		

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 02/12/2025 16:54

Quality Control
(Continued)

Per- and Polyfluoroalkyl Substances

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Method: EPA 537M									
Batch: BEA0327 - 537M									
Blank (BEA0327-BLK1)				Prepared & Analyzed: 01/16/25 19:13					
1 PFOA	ND	0.80	ng/L						
2 PFOS	ND	0.80	ng/L						
LCS (BEA0327-BS1)				Prepared & Analyzed: 01/16/25 19:27					
1 PFOA	15	0.80	ng/L	16.0		92	70-150		
2 PFOS	14	0.80	ng/L	14.9		97	55-150		
LCS Dup (BEA0327-BSD1)				Prepared & Analyzed: 01/16/25 19:40					
1 PFOA	14 EIS+	0.80	ng/L	16.0		87	70-150	5	30
2 PFOS	14	0.80	ng/L	14.9		95	55-150	2	30

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 02/12/2025 16:54

Quality Control
(Continued)

Metals

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Method: EPA 7470A									
Batch: BEA0326 - EPA 7470A/EPA 245.1									
Blank (BEA0326-BLK1)				Prepared & Analyzed: 01/16/25 11:30					
1 Mercury	ND	0.20	ug/L						
LCS (BEA0326-BS1)				Prepared & Analyzed: 01/16/25 11:32					
1 Mercury	0.25	0.20	ug/L	0.250		101	85-115		
Method: EPA 6020B									
Batch: BEA0339 - EPA 200.2									
Blank (BEA0339-BLK1)				Prepared & Analyzed: 01/16/25 10:42					
1 ARSENIC (AS)	ND	1.0	ug/L						
1 CADMIUM (CD)	ND	0.10	ug/L						
1 CHROMIUM (CR)	ND	2.0	ug/L						
1 COPPER (CU)	ND	2.0	ug/L						
1 LEAD (PB)	ND	2.0	ug/L						
1 LITHIUM (LI)	ND	1.0	ug/L						
1 MOLYBDENUM (MO)	ND	2.00	ug/L						
1 NICKEL (NI)	ND	2.0	ug/L						
1 SELENIUM (SE)	ND	2.0	ug/L						
1 SILVER (AG)	ND	0.10	ug/L						
1 ZINC (ZN)	ND	5.0	ug/L						
LCS (BEA0339-BS1)				Prepared & Analyzed: 01/16/25 10:43					
1 ARSENIC (AS)	93.4	1.0	ug/L	100		93.4	85-115		
1 CADMIUM (CD)	99.8	0.10	ug/L	100		99.8	85-115		
1 CHROMIUM (CR)	191	2.0	ug/L	200		95.6	85-115		
1 COPPER (CU)	197	2.0	ug/L	200		98.5	85-115		
1 LEAD (PB)	226	2.0	ug/L	200		113	85-115		
1 LITHIUM (LI)	114	1.0	ug/L	100		114	85-115		

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 02/12/2025 16:54

Quality Control
(Continued)

Metals (Continued)

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
LCS (BEA0339-BS1)				Prepared: 01/16/25 10:03 Analyzed: 01/17/25 13:40					
1 MOLYBDENUM (MO)	207	2.00	ug/L	200		103	85-115		
1 NICKEL (NI)	198	2.0	ug/L	200		99.1	85-115		
1 SELENIUM (SE)	96.0	2.0	ug/L	100		96.0	85-115		
1 SILVER (AG)	108	0.10	ug/L	100		108	85-115		
1 ZINC (ZN)	493	5.0	ug/L	500		98.5	85-115		

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 02/12/2025 16:54

Quality Control
(Continued)

Wet Chemistry

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Method: SM 5210B-2016									
Batch: BEA0301 - Wet Chem No Prep									
Blank (BEA0301-BLK1)				Prepared & Analyzed: 01/15/25 14:38					
1 Carbonaceous Biochemical Oxygen Demand	ND	2.0	mg/L						
Blank (BEA0301-BLK2)				Prepared & Analyzed: 01/15/25 14:38					
1 Carbonaceous Biochemical Oxygen Demand	ND	2.0	mg/L						
LCS (BEA0301-BS1)				Prepared & Analyzed: 01/15/25 14:38					
1 Carbonaceous Biochemical Oxygen Demand	168	100	mg/L	198		85.0	.59596-115.4		
Method: SM2540D									
Batch: BEA0308 - Wet Chem No Prep									
Blank (BEA0308-BLK1)				Prepared & Analyzed: 01/15/25 12:24					
1 Total Suspended Solids	ND	2.5	mg/L						
Blank (BEA0308-BLK2)				Prepared & Analyzed: 01/15/25 12:24					
1 Total Suspended Solids	ND	2.5	mg/L						
LCS (BEA0308-BS1)				Prepared & Analyzed: 01/15/25 12:24					
1 Total Suspended Solids	88.0	25	mg/L	100		88.0	78-110		
Duplicate (BEA0308-DUP1)	**Source: 25A0120-01**			Prepared & Analyzed: 01/15/25 12:24					
1 Total Suspended Solids	114	25	mg/L		109			4.48	10
Method: Hach 8000									
Batch: BEA0331 - Wet Chem No Prep									
Blank (BEA0331-BLK1)				Prepared & Analyzed: 01/16/25 13:30					
1 Chemical Oxygen Demand	ND	20	mg/L						

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 02/12/2025 16:54

Quality Control
(Continued)

Wet Chemistry (Continued)

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
LCS (BEA0331-BS1)				Prepared & Analyzed: 01/16/25 13:30					
1 Chemical Oxygen Demand	496	20	mg/L	500		99.3	90-110		
LCS Dup (BEA0331-BSD1)				Prepared & Analyzed: 01/16/25 13:30					
1 Chemical Oxygen Demand	496	20	mg/L	500		99.3	90-110	0.00	200
Duplicate (BEA0331-DUP1)	**Source: 25A0120-01**			Prepared & Analyzed: 01/16/25 13:30					
1 Chemical Oxygen Demand	28.4	20	mg/L		30.7			200	10

Method: EPA 365.3

Batch: BEA0332 - Wet Chem No Prep

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Blank (BEA0332-BLK1)				Prepared & Analyzed: 01/16/25 13:57					
1 Phosphorus	ND	0.010	mg/L						
LCS (BEA0332-BS1)				Prepared & Analyzed: 01/16/25 13:57					
1 Phosphorus	0.250	0.010	mg/L	0.250		100	85-115		
LCS Dup (BEA0332-BSD1)				Prepared & Analyzed: 01/16/25 13:57					
1 Phosphorus	0.252	0.010	mg/L	0.250		101	85-115	0.612	20
Matrix Spike (BEA0332-MS1)	**Source: 25A0120-01**			Prepared & Analyzed: 01/16/25 13:57					
1 Phosphorus	0.789	0.020	mg/L	0.500	0.275	103	80-120		
Matrix Spike Dup (BEA0332-MSD1)	**Source: 25A0120-01**			Prepared & Analyzed: 01/16/25 13:57					
1 Phosphorus	0.771	0.020	mg/L	0.500	0.275	99.2	80-120	2.36	20

Method: SM 4500 NH3 G

Batch: BEA0372 - Wet Chem No Prep

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Blank (BEA0372-BLK1)				Prepared & Analyzed: 01/17/25 16:49					
1 AMMONIA AS N	ND	0.010	mg/L						

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 02/12/2025 16:54

Quality Control
(Continued)

Wet Chemistry (Continued)

Analyte	Result/ Qual	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
LCS (BEA0372-BS1)					Prepared & Analyzed: 01/17/25 16:49				
1 AMMONIA AS N	5.30	0.010	mg/L	5.00		106	90-110		
LCS Dup (BEA0372-BSD1)					Prepared & Analyzed: 01/17/25 16:49				
1 AMMONIA AS N	5.44	0.010	mg/L	5.00		109	90-110	2.62	20

Method: EPA 1664B

Batch: BEB0198 - Wet Chem No Prep

Blank (BEB0198-BLK1)					Prepared & Analyzed: 02/11/25 12:00				
1 Oil and Grease	ND	5.0	mg/L						
Blank (BEB0198-BLK2)					Prepared & Analyzed: 02/11/25 12:00				
1 Oil and Grease	ND	5.0	mg/L						
LCS (BEB0198-BS1)					Prepared & Analyzed: 02/11/25 12:00				
1 Oil and Grease	34.6	5.0	mg/L	40.0		86.5	78-114		

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 02/12/2025 16:54

Notes and Definitions

Item	Definition
EIS+	The Isotope Dilution/Extracted Internal Standard area exceeds the upper control limit.
H	Hold time exceeded.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
Dry	Sample results reported on a dry weight basis.
MDL	Method Detection Limit (only displays if reported to the MDL)
ND	Analyte NOT DETECTED at or above the reporting limit.
DF	Dilution Factor
DL	Detection Limit
‡	Parameter not included in NELAC Scope of Analysis.
RPD	Relative Percent Difference
%REC	Percent Recovery
Source	Sample that was matrix spiked or duplicated.

PQL, Practical Quantitation Limit = Method Reporting Limit (MRL).

Accreditation Number(s):
MI001292024-1

Metiri Group - Holt - 1914 Holloway Dr, Holt, MI 48842

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 02/12/2025 16:54

WORK ORDER

25A0120

Printed: 02/12/2025 4:54 pm

Project: **Rose Arbor Basin / 097512.00**
Project Number: **097512.00**
Project Manager: **Jacob Sutherlund**
PO Number:

Report To:
Soil and Materials Engineers, Inc. - Kalamazoo
Aaron Reed
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611
Phone: 2693233555
Fax: 2693233553

Invoice To:
Soil and Materials Engineers, Inc. - Kalamazoo
Aaron Reed
3301 Tech Circle Drive
Kalamazoo, MI 49008-5611
Phone: 2693233555
Fax: 2693233553

Date Received: 01/14/2025 10:50 AM
Date Due: 01/21/2025 (5.00 day TAT)

Logged In By: Kalley Keyes
Received By: Alexander Woods

Analysis		Comments
25A0120-01 WS1 [Water] Sampled 1/13/2025 11:00:00AM		
537M-MI	PFOA & PFOS Only	PFOA & PFOS Only
Alcohols-MI	Methanol Only	Methanol Only
Ammonia-MI	NONE	
Arsenic 6020-MI	NONE	
Cadmium 6020-MI	NONE	
CBOD-MI	NONE	
Chromium 6020-MI	NONE	
COD - MI	NONE	
Copper 6020-MI	NONE	
Cyanide, Available-MI	NONE	
FOG-MI	NONE	
Lead 6020-MI	NONE	
Lithium 6020-MI	NONE	
Mercury 7470-MI	NONE	
Molybdenum 6020-MI	NONE	
Nickel 6020-MI	NONE	
PCB-MI	NONE	
pH-MI	NONE	
Phosphorus-MI	NONE	
Selenium 6020-MI	NONE	
SGT-HEM - MI	NONE	
Silver 6020-MI	NONE	
Total Suspended Solids-MI	NONE	
VOC 8260-W-MI	Btex, Acetone, Methlyene Chlori	BTEX, Acetone, & Methlyene Chloride
Zinc 6020-MI	NONE	

Samples subcontracted to: Trace Analytical Laboratories, Inc.

Soil and Materials Engineers, Inc. - Kalamazoo	Project: Rose Arbor Basin / 097512.00	
3301 Tech Circle Drive	Project Number: 097512.00	
Kalamazoo, MI 49008-5611	Project Manager: Aaron Reed	Reported: 02/12/2025 16:54

Analysis	Comments

Samples subcontracted to: Trace Analytical Laboratories, Inc.

25A0120-01 WS1 [Water] Sampled 1/13/2025 11:00:00AM

SUB - Hexachlorobenzene	NONE	2-1L Ambers to Trace

25A0120 **Sample Receipt Log**

Default Cooler

Samples Received at: **1.8°C**

Were Custody Seals present and signed?	No	Container/preservative correct for test requested?	Yes
Received on Ice	Yes	Sufficient amount sent for tests requested?	Yes
Within proper temp	Yes	Required containers sealed in separate bags?	Yes
Were all TO-15 samples received at ambient?	No	Were all samples inspected and sampled correctly?	Yes
Was a chain of custody received?	Yes	Were bubbles absent in volatile samples?	Yes
COCs complete/signed in the appropriate places?	Yes	Sufficient remaining holding time for analyses?	Yes
Were all samples listed on COC received?	Yes	If Applicable pH documented for necessary samples?	Yes
Did all samples/container labels agree with COCs?	Yes	If applicable, was the chlorine test negative?	No
Did all containers arrive in good condition?	Yes	If applicable, samples free of oxidizers?	No
Containers Intact	Yes	Thermometer # : 10003954 used?	Yes

Docusign Envelope ID: 1C4D8A1B-A630-4A30-8BBA-3757D8965213

Fibertec environmental services

Analytical Laboratory

1914 Holloway Drive
Holt, MI 48842
Phone: 517 699 0345
Fax: 517 699 0388
email: lab@fibertec.us

8660 S. Mackinaw Trail
Cadillac, MI 49601
Phone: 231 775 8368
Fax: 231 775 8584

Geoprobe

11766 E. Grand River Rd.
Brighton, MI 48116
Phone: 810 220 3300
Fax: 810 220 3311

Chain of Custody #

205580

PAGE ___ of ___

Client Name: SME

Contact Person: Aaron Reed

Project Name/ Number: Rose Arbor Basin / 097512.00

Email distribution list:

Quote# SME 021824-City of Kalamazoo Dewatering V2

Purchase Order#

Date	Time	Sample #	Client Sample Descriptor	MATRIX (SEE RIGHT CORNER FOR CODE)	# OF CONTAINERS	PARAMETERS: SEE Quote #	HOLD SAMPLE
1/13/25	1100		WS1	SW	18	X	

Matrix Code

S	Soil	GW	Ground Water
A	Air	SW	Surface Water
O	Oil	WW	Waste Water
P	Wipe	X	Other: Specify

Deliverables

- Level 2
- Level 3
- Level 4
- EDD

Remarks:

Received By
JAN 14 2025
Initials JH

Comments:

Sampled/Relinquished By: Anthony J. Hosbein	Date/ Time 1/13/25 1330	Received By: SME Cold Storage
Relinquished By: SME Cold Storage	Date/ Time 1/14/25 10:50	Received By:
Relinquished By:	Date/ Time 1-14-25 1335	Received By Laboratory: 1/14/25 14:26

Turnaround Time ALL RESULTS WILL BE SENT BY THE END OF THE BUSINESS DAY

_____1 bus. day _____2 bus. days _____3 bus. days _____4 bus. days

X 5-7 bus. days (standard) Other (specify time/date requirement): _____

LAB USE ONLY

Fibertec project number: 25A0120

Temperature upon receipt at Lab: 1.8°C

Received On Ice

Please see back for terms and conditions

Trace Analytical Laboratories, Inc.
2241 Black Creek Road
Muskegon, MI 49444-2673

TRACE
ANALYTICAL LABORATORIES, INC.

231-773-5998 Phone
888-979-4469 Fax
www.trace-labs.com

January 24, 2025

Mr. Jacob Sutherlund
Fibertec Environmental Services
1798 Holloway Drive, Suite B
Holt, MI 48842

RE: Trace Project 25A0584
Client Project 25A0120

Dear Mr. Sutherlund:

Enclosed are your analytical results. The results of this report relate only to the samples listed in the body of this report.

All reports were examined through Trace's validation process to ensure that requirements for quality and completeness were satisfied. All reported analytical results were obtained in accordance with the methods referenced on the reports. Every practical effort was made to meet the reporting limit specifications for this work, however, some results may have raised reporting limits to correct for percent solids.

For clients that require NELAP Accreditation, Trace certifies that these test results meet all requirements of the NELAP Standard, except for those analytes with a "N" notation. These analytes have not been evaluated by NELAP at Trace's discretion and will not be reported unless requested by client.

If you have questions concerning this report, please contact me at 231.773.5998 or by email at jmink@trace-labs.com.

Sincerely,

Jon Mink
Senior Project Manager
Enclosures

PJLA Testing
Accreditation# 1031

TNI EL V1:2016

Trace Analytical Laboratories, Inc.
2241 Black Creek Road
Muskegon, MI 49444-2673

231-773-5998 Phone
888-979-4469 Fax
www.trace-labs.com

SAMPLE SUMMARY

Trace Project ID: 25A0584
Client Project ID: 25A0120

Trace ID	Sample ID	Matrix	Collected By	Date Collected	Date Received
25A0584-01	25A0120-01 WS1	Surface Water	Client	01/13/25 11:00	01/15/25 14:09

CERTIFICATE OF ANALYSIS

Trace Analytical Laboratories, Inc.
2241 Black Creek Road
Muskegon, MI 49444-2673

TRACE ANALYTICAL LABORATORIES, INC.

231-773-5998 Phone
888-979-4469 Fax
www.trace-labs.com

ANALYTICAL RESULTS

Trace Project ID: 25A0584
Client Project ID: 25A0120

Trace ID: 25A0584-01 Matrix: Surface Water Date Collected: 01/13/25 11:00
Sample ID: 25A0120-01 WS1 Date Received: 01/15/25 14:09

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
SEMI-VOLATILE COMPOUNDS BY GC										
Analysis Method: EPA 612										
Batch: T161809										
Hexachlorobenzene	<0.010	ug/L	0.010	1	01/16/25	als	01/22/25	ahr	N	
Surrogates:										
Tetrachloro-m-xylene	81	%	18-105	1	01/16/25	als	01/22/25	ahr	N	

Trace Analytical Laboratories, Inc.
2241 Black Creek Road
Muskegon, MI 49444-2673

231-773-5998 Phone
888-979-4469 Fax
www.trace-labs.com

QUALITY CONTROL RESULTS

Trace Project ID: 25A0584
Client Project ID: 25A0120

QC Batch: T161809
QC Batch Method: EPA 3510C Separatory Funnel Liquid-Liquid Extr.

Analysis Description: Hexachlorobenzene
Analysis Method: EPA 612

METHOD BLANK: T161809-BLK1

Parameter	Units	Blank Result	Reporting Limit	Notes
Hexachlorobenzene	ug/L	<0.010	0.010	
Tetrachloro-m-xylene (S)	%	66	18-105	

LABORATORY CONTROL SAMPLE: T161809-BS1

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Hexachlorobenzene	ug/L	0.0500	0.0348	70	0-200	
Tetrachloro-m-xylene (S)	%	0.0600	0.0434	72	18-105	

Trace Analytical Laboratories, Inc.
2241 Black Creek Road
Muskegon, MI 49444-2673

TRACE ANALYTICAL LABORATORIES, INC.

231-773-5998 Phone
888-979-4469 Fax
www.trace-labs.com

AN EXPLANATION OF TERMS AND SYMBOLS WHICH MAY OCCUR IN THIS REPORT

DEFINITIONS

LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MS	Matrix Spike
MSD	Matrix Spike Duplicate
RPD	Relative Percent Difference
DUP	Matrix Duplicate
RDL	Reporting Detection Limit
MCL	Maximum Contamination Limit
TIC	Tentatively Identified Compound
<, ND or U	Indicates the compound was analyzed for but not detected
*	Indicates a result that exceeds its associated MCL or Surrogate control limits
N	Indicates that the laboratory is not accredited by NELAP for this compound
NA	Indicates that the compound is not available.

NOTE: Samples for volatiles that have been extracted with a water miscible solvent were corrected for the total volume of the solvent/water mixture.
Solid matrices Method Blanks are at 100% solids as such results are the same wet or dry.

CERTIFICATE OF ANALYSIS

Trace Analytical Laboratories, Inc.
2241 Black Creek Road
Muskegon, MI 49444-2673

TRACE ANALYTICAL LABORATORIES, INC.

