



SCISWA Landfill

Leachate Pond Construction

Construction Documents Project Manual

Issued for Bid

October 9, 2020

HDR Project No. 10232961



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I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

Katie Kinley
KATIE KINLEY, P.E.

10/9/2020

(DATE)

MY LICENSE RENEWAL DATE IS DECEMBER 31, 2021.

PAGES OR SHEETS COVERED BY THIS SEAL:
ALL SECTIONS



DIVISION 00

PROCUREMENT AND CONTRACTING
REQUIREMENTS



ADVERTISEMENT FOR BIDS

SCISWA LANDFILL
TRACY, IOWA
LEACHATE POND CONSTRUCTION

General Notice

South Central Iowa Solid Waste Agency (SCISWA) Landfill (Owner) is requesting Bids for the construction of the following Project:

SCISWA Landfill
Leachate Pond Construction

Bids for the construction of the Project will be received at the SCISWA scalehouse located 1736 Hwy T-17, Tracy, Iowa, until Wednesday, October 28, 2020 at 10 a.m. local time. At that time the Bids received will be publicly opened and read.

The Project includes the following Work:

- Approximately 60,000-cy of soil movement and structural fill placement
- Approximately 415-LF of dual 24" RCP culvert installation
- Approximately 60-LF of dual 36" RCP culvert installation
- Approximately 1.32-acres of clay liner and geosynthetics installation
- Approximately 1,500-LF of shared trenching, dual contained forcemains and conduits
- Approximately 1,250-LF of shared trenching, single contained forcemain and conduit
- Leachate loadout area with forcemain connections
- Electric, pump, and pump house installation

Bids are requested for the following Contract: Leachate Pond Construction

The Project has an expected duration of 60-working days.

Obtaining the Bidding Documents

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

<https://sciswa.org/>

Bidding Documents may be downloaded from the designated website. Prospective Bidders are urged to register with the designated website as a Bidding Documents holder, even if Bidding Documents are obtained from a third-party plan room or source other than the designated website in either electronic or paper format. The designated website will be updated periodically with Addenda, reports on the Site, 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.

Pre-bid Conference

A **mandatory virtual pre-bid conference** for the Project will be held on Friday, October 16, 2020 at 11 a.m. at the following webex link. Bids will not be accepted from Bidders that do not attend the mandatory pre-bid conference.

<https://meethdr.webex.com/meethdr/j.php?MTID=m24cbcab27797271f25af5b24a0cba06e>

Meeting number (access code): 146 369 0277

Meeting password: PwdfkPqm828

OR join by phone

+1-408-418-9388 United States Toll

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: South Central Iowa Solid Waste Agency

By: Mr. Rick Hurt

Title: Director

Date: October 7, 2020

INSTRUCTIONS TO BIDDERS

FOR CONSTRUCTION CONTRACT

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ARTICLE 1—DEFINED TERMS

- 1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:
- A. *Issuing Office*—The office from which the Bidding Documents are to be issued, and which registers plan holders.

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, nor does it grant or confer ownership or any property interest in the Bidding Documents and other documents distributed for the Project. Authorization to download documents, or other distribution, includes the right for Bidding Documents holders to print documents solely for their use, and the use of their prospective Subcontractors and Suppliers, provided the Bidding Documents holder pays all costs associated with printing or reproduction. Paper or other types of printed documents may not be re-sold under any circumstances.
- 2.03 Owner has established a Bidding Documents Website as indicated in the Advertisement or invitation to bid. Owner recommends that Bidder register as a Bidding Documents holder with the Issuing Office at such website, and obtain a complete set of the Bidding Documents from such website. Bidders may rely that sets of Bidding Documents obtained from the Bidding Documents Website are complete, unless an omission is blatant. Registered Bidding Documents holders will receive Addenda issued by Owner or Issuing Office.
- 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 Bidding Documents 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 other such sources (such as other prospective bidders), 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 prospective 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 DC. 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 any bidder's or 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 paper versions of the documents, and for Bidder's reliance upon such derived information.
- C. After the Contract is awarded, the Owner will provide or direct the Engineer to provide for the use of the Contractor certain documents that were developed by Engineer as part of the Project design process, as Electronic Documents in native file formats as originally prepared by Engineer.
 - 1. Electronic Documents that are available in native file format include:
 - a. CAD file of plan sheets in dwg format for top of subgrade and top of clay.
 - 2. Release of such documents will be solely for the convenience of the Contractor. No such document is a Contract Document.
 - 3. Unless the Contract Documents explicitly identify that such information will be available to the Successful Bidder (Contractor), nothing herein will create an obligation on the part of the Owner or Engineer to provide or create such information, and the Contractor is not entitled to rely on the availability of such information in the preparation of its Bid or pricing of the Work. In all cases, the Contractor shall take appropriate measures to verify that electronic/digital information provided in Electronic Documents is appropriate and adequate for Contractor's specific purposes.
 - 4. In no case will Contractor be entitled to additional compensation or time for completion due to any differences between the actual Contract Documents and any related document in native file format.

ARTICLE 3—QUALIFICATIONS OF BIDDERS

- 3.01 Bidder is to submit the following information with its Bid to demonstrate Bidder's qualifications to perform the Work:
 - 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. OSHA Recordable Incident Rate, Severity/lost workday rate, and experience modification rate, for the last 3-years (2017, 2018, 2019).
 - F. Number of OSHA Citations/Violations received in the last 3-years (2017, 2018, 2019).
 - G. Other required information regarding qualifications.
- 3.02 A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.
- 3.03 No requirement in this Article 3 to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.
- 3.04 Bidders shall be experienced in the kind of Work to be performed, shall have or be able to obtain construction equipment necessary for the Work, and shall possess sufficient capital to properly perform the Work within the time allowed. Bids received from Bidders who have previously failed to complete work within the time required, or who have previously performed similar work in an unsatisfactory manner, may be rejected. A Bid may be rejected if Bidder cannot show and document to Owner's satisfaction that Bidder has the necessary ability, facilities, equipment, and resources to commence the Work at the time prescribed and thereafter to prosecute and complete the Work at the rate or within the times specified. A Bid may be rejected if Bidder is already obligated for the performance of other work which would delay the commencement, prosecution or completion of the Work.

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. Bids will not be accepted from Bidders who do not attend the conference. It is each Bidder's responsibility to sign in and participate in the roll-call 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 Bidders that attended the pre-bid conference and are, on that basis alone, 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 Bidding Documents. Owner or Issuing Office will issue Addenda to make any changes to the Bidding 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, including in Specifications Section 01 11 00 – Summary of Work. 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 prospective Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.
3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.

- B. *Underground Facilities:* 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 Site Visit and Testing by Bidders

- A. Bidder is encouraged to visit the Site and conduct a thorough visual examination of the Site and adjacent areas prior to bidding. During the visit the Bidder must not disturb any ongoing operations at the Site. Contact Mr. Rick Hurt to coordinate the site visit and complete during operating hours.
- B. Bidders visiting the Site are required to: (1) arrange their own transportation to the Site; and (2) each Bidder visiting the Site is responsible for providing and using its own personal protective equipment appropriate for the Site and conditions, and in accordance with posted requirements, if any. At minimum, each visitor to the Site should have an appropriate hardhat, steel-toed boots, eye and hearing protection (other than ordinary eyewear), and a high-visibility reflective safety vest. Comply with Paragraph 5.05 of these Instructions to Bidders.
- C. 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: Mr. Rick Hurt

(641.828.8545). Bidder must conduct the required Site visit during normal working hours, Mondays through Fridays.

- D. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.
- E. 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.
- F. Bidder must comply with Laws and Regulations regarding excavation and location of utilities, obtain necessary 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.
- G. 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.

5.04 *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 indicated in the Supplementary Conditions. Where the Bidding Documents indicate an Owner's safety program, visitors to the Site during the bidding phase and at other times shall comply with Owner's safety programs.

5.05 *Other Work at the Site*

- A. Reference is made to Specifications Section 01 11 00 – Summary of Work, 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 potentially 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 complete and 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, Successful Bidder (as Contractor) will make similar express representations and certifications when it signs 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. Email to all of the following email addresses no later than 5 p.m. on Wednesday, October 21, 2020:
1. Rick Hurt, rhurt@sciswa.org
 2. Katie Kinley, Katie.Kinley@hdrinc.com
 3. Luke Cunningham, Luke.Cunningham@hdrinc.com
- 7.03 Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all Bidding Documents holders registered with the Issuing Office. 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 Bidding Documents.
- 7.05 Addenda that engineer judges to have a material or significant effect on Bidders' preparation of pricing and other requirement element of the Bid will be transmitted via Addendum for Bidders' receipt not less than three days prior to the scheduled date for receipt of the Bids. Clarifications or modifications that Engineer deems will not have a material or substantial effect on the preparation of Bids may be transmitted for Bidders' receipt later, for receipt prior to the deadline for receipt of Bids.

ARTICLE 8—BID SECURITY

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 and special 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, equipment, and procedures specified or described in the Bidding Documents without consideration during the bidding and Contract award process of possible substitute or “or-equal” items or procedures. 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 or procedure, 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, and will perform the Work in accordance with procedures indicated in the Bidding Documents, as supplemented by Addenda, if 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

- 11.01 A Bidder must be prepared to retain specific Subcontractors and Suppliers for the performance of the Work if required to do so in the Specifications or elsewhere in the Bidding Documents. If a prospective Bidder objects to retaining any such Subcontractor or Supplier and the concern is not relieved by an Addendum, then the prospective Bidder should not submit a Bid.
- 11.02 The apparent Successful Bidder, and any other Bidder so requested by Owner or Engineer, must submit to Owner (with a copy to Engineer) a list of the Subcontractors and Suppliers proposed for the Work within five days after the bid opening.
- 11.03 If requested by Owner or Engineer, such list must be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor or Supplier. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor or Supplier, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder will submit a substitute, Bidder’s Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and awarding the Contract.
- 11.04 If apparent Successful Bidder declines to make a requested substitution, Owner may award the Contract to another Bidder, consistent with the basis for evaluating the Bids for award as set forth in these Instructions to Bidders, that proposes to use acceptable Subcontractors and Suppliers. Any Subcontractor or Supplier, so listed and against which Owner or Engineer makes no written objection prior to issuance of the Notice of Award will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.07 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.”
 - C. The submitted bid must include a proposed schedule.

- 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 8.5inch 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 signed 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 signed 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 signed 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 indicated on the Bid Form.
- 12.11 The Bid must contain evidence of Bidder's authority to do business in the state where the Project is located, or Bidder must certify in writing that it will obtain such authority within the time for acceptance of Bids and attach such certification to the Bid.
- 12.12 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 item of Unit Price Work 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 final 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, where required, the Bid Bond Form and other supplements to the Bid Form. The unbound copy of the Bid Form and supplements (if any) is to be completed and submitted with the Bid security and the other documents required with the Bid by 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, and 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 method, 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 or invitation to bid.
- 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. Owner accepts no responsibility for delays in returning Bids submitted or delivered to the incorrect location.

ARTICLE 15—MODIFICATION AND WITHDRAWAL OF BID

- 15.01 An unopened Bid may be withdrawn by an appropriate document duly signed in the same manner that a Bid must be signed and delivered to the place where Bids are to be submitted, prior to the date and time established in the Bidding Documents for the receipt 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 of this Article and submit a new Bid prior to the date and time for established in the Bidding Documents the receipt 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.

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, will be 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 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. Owner may reject the Bid of any Bidder that fails to demonstrate appropriate qualifications, experience, and resources for the Work, in accordance with Article 3 of these Instructions to Bidders.