231-773-5998 Phone
888-979-4469 Fax
www.trace-labs.com

METIRI

SUBCONTRACT ORDER

NCV

Sending Laboratory:

Metiri Group - Holt
1914 Holloway Dr
Holt, MI 48842
Phone: (517) 699-0345
TAT Type: STD
Project Manager: Jacob Sutherlund
Report Type:
EDD:

Subcontracted Laboratory: 25A0584 - MJ

Trace Analytical Laboratories, Inc.
2241 Black Creek Road
Muskegon, MI 49444
Phone: (231) 773-5998
Fax:

Work Order: 25A0120

Analysis	Due	Expires	Comments
Sample ID: 25A0120-01 Surface Water Sampled: 01/13/2025 11:00 TAT: 10 Sample Name: WS1			
SUB - Hexachlorobenzene	01/21/2025	02/12/2025 11:00	2-1L Ambers to Trace
Containers Supplied:			

Released By — Date: 1-15-25 14:09

Received By — 1409 — Date: 1/15/25

Page 1 of 1

CERTIFICATE OF ANALYSIS

Trace Analytical Laboratories, Inc.
2241 Black Creek Road
Muskegon, MI 49444-2673

TRACE ANALYTICAL LABORATORIES, INC.

231-773-5998 Phone
888-979-4469 Fax
www.trace-labs.com

25A0584
Fibertec Environmental Ser
Project Manager: Jon Mink

Sample Log In Checklist

	Original Observation	Corrected Temperature	IR-9 (CF: 0.0°C)	IR-10 (CF: -0.3°C)	IR-12 (CF: 0.0°C)	SR1 (CF: -0.4°C)	SR2 (CF: -0.4°C)	Temp Blank	Client Sample
Date: 1-15-25									
Time: 1409									
Initials: MJ									
Package Description: Cooler									
Package Temp °C	0.0	0.0	/						
Representative Sample Temp °C	5.9	5.9	/						/

Sample Receipt

Yes No

- [x] [ ] Received on ice or other coolant
- [x] [ ] Ice still present upon receipt
- [ ] [x] Custody seals present — [ ] Yes [ ] No Custody seals intact (if applicable)
- [x] Trace Courier — [x] Client Drop-off — [ ] UPS [ ] Fed Ex [ ] US Mail [ ] Other

MJ 1-15-25

Sample Condition

Yes	No	N/A	
[x]	[ ]	[ ]	All sample containers arrived unbroken and labeled
[x]	[ ]	[ ]	Sufficient sample to run requested analyses
[ ]	[ ]	[x]	Correct chemical preservative added to samples
[ ]	[ ]	[x]	Samples preserved at Trace
[ ]	[ ]	[x]	Chemical preservation verified, check EMD pH test strip used (if applicable)
			[ ] pH 0-2.5 (Lot: HC311850) [ ] pH 11.0-13.0 (Lot: HC022540) [ ] Other
[ ]	[ ]	[x]	Air bubbles absent from VOAs

Chain of Custody (COC)

Yes No

- [x] [ ] All bottle labels agree with COC
- [x] [ ] COC filled out properly
- [x] [ ] COC signed by client

Notes:

Form 70-A.56
Effective 11/26/24

TRACE Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Lab Lab
Fibertec Inc.
1914 Holloway Drive
Holt, Michigan 48842

Generated 2/19/2025 9:17:53 AM Revision 1

JOB DESCRIPTION

SEDIMENT 1 - TENORM

JOB NUMBER

190-36146-1

Eurofins Michigan
10448 Citation Drive
Suite 200
Brighton MI 48116

See page two for job notes and contact information.

Eurofins Michigan

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization

Sue Schafer

Generated
2/19/2025 9:17:53 AM
Revision 1

Authorized for release by
Sue Schafer, Project Manager II
Sue.Schafer@et.eurofinsus.com
(810)229-2763

Table of Contents

Sample Summary

Client: Fibertec Inc.
Job ID: 190-36146-1
Project/Site: SEDIMENT 1 - TENORM

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
190-36146-1	25A0123 -01	Solid	01/13/25 11:30	01/16/25 12:05

Case Narrative

Client: Fibertec Inc. Job ID: 190-36146-1
Project: SEDIMENT 1 - TENORM

Job ID: 190-36146-1 Eurofins Michigan

Job Narrative
190-36146-1

Revision
The report being provided is a revision of the original report sent on 2/11/2025. REV1: Corrected formatter to report Lead 210 correctly.

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The sample was received on 1/16/2025 12:05 PM. Unless otherwise noted below, the sample arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 15.0°C.

Gamma Spectroscopy
Method 901.1_Ra: Gamma Prep Batch: 160-699131

The sample results for 25A0123 -01 (190-36146-1) and (190-36146-A-1 DU) are based upon sample as received (i.e. wet weight).

Method 901.1_Ra: Gamma Prep Batch 160-699131
Many isotopes requested by gamma spectrometry analysis do not have any gamma emissions, the gamma emissions they do have are very poor, and/or are reported by assuming secular equilibrium with a longer-lived parent (or vice-versa). For example, Th-232 (which does not have a good gamma-ray) is often reported assuming the shorter-lived Ra-228 daughter is in equilibrium with the Th-232 parent. Or, Pb-214 and/or Bi-214, daughters of potentially volatile Rn-222 in the Ra-226 decay chain, may not be in equilibrium with the parent unless sufficient time has been allowed since the break in equilibrium (e.g. 21 days in the case of Ra-226-supported ingrowth). The client should ensure that such inference is acceptable for their sample based upon process knowledge. The following assumptions were made for this report:

Inferred from	Reported to Analyte
Th-234	Pa-234
Th-234	U-238
Pb-210	Po-210
Pb-210	Bi-210
Cs-137	Ba-137m
Pb-212	Po-216
Xe-131m	Xe-131
Sb-125	Te-125m
Ag-108m	Ag-108
Rh-106	Ru-106
Pb-212	Th-228
Pb-212	Ra-224
U-235	Th-231
Ac-228	Th-232
Ac-228	Ra-228
Th-227	Ra-223
Th-227	Ac-227
Th-227	Bi-211
Th-227	Pb-211
Bi-214	Ra-226

25A0123 -01 (190-36146-1) and (190-36146-A-1-B DU)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Eurofins Michigan

Case Narrative

Client: Fibertec Inc. Job ID: 190-36146-1
Project: SEDIMENT 1 - TENORM

Job ID: 190-36146-1 (Continued) Eurofins Michigan

Client Sample Results

Client: Fibertec Inc.
Job ID: 190-36146-1
Project/Site: SEDIMENT 1 - TENORM

Client Sample ID: 25A0123 -01
Lab Sample ID: 190-36146-1
Date Collected: 01/13/25 11:30
Matrix: Solid
Date Received: 01/16/25 12:05

Method: EPA 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Lead-210	ND	U	1.34	1.34		1.85	pCi/g	01/20/25 10:05	02/10/25 09:27	1
Radium-226	**0.234**		0.0851	0.0882	1.00	0.0860	pCi/g	01/20/25 10:05	02/10/25 09:27	1
Radium-228	**0.372**		0.125	0.131		0.155	pCi/g	01/20/25 10:05	02/10/25 09:27	1

QC Sample Results

Client: Fibertec Inc.
Project/Site: SEDIMENT 1 - TENORM

Job ID: 190-36146-1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Lab Sample ID: MB 160-699131/1-A
Matrix: Solid
Analysis Batch: 702249

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 699131

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Lead-210	ND	U	0.456	0.456		1.44	pCi/g	01/20/25 10:05	02/10/25 09:26	1
Radium-226	ND	U	0.146	0.146	1.00	0.257	pCi/g	01/20/25 10:05	02/10/25 09:26	1
Radium-228	ND	U	0.0723	0.0724		0.185	pCi/g	01/20/25 10:05	02/10/25 09:26	1

Lab Sample ID: LCS 160-699131/2-A
Matrix: Solid
Analysis Batch: 702244

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 699131

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits
Americium-241	95.8	93.10		10.1		1.11	pCi/g	97	75 - 125
Cesium-137	24.3	25.51		2.60		0.217	pCi/g	105	75 - 125
Cobalt-60	5.48	5.537		0.598		0.106	pCi/g	101	75 - 125

Lab Sample ID: 190-36146-1 DU
Matrix: Solid
Analysis Batch: 702246

Client Sample ID: 25A0123 -01
Prep Type: Total/NA
Prep Batch: 699131

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	RER	RER Limit
Lead-210	ND	U	ND	U	0.990		1.35	pCi/g	0.04	1
Radium-226	0.234		0.2205		0.0887	1.00	0.0688	pCi/g	0.08	1
Radium-228	0.372		ND	U	0.183		0.239	pCi/g	0.87	1

Definitions/Glossary

Client: Fibertec Inc. Job ID: 190-36146-1
Project/Site: SEDIMENT 1 - TENORM

Qualifiers

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

SUBCONTRACT ORDER

Sending Laboratory:

Metiri Group - Holt
1914 Holloway Dr
Holt, MI 48842
Phone: (517) 699-0345
TAT Type: STD
Project Manager: Jacob Sutherlund
Report Type: L 2
EDD:

Subcontracted Laboratory:

Eurofins TestAmerica
10448 Citation Dr STE 200
Brighton, MI 48116
Phone: (810) 229-2763
Fax:

Work Order: 25A0123

Analysis	Due	Expires	Comments
Sample ID: 25A0123-01 Solid Sampled: 01/13/2025 11:30 TAT: 5 Sample Name: Sediment 1			
SUB-Tenorm-MI	01/21/2025	02/12/2025 11:30	Tenorm to Eurofins TestAmerica
Containers Supplied:			

190-36146 Chain of Custody

Released By — Date 1/16/25 8:40

Received By — Date 1/16/25

Page 1 of 1

Received by 11/16/25

eurofins | Environment Testing TestAmerica

☐ SDS or Known Hazard Information Supplied by Client
☐ Discrepancies
☐ Short Hold
Client ID: Fibertec
Work Oder #: 36146
☐ Rush ☐ 24 Hr ☐ 2-Day ☐ 3-Day ☐ 5-Day ☐ Other: _____
Receipt Evaluation Performed by: Initials: JH Date: 1/16 Time: 12:05

Cooler / Sample Receipt

After hours receipt: complete gray areas. Place cooler in walk-in, place form in Receiving box. Date: _____ Time: _____

Method of Shipment:
Walk-In Client ☐ Eurofins TA Field/Courier
Other Client / 3rd Party Courier: _____
Fed Ex Tracking #: _____
UPS Tracking #: _____
Other: _____

Shipping Container Type:
☐ Cooler ☐ Box
☐ None ☐ Other: _____

Packing Materials:
☐ Plastic Bags ☐ Foam
☐ Bubble Wrap ☐ Paper
☐ Packing Peanuts ☐ None
☐ Other: _____

Custody Seals Intact:
☐ Yes ☐ No
☐ NA (not used or required)

Cooling Materials:
☐ Ice (Solid) ☐ Ice (Melted)
☐ Blue Ice ☐ None
☐ Other: Unknown

Bacteriological Samples	Temp Corrected (°C)	Frozen? Yes	Frozen? No	Rec'd Within 2 Hrs? Yes	Rec'd Within 2 Hrs? No	Sample Flagged? Yes	Sample Flagged? No

Received on same day sampled? Yes (No)
Additional Sheets Required? Yes (No)

Receipt Temperatures

Thermometer ID	Observed (°C)	Corrected (°C)	Temp Blank	Sample Temp	Acceptable	Cooler ID	Affected Samples
CP313209	15.0	15.0	_____	_____	Y N	_____	_____
_____	_____	_____	_____	_____	Y N	_____	_____
_____	_____	_____	_____	_____	Y N	_____	_____

Receipt Questions**	Y	N	NA	"No" answers require additional comment
CoC present and ETA receipt signature, date, and time properly documented?	✓			
Containers and Labels in good condition? *(unbroken, not leaking, appropriately filled, labels legible & attached)*	✓			
Appropriate containers used and adequate volume provided?	✓			Preserved bottles checked for pH?* Yes (No)
Number of sample containers match CoC?	✓			pH strip lot # _____
Samples received within hold?	✓			
Samples submitted for GRO and Volatiles analysis (8260, 624, 524) received without headspace?			✓	
Was a Trip Blank received with VOA samples?			✓	
Were the samples free of any questionable physical conformities? (i.e.; field duplicates or multiple bottles of the same sample do not significantly vary in appearance – color, solid proportions, etc.)	✓			
Were the CoC bottle labels and all other items free of all other discrepancies or issues that would need to be addressed with the Project Manager and/or Client?	✓			
**May not be applicable if samples are not for compliance testing				*Excludes FOG, VOAs, TOC Vials, HEM

Client Contact Record
Contact Via: ☐ Phone ☐ Email ☐ Other: _____ Person Contacted: _____ Date/Time: _____
☐ Discrepancy allowance agreement is on record in the client project file
Discussion / Resolution

Any additional documentation and clarification from the client must be noted in the narrative and/or scanned into the CoC directory.
Reviewed by _____ Date: 1/16/25

WI-MI-010_020720

Eurofins Michigan
10448 Citation Drive Suite 200
Brighton, MI 48116
Phone: 810-229-2763 Fax: 810-229-0000

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler: N/A	Lab PM: Schafer, Sue	Carrier Tracking No(s): N/A	COC No: 190-41189.1
Client Contact: Shipping/Receiving	Phone: N/A	E-Mail: Sue.Schafer@et.eurofinsus.com	State of Origin: Michigan	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): N/A		Job #: 190-36146-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 1/29/2025			
City: Earth City	TAT Requested (days): N/A			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #: N/A			
Email: N/A	WO #: N/A			
Project Name: Sediment 1 - Tenorm	Project #: 19001581			
Site: N/A	SSOW#: N/A			

Analysis Requested

Preservation Codes: -

Other: N/A

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	901.1_Ra/Fll_Geo_21 TENORM 21 DAY INGROWTH	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
25A0123 -01 (190-36146-1)	1/13/25	11:30 Eastern	G	Solid			X	2	

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing North Central, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing North Central, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing North Central, LLC.

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	1/16/25 12:45	ECI	M. Pinette	JAN 17 2025 0920	
Relinquished by:	Date/Time:	Company	Received by: Meadow Pinette	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact:	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

eurofins | Environment Testing

500-262757 Login
PM: Knapp, Jim D
Company: Honeywell International Inc

CONDITION UPON RECEIPT FORM (CUR)

Client: Chicago

Initiated by: MLP Date: JAN 17 2025 Time: 0920 Shipper: FE Package Quantity: 2

• Mercury solid samples must be received at 0- 6°C. If not, note temp below. • Metal solid samples must be refrigerated (0- 6°C) upon receipt. • If samples are from West Virginia, please fill out form ADMIN-0031.	**Thermometer ID and CF (Circle One):** ID: CF: / **ID: IR-1 CF: -0.2°C**

	Shipping #(s)	Uncorrected Package Temp (°C)	Corrected Package Temp (°C)
1.	7051 7621 9918	8.8	8.6
2.	9907	9.6	9.4
3.			
4.			
5.			
6.			

Condition Circle "Y" for yes, "N" for no and "N/A" for not applicable.
Inspected by: MLP

1.	(Y) N	Are there custody seals present on the cooler?	9.	Y N (N/A)	Do custody seals on bottles appear to be tampered with?
2.	Y (N) N/A	Do custody seals on cooler appear to be tampered with?	10.	(Y) N	Sample received in proper containers?
3.	(Y) N	Were contents of cooler frisked after opening, but before unpacking?	11.	Y N (N/A)	Headspace in Rn-222 samples? (>6mm) (If Yes, note sample ID's below)
4.	(Y) N	Sample received with Chain of Custody (COC)?	12.	(Y) N N/A	Individual containers frisked after unpacking? CF
5.	(Y) N	Does the COC include the following : • sample ID's that match the container(s)? • location, date and time of collection? • collector's name? • sample preservation type?	13.	(Y) N N/A	Was sample received with proper pH? pH strip lot #: WRS-4801 If not: • contact PM (do not adjust without approval) • Record sample ID and pH in notes • If pH is adjusted, record info below
6.	Y (N)	Was sample received broken?	14.	Y N (N/A)	Are containers for Rn-222, C-14, Cl-36, H-3 & I-129/131 marked with "Do Not Preserve" label?
7.	(Y) N	Is sample volume sufficient for analysis?	15.	Y N (N/A)	Are soil containers for C-14, H-3,Tc-99 & I-129/131 marked with "Do Not Dry" label?
8.	Y (N)	Are there custody seals present on bottles?			

Notes:

pH Adjustment (if needed)	Date/Time of Preservation:
Preservative and lot#:	Final pH checked by (initials/date):
Amount of Preservative:	Final pH and pH strip lot#:

Division B

General Project Requirements

SECTION B.01 - DEFINITION OF PROJECT TERMS

PART 1 - GENERAL

1.01 *Abbreviations*

ANSI	American National Standards Institute, Inc.
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
JMF	Job Mix Formula (Bituminous Asphalt)
EGLE	(Michigan Department of) Environment, Great Lakes and Energy
MDOT	Michigan Department of Transportation
MMUTCD	Michigan Manual of Uniform Traffic Control Devices
OSHA	Occupational Safety and Health Administration
PSI	Pounds Per Square Inch

1.02 *Designation of Associations, Institutions, Societies & Standards*

A. Whenever in these Specifications reference is made to Associations, Institutions, Societies, or Standards, they will be designated as follows:

AA	Aluminum Association
AAMA	Architectural Aluminum Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AFBMA	Anti-Friction Bearing Manufacturers Association
AFI	Air Filter Institute
AGA	American Gas Association
AIHA	American Industrial Hygiene Association
AISC	American Institute of Steel Construction
AISI	American Iron & Steel Institute
ANSI	American National Standards Institute
API	American Petroleum Institute
ASA	American Standards Association
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing Materials
AWS	American Welding Society
AWWA	American Water Works Association
BLS	Bureau of Labor Standards
BOCA	Building Officials Code Administrators
CISPI	Cast Iron Soil Pipe Institute
IEEE	Institute of Electrical and Electronic Engineers
ISA	Instrument Society of America
MDOT	Michigan Department of Transportation
NBS	National Bureau of Standards
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Act
SSPC	Steel Structures Painting Council
UBC	Uniform Building Code
UL	Underwriters Laboratories, Inc.

B. Wherever specific standard numbers are indicated, i.e., ASTM C 150, it shall be understood to mean the latest revision thereof.

END OF SECTION B.01

SECTION B.02 - DEFINITION OF CONTRACT PAY ITEMS

SUMMARY

This Section defines the scope of Work included in each Pay Item listed in the Bid Forms. Drawings, General Conditions of the Agreement and other Specification Sections shall apply to the Work of this Section.

Under each Pay Item the Contractor shall furnish all labor, materials, tools, plant equipment, supplies, maintenance of equipment, heating, lighting and power, insurance and bonds, and all work that may be specifically described and included under the respective Pay Items and necessary to complete the Work in accordance with the obvious or expressed intent of the Contract.

The lump sum and unit prices stated in the Bid shall be payment in full for the completion of all Work specified and described to be included in the Contract, complete, and ready for use.-

PAY ITEMS

Mobilization - Item # 1010

Description

A. This Pay Item is intended to pay nonrecurring costs to the Contractor not recovered under other Pay Items of the Contract. It includes costs for moving equipment in and out of the project Site, security instruments as required in the "Advertisement for Bid", insurance, permits, utility connection costs, other applicable items of the General Conditions, and other expenses associated with preparation for construction.

Measurement for Payment

A. A. The lump sum price stated in the Bid shall not exceed 5% of the total bid price of the Contract. The Contractor shall receive 50% of the lump sum bid price for Mobilization with each of the first two Applications for Payment. The Contractor shall be responsible for preparing an Application for Payment, and submitting to the Engineer for approval.