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 *Basis for Award of Contract*

A. If Owner awards the contract for the Work, such award will be to the responsible Bidder submitting the lowest-priced, responsive Bid that has not otherwise been disqualified.

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 elsewhere in the Bidding Documents, or prior to the Notice of Award.

B. *Unit Price Work:* For the determination of the apparent low-price Bid 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 amount(s) of lump sum items (if any).

18.06 In evaluating whether a Bidder is responsible, Owner will consider the qualifications, experience, safety record, and resources of the Bidder and may consider the qualifications, experience, safety record, and resources 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, with or without Engineer's assistance, 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 Paragraph 2.01 and Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, set forth Owner's requirements as to performance and payment bonds, other required bonds (if any), and insurance. When the Successful Bidder delivers the signed Agreement to Owner (or Owner's representative), it must be accompanied by required bonds and insurance documentation.

ARTICLE 20—SIGNING OF AGREEMENT

- 20.01 When Owner issues a Notice of Award to the Successful Bidder, it will be accompanied by the unsigned 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 required bonds and insurance documentation (as required by the Contract Documents) to Mr. Rick Hurt. Within 10 days thereafter, Owner will deliver one fully signed counterpart of the Agreement to Successful Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.

ARTICLE 21—SALES AND USE TAXES

- 21.01 Owner is exempt from Iowa state sales and use taxes on materials and equipment to be incorporated in the Work. (Exemption No. to be provided at project award). Said taxes must not be included in the Bid. Refer to Paragraph SC-7.10 of the Supplementary Conditions for additional information.

ARTICLE 22—CONTRACTS TO BE ASSIGNED

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: Mr. Rick Hurt, Director
- 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. List of Proposed Subcontractors;
 - B. List of Proposed Suppliers;
 - C. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such authority within the time for acceptance of Bids;
 - D. Contractor's license number as evidence of Bidder's State Contractor's License or a covenant by Bidder to obtain said license within the time for acceptance of Bids;
 - E. Required Bidder Qualification Statement with supporting data; and
 - F. Construction Schedule

ARTICLE 3—BASIS OF BID—LUMP SUM BID AND UNIT PRICES

- 3.01 *Unit Price Bids*
 - A. Bidder will perform the following Work at the indicated unit and lump sum prices:

BID ITEM	ITEM	ESTIMATED QUANTITY	UNITS	BID UNIT PRICE	BID AMOUNT
1	MOBILIZATION/DEMOBILIZATION	1	LS		
2	STORMWATER EROSION AND SEDIMENT CONTROLS - INCLUDING SILT FENCE	1	LS		
3	MASS EXCAVATION TO STOCKPILE AREA (IF UNSUITABLE AS STRUCTURAL FILL)	1,000	CY		
4	MASS EXCAVATION TO STRUCTURAL FILL	5,500	CY		
5	HAUL AND PLACE STRUCTURAL FILL FROM BORROW AREA	54,250	CY		
6	SUBGRADE PREPARATION AND MAINTENANCE	1.26	AC		
7	2-FT CLAY LINER (HAULING, PROCESSING AND INSTALLATION AND MAINTENANCE)	6,116	SY		
8	EXCAVATE AND BACKFILL ANCHOR TRENCH	1,100	LF		
9	60-MIL HDPE TEXTURED GEOMEMBRANE SUPPLY AND INSTALL	55,050	SF		
10	LEACHATE POND PUMP, PUMP HOUSE, RIVER ROCK, GEOTEXTILE	1	LS		
11	EXTRACTION RISER - 24" SDR-11 HDPE EXTRACTION RISER	300	LF		
12	CHAINLINK FENCING WITH GATES SUPPLY AND INSTALLATION	1,100	LF		
13	FORCEMAIN - 10,000-GAL TANK TO CELL 4A RISER - 2" HDPE SINGLE CONTAINED PIPE, TRENCHING, DUAL CONTAINED TIE-INS	1,100	LF		
14	PIPE TRENCH WITH SAND BEDDING	1,350	LF		
15	FORCEMAIN - POND TO LEACHATE LOADOUT - 4"X8" HDPE DUAL CONTAINMENT PIPE	1,350	LF		
16	FORCEMAIN - CELLS TO POND - 3"X6" HDPE DUAL CONTAINMENT PIPE	1,110	LF		
17	GRAVITY LINE - CATCH BASIN DISCHARGE TO CELL 4A- 2"X4" HDPE DUAL CONTAINMENT PIPE	315	LF		
18	CONNECTION TO 4A SUMP ACCESS RISER, CONCRETE CUT AND REPLACE	1	LS		
19	LOADOUT CATCH BASIN, LOADOUT TREE, CONTROL PANEL AWNING	1	LS		
20	CONCRETE PAD WITH GRAVEL/GEOTEXTILE BASE	90	SY		
21	ELECTRICAL -INC. ALL CONNECTIONS, PANELS, WIRING, CONDUIT IN SHARED TRENCH, START UP	1	LS		
22	24" RCP CULVERT (CLASS IV) WITH FES AND RIPRAP/GEOTEXTILE APRONS (DUAL 415-LF)	830	LF		
23	36" RCP CULVERT (CLASS III) WITH FES AND RIPRAP/GEOTEXTILE APRONS (DUAL 60-FT)	120	LF		
24	RIP RAP LETDOWN WITH 8 OZ/SY GEOTEXTILE	2,880	SF		
TOTAL OF ALL BID ITEMS					

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. the 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.

3.02 *Total Bid Price (Lump Sum and Unit Prices)*

Total Bid Price (Total of all Lump Sum and Unit Price Bids)	\$
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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 days indicated in the Agreement.
- 4.02 Bidder agrees that the Work will be substantially complete on or before September 30, 2021, and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before October 30, 2021.
- 4.03 Bidder agrees that the Work will be substantially complete within 60 calendar days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within 60 calendar days after the date when the Contract Times commence to run.
- 4.04 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:

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.

6.02 *Bidder's Certifications*

A. The Bidder certifies the following:

1. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.
2. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.
3. Bidder has not solicited or induced any individual or entity to refrain from bidding.
4. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 8.02.A:
 - a. 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.
 - b. Fraudulent practice means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition.
 - c. 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.
 - d. 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.

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)

Bidder's Address for giving notices:

Bidder's Contact Person:

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Phone: _____

Email: _____

Address: _____

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

BID BOND (DAMAGES FORM)

<p>Bidder Name: [Full formal name of Bidder] Address (<i>principal place of business</i>): [Address of Bidder's principal place of business]</p>	<p>Surety Name: [Full formal name of Surety] Address (<i>principal place of business</i>): [Address of Surety's principal place of business]</p>
<p>Owner Name: [Full formal name of Owner] Address (<i>principal place of business</i>): [Address of Owner's principal place of business]</p>	<p>Bid Project (<i>name and location</i>): [Owner project/contract name, and location of the project] Bid Due Date: [Enter date bid is due]</p>
<p>Bond Bond Amount: [Amount] Date of Bond: [Date]</p>	
<p>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.</p>	
Bidder	Surety
_____ <i>(Full formal name of Bidder)</i>	_____ <i>(Full formal name of Surety) (corporate seal)</i>
By: _____ <i>(Signature)</i>	By: _____ <i>(Signature) (Attach Power of Attorney)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Attest: _____ <i>(Signature)</i>	Attest: _____ <i>(Signature)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
<p><i>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.</i></p>	

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder any difference between the total amount of Bidder's Bid and the total amount of the Bid of the next lowest, responsible Bidder that submitted a responsive Bid, as determined by Owner, for the work required by the Contract Documents, provided that:
 - 1.1. If there is no such next Bidder, and Owner does not abandon the Project, then Bidder and Surety shall pay to Owner the bond amount set forth on the face of this Bond, and
 - 1.2. In no event will Bidder's and Surety's obligation hereunder exceed the bond amount set forth on the face of this Bond.
 - 1.3. Recovery 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 will not in the aggregate exceed 120 days from 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 must 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.

QUALIFICATIONS STATEMENT

ARTICLE 1—GENERAL INFORMATION

1.01 Provide contact information for the Business:

Legal Name of Business:			
Corporate Office			
Name:		Phone number:	
Title:		Email address:	
Business address of corporate office:			
Local Office			
Name:		Phone number:	
Title:		Email address:	
Business address of local office:			

1.02 Provide information on the Business’s organizational structure:

Form of Business:	<input type="checkbox"/> Sole Proprietorship <input type="checkbox"/> Partnership <input type="checkbox"/> Corporation		
<input type="checkbox"/> Limited Liability Company <input type="checkbox"/> Joint Venture comprised of the following companies:			
1.			
2.			
3.			
Provide a separate Qualification Statement for each Joint Venturer.			
Date Business was formed:		State in which Business was formed:	
Is this Business authorized to operate in the Project location?		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Pending	

1.03 Identify all businesses that own Business in whole or in part (25% or greater), or that are wholly or partly (25% or greater) owned by Business:

Name of business:		Affiliation:	
Address:			
Name of business:		Affiliation:	
Address:			

Name of business:		Affiliation:	
Address:			

1.04 Provide information regarding the Business’s officers, partners, and limits of authority.

Name:		Title:	
Authorized to sign contracts:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Limit of Authority:	\$
Name:		Title:	
Authorized to sign contracts:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Limit of Authority:	\$
Name:		Title:	
Authorized to sign contracts:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Limit of Authority:	\$
Name:		Title:	

ARTICLE 2—LICENSING

2.01 Provide information regarding licensure for Business:

Name of License:			
Licensing Agency:			
License No:		Expiration Date:	
Name of License:			
Licensing Agency:			
License No:		Expiration Date:	

ARTICLE 3—DIVERSE BUSINESS CERTIFICATIONS

3.01 Provide information regarding Business’s Diverse Business Certification, if any. Provide evidence of current certification.

Certification	Certifying Agency	Certification Date
<input type="checkbox"/> Disadvantaged Business Enterprise		
<input type="checkbox"/> Minority Business Enterprise		
<input type="checkbox"/> Woman-Owned Business Enterprise		
<input type="checkbox"/> Small Business Enterprise		
<input type="checkbox"/> Disabled Business Enterprise		
<input type="checkbox"/> Veteran-Owned Business Enterprise		
<input type="checkbox"/> Service-Disabled Veteran-Owned Business		
<input type="checkbox"/> HUBZone Business (Historically Underutilized) Business		

<input type="checkbox"/> Other			
<input type="checkbox"/> None			

ARTICLE 4—SAFETY

4.01 Provide information regarding Business’s safety organization and safety performance.

Name of Business’s Safety Officer:			
Safety Certifications			
Certification Name	Issuing Agency	Expiration	

4.02 Provide Worker’s Compensation Insurance Experience Modification Rate (EMR), Total Recordable Frequency Rate (TRFR) for incidents, and Total Number of Recorded Manhours (MH) for the last 3 years and the EMR, TRFR, and MH history for the last 3 years of any proposed Subcontractor(s) that will provide Work valued at 10% or more of the Contract Price. Provide documentation of the EMR history for Business and Subcontractor(s).

Year									
Company	EMR	TRFR	MH	EMR	TRFR	MH	EMR	TRFR	MH

ARTICLE 5—FINANCIAL

5.01 Provide information regarding the Business’s financial stability. Provide the most recent audited financial statement, and if such audited financial statement is not current, also provide the most current financial statement.