Soil Erosion and Sedimentation Control - Item # 1041

Description

A. This Pay Item shall consist of materials and labor, and implementing and maintaining all appropriate measures to comply with its requirements and with Section C.09 of this Project Manual. All temporary erosion control (silt fence, sediment removal, inlet protection, construction access road, sweeping, etc.) required on this project will be paid for under this Pay Item.

B. All repair or replacement of existing utilities and structures scheduled to remain, but damaged as a result of Soil Erosion and Sedimentation Control operations shall be included as part of the Work of this Pay Item.

Measurement for Payment

B. The unit price stated in the Bid Form shall be lump sum payment for all provisions intended to control soil erosion, including all required permits and other incidental items, as specified

and required for the completion of the Work. The Contractor shall be responsible for preparing an Application for Payment, and submitting to the Engineer for approval.

Clearing - Item # 2010

Description

A. Under this Pay Item, the Contractor shall furnish all material, equipment and labor required to remove trees, brush, and ground cover in accordance with the requirements of Section C.01.

B. All vegetation, which is not designated in the drawings or by the Engineer and Owner to be removed, shall be carefully protected from damage during all construction operations. Any trees or shrubs damaged by the Contractor's operations that are outside the clearing limits and designated to remain shall be replaced at the Contractor's expense, at no additional cost to the Owner. If the Contractor cannot proceed with construction without damaging trees outside of the clearing limits, he shall secure permission from the Owner prior to proceeding.

C. All repair or replacement of existing utilities, pavement, trees, and structures scheduled to remain, but damaged as a result of Clearing operations shall be included as part of the Work of this Pay Item.

Measurement for Payment

A. A. The unit price stated in the Bid Form shall be full compensation per acre for cutting and disposing specified items, including all incidental items required for the completion of the Work, unless specifically included as Pay Items elsewhere. The Contractor shall be responsible for preparing an Application for Payment, and submitting to the Engineer for approval.

Tree Removal – Item #s (2011, 2112, 2113)

Description

A. The Work to be performed under this Pay Item includes all material, equipment and labor required to remove trees (> 6" diameter at chest height) from the ground, including roots, stumps, branches, etc. The trees to be removed are as indicated. Trees less than 6" in diameter shall be included as part of other Work. This Work shall be done in accordance with applicable portions of Section C.01, Clearing. Once removed, the trees become the property of the Contractor and shall be properly disposed of, off-site.

B. All earthwork necessary to perform this Work is included in this item of Work.

C. All repair or replacement of existing utilities, pavement, trees, and structures scheduled to remain, but damaged as a result of tree removal operations shall be included as part of the Work of this Pay Item.

D. Trees to be removed shall be clearly marked by the Owner or Engineer. Any trees damaged that are not marked for removal shall be replaced by an equal tree at no cost to the Owner.

Measurement for Payment

B. A. The unit price stated in the Bid Form shall be payment for each tree removed, including all incidental items, as specified, and required for the completion of the Work. The Contractor shall be responsible for preparing an Application for Payment, and submitting to the Engineer for approval.

Removal of Saturated Soil - Item # 2064

Description

A. Under this Pay Item, the Contractor shall excavate all saturated sediment and debris from the bottom of the storm basin as indicated on the drawings and as directed by the Engineer. The saturated material shall be stored on-site until dried enough to either level it out or dispose of it off-site, in accordance with Section C.07. If off-site disposal is necessary, the Contractor will be paid for the off-site disposal as part of Sediment Disposal Pay Item #2081 in addition to this Pay Item.

B. All repair or replacement of existing utilities and structures scheduled to remain, damaged as a result of saturated soil removal operations shall be included as part of the Work of this Pay Item.

C. This item of Work shall include storing saturated soils on site in upland areas. Any similar associated items required for the completion of this Work are included as part of this Pay Item. This Work is not intended for payment of any Work necessary for pipe construction. Pipe dewatering is covered by, or included as, part of the Work of other Pay Items.

Measurement for Payment

A. The unit price stated in the Bid Form shall be full compensation for each cubic yard of saturated soil removed, including all incidental items as specified and required for the completion of the Work. This will be a loose measure, by measuring each truck before and after it is filled. The Contractor shall be responsible for preparing a Pay Estimate and submitting to the Engineer for approval.

Sediment Disposal - Item #2081

Description

A. Under this Pay Item, the Contractor shall load, haul, and place in a landfill dredged sediment that has been stockpiled for drying per Pay Item #2064, Removal of Saturated Soil. Drying is part of this Pay Item, and shall continue until the material will pass a "paint filter test" in accordance with regulatory requirements and the 9095B Paint Filter Liquids Test landfill specification. The Contractor shall ensure that the drying process occurs in a controlled manner to prevent runoff and recontamination of adjacent areas.

B. All repair or replacement of existing utilities and structures scheduled to remain, damaged as a result of sediment removal and drying operations, shall be included as part of the Work of this Pay Item.

C. This item of Work includes all labor, equipment, and materials necessary to remove, transport, and stockpile the sediment for drying, as well as any required monitoring to confirm compliance with the "paint filter test." Any similar associated items required for the completion of this Work are included as part of this Pay Item.

Measurement for Payment

A. The unit price stated in the Bid Form shall be full compensation for each ton of material

delivered to and accepted by an approved landfill, including all incidental items as specified and required for the completion of the Work. The Contractor shall be responsible for preparing a Pay Estimate and submitting it to the Engineer for approval.

Site Grading – Item # 2100

Description

A. Under this Pay Item, the Contractor shall furnish all material, equipment and labor required to excavate, fill, compact, stockpile, smooth with a blade, etc. the entire site including the storm basins, open ditches, and fill areas as indicated on the Drawings and as directed by the Engineer. This shall also include all earth excavation, grading, on-site disposal of excess soils, backfill, compaction and any other Work necessary to bring the area to final grade. The Work of this Pay Item shall be performed according to Section C.07

B. All repair or replacement of existing utilities and structures scheduled to remain, but damaged as a result of Site Grading operations, shall be included as part of the Work of this Pay Item.

C. Any and all excavation, backfilling, compaction and grading Work performed outside of the Contract Limits shall be considered included as part of the Work of this Pay Item.

Definition of Items

A. The Contractor shall submit a unit price for each acre of graded area. Graded area shall be completed as specified in Section C.06. The unit price stated in the Bid Form shall be full compensation for each acre of graded area, regardless of the intended final surface, including all incidental items as specified and required for the completion of the Work. The Contractor shall be responsible for preparing a Pay Estimate and submitting to the Engineer for approval.

Riprap – Item #s (4354 through 4358)

Description

A. Under this Pay Item, the Contractor shall furnish all material, equipment and labor required to install Riprap and geotextile separator as shown on the Drawings, specified in Section E.01, and specified in MDOT Standard Specifications for Construction 2020 - Section 813. When d50 is specified, 50% of the rock shall have a minimum dimension greater than d50 and 50% shall have a minimum dimension less than d50. The largest stones minimum dimension in the mixture should be 1.5 times d50. The Riprap should be reasonably graded.

B. The following sections shall be included as part of the required Work under this Contract and shall be considered included as part of the Work of the Pay Item unless specifically included for payment under other Items:

Removal of Unacceptable Soil	Section C.04
Excavation, Backfill and Compaction	Section C.07

C. All repair or replacement of existing utilities and structures damaged as a result of riprap placement operations, including, but not limited to, paved surfaces scheduled to remain, driveway culverts and headwalls, shall be included as part of the Work of this Pay Item.

D. Riprap shall be placed below or at the flow line so that it does not impede flow or reduce cross-sectional flow area (including at the end of end sections). Riprap around end sections should be placed according to the detail located on the Drawings.

Measurement for Payment

A. The unit price stated in the Bid Form shall be full compensation for each square yard of Riprap, including geotextile fabric and all incidental items as specified and required for the completion of the Work, unless specifically included as Pay Items elsewhere. The Contractor shall be responsible for preparing a Pay Estimate and submitting to the Engineer for approval.

MH Rehabilitation – Item # 4920

Description

A. Under this Pay Item, the Contractor shall furnish all material, equipment, and labor necessary to rehabilitate existing storm sewer manholes by means of chemical pressure grouting using AV-100 (Acrylamide Grout) or an approved equal. Work shall be performed in accordance with the manufacturer's specifications and all applicable requirements of Section D.03 and E.02, as well as any supplemental specifications and the direction of the Engineer.

B. This Pay Item includes all cleaning, preparation, injection of AV-100 grout into soil or voids surrounding the manhole, sealing of active leaks, plugging of injection holes, and final surface restoration inside the manhole. Grouting shall be performed to stop infiltration through cracks, joints, and pipe penetrations, and to stabilize soils around the structure.

C. All repair or replacement of surrounding utilities, appurtenances, or existing surfaces damaged due to pressure grouting operations shall be included in the Work of this Pay Item.

Measurement for Payment

A. The price stated in the Bid Form shall be full compensation for each manhole rehabilitated using pressure grouting, including all labor, materials (including AV-100), equipment, and incidental items necessary for the completion of the Work, as shown on the Drawings or directed by the Engineer. The Contractor shall be responsible for preparing a Pay Estimate and submitting it to the Engineer for approval.

Dewatering Stormwater Basin - Item #9002

Description

A. Under this Pay Item, the Contractor shall furnish all labor, material, and equipment necessary to dewater the stormwater basin to the saturated sediment level. The Contractor shall then excavate pits in the bottom of the basin and allow water to slowly infiltrate into the newly exposed soil surface. Soil excavated from the pits will be considered saturated sediment. All dewatering operations shall be performed in accordance with Section J.05 and in a manner that prevents erosion, uncontrolled runoff, or adverse impacts to adjacent areas.

B. The Contractor shall construct and maintain stilling basins or other appropriate control measures to receive discharge from dewatering operations, as required, to prevent siltation of adjacent properties, streams, lakes, or wetlands.

C. All repair or replacement of existing utilities and structures scheduled to remain, including but not limited to paved surfaces, walks and drives, curb and gutter, driveway culverts, and headwalls, that are damaged as a result of dewatering operations, shall be included as part of the Work of this Pay Item.

Measurement for Payment

A. The unit price stated in the Bid Form shall be full compensation for all work associated with dewatering, excavation, and sediment drainage, measured as a **Lump Sum (LS)**. The Contractor shall be responsible for preparing a Pay Estimate and submitting it to the Engineer for approval.

Turf Establishment – Item # 9010

Description

A. The Contractor shall furnish all material, equipment and labor required to establish vegetative ground cover in locations shown on the Drawings and as specified in Section J.01.

B. These Items shall be included as part of the required Work under this Contract and shall be considered included as part of the Work of the Pay Item unless specifically included for payment under other Items:

Removal of Unacceptable Soil	Section C.04
Grading	Section C.06
Excavation, Backfill and Compaction	Section C.07

C. All repair or replacement of existing utilities, pavements and structures, damaged as a result of Turf Establishment operations as specified in Section J.01, including, but not limited to, paved surfaces, walks and drives, curb and gutter, is included as part of the Work of this Item.

D. Items of Work including topsoil placement, fine grading, removal and replacement of unacceptable soils, watering, and provisions for soil erosion control and similar associated items required for completion of the Work, shall be considered included as part of the Work unless specifically included elsewhere as a Pay Item.

Measurement for Payment

A. The unit price stated in the Bid Form shall be full compensation for each square yard of established area, including all incidental items, as specified and required for the completion of the Work. The Contractor shall be responsible for preparing a Pay Estimate and submitting to the Engineer for approval.

Chain Link Fence – Item #s (9204 through 9206)

Description

A. Under this Pay Item, the Contractor shall furnish all material, equipment and labor required to remove an existing chain link fence and replace it, or supply new fencing after the Work in the area of the fence is finished as shown on the Drawings or as indicated by the Engineer and specified in Section J.02. The replaced fence shall be of equal or better quality than the original. New fencing shall meet the specifications as noted on the drawings. The Contractor must observe the existing fence and determine what might be reusable and what new

materials are necessary. If there is any question about what is not reusable, the Contractor should get a determination from the Engineer prior to replacing fence.

B. The Contractor shall furnish a similar chain link fence for all existing chain link fence that gets damaged or removed, which shall be included as part of the Work of this Pay Item. The existing fence shall be removed and replaced when necessary. Excavation, backfill, compaction and any additional material required to install the fencing shall be included as part of the Work of this Pay Item.

C. All repair or replacement of existing utilities and structures scheduled to remain, but damaged as a result of the removal and replacement of the chain link fence shall be included as part of the Work of this Pay Item.

Measurement for Payment

A. The unit price stated in the Bid Form shall be full compensation for each foot of chain link fence removed and replaced, or supplied including any incidental items, as specified and required for the completion of the Work, unless specifically included as Pay Items elsewhere. The Contractor shall be responsible for preparing a Pay Estimate and submitting to the Engineer for approval.

End of Section B.02

SECTION B.03 - COORDINATION AND CONTROL OF THE WORK

PART 1 - GENERAL

1.01 *Summary*

A. This Section includes coordination and control of the Work.

1.02 *Cooperation of Contractor*

A. The Contractor shall conduct his operations so as to interfere as little as possible with those of the Owner, other contractors, utilities, or any public authority on or near the Work. The Owner reserves the right to perform other work by contract or otherwise, and to permit other public bodies, public utility companies, and others to do work on or near the project during progress of the Work. If a conflict arises, the Owner shall determine when and how the work shall proceed. Claims for delay or inconvenience due to operations of such other parties on work indicated or shown on the Drawings or which can be reasonably expected to be encountered by the nature and location of the Work, will not be considered.

1.03 *Control of Noise*

A. The Contractor shall eliminate noise to as great an extent as possible at all times. Air compressors shall be equipped with silencers and the exhaust of all gasoline motors and other power equipment shall be provided with mufflers. In the vicinity of hospitals, libraries, and schools, precautions shall be taken to avoid noise and other nuisance; and the Contractor shall abide by all pertinent ordinances and regulations.

1.04 *Smoke Prevention*

A. Strict compliance with all ordinances regulating the production and emission of smoke will be required and the Contractor shall accept full responsibility for all damage that may occur to property as a result of negligence in providing required control.

1.05 *Dust Control*

A. The Contractor shall apply water or dust palliative, or both, for the alleviation or prevention of dust nuisance caused by his operations. Dust control operations shall be performed by the Contractor at the time ordered by the Owner, but failure of the Owner to issue such order will not relieve the Contractor of this responsibility. Unless otherwise specified, no direct payment will be made for any such work performed or material used to control dust under this Contract.

1.06 *Sanitary Regulations*

A. Toilet accommodations shall be maintained for the use of the employees on the Work. The accommodations shall be in approved locations, properly screened from public observance, and shall be maintained in a strictly sanitary manner. The Contractor shall obey and enforce all other sanitary regulations and orders; shall take precautions against infectious diseases and the spread of same; and shall maintain at all times satisfactory sanitary conditions around all shanties, tool and supply houses, and on all other parts of the Work.

1.07 *Use of Explosives*

Not Allowed

1.08 *Emergency Maintenance Supervisor*

A. The Contractor shall submit to the Resident Project Representative the names, addresses, and telephone numbers of two employees responsible for performing emergency maintenance and repairs when the Contractor is not working. These employees shall be designated in writing by the Contractor to act as his representative and shall have full authority to act on his behalf as specified in Article 6, Section 6.01 of the General Conditions.

B. At least one of the designated employees shall be available for a telephone call any time an emergency arises.

1.09 *Public Service Structures*

A. Public service structures shall be understood to include all poles, tracks, pipes, wires, conduits, house-service connections, vaults, manholes, and other appurtenances, whether owned or controlled by the Owner or other public bodies or by privately-owned corporations, used to supply the public with transportation, heating, electric, telephone, water, sewer, or other services.

B. At least a week in advance of breaking ground, the Contractor shall notify the registered underground protection service, all public bodies, and other owners of such facilities of the proposed location of his operations, advising them that their property may be affected and that such measures as they may deem necessary should be promptly taken to protect, adjust, remove, and/or build them.

C. Three conditions which may be encountered will be dealt with as follows:

1. Structures which are adjacent to but not included within the limits of an excavation required for performance of the Work shall be acceptably protected, supported, and maintained in service by the Contractor at his expense.

2. Structures within the limits of the Work which can be satisfactorily supported and maintained in service and which do not require removal and rebuilding shall be thus supported by the Contractor at his expense, including cost of repair of damage incident to his operations.

a. Supports for water and gas mains, sewers, conduits, and similar structures shall be constructed of timber or other acceptable materials; shall be supported from undisturbed foundations, and shall be sufficiently substantial to ensure against settlement when pipe trenches or other excavations are backfilled. In all cases where permits or inspection fees are required by utilities in connection with changes to or temporary support of their conduits, the Contractor shall secure such permits and pay all inspection fees.

b. The Contractor shall assume full responsibility for maintaining all public service structures in service and shall support and protect, or remove and rebuild them at his

own expense. Such services shall not be interrupted without permission of the owner of the public service structure.

3. In case relocation of pipelines or other utility structures is required because of direct interference with the installation of the Work, the Contractor shall notify the Owners of the utility structure involved. The Contractor will not be reimbursed for the cost of the relocation if the interference is shown on the Drawings, described in the Specifications, apparent on visual inspection, or specifically included in the Work to be performed by the Contractor. The Contractor will not be paid for time lost because of such direct interference. Where it is the policy of any utility owner to perform such work with its forces, the Contractor shall cooperate to the fullest extent with such utility owner. All work shall be done in a manner to protect the public and the Work.

END OF SECTION B.03

SECTION B.05 - POLLUTION CONTROL

PART 1 - GENERAL

1.01 *Summary*

A. It shall be the responsibility of the Contractor to prevent or limit pollution of air and water resulting from his operations.

B. The Contractor shall perform work required to prevent soil from eroding or otherwise entering onto all paved areas and into natural watercourses, ditches, and public sewer systems, and to prevent dust attributable to his operations from entering the atmosphere.

C. Water containing suspended material from any part of the Contractor's operations shall be clarified before discharging to drains or streams.

D. The Contractor shall comply with all standards and regulations issued under Section 206 of the Clean Air Act.

1.02 *Street, Sidewalks and Driveways*

A. Streets, haul roads, and detours and bypass roads shall be swept by automatic self-contained sweepers.

B. Excessive dirt on pavements shall be removed by means of hand shoveling or appropriate mechanical equipment and the area swept as directed above.

C. Sidewalks and driveways shall be cleaned by means of shovels and hand brooms or appropriate mechanical equipment.

D. Dust on un-surfaced streets or parking areas and any remaining dust on surfaced streets shall be controlled with calcium chloride dust palliative. Dust palliative shall conform to section 922.12 A of MDOT's 2020 Standard Specifications for Construction.

E. The Contractor shall comply with the above requirements on a daily basis. If the Contractor fails to perform the above work in a satisfactory manner, all work, except cleanup operations, shall be stopped until the Contractor has complied with the above requirement.

1.03 *Water Discharged to Streams*

A. The Contractor shall construct and maintain filters, sedimentation traps, or stilling basins with overflows to clarify waters containing suspended materials from fill areas, excavations, deep wells, well points, and disposal sites before discharging to drains or streams. This work shall conform with the requirements of Public Act 451 of 1994, Part 91, as amended, and may be inspected by the appropriate representative of the Area Erosion Control Office.

1.04 *Soil Erosion Control Permit*

A. If so required by Public Act 451 of 1994, Part 91, as amended, the Contractor shall obtain a Soil Erosion Control permit from the Area Erosion Control Officer.

END OF SECTION B.05

SECTION B.06 - CONSTRUCTION ENGINEERING AND SURVEY WORK

PART 1 - GENERAL

1.01 *Construction Layout*

A. The Engineer will provide one set of construction stakes to define line and grade for the proposed Work. The Engineer will set such stakes and bench marks as are necessary to provide proper line and grade. The Contractor is to be knowledgeable with and have experience in the type of work associated with this project, and as such should be able to recognize if an error in staking by the Engineer exists. If there appears to be an error in staking, the Contractor shall not proceed with that work until the Engineer can remedy the potential error. It shall be the duty of the Contractor to maintain the stakes set by furnishing such protection as may be necessary and to notify the Engineer in writing of any stakes which may have been disturbed. The Contractor shall carefully preserve all bench marks, reference points and stakes, and in case of willful or careless destruction he shall be charged with the resulting expense of replacement, and shall be responsible for any mistakes that may be caused by their unnecessary loss or disturbance. It shall be the Contractor's responsibility to transfer the line and grade. The method used to attain proper grade must be approved by the Engineer. The existence and location of underground utilities and construction indicated as existing are not guaranteed. Before beginning site work, the Contractor must verify the existence and location of underground utilities and other construction.

1.02 *Construction Representation*

A. The Engineer will make periodic visits to the site to observe the progress and quality of the executed Work and to determine, in general, if the Work is proceeding in accordance with the Contract Documents. Their efforts will be directed toward providing assurance for the Owner that the completed project will conform to the requirements of the Contract Documents. On the basis of their on-site observations as an experienced and qualified design professional, they will keep the Owner informed of the progress of the Work and will endeavor to guard the Owner against defects and deficiencies in the Work of Contractors. Any checks the Engineer may perform will not be grounds for the Engineer to share in any liability for the Work being performed.

B. Where inspection of a specific and particular portion of the Work is stated to be required within an individual Specification section, the Contractor shall provide the Engineer advance notice, in writing, of a minimum 48 hours to allow for the scheduling of any personnel, sub-consultants, and\or equipment as may be required by the Engineer.

1.03 *Clarifications and Interpretations*

A. The Engineer will issue with reasonable promptness such written clarifications or interpretations of the Contract Documents (in the form of drawings or otherwise) as he may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents.

B. If the Owner and Engineer agree, the Engineer will furnish a full or part-time Resident Project Representative. The duties, responsibilities and limitation or authority of any such Resident Project Representative and assistants shall be as set forth in these specifications. The Owner and its representatives shall at all times have access to the Work whenever it is in

preparation or progress and the Contractor shall provide facilities for such access and for inspection.

C. All materials used and all work done shall at all times be subject to the inspection, tests and approval of the Owner and its authorized representatives.

D. The Contractor shall furnish samples for testing purposes of any material required by the Engineer and shall furnish any information required concerning the nature or source of any material which he proposes to use. All costs incident to material test shall be borne by the Owner. All samples will be selected by the Owner or his authorized representatives.

E. Resident Project Representatives shall have the authority, subject to the final decision of the Engineer, to condemn and reject any defective Work or material and to suspend the Work when the same is not being properly done.

F. Resident Project Representatives shall have no authority to permit any deviation from the plans and specifications except on written order from the Engineer, and the Contractor will be liable for any deviation except on such written order.

G. All condemned Work shall be promptly taken out and replaced by satisfactory Work, and all condemned materials shall be promptly removed from the vicinity of the Work. Should the Contractor fail or refuse to comply with instructions in this respect within a reasonable time, fixed by written notice, the Owner may, upon certification by the Engineer, withhold payment or proceed to terminate contracts as herein provided.

H. Re-examination of questioned Work previously inspected and/or approved may be ordered by the Engineer, and if so ordered, the Work must be uncovered by the Contractor. If such Work shall have been done in accordance with the Contract Documents, the Owner shall pay the actual cost of re-examination and replacement plus fifteen (15%) percent.

I. Any defective material or workmanship may be rejected by the Engineer at any time before the final acceptance of the Work, even though the same may have been previously overlooked and estimated for payment.

J. The Engineer will have authority to disapprove or reject Work which is "defective" (which term is hereinafter used to describe Work that is unsatisfactory, faulty or defective, or does not meet the requirements of any inspection, test or approval referred to in these contract documents). The Engineer will also have authority to require special inspection or testing of the Work as provided for, whether or not the Work is fabricated, installed or completed.

K. The Engineer will be the initial interpreter of the terms and conditions of the Contract Documents and the judge of the performance thereunder. In capacity as interpreter and judge the Engineer will exercise their best effort to insure faithful performance by both the Owner and the Contractor. They will not show partiality to either and shall not be liable for the result of any interpretation or decision rendered in good faith. Claims, disputes and other matters relating to the execution and progress of the Work or the interpretation of or performance under the Contract Documents shall be referred to the Engineer for decision, which the Engineer shall render in writing within a reasonable time.

L. Neither the Engineer's authority to act under these conditions nor any decision made by him in good faith either to exercise or not exercise such authority shall give rise to any duty or

responsibility of the Engineer to the Contractor, any Subcontractor, any of their agents or employees or any other person performing any of the Work.

M. The Engineer will not be responsible for the construction means, methods, techniques, sequences or procedures, or the safety precautions and programs incident thereto, and they will not be responsible for the Contractor's failure to perform the Work in accordance with the Contract Documents.

N. The Engineer will not be responsible for the acts or omissions of the Contractor, or any Subcontractors, or any of his or their agents or employees, or any other persons performing any of the Work.

1.04 *Construction Safety*

A. All construction shall be made the responsibility of the Contractor and should comply with all current and applicable Local, State & Federal safety codes, regulation & practices, including the Occupational Safety and Health Administration (OSHA).

END OF SECTION B.06

SECTIONS B.07 - WORKMANSHIP

PART 1 - GENERAL

1.01 Construction shall be done by a competent Contractor with experience in similar work and shall be done with quality workmanship.

1.02 All material, execution of work, and workmanship shall be in accordance with the general specifications, project specifications, and the drawings. Should the State, Local or other regulatory agency supersede these specifications, then the conflicting portions must follow the superseding regulation.

END OF SECTION B.07

SECTION B.08 - RESTORATION OF SURFACES BEYOND CONTRACT LIMITS

PART 1 - GENERAL

1.01 Under this Section, the Contractor shall restore all damaged surfaces, plants, structures, survey references, etc. in areas beyond the limits of the Contract, used by the Contractor for moving materials and equipment to and from the construction area and areas used for bypassing or detouring traffic around the construction area.

1.02 *Street Restoration*

. If it is determined by the Owner or his representative that excessive areas of the street surface have been damaged, the Owner may order the Contractor to place an asphalt concrete surface over the entire pavement.

A. If any part of a bituminous lane is damaged, then the full lane shall be replaced.

B. The Contractor shall repair all damaged areas of the roadway in accordance with Division G of these Specifications.

1.03 *Pavement Surface Restoration*

A. The entire street pavement shall be resurfaced with a bituminous tack coat of 0.10 gal/sq yd in conformance with section 501.03D of MDOT's 2020 Standard Specifications for Construction and a 1-1/2 in. minimum asphalt concrete surface course in accordance with these Specifications.

END OF SECTION B.08

SECTIONS B.09 – PROJECT CLEAN UP

PART 1- GENERAL

1.01 Before final acceptance of the Work, the Contractor shall remove all false work, excavated or obsolete materials, rubbish and temporary buildings, bridges and approaches, replace or renew any fences damaged, and restore in an acceptable manner all property, both public and private which may have been used or damaged during the execution of the Work.

1.02 Under this Section, the Contractor shall restore all damaged surfaces, plants, pavements, structures, survey references, etc. in areas beyond the limits of the Work, used by the Contractor for moving materials and equipment to and from the construction area and areas used for bypassing or detouring traffic around the construction area.

1.03 All excavated material, false work, or erosion control devices placed in stream channels during construction shall be removed.

1.04 The Contractor shall remove from the Right-of-Way all machinery, equipment, and surplus material and leave all areas occupied by the Contractor in conjunction with the Contract in a neat and presentable condition satisfactory to the Engineer.

1.05 Paved roadbeds shall be cleaned within 5 working days prior to opening the pavement surface to traffic or notification by the Contractor that the Work is completed, whichever occurs first. When so directed by the Engineer, the cleaning of roadbeds in urban areas shall be with self-propelled or towed street sweepers equipped with pick-up attachments and curb brushes that do not cause airborne dust.

1.06 Final cleanup as specified herein shall be considered incidental to the Work unless specifically included elsewhere as a Pay Item.

END OF SECTIONS B.09

Division C

Earthwork

SECTION C.01 - CLEARING

PART 1 - GENERAL

1.01 This work shall consist of cutting, removing from the ground, and disposing of trees, stumps, brush, shrubs, logs and other vegetation within the clearing limits of the project. Definition of this area and/or vegetation to be saved will be done by the Engineer and Owner. The Contractor shall provide the Owner notice (minimum 48 hours) prior to commencing clearing operations.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.01 All vegetation which is not designated on the plans or by the Engineer and Owner to be removed shall be carefully protected from damage during all construction operations. Any trees or shrubs that are not designated to be removed, but damaged by the Contractor's operations shall be repaired or replaced by the Contractor, as directed by the Owner. If the Contractor cannot proceed with construction without damaging the designated vegetation, permission shall be secured from the Owner.

3.02. Unless otherwise arranged, the merchantable timber becomes the property of the Contractor and it is recommended that he should make this merchantable timber available to wood-using industries or individuals. All, logs, brush, limbs, tops and other cleared debris shall be disposed of by one of the following methods:

A. By burning in an area approved by the Engineer with the proper permits. It is the Contractor's responsibility to obtain and abide by the proper burning permits. The remaining ash may be disposed of on site, but only in areas approved by the Engineer.

B. By reducing the material to chips with a chipping machine and disposing the chips in an approved area. Note that the chips may be usable for landscaping mulch.

C. By disposing the material in an area outside the project limits if approved by the Engineer and Owner.

3.03. *Regulatory Requirements:*

A. Conform to applicable codes for the hauling and disposal of debris, or the burning of debris on site. Obtain the necessary permits and comply with all safety regulations.

B. All excavation and site work is subject to the requirements of Act 451, State of Michigan Public Acts 1994, Part 91, "Soil Erosion and Sedimentation Control Act", and Division C - Section C.09.

C. Coordinate clearing work with utility companies and the local municipality.

END OF SECTION C.01

SECTION C.04 - REMOVAL OF UNACCEPTABLE SOIL

PART 1 - GENERAL

1.1 *Summary*

A. The Work of this section shall consist of removing soil(s) not suitable for foundation under any structure or pipe, (those soils being defined in Part 2 of this section), or as determined by the Engineer. Debris removal such as rock and concrete shall be part the Work when encountered.

B. This Work shall be incidental to installation of pipe, associated underground structures, and areas designated for seeding and mulching, unless specifically included as a separate Pay Item elsewhere.

C. Classification of unsuitable soils shall be determined by the Engineer. Removal of soils deemed by the Contractor to be unsuitable, without specific direction from the Engineer, shall be at the Contractor's option, and shall not result in any additional cost to the Owner.

D. Classification of soils for piping, structures, pavements and miscellaneous assemblies (if required) shall be in accordance with ASTM D 2487, ASTM D 2488, and this Specification section, except for installations where plastic pipe is specified. Classification of soils for use with plastic piping shall be in accordance with ASTM D 2321 and this Specification section.

1.2 *Reference Standards*

A.	ASTM D 2321	Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity Flow Applications.
B.	ASTM D 2487	Standard Practice for Classification of Soils for Engineering Purposes
C.	ASTM D 2488	Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)
D.	ASTM D 4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils

PART 2 - PRODUCTS

2.1 *General Fill and Backfill*

A. Satisfactory soil materials are defined as those complying with ASTM D 2487 soil classification groups GW, GP, GM, SM, SW, and SP.

B. Unsatisfactory soil materials are defined as those complying with ASTM D 2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT.

2.2 *Fill and Backfill for Use with Flexible Plastic Pipe*

A. Satisfactory soil materials for use with plastic pipe, in accordance with ASTM D 2321 “Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and other Gravity Flow Applications” are defined as follows:

ASTM D-2321 CLASS	SOIL GROUP SYMBOL (ASTM D-2487)	DESCRIPTION	PERCENT PASSING SIEVE SIZES		
			1½"	No. 4	No. 200
CLASS I-A[1]	NONE	Manufactured aggregates, open graded, clean consisting of angular, crushed stone or rock, crushed gravel, broken coral, crushed slag, cinders or shells; large void content, containing little or no fines.	100%	≤ 10%	< 5%
CLASS I-B[1]	NONE	Manufactured, processed aggregates; dense-graded, clean. Angular, crushed stone (or other Class I-A materials) and stone\sand mixtures with gradations selected to minimize migration of adjacent soils, containing little or no fines.	100%	≤ 50%	< 5%
CLASS II	GW	Coarse-grained soils, clean, consisting of well-graded gravels and gravel-sand mixtures with little or no fines.	100%	< 50% of Coarse Fraction	< 5%
	GP	Coarse-grained soils, clean, consisting of poorly-graded gravels and gravel-sand mixtures with little or no fines.	100%	< 50% of Coarse Fraction	< 5%
	SW	Coarse-grained soils, clean, consisting of well-graded sands and gravelly sands with little or no fines.	100%	> 50% of Coarse Fraction	< 5%
	SP	Coarse-grained soils, clean, consisting of poorly-graded sands and gravelly sands with little or no fines.	100%	> 50% of Coarse Fraction	< 5%
CLASS III	GM	Coarse-grained soils with fines, consisting of silty gravels and gravel-sand-silt mixtures.	100%	< 50% of Coarse Fraction	> 12% to < 50%
	GC	Coarse-grained soils with fines, consisting of clayey gravels and gravel-sand-clay mixtures.	100%	< 50% of Coarse Fraction	> 12% to < 50%
	SM	Coarse-grained soils with fines, consisting of silty sands and sand-silt mixtures.	100%	> 50% of Coarse Fraction	> 12% to < 50%
	SC	Coarse-grained soils with fines, consisting of clayey sands and sand-clay mixtures.	100%	> 50% of Coarse Fraction	> 12% to < 50%

[1] Atterberg Liquid Limit = Non-Plastic

PART 3 - EXECUTION

A. Soil materials classified as unacceptable shall be disposed of lawfully. Where off-site disposal of material is required, transportation of the excess material designated as "unacceptable soil" for subgrade shall be included in this item; proof of lawful disposal may be required of the Contractor, at the Owner's option. When spoiling surplus material within the Site, surplus excavated material of any class shall be deposited in such a manner that all spoil areas shall be left smooth, level, and stabilized with proper drainage.

B. Remove debris, unsatisfactory soil materials, obstructions, and deleterious materials in their entirety from acceptable subgrade soils intended to serve for placement of fills. Plow strip, or break up sloped surfaces so that fill material will bond with acceptable subgrade soils.

C. Voids left by removal of unacceptable soil(s) shall be filled in accordance with the requirements of Division C -Section C.07 for the type of final surface intended for the particular area.

D. Remediation of poor soils under pavement is specified in Section C.06.

END OF SECTION C.04

SECTION C.05 - STRIP AND STOCKPILE TOPSOIL

PART 1 - GENERAL

1.01 This section shall include any and all equipment, materials, labor, permits, etc. required to remove topsoil for reuse from areas indicated on the Drawings and as specified in this and other applicable Specification sections. This work shall be incidental to installation(s) of pipe and associated underground structures specified elsewhere in these Specifications, unless specifically included elsewhere as a Pay Item.

1.02 Topsoil shall be defined as consisting of loose, friable, loamy soils without admixtures of subsoil or refuse. It shall be reasonably free from peat, muck, roots, hard clay, coarse gravel, stones, weeds, tall grass, brush, sticks, or other litter. Each load of topsoil shall be subject to the approval of the Engineer. The fraction of topsoil passing a No. 10 sieve shall contain no more than 40% clay. Topsoil shall contain not less than 5% or more than 20% organic matter as determined by loss on ignition of oven-dried samples to constant weight at 212 deg F.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.01 This section shall consist of excavating topsoil from designated areas and stockpiling it in an approved location for reuse. All topsoil shall be removed down to inorganic material. Before removing topsoil, all vegetation of a height greater than one foot shall be reduced to a height of approximately 6 inches and all such vegetation and all brush, stones, rocks and any other objectionable litter or foreign material shall be removed and disposed of as part of Division C - section C.01 Clearing.

3.02 Topsoil stockpiles shall be located and shaped so as to avoid placing around trunks and over root areas of trees to be preserved or in drainage courses. The topsoil shall be completely removed to the required depth from any designated area prior to beginning of regular excavation or embankment in that area. Equipment and methods of operations shall be such as to avoid the lifting of subsoil. If soil or weather conditions are unsuitable for the topsoil removal operations, the Engineer will order the operations suspended until conditions become favorable for resumption of the Work.

END OF SECTION C.05

SECTION C.06 - GRADING

PART 1 - GENERAL

1.01 This section consists of the preparation of final Site grades including subbase foundations for roadways and walkways. This including movement of dirt, fine grading and any other work required to bring the Site to proposed subbase elevation unless otherwise stated.

1.02 Subgrade undercutting is specified elsewhere in this Division and shall not be included as part of this section.

1.03 Removing and disposing of all surplus excavated material is specified in Section C.04.

1.04 Excavation, backfill and compaction are specified in Section C.07.

1.05 Removal and disposal of pavements, curb, curb and gutter is specified in Section C.02.

1.05 Restoration of property, survey references and monuments, sidewalks, surface and curbing of all streets, alleys, and right-of-ways beyond the Contract Limits damaged as a result of construction operations is specified in Section B.08.

1.06 Restoration of lawns is specified in Division J - section J.01.

PART 2 - PRODUCTS

2.01 Soil and materials to be used in the preparation of this section shall meet the requirements of Division C - Section C.04 for determination and removal of unacceptable soils, and Section C.07 for backfill and compaction.

PART 3 - EXECUTION

3.01 General: Uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated or between such points and existing grades.

3.02 Grading Outside Building Lines: Grade areas within the Site, but outside of areas designated for construction, to drain away from structures and prevent ponding, unless specifically indicated otherwise. Finish surfaces free from irregular surface changes.

3.03 Lawn or Unpaved Areas: Finish areas to receive topsoil to within not more than 0.10 foot above or below required subbase elevations.

3.04 Walks: Shape surface of areas under walks to line, grade, and cross section, with finish surface not more than 0.10 foot above or below required subbase elevation.

3.05 Pavements: Shape subbase surfaces of areas under pavement to line, grade, and cross section, with finish surface not more than 1/2 inch above or below required subbase elevation.

3.06 Compaction: After grading, compact subbase surfaces to the depth and indicated percentage of maximum or relative density for each area classification as indicated in Division C - Section C.07.

3.07 Fine grade and proof roll completed areas of grading until it is ready for final cover. Protect graded areas until placement of pavement, walks, drives, curbs, gutters has taken place. Where prepared final grade of subbase is disturbed prior to placement of finished surfaces, regrade and compact to meet the requirements of Division C - Section C.07, and this section.

END OF SECTION C.06

SECTION C.07 - EXCAVATION, BACKFILL AND COMPACTION

PART 1 - GENERAL

1.1 *Summary*

A. Under this section, the Contractor shall excavate any material encountered and backfill the excavation, as required for construction of sewers, water lines, pavements, and other structures in accordance with the Drawings, together with any other excavations and embankments which are necessary for purposes pertinent to the construction of the Work. This section includes trenching; furnishing, placing, and removing sheeting and shoring as necessary for protecting the Work; fluming and pumping as necessary to keep excavation free of water; supporting and protecting all structures, pipes, conduits, culverts, manholes, catch basins, railroad tracks, posts, poles, wires, fences, buildings, and other public and private property adjacent to the Work; backfilling and compaction of backfill.

B. A graphic definition of acronyms related to the construction of roadways used in this Specification section is included in Section B.01.

C. This section shall be incidental to installation(s) of pipe and associated underground structures, unless specifically included as a Pay Item elsewhere.