Financial Institution:			
Business address:			
Date of Business’s most recent financial statement:		<input type="checkbox"/> Attached	
Date of Business’s most recent audited financial statement:		<input type="checkbox"/> Attached	
Financial indicators from the most recent financial statement			
Contractor’s Current Ratio (Current Assets ÷ Current Liabilities)			
Contractor’s Quick Ratio ((Cash and Cash Equivalents + Accounts Receivable + Short Term Investments) ÷ Current Liabilities)			

ARTICLE 6—SURETY INFORMATION

6.01 Provide information regarding the surety company that will issue required bonds on behalf of the Business, including but not limited to performance and payment bonds.

Surety Name:			
Surety is a corporation organized and existing under the laws of the state of:			
Is surety authorized to provide surety bonds in the Project location?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Is surety listed in “Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies” published in Department Circular 570 (as amended) by the Bureau of the Fiscal Service, U.S. Department of the Treasury?			
<input type="checkbox"/> Yes <input type="checkbox"/> No			
Mailing Address (principal place of business):			
Physical Address (principal place of business):			
Phone (main):		Phone (claims):	

ARTICLE 7—INSURANCE

7.01 Provide information regarding Business’s insurance company(s), including but not limited to its Commercial General Liability carrier. Provide information for each provider.

Name of insurance provider, and type of policy (CLE, auto, etc.):			
Insurance Provider	Type of Policy (Coverage Provided)		
Are providers licensed or authorized to issue policies in the Project location?			<input type="checkbox"/> Yes <input type="checkbox"/> No
Does provider have an A.M. Best Rating of A-VII or better?			<input type="checkbox"/> Yes <input type="checkbox"/> No
Mailing Address (principal place of business):			
Physical Address (principal place of business):			

Phone (main):		Phone (claims):	
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ARTICLE 8—CONSTRUCTION EXPERIENCE

8.01 Provide information that will identify the overall size and capacity of the Business.

Average number of current full-time employees:	
Estimate of revenue for the current year:	
Estimate of revenue for the previous year:	

8.02 Provide information regarding the Business’s previous contracting experience.

Years of experience with projects like the proposed project:		
As a general contractor:		As a joint venturer:
Has Business, or a predecessor in interest, or an affiliate identified in Paragraph 1.03:		
Been disqualified as a bidder by any local, state, or federal agency within the last 5 years? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Been barred from contracting by any local, state, or federal agency within the last 5 years? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Been released from a bid in the past 5 years? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Defaulted on a project or failed to complete any contract awarded to it? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Refused to construct or refused to provide materials defined in the contract documents or in a change order? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Been a party to any currently pending litigation or arbitration? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Provide full details in a separate attachment if the response to any of these questions is Yes.		

8.03 List all projects currently under contract in Schedule A and provide indicated information.

8.04 List a minimum of three and a maximum of six projects completed in the last 5 years in Schedule B and provide indicated information to demonstrate the Business’s experience with projects similar in type and cost of construction.

8.05 In Schedule C, provide information on key individuals whom Business intends to assign to the Project. Provide resumes for those individuals included in Schedule C. Key individuals include the Project Manager, Project Superintendent, Quality Manager, and Safety Manager. Resumes may be provided for Business’s key leaders as well.

ARTICLE 9—REQUIRED ATTACHMENTS

9.01 Provide the following information with the Statement of Qualifications:

- A. If Business is a Joint Venture, separate Qualifications Statements for each Joint Venturer, as required in Paragraph 1.02.
- B. Diverse Business Certifications if required by Paragraph 3.01.
- C. Certification of Business’s safety performance if required by Paragraph 4.02.

- D. Financial statements as required by Paragraph 5.01.
- E. Attachments providing additional information as required by Paragraph 8.02.
- F. Schedule A (Current Projects) as required by Paragraph 8.03.
- G. Schedule B (Previous Experience with Similar Projects) as required by Paragraph 8.04.
- H. Schedule C (Key Individuals) and resumes for the key individuals listed, as required by Paragraph 8.05.
- I. Additional items as pertinent.

This Statement of Qualifications is offered by:

Business: _____
(typed or printed name of organization)

By: _____
(individual's signature)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Date: _____
(date signed)

(If Business 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)

Address for giving notices:

Designated Representative:

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Address: _____

Phone: _____

Email: _____

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Schedule A—Current Projects

Name of Organization					
Project Owner		Project Name			
General Description of Project					
Project Cost		Date Project Completed			
Key Project Personnel		Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
Name		Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					
Project Owner		Project Name			
General Description of Project					
Project Cost		Date Project Completed			
Key Project Personnel		Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
Name		Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					
Project Owner		Project Name			
General Description of Project					
Project Cost		Date Project Completed			
Key Project Personnel		Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
Name		Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

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Schedule B—Previous Experience with Similar Projects

Name of Organization					
Project Owner		Project Name			
General Description of Project					
Project Cost		Date Project Completed			
Key Project Personnel		Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
Name		Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					
Project Owner		Project Name			
General Description of Project					
Project Cost		Date Project Completed			
Key Project Personnel		Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
Name		Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					
Project Owner		Project Name			
General Description of Project					
Project Cost		Date Project Completed			
Key Project Personnel		Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
Name		Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Schedule B—Previous Experience with Similar Projects

Name of Organization					
Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project Completed		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					
Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project Completed		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					
Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project Completed		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Schedule C—Key Individuals

Project Manager			
Name of individual			
Years of experience as project manager			
Years of experience with this organization			
Number of similar projects as project manager			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	
Project Superintendent			
Name of individual			
Years of experience as project superintendent			
Years of experience with this organization			
Number of similar projects as project superintendent			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	

Safety Manager			
Name of individual			
Years of experience as project manager			
Years of experience with this organization			
Number of similar projects as project manager			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	
Quality Control Manager			
Name of individual			
Years of experience as project superintendent			
Years of experience with this organization			
Number of similar projects as project superintendent			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	

AGREEMENT

BETWEEN OWNER AND CONTRACTOR
FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)

This Agreement is by and between SCISWA Landfill (“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: [Brief description of the Work—sufficient only to broadly indicate the type of construction]

ARTICLE 2—THE PROJECT

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: Leachate Pond Construction

ARTICLE 3—ENGINEER

3.01 The Owner has retained HDR (“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.

3.02 The part of the Project that pertains to the Work has been designed by HDR. Electrical design is excluded from leachate pond design and is by others.

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 September 30, 2021, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before October 30, 2021.

4.03 *Contract Times: Days*

A. The Work will be substantially complete within 60 days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within 80 days after the date when the Contract Times commence to run.

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 \$1,000 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 \$1,000 for each day that expires after such time until the Work is completed and ready for final payment.
 3. Liquidated damages for failing to timely attain 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.
- 4.07 Owner reserves the right to withhold from payments due Contractor under the Contract amounts for liquidated damages (if any), in accordance with the Contract.

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 Work other than Unit Price Work, a lump sum of **#[number]**.
 - B. 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).

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.
 - C. Total of Lump Sum Amount and Unit Price Work (subject to final Unit Price adjustment) **#[amount]**.
 - D. 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. 90 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 100 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 in effect under Iowa Code Section 12C.6, as of the day interest begins to accrue.

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 (copy of list attached).
 - 6. Drawings (not attached but incorporated by reference) consisting of 11 sheets with each sheet bearing the following general title: Leachate Pond and Loadout Construction.
 - 9. Drawings listed on the attached sheet index.
 - 10. Addenda (numbers ___to ____, inclusive).
 - 11. Exhibits to this Agreement (enumerated as follows):
 - a. Contractor’s Bid
 - 12. 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.
- 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).

Contractor:

(typed or printed name of organization)

By: _____
(individual's signature)

Date: _____
(date signed)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Attest: _____
(individual's signature)

Title: _____
(typed or printed)

Address for giving notices:

Designated Representative:

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Address:

Phone: _____

Email: _____

(If owner is a corporation, attach evidence of authority to sign. If owner is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)

(typed or printed name of organization)

By: _____
(individual's signature)

Date: _____
(date signed)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

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

Attest: _____
(individual's signature)

Title: _____
(typed or printed)

Address for giving notices:

Designated Representative:

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Address:

Phone: _____

Email: _____

License No.: _____
(where applicable)

State: _____

PERFORMANCE BOND

<p>Contractor</p> <p>Name: [Full formal name of Contractor]</p> <p>Address <i>(principal place of business)</i>: [Address of Contractor's principal place of business]</p>	<p>Surety</p> <p>Name: [Full formal name of Surety]</p> <p>Address <i>(principal place of business)</i>: [Address of Surety's principal place of business]</p>
<p>Owner</p> <p>Name: [Full formal name of Owner]</p> <p>Mailing address <i>(principal place of business)</i>: [Address of Owner's principal place of business]</p>	<p>Contract</p> <p>Description <i>(name and location)</i>: [Owner's project/contract name, and location of the project]</p> <p>Contract Price: [Amount from Contract]</p> <p>Effective Date of Contract: [Date from Contract]</p>
<p>Bond</p> <p>Bond Amount: [Amount]</p> <p>Date of Bond: [Date]</p> <p><i>(Date of Bond cannot be earlier than Effective Date of Contract)</i></p> <p>Modifications to this Bond form: <input type="checkbox"/> None <input type="checkbox"/> See Paragraph 16</p>	
<p>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.</p>	
Contractor as Principal	Surety
<hr style="border: none; border-top: 1px solid black; margin: 0;"/> <i>(Full formal name of Contractor)</i>	<hr style="border: none; border-top: 1px solid black; margin: 0;"/> <i>(Full formal name of Surety) (corporate seal)</i>
<p>By: _____</p> <p style="text-align: center;"><i>(Signature)</i></p>	<p>By: _____</p> <p style="text-align: center;"><i>(Signature)(Attach Power of Attorney)</i></p>
<p>Name: _____</p> <p style="text-align: center;"><i>(Printed or typed)</i></p>	<p>Name: _____</p> <p style="text-align: center;"><i>(Printed or typed)</i></p>
<p>Title: _____</p>	<p>Title: _____</p>
<p>Attest: _____</p> <p style="text-align: center;"><i>(Signature)</i></p>	<p>Attest: _____</p> <p style="text-align: center;"><i>(Signature)</i></p>
<p>Name: _____</p> <p style="text-align: center;"><i>(Printed or typed)</i></p>	<p>Name: _____</p> <p style="text-align: center;"><i>(Printed or typed)</i></p>
<p>Title: _____</p>	<p>Title: _____</p>
<p><i>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.</i></p>	

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

<p>Contractor</p> <p>Name: [Full formal name of Contractor]</p> <p>Address (<i>principal place of business</i>): [Address of Contractor's principal place of business]</p>	<p>Surety</p> <p>Name: [Full formal name of Surety]</p> <p>Address (<i>principal place of business</i>): [Address of Surety's principal place of business]</p>
<p>Owner</p> <p>Name: [Full formal name of Owner]</p> <p>Mailing address (<i>principal place of business</i>): [Address of Owner's principal place of business]</p>	<p>Contract</p> <p>Description (<i>name and location</i>): [Owner's project/contract name, and location of the project]</p> <p>Contract Price: [Amount, from Contract]</p> <p>Effective Date of Contract: [Date, from Contract]</p>
<p>Bond</p> <p>Bond Amount: [Amount]</p> <p>Date of Bond: [Date]</p> <p><i>(Date of Bond cannot be earlier than Effective Date of Contract)</i></p> <p>Modifications to this Bond form: <input type="checkbox"/> None <input type="checkbox"/> See Paragraph 18</p>	
<p>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.</p>	
Contractor as Principal	Surety
<p>_____</p> <p><i>(Full formal name of Contractor)</i></p>	<p>_____</p> <p><i>(Full formal name of Surety) (corporate seal)</i></p>
<p>By: _____</p> <p style="text-align: center;"><i>(Signature)</i></p>	<p>By: _____</p> <p style="text-align: center;"><i>(Signature)(Attach Power of Attorney)</i></p>
<p>Name: _____</p> <p style="text-align: center;"><i>(Printed or typed)</i></p>	<p>Name: _____</p> <p style="text-align: center;"><i>(Printed or typed)</i></p>
<p>Title: _____</p>	<p>Title: _____</p>
<p>Attest: _____</p> <p style="text-align: center;"><i>(Signature)</i></p>	<p>Attest: _____</p> <p style="text-align: center;"><i>(Signature)</i></p>
<p>Name: _____</p> <p style="text-align: center;"><i>(Printed or typed)</i></p>	<p>Name: _____</p> <p style="text-align: center;"><i>(Printed or typed)</i></p>
<p>Title: _____</p>	<p>Title: _____</p>
<p><i>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.</i></p>	

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”]

STANDARD GENERAL CONDITIONS

OF THE CONSTRUCTION CONTRACT

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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. *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.
34. *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.
35. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer’s review of the submittals.
36. *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.
37. *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.
38. *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.
39. *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.
40. *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.
41. *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.
42. *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.