D. Where native soils are unacceptable as bedding, haunching or trench backfill material as defined in Section C.04, granular pipe bedding or special backfill material shall be used. Granular pipe bedding, and special backfill material, shall be part of this section.

E. Removal and disposal of unacceptable soils, and replacement with special backfill shall take place solely at the direction of the Engineer. Where removal of unacceptable soil(s) is necessary, off-site disposal of the unacceptable soil(s) shall be part of the work of this section.

1.2 *Reference Standards*

ASTM C 136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates One Point Michigan Cone/AASHTO T-99 in accordance with MDOT guidelines Test Method for Laboratory Compaction Characteristics of Soil using Modified Effort

1.3 *Jobsite Safety Standards*

A. Before beginning construction, the Contractor shall become familiar with all applicable local, state and federal safety regulations. Construction site safety shall be the sole responsibility of the Contractor, who shall also be responsible for the means, methods, and sequencing of construction operations.

1.4 *Laboratory Services*

A. Laboratory services shall be paid for by the Owner

B. Sieve Analysis (ASTM C-136): One test for each material source:

1. Selected backfill.
2. Special backfill.
3. Granular bedding material.

C. Backfill Compaction:

1. The Michigan Cone Method of determining maximum density shall be used along with a Nuclear Density Gauge to determine in place density.

2. Test consolidated backfill material in trenches around conduits and around structures for conformance with Part 3.10 "Compaction Requirements" of this section, and as follows:

a. Where tests indicate insufficient compaction, the Contractor shall perform additional compaction as required by the Engineer. Testing shall continue until specified compaction has been attained by additional compaction effort.

b. Retests shall be referenced to the corresponding failing test. Any retesting required due to failure on the part of the Contractor to meet the specifications shall be paid for by the Contractor at no additional cost to the Owner.

1.5 *Construction Through Highways*

A. Permits - The Owner will obtain permits required for open cut construction through highways unless the Contractor is instructed to do this elsewhere in this Project Manual.

B. Notification - The Contractor shall give written notice to appropriate MDOT officials and local road agencies (counties, cities, villages, etc.) at least five working days before starting construction under highways and as required under other roadways.

C. The Owner will require the Contractor to promptly reimburse the MDOT and other road agencies for inspection of construction through their property. The Owner will withhold final payment to the Contractor until the Contractor has furnished the Owner a statement from MDOT that the bills chargeable hereunder to the Contractor by MDOT have been paid.

1.6 *Protection*

A. Test Pits: The Contractor shall dig such exploratory test pits as may be necessary in advance of excavation to determine the exact location and elevation of subsurface structures, pipelines, conduits, and other utilities which are likely to be encountered and shall make acceptable provision for their protection, support, and maintenance in operation.

B. Sheeting, Shoring, and Bracing:

1. The Contractor shall furnish and install adequate sheeting, shoring, and bracing to maintain safe working conditions, and to protect newly built Work and all adjacent and neighboring existing structures from damage by settlement or lateral soil movement.

2. Bracing shall be arranged so as not to place a strain on portions of completed work until the construction has proceeded far enough to provide ample strength. Sheeting and bracing may be withdrawn and removed at the time of backfilling, but the Contractor

shall be responsible for all damage to newly built work and adjacent and neighboring existing structures.

3. Bracing shall be removed at the time of backfilling to avoid problems with finish grade or future excavation.

C. Removal of Water:

1. The Contractor shall at all times during construction provide and maintain ample means and devices with which to remove promptly and dispose of properly all water entering excavations and other parts of the Work and shall keep said excavations dry until installation of pipe and/or structures has been completed and all backfill has been placed and properly compacted. No water shall be allowed to rise over or come in contact with masonry until the concrete and mortar has attained a satisfactory set, except in cases where the concrete has been tremied into place with the approval of the Engineer. In water-bearing sand, well points and/or sheeting shall be supplied, together with pumps and other appurtenances of ample capacity to keep excavations and other parts of the Work free of water.

2. The Contractor shall properly dispose of surface and ground water from the Work in a suitable manner without damage to adjacent property or structures, as specified in Section C.09.

3. The Contractor shall be responsible for protection of open trenches, subgrades and prepared subbases pending or during inclement weather. Any excavation or placement of specified fill or backfill performed by the Contractor pending or during inclement weather shall be at the Contractor's risk.

D. If, in the opinion of the Engineer, removal of backfill, native soil(s) in trenches, embankments, subbases or similar assemblies, is required due to failure on the part of the Contractor to observe proper precautions pending or during inclement weather, removal and replacement of soil(s) in accordance with applicable requirements of these Specifications shall occur solely at the expense of the Contractor at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 *Fill and Backfill - General*

A. Topsoil

1. Topsoil shall consist of loose, friable, loamy topsoil without admixture of subsoil or refuse. It shall be reasonably free from peat, muck, roots, hard clay, coarse gravel, stones, weeds, tall grass, brush, sticks, or other litter. Each load of topsoil shall be subject to the approval of the Engineer. The fraction of topsoil passing a No. 10 sieve shall contain no more than 40% clay. Topsoil shall contain not less than 5% or more than 20% organic matter as determined by loss on ignition of oven-dried samples to constant weight at 212° F.

B. Selected Backfill

1. Selected backfill shall consist of excavated native soils that meet the requirements of Section C.04 Part 2 for determining suitability, and Part 3.10 "Compaction Requirements" of this section for compaction.

C. Special Backfill Material

1. Special backfill material shall conform to Section 902.07 of the MDOT 2020 Standard Specifications for Construction, and shall meet the requirements of Table 902-3 therein for Class II materials.

D. Granular Pipe Bedding Material

1. Granular pipe bedding material for use with rigid pipe shall be well-graded durable crushed gravel, crushed stone, or crushed slag meeting the requirements of Table 902-1, Grading Requirements 17A, as defined in MDOT 2020 Standard Specifications for Construction.

2.2 *Fill and Backfill for Use with Flexible Plastic Pipe*

A. Acceptable soils for the installation of flexible plastic pipe shall meet the requirements of Part 5 of ASTM D 2321 "Standard Practice for the Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity Flow Applications", as shown on the Drawings and details, and as specified in section C.04.

2.3 *Miscellaneous*

A. Geotextiles

1. Non-woven geotextile fabric used as a separator in the bottom of the pipe trench shall be Geotex 801, as manufactured by Propex or approved equal.

2. Non-woven geotextile fabric used as a separator as part of subgrade undercutting and/or special backfill shall be Geotex 801 as manufactured by Propex or approved equal.

PART 3 - EXECUTION

3.1 *Clearing*

A. The site of all open cut excavations shall be first cleared of all obstructions preparatory to excavation in accordance with Section C.01. Wherever paved or surfaced streets are cut, the surfacing material shall be removed and disposed of as specified in Section C.02.

3.2 *Removing and Replacing Topsoil*

A. The Contractor shall remove, stockpile, and replace topsoil from the area of trench excavation. The work shall be done in accordance with applicable portions of Section 205.03 A.1 of MDOT 2020 Standard Specifications for Construction and Section C.05 of these Specifications.

3.3 *General Excavation*

A. General excavation as described in this sub-part of this section is intended to define the requirements for all installations and\or assemblies requiring earthwork, except for the underground installation of flexible plastic pipe, which is specified in the following sub-part "Trench Excavation for Flexible Thermoplastic Pipe".

B. The Drawings and details show the horizontal and the lower limits of new structures. The methods and equipment used by the Contractor when approaching the bottom limits of excavation and when trimming the bottom of the excavation to a smooth surface shall be selected to prevent disturbing the soil below the bottom limits of excavation.

C. The amount of open trench at any one time in advance of completed work shall be limited to the minimum necessary for conducting pipe laying operations.

D. In general, backfilling shall begin as soon as the completed Work is in approved condition to receive it and shall be carried to completion as rapidly as possible. New trenching shall not be started when earlier trenches need backfilling or the surfaces of streets or other areas need to be restored to a safe and proper condition.

E. Excavation which is carried below the bottom limits of structures shall be classified as unauthorized excavation and shall be incidental to the Work of this and related sections, unless said excavation has been authorized by the Engineer prior to each occurrence.

F. Unauthorized excavation shall be filled with Class B concrete to the bottom limits of structures. Under circumstances where structural integrity is not a factor, the Engineer may, at his discretion, allow the filling of unauthorized excavation with selected backfill, pipe bedding material or special backfill material compacted to a density as specified under compaction requirements Part 3.10 of this Section. Any remedial action required as a result of unauthorized excavation shall be performed to the satisfaction of the Engineer, at no additional cost to the Owner.

3.4 *Trench Excavation for Flexible Plastic Pipe*

A Trench excavation for the underground installation of flexible plastic pipe shall be performed in accordance with this sub-part, all applicable requirements of this Specification section, and ASTM D 2321 Standard Practice for the Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.

B Construction safety shall be the responsibility solely of the Contractor. Backfill all trenches as soon as practicable, but not later than the end of each working day.

C Do not lay or embed pipe in standing or running water. At all times prevent runoff and surface water from entering the trench. When groundwater conditions are encountered, cease all trenching operations and contact the Engineer immediately; trenching shall resume solely under the direction of the Engineer.

D Where ledge rock, hard pan, shale, or other unyielding material, cobbles rubble or debris, boulders, or stones larger than 1½ inches are encountered in the trench bottom, excavate a

minimum depth of 6 inches below the pipe bottom and replace with Class I or Class II material, as defined in Section C.04.

3.5 *Trench Excavation for Electrical Conduit*

A Excavate trenches to uniform width, sufficiently wide to provide ample working clearance on both sides of pipe or conduit.

B Excavate trenches to depths indicated or as required to establish indicated slope and invert elevations and to support bottom of pipe or conduit on undisturbed soil. Beyond the building perimeter, excavate trenches to provide a minimum of 42 inches of cover above top of conduit.

C Where rock is encountered, carry excavation 6 inches below required elevation and backfill with a 6 inch layer of crushed stone or gravel prior to the installation of pipe.

D For pipes or conduits less than 6 inches in size (nominal), and for flat-bottomed, multiple-duct conduit units, do not excavate beyond indicated depths. Hand excavate bottom cut to accurate elevations and support pipe or conduit on undisturbed soil.

E For pipes and equipment 6 inches or larger in nominal size, shape bottom of trench to fit bottom of pipe for 90 degrees (bottom 1/4 of the circumference). Fill depressions with tamped sand backfill. At each pipe joint, dig bell holes to relieve pipe bell of loads and ensure continuous bearing of pipe barrel on bearing surface.

3.6 *Subgrade Undercutting*

A. Unsuitable materials existing below the Contract bottom limits for excavation shall be removed and replaced with Class II granular material as defined in section 902.07 of MDOT 2020 Standard Specifications for Construction, and meeting the requirements of Table 902-3 for Class II materials as needed to provide a stable foundation. Such additional excavation shall not exceed the vertical and lateral limits prescribed by the Engineer.

B. At the Contractor's option, the voids left by removal of unsuitable material shall be filled with special backfill or 21AA as defined in MDOT Standard Specifications for Construction. Special backfill shall be placed over a geotextile fabric and compacted to a density as specified in Part 3.10 “Compaction Requirements” of this section; geotextile fabric separators are specified in Part 2 (Products) of this section.

3.7 *Disposal of Unsuitable and Surplus Material*

A. Dispose of unsuitable and surplus materials in accordance with the requirements of this section and section C.04.

B. All excavated materials which are unsuitable for use in backfilling trenches or structures, and materials excavated that are in excess of that required for backfilling and for constructing

fills, shall be disposed of by the Contractor at his expense and at sites provided by him as may be required, except that the Owner reserves the right to require the Contractor to deposit such surplus at locations designated by the Owner within a two-mile radius of the Work.

C. Surplus excavated material of any class shall be deposited in such a manner that all spoil areas shall be left smooth, level, stabilized, with proper drainage.

D. If, in the opinion of the Engineer, removal of soil(s) is required due to failure on the part of the Contractor to observe proper precautions pending or during inclement weather, removal and replacement of soil(s) in accordance with applicable requirements of these Specifications shall occur solely at the expense of the Contractor at no additional cost to the Owner.

3.8 *Backfill - General*

A. Backfill and compaction as described in this sub-part of the Specification is intended to define the requirements for all installations and\or assemblies requiring such work.

B. Conduit Bedding: Unless otherwise directed, conduits shall be installed in bedding consisting of native soils, where such soils meet the requirements of Section C.04 for suitability and shall be compacted in accordance with Part 3.10 “Compaction Requirements” of this section. Removal of unsatisfactory native soils and replacement with bedding materials, specified in section C.07 Part 2.1 shall be performed solely at the direction of the Engineer.

C. Backfilling Under Existing Conduits: Where it is necessary to undercut or replace existing utility conduits and/or service lines, the excavation beneath such lines shall be backfilled the entire length with granular bedding material tamped in place in 6-inch layers to the required density. The granular bedding shall extend outward from the spring line of the conduit a distance of 2 feet on either side and thence downward at its natural slope.

D. Backfill with Excavated Material - Unless otherwise directed, “selected backfill” excavated in connection with the work shall be used for backfilling and other filling purposes, insofar as it meets the applicable requirements of Section C.04 and Part 3.10 “Compaction Requirements” of this section. No material shall be used for backfilling that contains stones, rock, or pieces of masonry greater than 12-inch, frozen earth, debris, and earth with an exceptionally high void content, organic material, or marl. No pieces of rock or masonry larger than 1 1/2-inch diameter shall be deposited closer than 24 inches from the completed outside surface of any structure or pipe. Replacement of unsatisfactory backfill material with selected or special backfill material shall be solely at the direction of the Engineer.

E. Backfill Immediately - All trenches and excavations shall be backfilled immediately after pipe is laid therein, unless otherwise directed by the Engineer. Under no circumstances shall water be permitted to pond in backfilled trenches after pipe has been placed.

F. Backfill around and over structures and pipes shall be carefully done by hand and tamped with suitable tools of approved weight to a point 1 foot above the top of same. Selected material or, where specified or ordered by the Engineer, special backfill material shall be used in this area. The material shall be placed in uniform layers not exceeding 6 inches (uncompacted thickness) up each side. Each layer shall be placed, then carefully and uniformly tamped to the specified density so as to eliminate the possibility of lateral displacement of conduit, pipe or structure.

G. Backfill by Machinery - After the backfill has been placed and compacted around the structures and conduits to a height of 1 foot above the top, the remainder of the trench may be backfilled by machine. The backfill material shall be deposited in horizontal layers and each layer shall be thoroughly compacted to the specified density by approved methods before a succeeding layer is placed. In no case will backfill material from a bucket be allowed to fall directly on a structure or pipe and in all cases the bucket must be lowered so that the shock of the falling earth will not cause damage to the conduit, pipe, or structure.

H. Backfill Under Pavement and Walks - Where any pavement, driveway, parking lot, curb and gutter, or walk covers the trench and/or within 10 feet of railroad tracks, selected backfill material shall be used to backfill the entire trench from the bedding material to the surface. The material shall be placed and compacted to the required density in accordance with one of the following methods:

1. The backfill material shall be deposited in 6-inch horizontal layers (uncompacted thickness) and each layer shall be thoroughly compacted to the proper density by approved compaction equipment before a succeeding layer is placed.

2. Solely by approval of the Engineer, the backfill may be compacted with water if all of the following conditions are met:

   a. Satisfactory drainage is provided,
   b. The backfill material consists of clean, granular material,
   c. The temperature of the air is above freezing, and
   d. The results of such compaction method provide the specified density.

   The backfill may be flooded, sluiced, or jetted into place with water, or deposited in water as the work progresses. If flooded, the material shall be deposited in layers not exceeding 2 feet in thickness. If sluiced, the material shall be deposited by means of water under pressure equal to that of the public water mains and shall be completely saturated throughout the mass. Where sluicing methods are used, compaction tests will be made at various depths after completion of the sluicing operation. Compaction will continue until specified density is obtained.

3. No methods of compaction which alters the gradation of the special backfill material or prevents compaction testing by standard testing methods shall be used.

I. Embankments - Unless otherwise directed, selected backfill material excavated in connection with the work shall be used for embankment fill, insofar as it meets the applicable requirements of Section C.04 for suitability, and Part 3.10 “Compaction Requirements” of this section for compaction. No material shall be used for embankment fill that contains stones, rock, or pieces of masonry greater than 12 inches, frozen earth, debris, earth with an exceptionally high void content, organic material, or marl. No pieces of rock or masonry larger than 1½ inch diameter shall be deposited closer than 24 inches from the completed outside surface of any structure or pipe.

Where selected backfill (native soil) is unsatisfactory (as defined in Section C.04), the Contractor shall, solely at the direction of the Engineer, furnish and install embankment fill consisting of special backfill material, conforming to Section 902.07 of MDOT 2020 Standard Specifications for Construction, and meeting the requirements of Table 902-3 for Class II materials.

3.9 *Backfill for Flexible Plastic Pipe*

A. Trench Bottom: Install foundation and bedding in accordance with details shown on the Drawings. Provide a firm, stable and uniform bedding for the pipe barrel and any protruding features of its joint. Provide a minimum bedding thickness of one-half of the pipe diameter.

B. When rock or unyielding material is present in the trench bottom, install a 6-inch-thick (minimum) cushion of bedding below the bottom of the pipe. Compact bedding to a minimum of 95% optimum dry density when tested in accordance with One Point Michigan Cone/AASHTO T-99 In accordance with MDOT guidelines.

C. Where the trench bottom is unstable or shows a "quick" tendency, cease all trenching operations; resume pipe installation solely under the direction of the Engineer, and in strict accordance with the "Subgrade Undercutting" sub-part of this section.

D. Minimize local loadings and differential settlement wherever the pipe crosses other utilities or subsurface structures. Provide a cushion of bedding material between the pipe and any such point of localized loading.

E. If the trench bottom is over-excavated below the intended grade, fill the over-excavation with bedding material and compact to not less than 95% of maximum dry density as determined by One Point Michigan Cone/AASHTO T-99 in accordance with MDOT guidelines. Over-excavation shall be considered unauthorized excavation; provision and placement of additional bedding material required to reestablish the intended grade shall not result in any additional cost to the Owner.

F. If trench sidewalls slough off during any part of excavating or installing the pipe, remove all sloughed and loose material from the trench.

G. Place embedment materials by methods which will not disturb or damage the pipe. Work in and tamp the haunching material in the area between the bedding and the underside of the pipe before placing and compacting the remainder of the embedment in the pipe zone. Do not permit compaction equipment to contact and damage the pipe. Use compaction equipment and techniques that are compatible with the materials used in the trench. Before using heavy compaction or construction equipment directly over the pipe, place sufficient backfill to prevent damage, excessive deflections, or other disturbance of the pipe as follows (embedment classifications shall be as defined in Section C.04 of these specifications):

   1. 24 inch minimum (or one pipe diameter, whichever is larger) above top of pipe for Class I-A or I-B embedment
   2. 36 inch minimum (or one pipe diameter, whichever is larger) above top of pipe for Class II or III embedment

H. Compact bedding, haunching, initial and final backfill as shown on the trench detail in the Drawings.

3.10 *Compaction Requirements*

A. Backfill of trenches in locations below areas designated to receive pavement, curb, curb and gutter, walks and drives, and with any method and classification of aggregate material used,

the Contractor shall obtain minimum compaction throughout the fill of 95% of the maximum dry density as determined by One Point Michigan Cone/AASHTO T-99 in accordance with MDOT guidelines.

B. The backfill of trenches in locations other than below areas to receive pavement, curb, curb and gutter, walks and drives shall be compacted to a density no less than that of the surrounding ground unless otherwise specified.

C. Backfill placed around structures where other structures, pipelines, slabs or pavements are to be constructed shall be compacted to a minimum of 95% maximum dry density as determined by One Point Michigan Cone/AASHTO T-99 in accordance with MDOT guidelines.