43. *Successful Bidder*—The Bidder to which the Owner makes an award of contract.
44. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
45. *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.
46. *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.
47. *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.
48. *Unit Price Work*—Work to be paid for on the basis of unit prices.
49. *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.
50. *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, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
- 2. 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

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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, if any, used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The paragraph address system used in these Supplementary Conditions is the same as the paragraph address system used in the General Conditions, with the prefix "SC" added—for example, "Paragraph SC-4.05."

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

SC-1.01.A.16 Add the following to Paragraph 1.01.A.16:

When the Project is to be constructed under multiple direct Contracts awarded by the Owner, the term "Contractor" shall mean the appropriate prime contractor. Whenever a specific prime Contractor is referred to, terms such as "General Contractor", "Electrical Contractor", "Plumbing Contractor", "HVAC Contractor", or other appropriate Contract-indicating term will be used.

SC-1.01.A.40 Add the following to Paragraph 1.01.A.40:

Trucking, shipping, delivery firms, consultants, and entities performing testing or inspection retained by Contractor or any Subcontractor are considered to be Subcontractors.

SC-1.01.A.45 Add the following to Paragraph 1.01.A.45:

Entities that rent construction equipment or machinery, but are not incorporated into the Work, are considered to be Suppliers. If such rental entity furnishes both equipment and one or more personnel to operate and maintain the equipment, such entity is a Subcontractor.

ARTICLE 2—PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

SC-2.01 Delete Paragraphs 2.01.B. and C. in their entirety and insert the following in their place:

- B. *Evidence of Contractor's Insurance:* When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner copies of the policies (including all endorsements, and identification of applicable self-insured retentions and deductibles) of insurance required to be provided by Contractor in this Contract. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

2.02 *Copies of Documents*

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

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

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 2 paper copies of conformed Contract Documents incorporating and integrating all Addenda and amendments, if any, 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 paper copies of the conformed Contract Documents will be furnished upon request at the cost of reproduction.

2.06 *Electronic Transmittals*

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

SC-3.01 Delete Paragraph 3.01.C in its entirety.

SC-3.01 Add the following new paragraphs immediately after Paragraph 3.01.E:

- F. The Specifications and other verbal components of the Contract Documents may vary in form, format, and style. Some Specification sections are written in varying degrees of streamlined or declarative style and some Specifications sections may, in comparison, employ a more-narrative style. Omissions of such words and phrases as "Contractor shall," "in conformity with," "as shown," or "as specified" are intentional in streamlined language in the Contract Documents. Omitted words and phrases are incorporated by inference. Similar types of provisions may appear in various parts of a Specifications section or elsewhere in the Contract Documents. Contractor shall not attempt to take advantage of any variation of form, format or style in Change Proposal(s) and Claim(s).
- G. Cross referencing of Specification sections in a Specifications section's heading "Related Sections includes, but are not necessarily limited to: "and elsewhere within each Specifications section is provided as an aid and convenience to Contractor. Contractor shall not rely on cross referencing indicated and is responsible for coordinating the entire Work and providing a complete Project whether or not cross referencing is provided in each Specifications section or whether or not cross referencing is complete.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.05 *Delays in Contractor's Progress*

SC-4.05.C 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 on the critical path at the time of the delay.

- b. The existence of abnormal weather conditions will be determined on a month-by-month basis in accordance with the following:
 - 1) Every workday on which one or more of the following conditions exist will be considered a “bad weather day” bad weather days in excess of average conditions will be considered for schedule adjustments:
 - i) Total precipitation (as rain equivalent) occurring between 7:00 p.m. on the preceding day (regardless of whether such preceding day is a workday) through 7:00 p.m. on the workday in question equals or exceeds an inch of precipitation (as rain equivalent, based on the snow/rain conversion indicated in Table SC-4.05.C-1—Foreseeable Bad Weather Days .
 - ii) Ambient outdoor air temperature at 11:00 a.m. is equal to or less than the following low temperature threshold: 32 degrees Fahrenheit; or, at 3:00 p.m. the ambient outdoor temperature is equal to or greater than the following high temperature threshold: 100 degrees Fahrenheit.

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:

Report Title	Date of Report	Technical Data
Soil pre-qualification data	NA	Initial testing of soils for clay placement

- 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 HDR Omaha office during regular business hours, or may request copies from Engineer.

SC-5.04.A Add the following new paragraph immediately after Paragraph 5.04.A.4:

- 5. Contractor encounters human remains, recognizes the existence of burial markers, archaeological sites, historical sites, artifacts of potential archaeological or historical interest, or wetlands not shown or indicated in the Contract Documents, Contractor shall immediately cease operations that may disturb such area(s) and secure the adjacent Work; and Owner shall promptly take any

action necessary to obtain governmental authorization required to resume the operations (Contractor shall continue to suspend such operations until otherwise instructed by Owner but shall continue with all other operations that do not affect those remains or features);

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).

SC-6.01 Add the following paragraphs immediately after Paragraph 6.01.B:

1. After Substantial Completion, Contractor shall furnish a warranty bond issued in the form of EJCDC® C-612, Warranty Bond (2018). The warranty bond must be in a bond amount of 10 percent of the final Contract Price. The warranty bond period will extend to a date one year after Substantial Completion of the Work. Contractor shall deliver the fully executed warranty bond to Owner prior to or with the final Application for Payment, and in any event not later than 11 months after Substantial Completion.
3. The warranty bond must be issued by the same surety that issues the performance bond required under Paragraph 6.01.A of the General Conditions.

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	

Workers' Compensation and Related Policies	Policy limits of not less than:
State	Statutory
Applicable Federal (e.g., Longshoreman's)	Statutory
Foreign voluntary workers' compensation (employer's responsibility coverage), if applicable	Statutory
Jones Act (if applicable)	
Bodily injury by accident—each accident	\$NA
Bodily injury by disease—aggregate	\$NA
Employer's Liability	
Each accident	\$1,000,000
Each employee	\$1,000,000
Policy limit	\$1,000,000
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:	\$NA

- 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	\$2,000,000
Bodily Injury and Property Damage—Each Occurrence	\$2,000,000

- 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	\$2,000,000
Each Accident	\$2,000,000
Property Damage	
Each Accident	\$2,000,000
Combined Single Limit	
Combined Single Limit (Bodily Injury and Property Damage)	\$2,000,000

- 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	\$2,000,000
General Aggregate	\$2,000,000

- 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	\$3,000,000

- N. *Contractor's Professional Liability Insurance:* If Contractor will provide or furnish professional services under this *Contract*, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance must cover negligent acts, errors, or omissions in the performance of professional design or related services by the insured or others for whom the insured is legally liable. The insurance must be maintained throughout the duration of the *Contract* and for a minimum of two years after Substantial Completion. The retroactive date on the policy must pre-date the commencement of furnishing services on the *Project*.

Contractor's Professional Liability	Policy limits of not less than:
Each Claim	\$1,000,000
Annual Aggregate	\$1,000,000

6.04 *Builder's Risk and Other Property Insurance*

Contractor shall be required to purchase and maintain builder's risk insurance for this project.

SC-6.04 Supplement Paragraph 6.04 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 \$100,000.
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 \$20,000.
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, or until written confirmation of Owner's procurement of property insurance following Substantial Completion, whichever occurs first.
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. For purposes of Paragraphs 6.04, 6.05, and 6.06 of the General Conditions, and this and all other corresponding Supplementary Conditions, the parties required to be insured will be referred to collectively as "insureds." In addition to Owner, Contractor, and Subcontractors of every tier, include as insureds the following:
 - a. HDR, Inc.
12. If debris removal in connection with repair or replacement of insured property is subject to a coverage sublimit, such sublimit will be a minimum of \$20,000.

SC-6.04 Supplement Paragraph 6.04 of the General Conditions with the following provision:

- G. *Coverage for Completion Delays:* The builder's risk policy will include, for the benefit of Owner, loss of revenue and soft cost coverage for losses arising from delays in completion that result from covered physical losses or damage. Such coverage will include, without limitation, fixed expenses and debt service for a minimum of 12 months with a maximum deductible of 30 days, compensation for loss of net revenues, rental costs, and attorneys' fees and engineering or other consultants' fees, if not otherwise covered.

SC-6.04 Supplement Paragraph 6.04 of the General Conditions with the following provisions:

- H. *Builder's Risk and Other Property Insurance Deductibles:* The purchaser of any required builder's risk, installation floater, or other property insurance will be responsible for costs not covered because of the application of a policy deductible.
1. The builder's risk policy (or if applicable the installation floater) will be subject to a deductible amount of not more than \$10,000 for direct physical loss in any one occurrence.

SC-6.04 Delete Paragraph 6.04.A and substitute the following in its place:

A. *Installation Floater*

1. Contractor shall provide and maintain installation floater insurance on a broad form or "all risk" policy providing coverage for materials, supplies, machinery, fixtures, and equipment that will be incorporated into the Work ("Covered Property"). Coverage under the Contractor's installation floater will include loss from covered "all risk" causes (perils) to Covered Property:
 - a. of the Contractor, and Covered Property of others that is in Contractor's care, custody, and control;
 - b. while in transit to the Site, including while at temporary storage sites;
 - c. while at the Site awaiting and during installation, erection, and testing;
 - d. continuing at least until the installation or erection of the Covered Property is completed, and the Work into which it is incorporated is accepted by Owner.
2. The installation floater coverage cannot be contingent on an external cause or risk, or limited to property for which the Contractor is legally liable.
3. The installation floater coverage will be in an amount sufficient to protect Contractor's interest in the Covered Property. The Contractor will be solely responsible for any deductible carried under this coverage.
4. This policy will include a waiver of subrogation applicable to Owner, Contractor, Engineer, all Subcontractors, and the officers, directors, partners, employees, agents and other consultants and subcontractors of any of them.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.02 Supervision and Superintendence

SC-7.02 Add the following to Paragraph 7.01, following Paragraph 7.02.B:

- C. Unless Owner otherwise agrees in writing, the superintendent will be Contractor's representative at the Site and shall have authority to act on behalf of Contractor. All communications given to or received from the superintendent shall be binding on Contractor.

7.03 *Labor; Working Hours*

SC-7.03 Delete Paragraph 7.03.C in its entirety, and insert the following:

- C. In the absence of any Laws or Regulations to the contrary, Contractor may perform the Work on holidays, during any or all hours of the day, and on any or all days of the week, at Contractor's sole discretion.

SC-7.03 Add the following new paragraph immediately after Paragraph 7.03.C:

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

SC-7.03 Add the following new subparagraph immediately after Paragraph SC-7.03.D:

- 1. For purposes of administering the foregoing requirement, additional overtime costs are defined as exceeding 60 hours of active Work during any given week of construction. The hourly cost of the Resident Project Representative is \$125 per hour.

7.10 *Taxes*

SC-7.10 Add a new paragraph immediately after Paragraph 7.10.A:

- A. Owner is exempt from payment of sales and compensating use taxes of the State of Iowa and on all materials to be incorporated into the Work.
 - 1. Owner will furnish the required certificates of tax exemption to Contractor for use in the purchase of materials and equipment to be incorporated into the Work.
 - 2. Owner's exemption does not apply to construction tools or machinery, construction equipment, or other property purchased by or leased by Contractor, or to supplies or materials not incorporated into the Work.

7.11 *Laws and Regulations*

SC-7.11 Add the following new paragraph immediately after Paragraph 7.10.C:

- D. Refer to Article SC-19 any Law or Regulation applicable to the performance of the Work does not diminish Contractor's responsibility to comply with all Laws and Regulations applicable to the performance of the Work.

ARTICLE 8—OWNER'S RESPONSIBILITIES

9.13 *Owner's Site Representative*

SC-9.13 Add the following new paragraph immediately after Paragraph 9.12 of the General Conditions:

9.13 *Owner's Site Representative*

- A. Owner will furnish an “Owner’s Site Representative” (OSR) to represent Owner at the Site and assist Owner in observing the progress and quality of the Work. The Owner’s Site Representative is not Engineer’s consultant, agent, or employee. Owner’s Site Representative will be Mr. Rick Hurt.

ARTICLE 9—ENGINEER’S STATUS DURING CONSTRUCTION

10.03 Resident Project Representative

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. This does not impose on either RPR or Engineer any obligation to find all, or any specific element of, defective Work, for which Contractor remains solely responsible.
 - b. 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 (1) code-required tests and special inspections, and (2) those performed by public or other agencies having jurisdiction over the Work.
- b. Observe specific tests, inspections, and other field quality control required by the Contract Documents and performed by Contractor, Subcontractor, Supplier, or by testing or laboratories retained by any of them, .
- c. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Work.

7. *Completion*

- a. Participate in Engineer's visits regarding inspection for Substantial Completion.
- b. Assist in the augmenting or amending the punch list of items to be completed or corrected prior to final inspection.
- c. *Final Inspection*: 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 (if any) of items to be completed or corrected by Contractor.
- d. Observe whether items on the final punch list have been completed or corrected.
- d. *Record Documents*: Periodically during the Work, review with Contractor the status of Contractor's record documents required by the Contract Documents and advise Contractor on whether such record documents appear to comply with the Contract's requirements for record documents. Review final record documents submitted by Contractor.

D. The RPR will not:

- 1. Authorize any deviation from the Contract Documents or substitution of materials, equipment (including "or-equal" items), or procedures or sequences indicated in the Contract Documents.
- 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 or responsibility over any aspect of the means, methods, techniques, sequences or procedures of construction.
- 5. Advise on, issue directions regarding, or assume control over security protection, 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 10—CHANGES TO THE CONTRACT

No Supplementary Conditions in this Article.

ARTICLE 11—CLAIMS

No Supplementary Conditions in this Article.

ARTICLE 12—COST OF WORK; ALLOWANCES, UNIT PRICE WORK

13.01 *Cost of the 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 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 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.

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price if the quantity on an individual bid item extends or fails to achieve [number] percent of the estimated quantity at the time of Contract formation plus any additions or deletions included in change orders to the contract.
2. The adjusted unit price will apply only to all units installed for that bid item.

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

No Supplementary Conditions in this Article.

ARTICLE 14—PAYMENTS TO CONTRACTOR, SET OFFS; COMPLETIONS; CORRECTION PERIOD

15.01 *Progress Payments*

SC-15.01 Add the following new Paragraph 15.01.F:

- F. If Owner determines that progress payments made to date substantially exceed the actual progress of the Work (as measured by reference to the Schedule of Values), or present a potential conflict with the Guaranteed Maximum Price, then Owner may require that

Contractor prepare and submit a plan for the remaining anticipated Applications for Payment that will bring payments and progress into closer alignment and take into account the Guaranteed Maximum Price (if any), through reductions in billings, increases in retainage, or other equitable measures. Owner will review the plan, discuss any necessary modifications, and implement the plan as modified for all remaining Applications for Payment.

15.03 *Substantial Completion*

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

1. If some or all of the Work has been determined by Engineer not to be at a point of Substantial Completion and will require re-inspection or re-testing by Engineer or other entity retained by Owner, the cost of such re-inspection or re-testing, including the cost of time, travel and living expenses, will be paid by Contractor to Owner. If Contractor does not pay, or the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under this Article 15.

15.08 *Correction Period*

SC-15.08.G Add the following new Paragraph 15.08.G:

- G. The correction period specified as one year after the date of Substantial Completion in Paragraph 15.08.A of the General Conditions is hereby revised to be the number of years set forth in Paragraph SC-6.01.B.1; or if no such revision has been made in SC-6.01.B, then the correction period is hereby specified to be 0.5 years after the date of Substantial Completion established in Engineer's certificate of Substantial Completion.

ARTICLE 15—SUSPENSION OF WORK AND TERMINATION

No Supplementary Conditions in this Article.

ARTICLE 16—FINAL RESOLUTIONS OF DISPUTES

17.02 *Arbitration*

SC-17.02 Add the following new paragraph immediately after Paragraph 17.01.

SC-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 concurrently 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 arbitration will be held in [indicate location, such as “the same locality as the Site” or “the same municipality as the Owner’s principal office location”, or other, as directed by the Owner].
- D. 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 arbitrator(s) 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.
- E. The Arbitrator(s) 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.
- F. The award of the arbitrator(s) 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.
- G. 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.
- H. 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.
- I. 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.

- J. 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.

SC-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 17—MISCELLANEOUS

18.08 *Assignment of Contract*

SC-18.08 Add the following new paragraph immediately after Paragraph 18.08.A:

- B. The contract dated _____ between Owner as "buyer" and _____ as "seller" for procurement of goods and special services ("procurement contract") will be assigned to Contractor by Owner, and Contractor will accept such assignment. A form documenting the assignment is attached as an exhibit to this Contract.
1. This assignment will occur on the Effective Date of the Contract, and will relieve the Owner as "buyer" from all further obligations and liabilities under the procurement contract.
 2. Upon assignment, the "seller" will be a Subcontractor or Supplier of the Contractor, and Contractor will be responsible for seller's performance, acts, and omissions, as set forth in Paragraph 7.07 of the General Conditions just as Contractor is responsible for all other Subcontractors and Suppliers.
 3. Notwithstanding this assignment, all performance guarantees and warranties required by the procurement contract will continue to run for the benefit of the Owner and, in addition, for the benefit of the Contractor.
 4. Except as noted in the procurement contract, all rights, duties and obligations of Engineer to "buyer" and "seller" under the procurement contract will cease upon the assignment to Contractor.

SC-18.11 Add a new paragraph immediately after Paragraph 18.10:

SC-18.11 *Confidential Information*

- A. All Drawings, Specifications, technical data, and other information furnished to Contractor either by Owner or Engineer or developed by Contractor or others in connection with the Work are, and will remain, the property of Owner or Engineer, and shall not be copied or

otherwise reproduced or used in any way except in connection with the Work, or disclosed to third parties or used in any manner detrimental to the interests of Owner or Engineer.

- B. The following information is not subject to the above confidentiality requirements:
1. information in the public domain through no action of Contractor in breach of the Contract Documents; or
 2. information lawfully possessed by Contractor before receipt from Owner or Engineer; or
 3. information required to be disclosed by Laws or Regulations, or by a court or agency of competent jurisdiction. However, in the event Contractor shall be so required to disclose such information, Contractor shall, prior to disclosure, provide reasonable notice to Owner and Engineer, who shall have the right to interpose all objections Owner may have to the disclosure of such information.

SC-18.12 Add a new paragraph immediately after Paragraph 18.11, to read as follows:

SC-18.12 *Publicity*

- A. Contractor shall not disclose to any third party the nature of its Work on the Project, nor engage in publicity or public media disclosures with respect to the Project without the prior written consent of Owner.

SC-19 Add new article immediately after Article 18, to read as follows:

ARTICLE SC-19 – STATUTORY REQUIREMENTS

SC-19.01 This article contains portions of certain Laws or Regulations which, by provision of Laws or Regulations, are required to be included in the Contract Documents. The matters addressed in this Article SC-19 may not be complete or current. Contractor's obligation to comply with all Laws and Regulations is set forth in Paragraph 7.11 of the General Conditions.



DIVISION 01

GENERAL REQUIREMENTS



SECTION 01 11 00
SUMMARY OF WORK

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Location and Description of Work.
 - 2. Contracts for this Project.
 - 3. Work by Others Under Owner's Control - Other Projects.
 - 4. Work by Others Not Under Owner's Control.
 - 5. Work by Owner.
 - 6. Sequence and Progress of Work.
 - 7. Contractor's Use of Site.
 - 8. Easements and Rights-of-Way.
 - 9. Partial Utilization by Owner.
 - 10. Utility Owners.
 - 11. Tree Trimming, Clearing, and Tree Removal.
 - 12. Fences.

1.2 LOCATION AND DESCRIPTION OF WORK

- A. The Work is located in Tracy, Iowa, at SCISWA Landfill.
- B. Work to be completed in accordance with the Drawings, bid documents and specifications, and CQA Plan.
- C. Owner reserves the right to award part, some, or none of each bid item. Owner may reduce excavation or structural fill placement items if the site executes portions of work prior to commencement of the project.
- D. Work to be performed under this Contract includes, but is not limited to, constructing a leachate pond and loadout system and all other Work required in accordance with the Contract Documents. Descriptions corresponding to bid items are as follows:
 - 1. Mobilization/Demobilization: Includes all costs to mobilize to site, permits, etc. Measurement and payment shall be completed on a lump sum basis as described in the specifications.
 - 2. Stormwater Erosion and Sediment Controls, including silt fence: Included in this item is all labor, equipment, and materials needed to manage stormwater for the duration of the project. Included in this item is silt fence as shown in the drawings. Maintenance of silt fence, grading, and dewatering pumping is included in this item. Not included in this item is seeding and fertilizing, or placement of topsoil. Owner to execute topsoil and seeding. Measurement and payment shall be completed on a lump sum basis for this item.
 - 3. Mass excavation to stockpile area (if unsuitable as structural fill): Included in this item is all labor, equipment, and materials required to excavate to the grades shown in the drawings, haul and place material in the designated stockpile area. Included in this item is stockpile grading and maintenance. Included in this item is grading to the design grades and maintaining minimum slopes and drainage. Not included in this item is placement of gravel. Owner to install gravel on road separately, after it has been smooth graded by Contractor. Contractor to smooth grade road to eliminate low spots and promote drainage. Payment for this item shall be measured by comparison of pre construction and post construction survey

of stockpiled material. Item quantity to be re-evaluated with pre-construction survey and may change if Owner executes earthwork prior to project start date.