D. Aggregate base which will provide bearing support for pavements, curbs, curbs and gutters, or drives shall be placed and compacted to a width of 6 inches beyond the back of curb, to the full depth indicated in the Drawings, and to not less than 98% maximum dry density as determined by One Point Michigan Cone/AASHTO T-99 in accordance with MDOT guidelines.

Embankment (fill) below the subbase shall be compacted to not less than 95% of maximum dry density as determined by One Point Michigan Cone/AASHTO T-99 in accordance with MDOT guidelines.

Subgrade backfill in trenches and in areas of subgrade undercutting shall be compacted to not less than 95% of maximum dry density as determined by One Point Michigan Cone/AASHTO T-99 in accordance with MDOT guidelines.

E. Where compaction testing indicates failure of the soils(s) to attain the minimum densities as specified in this section, the Contractor shall aerate and recompact the area until minimum density is achieved. Aeration shall be accomplished by disking or manipulation by other means approved by the Engineer. Aeration and recompacting of soils which do not meet compaction requirements shall be performed by the Contractor at no additional to the Owner.

Any retesting required due to failure to achieve minimum specified densities shall be paid for by the Contractor, at no additional cost to the Owner.

3.11 *Compaction Testing*

A. Trenches and excavation around structures shall be backfilled and compacted in layers from bottom of trench to top of existing surrounding subgrade. Compaction tests shall be performed on each layer immediately after compaction.

B. Initial test series for each type of backfill material shall be continued until the method of consolidation employed has proven to attain the required compaction. Any change in the proven method of soil compaction will not be permitted unless approved by the Engineer.

C. The laboratory shall perform the following field tests:

1. Special backfill and granular pipe bedding material: One test for every 50 linear feet of trench, per layer of material compacted in place.
2. Selected backfill in utility trenches: One test for every 100 linear feet of trench, per layer of material compacted in place.

3. Aggregate base under curb, curb and gutter, or walks: One test for every 50 linear feet of trench, per layer of material compacted in place.
4. Fill or aggregate base below areas designated to receive pavement: One test for every 5000 square feet of trench, per layer of material compacted in place, or as otherwise directed by the Engineer.
5. The Engineer may decrease testing frequency if acceptable testing is consistently obtained.

D. Subsequent tests or series of tests shall be in locations and at depths ordered by the Engineer.

END OF SECTION C.07

SECTION C.09 - SOIL EROSION AND SEDIMENTATION CONTROL

PART 1 - GENERAL

1.01 This section shall include obtaining and paying for the proper Public Act 451 of 1994, Part 91 (as amended) Permit and complying with its requirements. The Contractor will pay for the application fee. Any temporary erosion control required on this project shall be part of this section. It is the Contractor's responsibility to obtain this permit unless defined differently elsewhere in this Project Manual.

1.02 The use of loose-laid (unconfined) straw in the provision of soil erosion and sedimentation control shall not be permitted.

PART 2 - PRODUCTS

2.01 *Silt Fence and Fabric*

A. Silt fence shall meet the requirements of Section 208 of MDOT Standard Specifications for Construction, 2020 Edition.

2.02 *Erosion Control Blankets*

A. Unless otherwise specified, erosion control blanket shall be a machine produced mat of 100% agricultural straw, of consistent thickness, with straw evenly distributed over the entire area of the matrix, at the approximate rate of 0.5 lbs per square yard. The blanket shall be covered on the top side with a polypropylene photodegradable netting having an approximate ½" x ½" mesh, sewn together with cotton thread. Straw erosion control blanket shall be #S75 as manufactured by North American Green, or approved equal.

B. Unless otherwise specified, heavy duty erosion control blanket shall be a machine produced composite matrix of 70% agricultural straw and 30% coconut, of consistent thickness, with straw and coconut evenly distributed over the entire area of the matrix, at the approximate rate of 0.5 lbs per square yard. The blanket shall be covered on the top side with a heavyweight polypropylene netting having an approximate ½" x ½" mesh, and a weight of 5.0 lbs/1,000 ft^2. Center net shall be ultra-heavyweight polypropylene corrugated netting with a weight of 24.0 lbs/1,000 ft^2. The blanket shall be covered on the bottom side with a heavyweight polypropylene UV-stabilized netting having an approximate ½" x ½" mesh, and a weight of 5.0 lbs/1,000 ft^2. Heavy duty erosion control blanket shall be #SC250 as manufactured by North American Green, or approved equal.

C. Unless otherwise specified, erosion control blanket in or near wetland areas shall be Curlex NetFree as manufactured by American Excelsior Company. Fiber shall be Great Lakes Aspen curled with interlocking fibers, 80% of fibers shall be a minimum of 6 inches long, fiber weight shall be 0.73 0.5 lbs per square yard. Thread shall be biodegradable with no more than 2.0-inch transverse stitch spacing.

2.03 *Riprap*

A. Field Stone or crushed lime stone shall be used, and shall be placed according to the Drawings. Size of Riprap shall be defined by the Drawings and this Project Manual, and shall be large enough to prevent movement of the Riprap during full pipe flows.

B. Geotextile underlay or separator shall be Geotex 801 as manufactured by Propex or Approved Equal.

2.04 *Turbidity Curtain*

Turbidity Curtain fabric will be PVC-coated polyester. The flotation component will be 6" minimum expanded polystyrene. The ballast will be ¼" minimum galvanized chain.

2.05 *Silt Sack*

Silt sack for storm sewer manhole and inlet protection shall be manufactured to fit the opening of the manhole or inlet. Silt sacks shall be manufactured from a specially designed woven polypropylene geotextile and sewn by a double needle machine, using a high strength nylon thread. Silt sacks shall have the following minimum specifications:

Puncture (ASTM D-4833)	125 pounds
Mullen Burst (ASTM D-3786)	650 pounds
Flow Rate (ASTM D-4491)	40 gal/min/ft^2

2.06 *Construction Access*

A. Surface of construction access shall consist of a minimum of 8 inches of 2-3 inch diameter crushed rock, gravel, or reconstituted concrete with all reinforcing bar removed. Crown the construction access to ensure positive water runoff.

B. Geotextile underlay or separator shall be Geotex 801 as manufactured by Propex or approved equal.

C. Minimum dimensions of temporary construction access shall be 50 feet long by 12 feet wide. Radius onto public road shall be 25 feet on each side.

D. Remove accumulated sediment when the buildup reduces the effectiveness of the construction access at removing sediment from tires.

E. At the completion of construction, the access road gravel surface, accumulated sediment, and geotextile underlay shall be removed and the final surface installed according to the Drawings.

PART 3 - EXECUTION

3.01 The Contractor shall be responsible for all control measures to prevent damage resulting from erosion and sedimentation to on-site or off-site areas per the state "Uniform Keying System" and as described in this section. The Contractor is to provide all materials and labor necessary to complete erosion control measures. Materials, installation and performance standards shall comply with guidelines set forth by Act 451 of the Public Acts of 1994, Part 91, "The Michigan Soil Erosion and Sedimentation Control Act"; the Michigan Unified Keying System can be referenced to the measures outlined in the Michigan Soil Erosion and Sedimentation Control Guide Book.

3.02 Any area of stockpiled soil shall be limited to a 30-day period prior to instituting final and/or temporary soil erosion measures as directed by the Engineer.

3.03 Daily inspections shall be made by the Contractor to determine effectiveness of erosion and sedimentation measures, and any necessary repairs shall be performed without delay.

3.04 Erosion and any sedimentation from work on site shall be contained on the site and not allowed to collect on any off-site areas or in waterways. Waterways include both natural and man-made open ditches, streams, and storm drains.

3.05 Erosion and sediment control measures are to be placed prior to, or as the first step in, construction. Sedimentation control practices will be applied as a perimeter defense against any transporting of silt off the Site.

3.06 The Contractor shall be responsible for the installation and application of all temporary erosion and sedimentation control measures required to preclude damage to on or off-site properties and structures. These temporary measures shall be removed upon the permanent stabilization of slopes, ditches and mounds.

3.07 Permanent soil erosion control measures for all slopes, channels, ditches or any disturbed land area shall be completed within 15 calendar days after final grading or the final earth change has been completed. When it is not possible to permanently stabilize a disturbed area after an earth change has been completed or where significant earth change activity ceases, temporary soil erosion control measures shall be implemented within 15 calendar days therefrom.

3.08 Silt Fence and Fabric: Fencing shall be installed so as to allow filter fabric to be installed and remain taut and upright. Contractor shall maintain this condition of fencing at all times during construction. The bottom of the fence must be "toed" into the ground per manufacturer's recommendations. The fabric shall allow the movement of storm water through it but not permit the passage of soil.

END OF SECTION C.09

Division E

Storm Sewer

SECTION E.01 - STORM SEWER PIPING AND END SECTIONS

PART 1 – GENERAL

1.01 *Related Documents*

A. Drawings and General Provisions of the Contract, including General Conditions, Division B - General Project Requirements, and other applicable specification sections, apply to this section (see Division C - Earthwork).

1.02 *Summary*

A. Under the Work of this section, the Contractor shall furnish all labor, material and equipment required to install a storm water piping system. This section shall include furnishing and installing all required pipe, fittings, specials, adaptors, blind flanges, reducing flanges, closure pieces, tees, bends, joint restraints, granular pipe bedding material, Class B concrete used for encasement or bedding, making connections to new or existing structures, testing pipe, and other work incidental to but required to provide a completed pipe installation.

1.03 *References*

A) Except as herein specified or as indicated on the Drawings, the work of this section shall comply with the following:

ASTM Standards and Standard Specifications:

1. C 76 Standard Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe
2. C 443 Standard Specifications for Joints for Circular Concrete Pipe and Manholes, Using Rubber Gaskets
3. C 478 Standard Specification for Precast Reinforced Concrete Manhole Sections
4. C 497 Standard Test Methods for Concrete Pipe, Manhole Sections, or Tile
5 C 507 Standard Specification for Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe
6. C 822 Standard Terminology Relating to Concrete Pipe and Related Products
7. C 877 Standard Specification for External Sealing Bands Concrete Pipe, Manholes, and Precast Box Sections
8. C 891 Standard Practice for Installation of Underground Precast Concrete Utility Structures
9. C 923 Standard Specifications for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals
10. C 924 Standard Practice for Testing Concrete Pipe Sewer Lines by Low-Pressure Air Test Method
11. C 1479-01 Standard Practice for Installation of Precast Concrete Sewer, Storm Drain, and Culvert Pipe Using Standard Installations
12. D 449 Standard Specification for Asphalt Used in Dampproofing and Waterproofing
13. D 1056 Standard Specification for Flexible Cellular Materials-Sponge or Expanded Rubber
14. D 2321 Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and other Gravity-Flow Applications

15. D 2680 Standard Specification for ABS and PVC Composite Sewer Piping
16. D 2751 Standard Specification for ABS Sewer Pipe and Fittings
17. D 3034 Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
18. D 3350 Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
19. F 405 Standard Specification for Corrugated Polyethylene (PE) Pipe and Fittings
20. F 477 Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
21. F 667 Standard Specification for Large Diameter Corrugated Polyethylene Pipe and Fittings
22. F 810 Standard Specification for Smoothwall Polyethylene (PE) Pipe for Use in Drainage and Waste Disposal Absorption Fields
23. F 1417 Standard Practice for Installation Acceptance of Plastic Non-pressure Sewer Lines Using Low-Pressure Air

B) AASHTO Standards:

1. M 207 Standard Specification for Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe
2. M 252 Standard Specification for Corrugated Polyethylene (PE) Drainage Pipe
3. M 278 Standard Specification for Class PS46 Polyvinyl Chloride (PVC) Pipe
4. M 294 Specification for Corrugated Polyethylene (PE) Pipe, 12 to 36 Inch Diameter
5. M 36 91 Standard Specification for Corrugated Steel Pipe, Metallic Coated, for Sewers and Drains
6. M 190 88 Standard Specification for Bituminous-Coated Corrugated Metal Culvert Pipe and Pipe Arches
7. M 218 87 Standard Specification for Steel Sheet, Zinc Coated (Galvanized) for Corrugated Steel Pipe
8. M 232 84 Standard Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware
9. T 241 80S Standard Method of Test for Helical Continuously Welded Seam Corrugated Steel Pipe
10. M 245 91 Standard Specification for Corrugated Steel Pipe, Polymer-Precoated, for Sewer and Drains
11. M 246 87 Standard Specification for Steel Sheet, Metallic Coated and Polymer-Precoated, for Corrugated Steel Pipe
12. M 247 87 Standard Specification for Steel Sheet Aluminum Coated (Type 2) for Corrugated Steel Pipe
13. T 249 93 Standard Method of Test for Helical Lock Seam Corrugated Pipe

1.04 *Submittals*

A. General: Submit the following in accordance with General Conditions and the following:

1. Coordination drawings showing pipe sizes and manholes, locations, and elevations. Include details of underground structures and connections. Show other piping and utilities in the same trench and clearances to storm sewer piping. Indicate interface and spatial relationship between piping and proximate structures.

1.05 *Quality Assurance*

A. Environmental Compliance: Comply with applicable portions of local environmental agency regulations pertaining to storm sewerage systems.

B.) Utility Compliance: Comply with local utility regulations and standards pertaining to storm sewerage systems.

1.06 *Project Conditions*

A. Site Information: Verify existing utility locations with local utility providers, "Miss Dig" and the local municipality. Verify that storm sewerage system piping may be installed in compliance with original design and referenced standards.

1.07 *Maintenance of Storm Sewer System During Construction*

A. When so required, coordinate connection to public sewer with local municipality. All construction which requires interruption of existing sewer system flow shall be executed during periods designated by the authorities with jurisdiction over the stormwater discharge system(s).

B. Coordinate with other utilities as required by the Work.

PART 2 - PRODUCTS

2.01 *Reinforced Concrete Storm Sewer Pipe (RCP)*

A. Reinforced concrete: Storm sewer piping shall be reinforced concrete to meet or exceed the requirements of Class III pipe in accordance with ASTM C 76 Standard Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe. Reinforced concrete pipe shall be of the bell-and-spigot or the tongue-and-groove type; joints shall be compression-type rubber gasket joints meeting the requirements of ASTM C 443 or external sealing band type meeting the requirements of ASTM C 877.

B. Elliptical reinforced concrete: Storm sewer piping shall be reinforced concrete to meet or exceed the requirements of Class III pipe in accordance with ASTM C 507 Standard Specification for Reinforced Concrete Elliptical Culvert, Storm Drain and Sewer Pipe. Reinforced concrete pipe shall be of the bell-and-spigot or the tongue-and-groove type; joints shall be compression-type rubber gasket joints meeting the requirements of ASTM C 443 or external sealing band type meeting the requirements of ASTM C 877.

2.02 *Corrugated Polyethylene (CPE) Pipe [Smooth Lined Corrugated Plastic Pipe (SLCPP)]*

A. Corrugated Polyethylene (CPE) Pipe: The pipe furnished under the requirements of this Subsection shall be a high density polyethylene (HDPE) corrugated exterior/smooth interior pipe. Twelve to forty-eight inch diameter pipe shall meet or exceed the requirements of AASHTO M 294 Type S. Material shall meet the requirements of ASTM D 3350 Cell Classification 324420C.

B. Joints shall be bell and/or spigot with a silt-tight and leak resistant rubber gasket conforming to ASTM F 477.

C. Fittings: Fittings shall meet all applicable requirements of AASHTO M 252 or AASHTO M 294, and shall be constructed of the same material classification as the pipe. Fittings shall be welded on the interior and exterior at all junctions.

2.03 *Perforated Corrugated High Density Polyethylene (PCPE) Pipe Storm Sewer Pipe with Synthetic Envelope*

A. Corrugated Perforated PE Pipe: The pipe furnished under the requirements of this Subsection shall be a high density polyethylene corrugated exterior pipe. Three to ten inch diameter (nominal) perforated pipe shall meet or exceed the requirements of AASHTO M 252, ten to sixty inch diameter (nominal) shall meet or exceed the requirements of AASHTO M294.

B. Synthetic Envelope (Geotextile): The geotextile wrap for corrugated perforated PE storm sewer piping shall be a spunbonded nylon fabric, Type 25 Cerex (Monsanto Corp.) or approved alternate, as follows:

1. Weight: 0.85 oz./sq.yd. (ASTM D 3376)
2. Fiber size: 4.7 denier per filament
3. Thickness: 5.4 mils (ASTM D 1777)
4. Grab Strength: 26 lbs. machine direction, 18 lbs. transverse direction (ASTM D 1682)
5. Burst strength: 36 psi (ASTM D 3786)
6. Air permeability: 700 cfm/sq. ft. (ASTM D 737)
7. Temperature resistance: 425 ºF (ASTM D 276)
8. Water Flow Rate: 530 gpm/sq. ft. at 3 inches of head

C. Synthetic Envelope (Geotextile): The geotextile wrap for corrugated perforated PE storm sewer piping shall be a knit polyester fabric, as follows:

1. Weight: 3.0 oz./sq.yd. (ASTM D 1910)
2. Grab Tensile Strength: 90 pounds (ASTM D 4632)
3. Trapezoid Tear Strength: 45 pounds (ASTM D 4533)
4. Puncture Strength: 45 pounds (ASTM D 4833)
5. Mullen burst strength: 100 psi (ASTM D 3786)
6. Permittivity: 0.5 per second (ASTM D 4491)
7. Apparent Opening Size: 0.60 mm (ASTM D 4751) for nonpavement areas
   0.30 mm for pavement and foundation underdrains

2.04 *Corrugated Steel Pipe (CSP)*

A. Steel pipe of circular cross-section (Type 1) with annular corrugations shall meet the requirements of AASHTO M 36, ASTM 929, and Section 909.05 A of MDOT 2020 Standard Specifications for Construction. The pipe shall be fabricated from zinc-coated steel sheet (coating weight of 2 oz/ ft^2) in accordance with AASHTO M 218, or aluminum-coated steel sheet (5 to 11% silicon and coating weight of 1 oz/ ft^2).

B. Steel pipe of circular cross-section (Type 2) with helical corrugations shall meet the requirements of AASHTO M 274, ASTM 929, and Section 909.05 A of MDOT 2020 Standard Specifications for Construction. The pipe shall be fabricated from aluminum-coated steel sheet (less than 0.35% silicon and coating weight of 1 oz/ ft^2). Pipe fabricated from aluminum-coated steel sheet shall not be manufactured using continuously welded seams.

C. Furnish Polymer Coated Steel pipe for circular pipe or pipe arch culverts fabricated from zinc coated sheet steel conforming to AASHTO M218. Before fabrication, coat the sheets on both sides with polymer protective coating grade 250/250 according to AASHTO M246. Fabricate the pipe according to AASHTO M245. Only lock seam pipe will be allowed.

D. End finish for corrugated steel pipe shall have the ends of the pipe rerolled to form at least two circumferential corrugations, or to form an upturned flange, in accordance with AASHTO M 36 or M 245.

E. Coupling bands for connecting sections of pipe and attaching end sections to culvert pipe shall be circumferentially corrugated with the same size corrugations as on the ends of the pipe being joined, meeting the requirements of AASHTO M 36. The metallic coating used on the coupling band shall be the same as metallic coating on the pipe with which it is to be used.

F. Thickness and corrugation shall be as follows:
N/A

2.05 *End Sections with Rip Rap and Geotextile Liner*

A. End sections shall be fabricated in accordance with the details shown on the Plans, furnished complete with coupling bands or hardware to be compatible with storm sewer piping specified in this Section. Corrugated Steel Pipe (CSP) end sections will be required for all non-concrete pipe.

B. Concrete for cast-in-place end sections shall meet all applicable requirements of ASTM C 76. Concrete for precast end sections made by the wet-cast method shall contain an entrained air content of 6.0 ± 2.0%. Concrete for precast end sections made by the dry-pack method shall contain a minimum of 658 pounds of cement per cubic yard and a liquid air-entraining agent used at four times the dosage used for conventional slump concrete.