4. Mass Excavation To Structural Fill: Included in this item is all labor, equipment, and materials required to excavate soil, haul, place & compact in lifts, and smooth grade structural fill areas to the design grades in accordance with the design drawings, specifications, and CQA Plan. Included in this item is grading to the design grades and maintaining minimum slopes and drainage. Not included in this item is placement of gravel. Owner to install gravel on road separately, after it has been smooth graded by Contractor. Contractor to smooth grade road to eliminate low spots and promote drainage. Payment for this item shall be measured by comparison of pre construction and post construction survey of placed material. Item quantity to be re-evaluated with pre-construction survey and may change if Owner executes earthwork prior to project start date.
5. Haul And Place Structural Fill From Borrow Area: Included in this item is all labor, equipment, and materials required to excavate from the borrow area, haul, place & compact in lifts, and smooth grade structural fill areas to the design grades in accordance with the design drawings, specifications, and CQA Plan. Included in this item is grading to the design grades and maintaining minimum slopes and drainage. Not included in this item is placement of gravel. Owner to install gravel on road separately, after it has been smooth graded by Contractor. Contractor to smooth grade road to eliminate low spots and promote drainage. Payment for this item shall be measured by comparison of pre construction and post construction survey of placed material minus the quantity calculated for bid item 4. Item quantity to be re-evaluated with pre-construction survey and may change if Owner executes earthwork prior to project start date.
6. Subgrade Preparation And Maintenance: Included in this item is grading subgrade to meet design grades and maintaining until surveyed and through clay liner placement. Included in this item is excavation and replacement with structural fill any unsuitable areas. Anticipated to be limited due to grading to leachate pond base grades. Payment for this item shall be measured by survey within the approved item limits as a 3D-area as calculated in AutoCAD Civil 3D 2020.
7. 2-Ft Clay Liner (Hauling, Processing And Installation And Maintenance): Included in this item is all labor, equipment, and materials required to install the clay liner per the drawings, specifications, and CQA Plan. Included in this item is all repair and maintenance of the clay liner up to and throughout geomembrane installation. This item shall be measured and paid by 3D area installed within the design boundaries. Installed clay liner thickness is 2-ft with a +0.1' tolerance. Included in this item is all stormwater and groundwater management throughout installation. Payment for this item shall be measured by survey to the approved item limits as a 3D area as calculated in AutoCAD Civil 3D 2020.
8. Excavate And Backfill Anchor Trench: Included in this item is all labor, equipment, and materials required to excavate and backfill the anchor trench in compacted lifts such that the complete anchor trench promotes positive drainage. Included in this item is excavation of anchor trench ahead of liner installation and backfilling following geomembrane installation in coordination with the liner crew to protect against stormwater and allow for timely geomembrane installation. Re-excavation of anchor trench due to failing geomembrane tests, or after storm events is incidental to this item. Payment for this item shall be measured by survey from the crest of the anchor trench within the design limits.
9. 60-Mil HDPE Textured Geomembrane Supply And Install: Included in this item is all labor, equipment, and materials required to install the geomembrane liner in accordance with the drawings, specifications, and CQA Plan. Included in this item is geosynthetics testing, shipping, and repairs in accordance with the specifications and CQA Plan. Included in this

item is all stormwater and groundwater management throughout installation. Payment for this item shall be measured by survey to the approved item limits as a 3D area as calculated in AutoCAD Civil 3D 2020.

10. Leachate Pond Pump, Pump House, River Rock, Geotextile: Included in this item is all labor, equipment, and materials required to supply and install the leachate pond pump, pump house with concrete floor, and access riser geotextile/river rock bedding. Included in this item are all fittings, hose, and connections required to operate the pump as shown on the drawings. Included in this item is supply and installation of heater, pump house, valves, air/vac valve, magnetic flow meter, and fittings as shown on the drawings. Payment for this item shall be by lump sum.
11. Extraction Riser – 2 x 24" SDR-11 HDPE Extraction Risers: Included in this item is all labor, equipment, and materials required to install the leachate pond pump risers, with all fittings and appurtenances, including GLF quick connect lid and perforated section. This item shall be measured by survey and paid for by linear foot installed.
12. Chainlink Fencing With Gates Supply And Installation: Contractor to supply and install fence as indicated on the drawings. Any damage to fencing by the contractor or subcontractors shall be repaired at no cost to the Owner. This item shall be measured by survey and paid for by linear foot installed.
13. Pipe Trench With Sand Bedding: Included in this item is excavation, backfill, and maintenance of trenches as shown on the drawings and details. Contractor shall supply and install all bedding material and in place warning tape necessary to complete the trenches. Trenches will not be excavated further than can be installed with piping and backfilled each day. Included in this item is location and protection of underground infrastructure. Included in this item are any safety measures required to maintain safe working conditions, such as trench boxes, caution tape, or barricades. This item shall be measured by survey and paid for by linear foot installed.
14. Forcemain - 10,000-Gal Tank To Cell 4a Riser - 2" HDPE Single Contained Pipe, Trenching, Dual Contained Tie-Ins: Included in this item is all labor, equipment, and material required to install and test piping, fittings, and appurtenances as shown in the drawings and described in the specifications and CQA Plan. Included in this item is pressure testing, reconnection/startup of existing pump, and approximately 100-LF of dual contained 2" SDR-11 HDPE in 4" SDR-17 HDPE where the forcemain is within 20-ft or outside the solid waste boundary. Included in this item is excavation, backfill, and maintenance of trenches as shown on the drawings and details. Contractor shall supply and install all bedding material and in place warning tape necessary to complete the trenches. Trenches will not be excavated further than can be installed with piping and backfilled each day. Included in this item is location and protection of underground infrastructure. Included in this item are any safety measures required to maintain safe working conditions, such as trench boxes, caution tape, or barricades. Included in this item is hauling waste from trench excavation to active face of landfill, and placing minimum 1-ft of soil over trench or any other waste exposed by contractor. This item shall be measured by survey and paid for by linear foot installed.
15. Forcemain - Pond To Leachate Loadout - 4"X8" HDPE Dual Containment Pipe: Included in this item is all labor, equipment, and material required to install and test piping, fittings, and appurtenances as shown in the drawings and described in the specifications and CQA Plan. Included in this item is pressure testing, supply and installation of 4-dual contained check valves, 4-dual contained ball valves, 4-single contained ball valves, and 4-dual contained cleanout/access riser assemblies. This item shall be measured by survey and paid for by linear foot installed.

16. Forcemain - Cells To Pond - 3"X6" HDPE Dual Containment Pipe: Included in this item is all labor, equipment, and material required to install and test piping, fittings, and appurtenances as shown in the drawings and described in the specifications and CQA Plan. Included in this item is pressure testing, supply and installation of 3-dual contained check valves, and 4-dual contained cleanout/access riser assemblies. This item shall be measured by survey and paid for by linear foot installed.
17. Gravity Line - Catch Basin Discharge To Cell 4A- 2"X4" HDPE Dual Containment Pipe: Included in this item is all labor, equipment, and material required to install and test piping, fittings, and appurtenances as shown in the drawings and described in the specifications and CQA Plan. Included in this item is pressure testing, supply and installation of 1-dual contained check valve, and stub-out assembly. This item shall be measured by survey and paid for by linear foot installed.
18. Connection To 4A Sump Access Riser, Concrete Cut And Replace: Included in this item is all labor, equipment, and materials required to run a stub-up for future connection at 4A. Stub-up will be within the 4A pumphouse and require temporarily moving the pump house, cutting concrete out, installation of stub-up, reinstallation of concrete with rebar, and replacement of pump house on concrete pad. If pump house is damaged during construction of this item, Contractor to replace at no additional cost to the Owner. Current leachate connection from 4A must remain active throughout construction. This item shall be paid as a lump sum upon completion.
19. Loadout Catch Basin, loadout tree, and control panel awning: included in this item is all labor, equipment, and materials required to supply and install the loadout catch basin, valves, magnetic flow meter, control panel awning, and loadout tree as shown on the drawings. Contractor must submit shop drawings to the Engineer for approval of proposed loadout tree. This item shall be paid as a lump sum upon completion.
20. Concrete Pad with Gravel/Geotextile Base: Included in this item is all labor, equipment, and materials necessary to supply and install the concrete loadout pad in accordance with the drawings, specifications, and CQA Plan. Included in this item is all concrete testing described in the specifications. This item shall be paid by square yard installed as measured by survey within the design boundaries.
21. Electrical -Including All Connections, Panels, Wiring, Conduit In Shared Trench, Start Up. Full electrical design and installation to be completed by subcontract to ABC Electric. Design and specifications are not included in this bid. Contact ABC for subcontract price. Electrical scope includes all control panels, wiring, conduit, new electrical drop for increased voltage, handholes at locations for future connection. Contractor responsible for all permits, coordination with utilities, underground location and protection of existing infrastructure, and meeting applicable laws and regulations. Any electrical shutdowns required to be closely coordinated with the Owner. This item shall be paid as a lump sum upon completion.
22. 24" RCP Culvert (Class IV) With FES And Riprap/Geotextile Aprons (Dual 415-Lf): included in this item is all labor, equipment, and materials needed to supply and install the 24"-culverts. Included in this item is all stormwater, groundwater, and drainageway water management required to install the culverts. Flared end sections to be installed on BOTH inlets and outlets. This item shall be measured by survey and paid for by linear foot installed.
23. 36" RCP Culvert (Class III) With FES And Riprap/Geotextile Aprons (Dual 60-Ft): included in this item is all labor, equipment, and materials needed to supply and install the

36"-culverts. Included in this item is all stormwater, groundwater, and drainageway water management required to install the culverts. Flared end sections to be installed on BOTH inlets and outlets. This item shall be measured by survey and paid for by linear foot installed.

24. Rip Rap Letdown With 8 oz/sy Geotextile: included in this item is all labor, equipment, and materials needed to supply and install the riprap letdown as shown in the project drawings. Included in this item is grading necessary to achieve positive drainage from the culvert and letdown outlet to the drainageway to the north. This item shall be paid by square foot installed as measured by survey within the design boundaries.

- E. Contracting Method: The Project will be constructed under a single prime construction contract.
- F. Damage to the work by the Contractor or subcontractors to be repaired at no additional cost to the Owner.
- G. Hazardous Environmental Conditions:
 - 1. To the best of Owner's knowledge, information, and belief, the prior use of the Site included coal mining followed by use as a landfill
- H. Owner-Furnished Materials and Equipment:
 - 1. On-site soils to be provided by Owner.

1.3 WORK BY OTHERS NOT UNDER OWNER'S CONTROL

- A. Work by Utility Owners and Transportation Facilities Owners: as part of this project, Contractor will coordinate with the electric utility company for installation of a new electrical drop.

1.4 WORK BY OWNER

- A. Owner will perform the following in connection with the Work:
 - 1. Operate all existing valves, flow-control gates, pumps, equipment, and appurtenances that will affect Owner's operations, unless otherwise specified or indicated.
 - 2. Certification Survey. Owner to provide certification survey of construction and pond liner system. Contractor responsible for construction surveying and cost of any certification resurveying due to construction not meeting drawings, CQA Plan, or specifications.
 - 3. As-built survey. Piping as-built survey to be completed by Owner. If surveyor is not present at time of trench backfill, Contractor to place sight pipes every 100 LF and at bends or fittings with labels. Contractor to pull and backfill sight pipes after survey is complete.
 - 4. Owner to complete supply and installation of road aggregate, topsoil, and seeding.

1.5 SEQUENCE AND PROGRESS OF WORK

- A. Sequencing:
 - 1. Incorporate sequencing of the Work into the Progress Schedule.
 - 2. Sequencing Requirements:
 - a. Schedule and duration may not be adjusted without approval from Owner. Duration no longer than four months, demobilization no later than September 30, 2021. Submit proposed project schedule with Bid.

1.6 CONTRACTOR'S USE OF SITE

- A. Contractors' use of the Site shall be confined to the areas shown on the Drawings.
 - 1. Site access and staging area to be coordinated with the Owner. Site operations to have the right of way throughout the project. Any construction affecting site traffic to be coordinated with the Owner prior to commencement.
- B. Move stored materials and equipment that interfere with operations of Owner, other contractors, and others performing work for Owner.
 - 1. Contractor to not use the Site for operations other than those required for the Project.