C. CSP end sections shall meet the requirements of AASHTO M 36, ASTM 929, and Section 909.05 A of MDOT 2020 Standard Specifications for Construction. The pipe shall be fabricated from zinc-coated steel sheet (coating weight of 2 oz/ ft2) in accordance with AASHTO M 218, or aluminum-coated steel sheet (5 to 11% silicon and coating weight of 1 oz/ ft2). CSP end sections shall match the gauge of the CSP pipe it is connected to. If a CSP is not used the CSP end section shall be 16 gauge unless specified elsewhere by the engineer.

D. Geotextile Liner for Riprap Areas: The areas of riprap assembly installation are indicated on the Plans. The geotextile liner shall weigh a minimum of 4.5 ounces per square yard, and shall contain a non-toxic ultra-violet inhibitor. The geotextile liner shall meet all applicable requirements of AASHTO M 288, except as modified following:

Minimum tensile strength:	200 lbs. (ASTM D 4632)
Minimum static [CBR] puncture strength:	400 psi (ASTM D 6241)
Range for Apparent Opening Size:	70-120 U.S. Standard Sieve size (ASTM D 4751)

(Geotex 801 as manufactured by Propex has been preapproved by the Engineer)

E. Riprap: Riprap shall be clean, sound, tough, durable rock free from structural defects. Concrete will not be acceptable. The median stone/rock diameter shall equal d50 as

designated in the Pay Items and on the Drawings, and 50% of the stone by volume shall be larger than d50 and 50% shall be smaller, with the largest stone being 1.5 times d50.

PART 3 - EXECUTION

3.01 *General*

A. The Work of this section shall consist of the proper installation of storm sewer pipe of the required material, class and size, at locations and grades as shown on the Plans. Excavation, backfill, and compaction shall be performed in accordance with the applicable requirements of Section C.07, and shall be incidental to the installation of storm sewer piping except where specifically provided as a separate Pay Item. Installation of concrete pipe shall be per ASTM Standard C 1479-01.

3.02 *Preparation of Foundation and Backfill for Buried Sewerage Systems*

A. Excavate trench(es) for storm sewer in accordance with all applicable requirements of Section C.07. Where discrepancies may occur between this Section and Division C, Division C governs. Trenching and backfill performed as part of this Section is incidental to Storm Sewer Pay Items.

B. Grade trench bottom to provide a smooth, firm, stable, and rock free foundation, throughout the length of the pipe.

C. Unstable, soft, and unsuitable materials shall be removed and replaced as specified in Section C.07 at the surface upon which pipes are to be laid, and backfilled with proper materials to indicated levels.

D. Shape bottom of trench to fit bottom of pipe. Fill unevenness with tamped selected backfill. Dig bell holes at each pipe joint to relieve the bells of all loads and to ensure continuous bearing of the pipe barrel on the foundation.

E. Corrugated perforated storm sewer piping (with synthetic drainage envelope) to be used for underdrains shall not be placed in its trench shortly before, during or immediately after inclement weather, or whenever the moisture content of soils within the influence area of the underdrain piping exceeds the optimum range of soil moisture content as specified in the Standard Proctor Test.

3.03 *Piping Installation, General*

A. General Locations and Arrangements: Drawings (plans and details) indicate the general location and arrangement of the underground storm sewerage system piping. Install the piping in accordance with ASTM D 2321. The backfill shall be suitable granular material (Class I, II, or III) conforming to ASTM D 2321.

B. Install piping beginning at low point of systems, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings in accordance with manufacturer's recommendations for use of lubricants, cements, and other installation requirements. Maintain swab or drag in line and pull past each joint as it is completed.

C. Use manholes for taps into existing sewer where indicated.

D. Install piping pitched down in direction of flow, at the slopes indicated on the Drawings or as directed by the Engineer.

E. The Contractor shall use a laser beam for establishing grade when installing pipe in open cut.

F. The grade of pipe in open cut shall be checked using surveying equipment. The Contractor shall have a surveyor's level and level rod on the site at all times when sewer pipe is being placed. The level rod shall be equipped with an attached "shoe" extension of the bottom for placing on the pipe invert. The pipe invert elevation shall be checked at 25-ft (maximum) intervals or more often as directed by the Engineer. Checks will be performed by the Contractor and the Resident Project Representative.

G. The Contractor shall furnish all equipment and labor and check his alignment from the grade line at 25-ft maximum intervals.

H. Any inspection or checking of the Contractor's layout by the Engineer shall not relieve the Contractor of his responsibility to secure the proper dimensions, grades, and elevations of the several parts of the work.

I. Connect manholes, inlets, leaching basins and similar structures in accordance with the requirements of Section E.02.

3.04 *Pipe Joint Construction and Installation*

A. Join corrugated pipe and fittings with couplings provided by the manufacturer of the plastic pipe and in strict accordance with the manufacturer's installation requirements and recommendations.

B. Join different types of pipe with standard manufactured couplings and fittings intended for that purpose.

3.5 *Field Quality Control*

A. Testing: Perform testing of completed piping in accordance with local authorities having jurisdiction. The cost of testing shall be incidental to the installation of storm sewer piping.

B. Cleaning: Clear interior of piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed.

1. Place plugs in ends of uncompleted pipe at end of day or whenever work stops.

2. Flush piping between manholes, if required by local authority, to remove collected debris.

C. Interior Inspection: Inspect piping to determine whether line displacement or other damage has occurred.

1. If inspection indicates poor alignment, debris, displaced pipe, infiltration or other defects correct such defects, and re-inspect.

D. Deflection Testing

1. All corrugated plastic pipe CPE shall be tested for deformation by the Contractor using a nine-point mandrel. The mandrel shall have an effective diameter equal to 95 percent of the nominal pipe diameter; the Contractor shall provide the Engineer with a proving-ring to verify mandrel size. The Contractor shall perform the mandrel testing after the required backfill compaction of the trench has been achieved. Conduct the mandrel testing between 5 and 10 working days prior to pavement surfacing or completion of final grade, except as otherwise approved by the Engineer. Pipe with diameter reduced by 5 percent or more shall be removed and either re-installed, if the pipe is not damaged, or replaced at no cost to the Owner. Such pipe shall not be re-installed without prior approval from the engineer. The Contractor will be responsible for all expenses and delays due to the replacement of deformed or damaged pipe. Pipe damaged by the Contractor's operations shall be removed, replaced and mandrel tested at the Contractor's expense.

3.06 *Riprap Construction*

A. Slopes indicated on the Drawings for riprap shall be excavated and compacted to the required cross-section and elevation. The slope shall be lined with geotextile, as specified in Part 2 Products of this Section, laid parallel with the toe of the slope. Laps in the geotextile shall be a minimum of 2 feet with the upgrade section overlapping the downgrade section (shingle-type lap).

B. Riprap shall commence in a trench below the toe of the slope, as shown on the Drawings, and shall progress upward, with each stone firmly bedded into the slope and against adjoining stones. The stones shall be laid perpendicular to the slope with surfaces in contact. The riprap shall be thoroughly compacted as construction progresses, with the finished surface presenting an even, tight surface. The thickness of the riprap shall not be less than 2 times d50, measured perpendicular to the slope. Individual stones shall be placed with their minimum dimension perpendicular to the plane of the surface to be riprapped.

END OF SECTION E.01

SECTION E.02 - STORM MANHOLES AND INLETS

PART 1 - GENERAL

1.01 *Related Documents*

A. Drawings and General Provisions of the Contract, including General Conditions, Division B - General Project Requirements, and other applicable Specification Sections, apply to this Section (see also Division C - Earthwork).

1.02 *Summary*

A. In general, the Work of this section consists of the furnishing and installation of storm sewerage structures and appurtenances for storm water conveyance. Manholes, inlets, and leaching basins are included in this section.

1.03 *References*

A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:

ASTM Standards and Standard Specifications:

1. C 76 Standard Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe
2. C 443 Standard Specifications for Joints for Circular Concrete Pipe and Manholes, Using Rubber Gaskets
3. C 478 Standard Specification for Precast Reinforced Concrete Manhole Sections
4. C 497 Standard Test Methods for Concrete Pipe, Manhole Sections, or Tile
5. C 822 Standard Terminology Relating to Concrete Pipe and Related Products
6. C 877 Standard Specification for External Sealing Bands Concrete Pipe, Manholes, and Precast Box Sections
7. C 891 Standard Practice for Installation of Underground Precast Concrete Utility Structures
8. C 923 Standard Specifications for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals
9. C 924 Standard Practice for Testing Concrete Pipe Sewer Lines by Low-Pressure Air Test Method
10. D 449 Standard Specification for Asphalt Used in Dampproofing and Waterproofing
11. D 1056 Standard Specification for Flexible Cellular Materials-Sponge or Expanded Rubber
12. D 1248 Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable
13. D 2321 Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and other Gravity-Flow Applications
14. D 2680 Standard Specification for ABS and PVC Composite Sewer Piping
15. D 2751 Standard Specification for ABS Sewer Pipe and Fittings
16. D 3034 Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
17. D 3350 Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
18. F 405 Standard Specification for Corrugated Polyethylene (PE) Pipe and Fittings

19. F 477 Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
20. F 667 Standard Specification for Large Diameter Corrugated Polyethylene Pipe and Fittings
21. F 810 Standard Specification for Smoothwall Polyethylene (PE) Pipe for Use in Drainage and Waste Disposal Absorption Fields
22. F 1417 Standard Practice for Installation Acceptance of Plastic Non-pressure Sewer Lines Using Low-Pressure Air

1.04 *Submittals*

A. General: Submit the following in accordance with General Conditions and the following:

1. Coordination drawings showing pipe sizes and manholes, locations, and elevations. Include details of underground structures and connections. Show other piping and utilities in the same trench and clearances to storm sewer piping. Indicate interface and spatial relationship between piping and proximate structures.

1.05 *Quality Assurance*

A. Environmental Compliance: Comply with applicable portions of local environmental agency regulations pertaining to storm sewerage systems.

B. Utility Compliance: Comply with local utility regulations and standards pertaining to storm sewerage systems.

1.06 *Project Conditions*

A. Site Information: Verify existing utility locations with local utility providers, "Miss Dig" and the local municipality. Verify that storm sewerage system piping may be installed in compliance with original design and referenced standards.

1.07 *Maintenance of Storm Sewer System During Construction*

A. Coordinate connection to public sewer with local municipality. All construction which requires interruption of existing sewer system flow shall be executed during periods designated by the authorities with jurisdiction over the stormwater discharge system(s).

B. Coordinate with other utilities as required by the Work.

PART 2 - PRODUCTS

2.01 *Manufacturers*

A. Available Manufacturers: Subject to compliance with requirements, provide products solely from manufacturers qualified and experienced in this type of work.

2.02 *Manholes, Catch Basins, Inlets and Leaching Basins*

A. Precast Concrete Manholes: ASTM C 478, precast reinforced concrete, of depth indicated on the Drawings, with provision for rubber gasket joints, and as follows:

1. Base Section: 6 inch minimum floor slab thickness for 48" diameter or less manholes and 8 inch minimum floor slab thickness for greater than 48" diameter manholes. 5 inch minimum thickness for walls and base riser section, having a separate base slab or base section with integral floor.

2. Riser Sections: 5 inch minimum thickness; 48 inch diameter, and lengths to provide depth indicated.

3. Top Section: Eccentric cone type, unless grade prohibits or concentric cone or flat slab top type is indicated. Top of cone to match grade rings.

B. Grade Rings: Provide 2 or 3 reinforced concrete rings, of 6 to 9 inches total thickness and match 24 inch diameter frame and cover.

C. Gaskets: ASTM C 443, rubber.

D. Concrete: Portland cement mix, 3000 psi.

1. Cement: ASTM C 150, Type II.
2. Fine Aggregate: ASTM C 33, sand.
3. Coarse Aggregate: ASTM C 33, crushed gravel.
4. Water: Potable.

E. Reinforcement: Steel conforming to the following:

1. Fabric: ASTM A 185, welded wire fabric, plain.
2. Reinforcement Bars: ASTM A 615, Grade 60, deformed.

F. Manhole Steps: Cast into base, riser, and top sections sidewall at 12 to 16 inch intervals, and shall be wide enough for a man to place both feet on one step, designed to prevent lateral slippage off the step. Installed rungs shall support a minimum concentrated load of 300 lbs at any point on the step.

1. Steel reinforced polypropylene steps, or approved equal.

G. Manhole Frames/Covers: East Jordan Iron Works as shown on the drawings.

H. Weir Manhole: Tie weir reinforcement bar into manhole structure. When possible, integrally cast weir with manhole. Exposed edges to have a ¾" chamfer. Weir wall shall be able to withstand force of a manhole full of water.

2.03 *Leaching Basins*

A. Precast Concrete Manholes: ASTM C 478, precast reinforced concrete, of depth indicated with provision for rubber gasket joints, perforated with 5/8" inch holes 12 inches on center horizontally and vertically.

1. Base Section: For 48" diameter manhole, 6 inch minimum thickness for floor slab and 5 inch minimum thickness for walls and base riser section is required. Manhole may have a separate base slab or a base section with integral floor.

2. Riser Sections: 5 inch minimum thickness; 48 inch diameter, and lengths to provide depth indicated.

3. Top Section: Eccentric cone type, unless concentric cone or flat slab top type is indicated. Top of cone to match grade rings.

B. Grade Rings: Provide 2 or 3 reinforced concrete rings, of 6 to 9 inches total thickness and match 24 inch diameter frame and cover.

C. Gaskets: ASTM C 443, rubber.

D. Steps: Cast into base, riser, and top sections sidewall at 12 to 16 inch intervals; cast aluminum East Jordan Iron Works #8501 or approved equal.

E. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base or riser section.

F. Channel and Bench: Cast-in-place concrete.

G. Concrete: Portland cement mix, 3000 psi.

1. Cement: ASTM C 150, Type II.
2. Fine Aggregate: ASTM C 33, sand.
3. Coarse Aggregate: ASTM C 33, crushed gravel.
4. Water: Potable.

H. Reinforcement: Steel conforming to the following:

1. Fabric: ASTM A 185, welded wire fabric, plain.
2. Reinforcement Bars: ASTM A 615, Grade 60, deformed.

I. Manhole Steps: Wide enough for a man to place both feet on one step and designed to prevent lateral slippage off the step.

1. Material: Cast aluminum: East Jordan Iron Works #8501 or approved equal.

J. Manhole Frames/Covers:

1. East Jordan Iron Works No. 7065 or 7045 with Type M2 grate for inlets at concrete curb-and-gutter.
2. East Jordan Iron Works No. 1040 with Type M1 grate for parking area inlets.

K. Geotextile: Non-woven geotextile fabric used as a separator in the bottom of the pipe trench shall be Geotex 801 as manufactured by Propex.

L. Drainage fill: 6A coarse aggregate to meet the requirements of MDOT's Standard Specifications for Construction Table 902-1.

PART 3 - EXECUTION

3.01 *Preparation of Foundation for Buried Sewerage Systems*

A. Excavate for structures in accordance with all applicable Sections of Division C - Earthwork. Where discrepancies may occur between this Section and Division C, Division C governs. Excavation and backfill performed as part of this Section is incidental to Storm Sewer Pay Items.

B. Grade excavation bottom to provide a smooth, firm, stable, and rock free foundation.

C. Unstable, soft, and unsuitable materials shall be removed and replaced, at the direction of the Engineer (as specified in Division C - section C.07) at the surface upon which structures are to be placed, and backfilled with proper materials to indicated levels.

3.02 *Installation, General*

A. General Locations and Arrangements: Drawings (Drawings and details) indicate the general location and arrangement of the underground storm sewerage system. Install structures in strict accordance with the most current issue of the referenced standard(s).

B. Any inspection or checking of the Contractor's layout by the Engineer shall not relieve the Contractor of his responsibility to secure the proper dimensions, grades, and elevations of the several parts of the work.

3.03 *Installation of Manholes, Inlets and Leaching Basins*

A. General: Install structures complete with accessories as indicated. Set tops of frames and covers flush with finish surface where structures occur in pavements. Elsewhere, set tops 3 inches above finish surface, unless otherwise indicated.

B. Place precast concrete manhole sections as indicated, and install in accordance with ASTM C 891. Install manholes to provide proper alignment between steps and cast-iron frames and covers, as shown on the details.

C. Provide rubber joint gaskets complying with ASTM C 443 at joints of sections.

D. Apply bituminous mastic coating at joints of sections.

E. Leaching basins: Place drainage fill around perforated manhole section(s) to provide a minimum of 24 inches entirely around the structure, from bottom of base section to top of uppermost riser section, as shown on the Drawings.

1. Provide a geotextile filter fabric around the exterior bottom, side and top of the drainage fill as a separator between fill and soil. Install geotextile fabric in accordance with manufacturer's recommendations with a minimum overlap of 12 inches at all seams.

3.04 *Field Quality Control*

A. Testing: The Contractor shall be responsible for determining testing requirements as may be established by the agency(s) of local jurisdiction for storm sewer piping. Such tests shall be performed by the Contractor with copies of the written results being submitted to the Engineer. Testing of storm sewer structures shall be incidental unless specifically designated as a Pay Item elsewhere.

B. Cleaning: Clear interior of structures of dirt and other superfluous material as work progresses.

END OF SECTION E.02

Division J

Miscellaneous

SECTION J.01 - TURF ESTABLISHMENT

PART 1 - GENERAL

1.01 *Scope*

A. This Section includes spreading topsoil as indicated on the plans, fertilizing, fine grading, seeding and mulching areas designated on the Drawings, specified, or ordered.

B. The work consists of fine grading, placing topsoil, seed, mulching material, and fertilizer, and watering until growth is assured.

C. The Contractor shall restore all grass areas damaged by his operations.

D. Unless otherwise specified herein or directed, work shall be in conformance with The Michigan Department of Transportation (MDOT) 2020 Standard Specifications for Construction, Section 816, Turf Establishment.

1.02 *Referenced Standards*

A. MDOT Standard Specifications for Construction, 2020 Edition.

1.03 *Submittals*

A. Submittals shall include:

1. Manufacturer's material certification.

2. To Owner's Representative -

a. Invoices showing the weight, brand, and composite analysis of all fertilizer used on the Project.

b. Bag tickets showing weight and composition of all seed used on the Project.

1.04 *Protection*

A. Permanent seed shall be sown only between the dates of April 15 and October 10th, unless otherwise permitted by the Engineer.

B. The operation of finish grading and sowing shall not be performed when the ground is frozen or muddy.

PART 2 - PRODUCTS

2.01 *Seed*

A. Seed mixtures shall be in conformance with the requirements of The MDOT 2020 Standard Specifications for Construction Section 816, turf seed mixture TUF.

2.02 *Fertilizer*

A. Commercial fertilizers shall be from a dealer or manufacturer whose brands and grades are registered or licensed by the State of Michigan, Department of Agriculture.

2.03 *Mulching Material*

A. Mulching material shall be straw in an air-dry condition reasonably free of weed, seed, and other foreign materials.

2.04 *Mulch Anchoring Material*

A. Mulch Anchoring material shall be in conformance with the requirements of The MDOT 2020 Standard Specifications for Construction, Section 917.15.

2.05 *Topsoil*

A. Topsoil shall be as specified in Section C.05 of these Specifications.

PART 3 - EXECUTION

3.01 *Furnishing and Placing Topsoil*

A. Areas to be seeded or sodded shall be covered with a minimum of 3 inches of topsoil, compost, or both in conformance with The MDOT 2020 Standard Specifications for Construction Section 816.

3.02 *Preparation of Areas to be Seeded*

A. The area to be seeded shall be disked and harrowed and all depressions filled.

B. Fertilizer shall be applied at a rate which will provide 240 lbs/acre of chemical fertilizer nutrients in equal proportions of Nitrogen, Phosphoric Acid, and Potash. Either dry or liquid fertilizer may be used and shall be distributed in an even pattern over the specified area, then thoroughly disked, harrowed, or raked into the soil to a depth of not less than 1 in.

C. All clods, rubbish, and stones greater than 1-in. in any dimension shall be removed and the area graded to a smooth surface. Hand raking will be required in areas inaccessible to machines and may be required in areas of urban character and in front of residences where machines do not provide results equivalent to hand raking.

3.03 *Seeding*

A. The seed shall be mixed thoroughly and sown evenly at a rate of 220 lbs/acre. The seed mixture may be sown dry or hydraulically.

B. The seed mixture shall be applied when the soil is in a workable condition and shall be raked or drilled into a depth of approximately ¼ in.

3.04 *Mulching*

A. Within one calendar day after an area has been seeded it shall be mulched in conformance with one of the following specified methods as designated in Special Provisions or the Contract Item for Seeding:

1. Straw Mulch -

a. Apply mulch at a rate of 2 tons/acre except in areas of dormant seeding where rate is 3 tons/acre. Mulching with straw shall be in conformance with mulching requirements of MDOT Section 816, except that in front of buildings the mulching material shall be kept in place by an approved non-tracking adhesive or other approved method in lieu of the specified asphalt emulsion.

B. Mulch which has become displaced prior to complete seed germination shall be restored.

3.05 *Mulch Anchoring*

A. Mulch Anchoring shall be in conformance with mulching requirements of MDOT Section 816.

3.06 *Watering and Maintenance*

A. Seeded and mulched or sodded areas shall be watered and maintained as specified below until they are established.

1. The seed bed and mulch shall be thoroughly watered, as soon as the seed is covered.

2. Water shall be applied by a hydro-seeder or water tank under pressure with a nozzle producing a spray that will not dislodge the mulching material.

3. Water applications shall be made at least once a week, provided significant rainfall has not occurred within the weekly period.

4. The rate of application shall be 120 gal/1,000 sf.

5. The Contractor shall keep all sodded areas, including the subgrade, thoroughly moist for two weeks after sodding. After the two-week period, the Contractor shall water the sod as specified above.

6. Matting areas shall be maintained until all work on the Contract has been completed and accepted.

7. Maintenance shall consist of the repair of areas damaged by erosion, wind, fire, or other causes. The soil in these damaged seeded areas shall be restored to the condition and grade existing prior to application of matting, and restored areas shall be re-limed, re-fertilized, and reseeded. Where necessary, the jute matting shall be completely replaced. Damaged sod shall be replaced with new sod.

PART 4 - SPECIAL PROVISIONS

4.01 *Seeding*

A. All disturbed areas are to be seeded in accordance with contract specifications.

END OF SECTION J.01

SECTION J.02 CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.01 *Related Documents*

A. The Drawings, including details.

1.02 *Summary*

A. This Section includes the following:

1. Galvanized steel chain link fence and gates.

B. Related Sections: The following sections contain requirements that relate to this section:

1. Division C - Earthwork for filling and grading work.

1.03 *Submittals*

A. General: Submit the following in accordance with the General Conditions.

1. Product data in the form of manufacturer's technical data, specifications, and installation instructions for fence and gate posts, fabric, gates, and accessories.

2. Shop drawings showing location of fence, gates, each post, and details of post installation, extension arms, gate swing, hardware, and accessories.

3. Certificates of Compliance from pipe and fabric supplier.

1.04 *Quality Assurance*

A. Single Source Responsibility: Obtain chain link fences and gates as complete units, including necessary erection accessories, fittings, and fastenings from a single source or manufacturer.

PART 2 - PRODUCT

2.01 *Manufacturers*

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work shall be currently certified by the Chain Link Fence Manufacturer’s Institute (CLFMI).

2.02 *Fabric*

A. Fence: 48” height, 2¼ inch mesh, 11½ gauge steel chain link fabric, aluminized per ASTM A 491 with aluminum coating before weaving with minimum 0.4 oz. aluminum per sq. ft. of uncoated wire surface and knuckling at each selvage. Fabric shall have a 25-year manufacturer’s written warranty.

B. Selvage: Fabric 72 inches high and over with 2¼ inch mesh shall be knuckled at one selvage and twisted at the other; all mesh 60 inches high and under shall be knuckled at both selvages.

2.03 *Framing*

A. Strength requirements for posts and rails conforming to ASTM F 1043 .

B. Cantilever bending strength requirements for posts and rails conforming to ASTM F 1083.

C. Pipe shall be straight, true to section, of material, and sizes specified.

D. Steel Framework, General: Furnish posts, rails, and gate frames, at locations shown on the Plans, to a top rail height of 48 inches (4'-0").

E. End, corner, and pull posts:

1. 2½ inch OD Type II steel pipe with a minimum of 16 ga. steel tubing.

F. Line or intermediate posts:

1. 1 5/8 inch OD Type II steel pipe with a minimum of 16 ga. steel tubing.

G. Gate Posts: Furnish posts for supporting each gate leaf for nominal gate widths as follows:

1. 6 feet: 2½ inch OD Type I or II steel pipe.

H. Top Rail:

1. 1 3/8 inch OD Type II steel pipe with a minimum of 16 ga. steel tubing.

2. Manufacturer's longest lengths, with expansion type couplings, approximately 6 inches long, for each joint, or factory wedged. Provide means for attaching top rail securely to each gate corner, pull, and end post.

2.04 *Fittings and Accessories*

A. Material: Comply with ASTM F 626. Mill finished aluminum or galvanized iron or steel, to suit manufacturer's standards.

1. Zinc Coating: Unless specified otherwise, galvanize steel fence fittings and accessories in accordance with ASTM A 153, with zinc weights per Table I.

B. Tie Wires: 9 gauge aluminum.

C. Post and Line Caps: Provide weather tight closure cap for each post. Provide line post caps with loop to receive tension wire or top rail.

D. Tension or Stretcher Bars: Hot dip galvanized steel with minimum length 2 inches less than full height of fabric, minimum cross section of 3/16 inch by 3/4 inch and minimum 1.2 oz.

zinc coating per sq. ft. of surface area. Provide one bar for each gate and end post, and two for each corner and pull post.

E. Tension and Brace Bands: Minimum ¾ inch wide hot dip galvanized steel with minimum 1.2 oz. zinc coating per sq. ft. of surface area.

1. Tension Bands: Minimum 14 gage (0.074 inch) thick.
2. Brace Bands minimum 12 ga.

F. Concrete: Provide concrete consisting of Portland cement, ASTM C 150, aggregates ASTM C 33, and clean water. Mix materials to obtain concrete with a minimum 28 day compressive strength of 2500 psi. Use at least 4 sacks of cement per cu. yd., 1 inch maximum size aggregate, maximum 3 inch slump, and 2 to 4 percent entrained air.

2.05 *Gates*

A. Fabrication: Fabricate perimeter frames of gates from metal and finish to match fence framework. Assemble gate frames by welding. Provide horizontal and vertical members to ensure proper gate operation and attachment of fabric, hardware, and accessories. Space frame members maximum of 6 feet apart unless otherwise indicated.

1. Provide same fabric as for fence unless otherwise indicated. Install fabric with tension bars and bands at vertical edges tied at top & bottom with 9 ga. aluminum ties.

B. Swing Gates: Comply with ASTM F 900.

1. Steel:

a. 4 feet High and 6 feet Wide per side: Fabricate perimeter frames of minimum 1 3/8 inch OD Type I steel pipe. Shop cope, fit and weld perimeter frame square and true; repair all damaged galvanizing coating(s) with manufacturer's standard cold galvanizing compound.

C. Gate Hardware: Provide hardware and accessories for each gate, galvanized per ASTM A 153, and in accordance with the following:

1. Hinges: Size and material to suit gate size, non lift off type, offset to permit 180 degree gate opening. Provide 1 pair of hinges for each leaf over 6 foot nominal height.

2. Latch: Forked type or plunger bar type to permit operation from either side of gate, with padlock eye as integral part of latch.

3. Keeper: Provide keeper for vehicle gates, which automatically engages gate leaf and holds it in open position until manually released.

PART 3 - EXECUTION

3.01 *Installation*

A. General: Install fence in compliance with ASTM F 567. Do not begin installation and erection before final grading is completed, unless otherwise permitted.

1. Apply fabric to outside of framework. Install fencing on boundary lines inside of property line established by others.

B. Excavation: Drill or hand excavate (using post hole digger) holes for posts to diameters and spacings indicated, in firm, undisturbed or compacted soil.

1. Excavate holes for each post to minimum diameter recommended by fence manufacturer, but not less than 4 times largest cross section of post; excavate hole depths approximately 3 inches lower than post bottom, with bottom of posts set not less than 36 inches below finish grade surface.

C. Setting Posts: Center and align posts in holes 3 inches above bottom of excavation. Space posts as recommended by fence manufacturer, but not to exceed maximum 10 feet o.c.

1. Protect portion of posts above ground from concrete splatter. Place concrete around posts and vibrate or tamp for consolidation. Check each post for vertical and top alignment, and hold in position during placement and finishing operations.

D. Top Rails: Run rail continuously through line post caps, bending to radius for curved runs and at other posts terminating into rail end attached to posts or post caps fabricated to receive rail. Provide expansion couplings as recommended by fencing manufacturer.

E. Fabric: Leave approximately 2 inches between finish grade and bottom selvage unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Install fabric on security side of fence, and anchor to framework so that fabric remains in tension after pulling force is released.

F. Tension or Stretcher Bars: Thread through or clamp to fabric 4 inches o.c., and secure to end, corner, pull, and gate posts with tension bands spaced not over 12 inches o.c.

G. Tie Wires: Use U shaped wire of proper length to secure fabric firmly to posts and rails with ends twisted at least 2 full turns. Bend ends of wire to minimize hazard to persons or clothing.

1. Maximum Spacing: Tie fabric to line posts 12 inches o.c. and to rails 18 inches o.c.

H. Fasteners: Install nuts for tension bands and hardware bolts on side of fence opposite fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

I. Gates: Install gates plumb, level, and secure for full opening without interference. Install ground set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

END OF SECTION J.02

SECTION J.05 - DEWATERING

PART 1 - GENERAL

1.01 *Scope*

A. The Contractor shall furnish all materials, labor, and equipment required to remove groundwater that would enter excavated areas and would interfere with the Work of other Pay Items. Surface water removal from excavated areas is not intended to be covered by this Work and is incidental to other Work.

B) Mechanical dewatering using a pumping system shall be required as part of this Work. Pipe bedding with aggregates to firm up the bottom of pipe trenching that is moist is not considered dewatering.

PART 2 - PRODUCTS

2.01 Not Applicable

PART 3 - EXECUTION

3.01 *General*

A. The Contractor shall at all times during construction provide and maintain ample means and devices with which to remove promptly and dispose of properly all water entering excavations and other parts of the Work and shall keep said excavations dry until installation of pipe and/or structures has been completed and all backfill has been placed and properly compacted. No water shall be allowed to rise over or come in contact with masonry until the concrete and mortar has attained a satisfactory set, except in cases where the concrete has been tremied into place with the approval of the Engineer. In water-bearing sand, well point and/or sheeting shall be supplied, together with pumps and other appurtenances of ample capacity to keep excavations and other parts of the Work free of water.

B. The Contractor shall properly dispose of water from the Work in a suitable manner without damage to adjacent property or structures. Erosion protection must be provided and maintained.

C. Sediment-laden water from cofferdams, trenches, and other areas which need to be dewatered, shall be pumped through a geotextile material filter bag before the water is discharged to a watercourse. The sediment from the filter bag shall be disposed of by the Contractor at an upland site. The Contractor shall get written permission from property owners prior to disposal of any and all spoil from the Work before said property or properties are used to dispose of spoil from the Work.

END OF SECTION J.05

SECTION J.06 - SITE DATA COLLECTION

PART 1 - GENERAL

1.01 *Scope*

A. Description of Work: The Contractor shall provide all labor, materials, equipment, services, and perform all operations necessary to furnish to the Owner a complete color audio-video digital record of the surface features within the proposed construction's zone of influence. This record shall include, but not be limited to, all storage cases, flash drives or data devices and indexes. The purpose of this coverage shall be to accurately document the pre-construction condition of these surface features. Videotaping shall take place prior to the placement of equipment and materials on the jobsite.

B. Private Property Entry: When planning on entering private property, the Contractor shall notify such property owner to obtain his permission to do so. Should the property owner refuse to give his permission for said entry, the Contractor shall immediately notify the Owner, who will obtain the right to enter the property through the legal powers vested in the Owner as a public entity. The Contractor is advised that he shall not enter any private property before permission is granted to do so or the Owner has notified the Contractor that he has gained the legal right to do so.

PART 2 - PRODUCTS

2.01 *Recording Equipment*

A. Recording Equipment: The total audio-video recording system and the procedures employed in its use shall be such as to produce a finished product that will fulfill the technical requirements of the project, as well as those more subjective requirements of high quality audio and video production. The video portion of the recording shall reproduce bright, sharp, clear pictures with accurate colors and shall be free from distortion, tearing, rolls, or any other form of picture imperfection. The audio portion of the recording shall reproduce the commentary of the camera operator with proper volume, clarity, and be free from distortion.

The color video camera used in the recording system shall have a horizontal resolution of 300 lines at center, a luminance signal to noise ratio of 45db, and a minimum illumination requirement of 25 foot-candles. Camera zoom to be no faster than a doubling of focal distance within a 1/2 second interval, or slower. Zoom is capable of 17 to 120 mm, then the minimum time to perform a full zoom is 3/5 seconds.

Where conventional wheeled vehicles are used camera is to be mounted securely to produce steady viewing. Camera lens is to be minimum of 8 feet from ground of viewing area, or at a level to facilitate best perspective and line of sight.

The flash drive or data device used for the recordings shall be that conforms current recording standards. No flash drive or data device used for any previous recording will be used except when furnished by the Owner.

2.02 *Record: Required Displays*

A. Video Content: All video recordings shall, by electronic means, display continuously and simultaneously generated, transparent, alphanumeric information to include the following:

1. Time and Date: During the entire duration of the recordings, the time and date of recording shall appear in the upper left hand corner of the picture. To preclude the possibility of tampering or editing, time and date information must be electronically incorporated through the original recording device.

2. Name and Site of Streets or Easement: During the entire duration of the recordings, the name of the street or easement being recorded must appear across the bottom of the picture.

3. Engineering stationing shall be displayed to coincide with project plans, direction of travel, and viewing side. The engineering stationing must be continuous and accurate and reflect the stationing within the field of view. The engineering stationing must coincide with stationing on project plans and utilize standard engineering symbols i.e. 5+00.

B. Audio Content: Accompanying the video recording of each video record shall be a corresponding and simultaneously recorded audio recording. This audio recording, exclusively containing the commentary of the camera operator, shall assist in the maintenance of viewer orientation and in any needed identification, differentiation, clarification, or objective description of the structures being shown in the video portion of the recording. The camera positioning, by use of the standard stationing format shall also be clearly identified by narration.

C. 3 sets of video records shall be provided. 1 set shall be delivered to the Owner upon completion and will become the property of the Owner. 1 set shall be delivered to the Engineer and the final set shall be kept but the Contractor.

2.03 *Record: Identification*

A. All records are to be labeled with appropriate project information and be able to be cross referenced with run sheets. Information on labels will include:

1. Roll number
2. Project Title
3. Location of project
4. Month and year of coverage
5. As multiple copies of each copy must be marked as s i.e. engineer set, owner set, contractor set
6. Quick reference list of contents

B. A run sheet log shall be provided that accurately catalogs the contents of each flash drive or data device. Information contained in the run sheet will include:

1. Street name, easement, or address
2. Sheet number or numbers relative to the line entry of a particular area of coverage
3. Roll numbers

4. Real time code indexing for each segment of the project, real time code indexing will indicate hours, minutes, and seconds to cross reference with playback equipment to locate specific points of interest on the project.
5. Direction of travel for each specific segment.
6. Viewing side for each specific segment
7. Starting point for each specific segment
8. Ending point for each specific segment
9. Project information, i.e. project title, owner, date

PART 3 - EXECUTION

3.01 *Scope of Coverage*

A. The recordings shall contain coverage of all surface features located within the construction's zone of influence. The construction's zone of influence shall be defined as:

1. The area within the permanent and temporary easements, and areas adjacent to these easements which may be affected by routine construction operations; and

2. As directed by the Owner and/or the Engineer.

The surface features within the construction's zone of influence shall include, but not be limited to, all roadways, pavements, curbs, driveways, sidewalks, culverts, headwalls, retaining walls, buildings, landscaping, trees, shrubbery and fences. Of particular concern shall be the existence or non-existence of any faults, fractures or defects.

Where construction will extend in or adjacent to a street, the full width of the construction's zone of influence including the street right-of-way and the areas adjacent to both sides of that right-of-way shall be recorded.

Where construction will extend through easement areas, the permanent and temporary easements and all other adjacent areas lying within the construction's zone of influence shall be recorded.

3.02 *Procedural Requirements*

A. The following procedures shall be implemented in the production of pre-construction color audio-video flash drive or data device documentation. Above all, the documentation shall be executed in a conscientious and professional manner to assure the end product's maximum usefulness to the Owner.

1. Schedule of Recording: The schedule for recording shall be performed prior to the placement of any construction materials or equipment on the proposed construction site. The recording sequence shall correspond with the proposed construction schedule.

2. Visibility: All recording shall be performed during times of good visibility. No recording shall be done during periods of visible precipitation. The recording shall only be done when sufficient ambient light is present to properly illuminate the subjects of recording, and to produce bright, sharp video recordings of those subjects.

3. Snow: No recording shall be performed when more than 10 percent of the ground area is covered with snow, unless otherwise authorized by the Owner.

4. Coverage Continuity: Coverage shall consist of a single, continuous, unedited recording which begins at one end of a particular construction area and continues to the other end of that construction area. However, where coverage is required in areas not accessible by conventional wheeled vehicles and smooth transport of the recording system is not possible, such coverage shall be executed by walking or special conveyance approved by the Engineer, and shall be noted on computer print-out.

5. Coverage Rates: The vehicle rate of travel shall be directly proportional to the number, size, and value of the surface features within that construction area's zone of influence. The following table classifies typical areas and sets the maximum average rates of travel in those areas:

Area Type	Typically Characterized By	Avg. Feet/Min
High Density	Hard surface streets, curbs, drives & sidewalks, 50 ft. lots; very few empty lots	48
Medium Density	Gravel roads, hard and soft surface drives, no sidewalks, culverts and headwalls, 100' lots; few empty lots	60
Low Density	Gravel roads, small fields or woods, occasional houses or buildings	90
Extra Low Density	Gravel roads, large fields, sparse number of houses	120

The vehicle rate of travel for haul routes, rainfall studies, and road surface view shall be approximately five (5) mph.

6. Camera Height and Stability: When conventional wheeled vehicles can be used as conveyances for the recording system, the distance between the camera lens and the ground shall not be less than 8 feet. The camera shall be firmly mounted, such that transport of the camera during the recording process will not cause an unsteady picture.

7. Panning and zoom rates shall be electronically or manually controlled to provide clear viewing on playback.

8. Houses and buildings shall be identified visually by house number, when visible, in such a manner that structures of the proposed system, i.e. manholes on a sewer system, and gate valves and hydrants on a water system can be located by reference. In all instances location shall be identified by audio or visual means at intervals not to exceed 100 lineal feet.

9. Accompanying the video recording shall be a corresponding and simultaneously recorded audio track containing the commentary of the camera operator. The commentary shall assist in the maintenance of viewer orientation, identification of surface features, and objective description of the points of interest being shown on the video portion of the recording.

10. The Owner / Engineer shall have the authority to reject all or any portion of the flash drive or data device recording not conforming to specifications.

END OF SECTION J.06