- C. Owner will occupy the Site jointly with Contractor during construction for performance of Owner's typical operations. Coordinate with Owner in all construction operations to minimize conflicts between Contractor and Owner's employees and others under Owner's control.
- D. Contractor shall not track out soils or other materials from the project area.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION - (NOT USED)

END OF SECTION

SECTION 01 22 00
MEASUREMENT AND PAYMENT (UNIT PRICE CONTRACTS)

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Defines how work items are measured and paid for on Unit Price Contracts. These items include unit price, lump sum price, and allowance payment items.
 - 2. In the case of conflict between this Section and the measurement methods specified in the individual Technical Specification Sections, the measurement methods in Technical Specification Sections shall govern.
 - 3. Receive payment for work after it is installed. Payment for material on hand can only be paid for if allowed by the Agreement, the General and/or Special Conditions.
 - 4. Partial payment may be requested for items partially installed when agreed to by the Owner.
- B. Related Specification Sections include but are not necessarily limited to:
 - 1. Division 01 - General Requirements.

1.2 UNIT PRICE ITEMS

- A. Quantity and measurement estimates stated in the Bid Form are estimates for bidding purposes only. Actual payments shall be based on actual quantities installed, in-place, as measured and/or verified by the Engineer.
- B. Unless otherwise stated in the Contract Documents, the bid unit prices shall be in effect throughout the contract duration. When the variance between the estimated quantities and the actual installed quantities is more than 25 PCT, the Contractor or the Owner may negotiate a change to the Unit Price. That change will be made in accordance with the Change Order process as defined in the Contract Documents.
- C. Except as defined above, make no claim, nor receive any compensation, for anticipated profits, loss of profit, damages, or any extra payment due to any difference between the amounts of work actually completed, or materials or equipment furnished, and the estimated quantities.
- D. The Owner can only pay for quantities that exceed the estimated quantities so long as the total payments to the Contractor do not exceed the Contract Price. If the added quantities will result in payments that exceed the Contract Price, a Change Order will need to be executed before payment can be made for the added quantities. No additional payment will be made for installations outside of the project grades or limits without prior approval by Owner and execution of a change order.
- E. Assist Engineer by providing necessary equipment, workers, and survey personnel as required to measure quantities.
- F. Unless stated in the Contract Documents, measured quantities shall be rounded to the nearest whole integer.
- G. Measurement:
 - 1. Measurement for progress payment shall be made by, or approved by, the Engineer based on the actual quantities installed. The actual quantities installed can be adjusted for corrections to previous calculations, incomplete elements or components if agreed to in advance and in writing by the Engineer.
 - 2. Unless otherwise provided for in the Contract Documents, unit price items are all inclusive of all related work, direct and indirect costs, to provide a complete and functional item.

3. The final measurement shall be based on actual installed quantities, jointly measured and agreed to by the Contractor and the Engineer. Quantities can be adjusted (increased or decreased) based on a final calculation of quantities by the Engineer and Contractor.

H. Payment:

1. Progress payments shall be in accordance with the Contract Documents based on estimated quantities installed paid at the bid unit price.
2. The final payment shall be based on actual quantities, fully installed, tested and placed into service, paid at the bid unit price.

1.3 LUMP SUM ITEMS

- A. Progress payments for Lump Sum items in the Bid Schedule will be based on the breakdown prepared by the Contractor and approved by the Engineer and Owner before acceptance of the Application for Payment for the Lump Sum item.
- B. Lump Sum payment will be for the entire item as specified and as indicated in the Contract Documents. Payment for all bid items indicated as Lump Sums shall include the cost of all labor, materials, equipment and incidentals necessary to furnish, install, clean, test, and place each bid item into operation; including permitting, general conditions, overhead and profit.

1.4 APPLICATION FOR PAYMENT

- A. Provide a Summary Sheets and breakdown sheets equivalent to those of EJCDC document C-620, Contractor's Application for Payment forms.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION - (NOT USED)

END OF SECTION

SECTION 01 31 19
PROJECT MEETINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Preconstruction, progress and other project meetings.
- B. Related Sections include but are not necessarily limited to:
 - 1. Division 00 - Procurement and Contracting Requirements.
 - 2. Division 01 - General Requirements.

1.2 PRECONSTRUCTION MEETING

- A. Meet with the Owner and Engineer for a pre-construction conference at a time mutually agreed upon after the contract is awarded, but before any work is performed,
- B. The Engineer will schedule a meeting of the Owner, Contractor, Contractor's Subcontractors, and their respective representatives.
 - 1. The purpose of the meeting will be to clarify construction contract administration procedures, to establish lines of authority and communication and identify duties and responsibilities of the parties.
- C. The Engineer will schedule the pre-construction conference after receipt of the Contractor's draft proposed schedule.
- D. The Engineer will provide an agenda and compile meeting minutes from the transcribed record of the meeting and electronically distribute copies to all participants.
- E. Pre-Construction Conference Submittals:
 - 1. The names and telephone numbers of Contractor's Superintendent and Office Manager.
 - 2. List of personnel authorized to sign change orders and receive progress payments.
 - 3. The name, address and telephone numbers of two or more persons employed by the Contractor who can be reached at any time of the day or night to handle emergency matters.
 - 4. A list of all subcontractors that will work on the project, a description of work they will perform, and a contact list for each subcontractor with phone numbers and address.
 - 5. A list of materials suppliers and products over \$2,000.
 - 6. A draft proposed Construction Schedule.
 - 7. Material Safety Data Sheets for all hazardous chemical products to be used by the Contractor on this project.
 - 8. Temporary Erosion and Sediment Controls Plan.
 - 9. Traffic Control Plan.

1.3 PROGRESS MEETINGS

- A. Weekly progress meetings will be held a location determined by the Engineer, unless otherwise arranged.
- B. Attendees will include the Owner, Engineer, Contractor, subcontractors, and suppliers' representatives as may be needed, other Contractors working at the site, and other interested or affected parties.
- C. Preliminary Agenda: Be prepared to discuss in detail the following: current progress, updated schedule, submittals, contract modifications, applications for payment, problems/resolutions, project coordination, safety, permits, testing and documentation, and project completion.

Revised agenda, if any, will be furnished to Contractor prior to associated progress meeting(s). Progress meeting agenda may be modified by Engineer during the Project as necessary.

- D. Bring a two-week look ahead schedule to each meeting, including the following items:
 - 1. Work completed last week.
 - 2. Work anticipated for the next two weeks ("Look Ahead").
 - 3. Subcontractors on site the prior week.
 - 4. Subcontractors scheduled on site for the next two weeks.
 - 5. Contract document deficiencies or questions noted during prior week.
 - 6. Anything that could impede the progress of the work or affect the critical path on the project schedule.
 - 7. Corrective measures and procedures planned to regain planned schedule, cost or quality assurance, if necessary.
 - 8. Report of any accidents, and any site safety issues that need to be addressed.
- E. Other Agenda items to be discussed:
 - 1. Review and revise as necessary and approve minutes of previous meetings.
 - 2. Status of submittals of equipment and shop drawings.
 - 3. Identify problems that impede planned progress.
 - 4. Other current business.
- F. Revision of Minutes:
 - 1. Unless published minutes are challenged in writing prior to the next regularly scheduled progress meeting, they will be accepted as properly stating the activities and decisions of the meeting.
 - 2. Persons challenging published minutes shall reproduce and distribute copies of the challenge to all indicated recipients of the particular set of minutes.
 - 3. Challenge to minutes shall be settled as priority item of "old business" at the next regularly scheduled meeting.
- G. Minutes of Meeting:
 - 1. The Engineer will compile minutes of each project meeting and will furnish electronic copies to the Contractor.

1.4 OTHER MEETINGS

- A. Other meetings will be required to facilitate progress of the Work. These include, but are not limited to the following:
 - 1. Pre-Installation Conferences (geomembrane, piping):
 - a. Coordinate and schedule with Engineer for each material, product or system specified.
 - 1) Conferences to be held prior to initiating installation, but not more than two weeks before scheduled initiation of installation.
 - 2) Conferences may be combined if installation schedule of multiple components occurs within the same two week interval.
 - 3) Review manufacturers recommendations and Contract Documents Specification Sections.
 - 2. Facility Startup Planning and Coordination Meeting.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION - (NOT USED)

END OF SECTION

SECTION 01 33 00 SUBMITTALS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Mechanics and administration of the submittal process for:
 - a. Shop Drawings.
 - b. Samples.
 - c. Informational submittals.
 - 2. General content requirements for Shop Drawings.
- B. Related Specification Sections include but are not necessarily limited to:
 - 1. Division 00 - Procurement and Contracting Requirements.
 - 2. Division 01 - General Requirements.
 - 3. Construction Progress Schedule submittal requirements.
 - 4. Operations and Maintenance Manual submittal requirements.
 - 5. Technical Specification Sections identifying required submittals.

1.2 DEFINITIONS

- A. Action Submittals:
 - 1. Action Submittals require an explicit, written approval or other appropriate action by Engineer before Contractor may release the associated item(s) for raw materials procurement, fabrication, production, and shipment.
 - 2. Unless otherwise indicated in the Contract Documents, Action Submittals include the following:
 - a. Shop Drawings.
 - b. Product data.
 - c. Samples.
 - d. Testing plans for quality control activities required by the Contract Documents.
 - e. Delegated Designs: Design drawings, design specifications, calculations, reports, and other instruments of service sealed and signed by design professional retained by Contractor, Subcontractor, or Supplier for a portion of the completed Work as part of the completed Project. Engineer's approval or other appropriate action on such delegated design Submittals will be only for the limited purposes set forth in the General Conditions.
- B. Informational Submittals:
 - 1. Informational Submittals are Submittals, other than Action Submittals, required by the Contract Documents. Explicit response from Engineer is not required when such Submittal is acceptable and Engineer's acceptance thereof will be indicated in the Engineer's Submittals log. When Informational Submittal does not indicate full compliance with the Contract Documents, Engineer will indicate the non-compliance in a written response to Contractor.
 - 2. Representative types of informational submittal items include but are not limited to:
 - a. Geosynthetics QC data as required by the CQA Plan.
 - b. Installed equipment and systems performance test reports.
 - c. Manufacturer's installation certification letters.
 - d. Instrumentation and control commissioning reports.
 - e. Warranties.
 - f. Service agreements.
 - g. Construction photographs.

- h. Survey data.
 - i. Work plans.
 - j. Shop Drawings, product data, Samples, and testing plans, submitted as a requirement of for delegated designs, bearing the Submittal approval stamp of associated design professional retained by Contractor, Subcontractor, or Supplier.
3. For-Information-Only submittals upon which the Engineer is not expected to conduct review or take responsive action may be so identified in the Contract Documents.

1.3 SUBMITTAL SCHEDULE

- A. Schedule of Shop Drawings:
 - 1. Submitted and approved within 20 days of receipt of Notice to Proceed.
 - 2. Account for multiple transmittals under any specification section where partial submittals will be transmitted.
- B. Shop Drawings: Submittal and approval prior to 20 PCT completion of project.
- C. Informational Submittals:
 - 1. Reports and installation certifications submitted within 7 days of conducting testing, installation, or examination.
 - 2. Submittals showing compliance with required qualifications submitted 20 days prior to any work beginning using the subject qualifications.
- D. The submittal schedule shall include the following columns as a minimum:

Submittal Section	Submittal Description	Planned Submittal Date	Submittal Need Date	Actual Submittal Date	Actual Return Date	Disposition

1.4 PREPARATION OF SUBMITTALS

- A. General:
 - 1. All submittals and all pages of all copies of a submittal shall be completely legible.
 - 2. Submittals which, in the Engineer’s sole opinion, are illegible will be returned without review.
 - 3. Minimize extraneous information for equipment and products not relevant to the submittal.
 - 4. Contractors or vendors written comments on the submittal drawings shall be in green
- B. Shop Drawings, Product Data, and Samples:
 - 1. Scope of any submittal and letter of transmittal:
 - a. Limited to one Specification Section.
 - b. Submittals with more than one Specification section included will be rejected.
 - c. Do not submit under any Specification Section entitled (in part) "Basic Requirements" unless the product or material submitted is specified, in total, in a "Basic Requirements" Specification Section.
 - 2. Numbering letter of transmittal:
 - a. Include as prefix the Specification Section number followed by a series number, "-xx", beginning with "01" and increasing sequentially with each additional transmittal for that Specification Section.
 - b. If more than one submittal under any Specification Section, assign consecutive series numbers to subsequent transmittal letters.
 - 3. Describing transmittal contents:
 - a. Provide listing of each component or item in submittal capable of receiving an independent review action.
 - b. Identify for each item:
 - 1) Manufacturer and Manufacturer's Drawing or data number.

- 2) Contract Document tag number(s).
- 3) Unique page numbers for each page of each separate item.
- c. When submitting "or-equal" items that are not the products of named manufacturers, include the words "or-equal" in the item description.
4. Contractor certification of review and approval:
 - a. Contractor's review and approval certification stamp shall be applied either to the letter of transmittal or a separate sheet preceding each independent item in the submittal.
 - 1) Stamp may be either a wet ink stamp or electronically embedded.
 - 2) Clearly identify the person who reviewed the submittal and the date it was reviewed.
 - 3) Shop Drawing submittal stamp shall read "(Contractor's Name) has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval as stipulated in the General Conditions."

OR

- b. Execute Exhibit AA, Contractor's Submittal Certification form, to indicate Contractor has reviewed and approved the submittal contents.
 - 1) Clearly identify the person who reviewed the submittal and the date it was reviewed."
- c. Submittals containing multiple independent items shall be prepared with each item listed on the letter of transmittal or on an index sheet for all items listing the discrete page numbers for each page of each item, which shall be stamped with the Contractor's review and approval stamp.
 - 1) Each independent item shall have a cover sheet with the transmittal number and item number recorded.
 - a) Provide clear space of 3 IN SQ for Engineer stamping.
 - 2) Individual pages or sheets of independent items shall be numbered in a manner that permits the entire contents of a particular item to be readily recognized and associated with Contractor's certification.
5. Resubmittals:
 - a. Number with original Specification Section and series number with a suffix letter starting with "A" on a (new) duplicate transmittal form.
 - b. Do not increase the scope of any prior transmittal.
 - c. Provide cover letter indicating how each "B", "C", or "D" Action from previous submittal was addressed and where the correction is found in the resubmittal.
 - d. Account for all components of prior transmittal.
 - 1) If items in prior transmittal received "A" or "B" Action code, list them and indicate "A" or "B" as appropriate.
 - a) Do not include submittal information for items listed with prior "A" or "B" Action in resubmittal.
 - 2) Indicate "Outstanding-To Be Resubmitted At a Later Date" for any prior "C" or "D" Action item not included in resubmittal.
 - a) Obtain Engineer's approval to exclude items.
6. Do not use red color for marks on transmittals.
 - a. Duplicate all marks on all copies transmitted, and ensure marks are photocopy reproducible.
 - b. Engineer will use red marks or enclose marks in a cloud.
7. Transmittal contents:
 - a. Coordinate and identify Shop Drawing contents so that all items can be easily verified by the Engineer.
 - b. Provide submittal information or marks defining specific equipment or materials utilized on the Project.
 - 1) Generalized product information, not clearly defining specific equipment or materials to be provided, will be rejected.
 - c. Identify equipment or material project use, tag number, Drawing detail reference, weight, and other Project specific information.

- d. Provide sufficient information together with technical cuts and technical data to allow an evaluation to be made to determine that the item submitted is in compliance with the Contract Documents.
 - e. Do not modify the manufacturer's documentation or data except as specified herein.
 - f. Submit items such as equipment brochures, cuts of fixtures, product data sheets or catalog sheets not exceeding 11 x 17 IN pages.
 - 1) Indicate exact item or model and all options proposed by arrow and leader.
 - g. When a Shop Drawing submittal is called for in any Specification Section, include as appropriate, scaled details, sizes, dimensions, performance characteristics, capacities, test data, anchoring details, installation instructions, storage and handling instructions, color charts, layout Drawings, rough-in diagrams, wiring diagrams, controls, weights and other pertinent data in addition to information specifically stipulated in the Specification Section.
 - 1) Arrange data and performance information in format similar to that provided in Contract Documents.
 - 2) Provide, at minimum, the detail specified in the Contract Documents.
 - h. If proposed equipment or materials deviate from the Contract Drawings or Specifications in any way, clearly note the deviation and justify the said deviation in detail in a separate letter immediately following transmittal sheet. Any deviation from plans or specifications not depicted in the submittal or included but not clearly noted by the Contractor may not have been reviewed. Review by the Engineer shall not serve to relieve the Contractor of the contractual responsibility for any error or deviation from contract requirements.
8. Samples:
- a. Identification:
 - 1) Identify sample as to transmittal number, manufacturer, item, use, type, project designation, tag number, Specification Section or Drawing detail reference, color, range, texture, finish and other pertinent data.
 - 2) If identifying information cannot be marked directly on sample without defacing or adversely altering samples, provide a durable tag with identifying information securely attached to the sample.
 - b. Include application specific brochures, and installation instructions.
 - c. Provide Contractor's review and approval certification stamp or Contractor's Submittal Certification form as indication of Contractor's checking and verification of dimensions and coordination with interrelated work.
 - d. Resubmit revised samples of rejected items.
- C. Informational Submittals:
- 1. Prepare in the format and detail specified in Specification requiring the informational submittal.

1.5 TRANSMITTAL OF SUBMITTALS

- A. Shop Drawings and Samples:
 - 1. Transmit all submittals to:

HDR
 1917 S 67th Street
 Omaha, NE 68106-2973
 Attn: Katie Kinley
 katie.kinley@hdrinc.com

SCISWA Landfill
1736 Marion County Hwy T17
Tracy, IA 50256
Attn: Rick Hurt
rhurt@sciswa.org

2. Utilize two copies of attached Exhibit A to transmit all Shop Drawings and samples.
3. All submittals must be from Contractor.
 - a. Submittals will not be received from or returned to subcontractors.

B. Informational Submittals:

1. Transmit under Contractor's standard letter of transmittal or letterhead.
2. Submit in triplicate or as specified in individual Specification Section.
3. Transmit to:

HDR
1917 S 67th Street
Omaha, NE 68106-2973
Attn: Katie Kinley
katie.kinley@hdrinc.com

SCISWA Landfill
1736 Marion County Hwy T17
Tracy, IA 50256
Attn: Rick Hurt
rhurt@sciswa.org

C. Electronic Transmission of Submittals:

1. Transmittals shall be made electronically.
 - a. Use email.
 - b. Protocols and processes will be determined at the Pre-Construction Conference.
2. Provide documents in Adobe Acrobat Portable Document Format (PDF), latest version.
3. Do not password protect or lock the PDF document.
4. Drawings or other graphics must be converted to PDF file format from the original drawing file format and made part of the PDF document.
 - a. Scanning of drawings is to be used only where actual file conversion is not possible and drawings must be scanned at a resolution of 300 DPI or greater.
 - b. Required signatures may be applied prior to scanning for transmittal.
5. Electronic drawings shall be formatted to be at full-scale (or half-scale when printed to 11x17).
 - a. Do not reduce drawings by more than 50 PCT in size.
 - b. Reduced drawings shall be clearly marked "HALF-SIZE" and shall scale accurately at that size.
6. Rotate sheets that are normally viewed in landscape mode so that when the PDF file is opened the sheet is in the appropriate position for viewing.
7. Create bookmarks in the bookmarks panel for the cover, the Table of Contents, and each major section of the document.
8. File naming conventions:
 - a. File names shall use the convention (XXXXXX-YY-Z.PDF) where XXXXXX is the Specification Section number, YY is the Shop Drawing Root number and Z is an ID number used to designate the associated volume.
9. Labeling:
 - a. As a minimum, include the following labeling on all electronic media:
 - 1) Project Name.
 - 2) Equipment Name and Project Tag Number.

- 3) Project Specification Section.
 - 4) Manufacturer Name.
 - 5) Vendor Name.
10. Binding:
- a. Include labeled electronic media in a protective case.
 - 1) Bind protective case in three-ring binder, inserted at the front of the Final paper copy submittal.
 - 2) Protective case(s) to have means for securing electronic media to prevent loss (e.g., zip case, flap and strap, or equivalent).

1.6 ENGINEER'S REVIEW ACTION

- A. Shop Drawings and Samples:
1. Items within transmittals will be reviewed for overall design intent and will receive one of the following actions:
 - a. A - FURNISH AS SUBMITTED.
 - b. B - FURNISH AS NOTED (BY ENGINEER).
 - c. C - REVISE AND RESUBMIT.
 - d. D - REJECTED.
 - e. E - ENGINEER'S REVIEW NOT REQUIRED.
 2. Submittals received will be initially reviewed to ascertain inclusion of Contractor's approval stamp.
 - a. Submittals not stamped by the Contractor or stamped with a stamp containing language other than that specified herein will not be reviewed for technical content and will be returned rejected.
 3. In relying on the representation on the Contractor's review and approval stamp, Owner and Engineer reserve the right to review and process poorly organized and poorly described submittals as follows:
 - a. Submittals transmitted with a description identifying a single item and found to contain multiple independent items:
 - 1) Review and approval will be limited to the single item described on the transmittal letter.
 - 2) Other items identified in the submittal will:
 - a) Not be logged as received by the Engineer.
 - b) Be removed from the submittal package and returned without review and comment to the Contractor for coordination, description and stamping.
 - c) Be submitted by the Contractor as a new series number, not as a re-submittal number.
 - b. Engineer, at Engineer's discretion, may revise the transmittal letter item list and descriptions, and conduct review.
 - 1) Unless Contractor notifies Engineer in writing that the Engineer's revision of the transmittal letter item list and descriptions was in error, Contractor's review and approval stamp will be deemed to have applied to the entire contents of the submittal package.
 4. Submittals returned with Action "A" or "B" are considered ready for fabrication and installation.
 - a. If for any reason a submittal that has an "A" or "B" Action is resubmitted, it must be accompanied by a letter defining the changes that have been made and the reason for the resubmittal.
 - b. Destroy or conspicuously mark "SUPERSEDED" all documents having previously received "A" or "B" Action that are superseded by a resubmittal.
 5. Submittals with Action "A" or "B" combined with Action "C" (Revise and Resubmit) or "D" (Rejected) will be individually analyzed giving consideration as follows:
 - a. The portion of the submittal given "C" or "D" will not be distributed (unless previously agreed to otherwise at the Preconstruction Conference).

- 1) One copy or the one transparency of the "C" or "D" Drawings will be marked up and returned to the Contractor.
 - a) Correct and resubmit items so marked.
- b. Items marked "A" or "B" will be fully distributed.
- c. If a portion of the items or system proposed are acceptable, however, the major part of the individual Drawings or documents are incomplete or require revision, the entire submittal may be given "C" or "D" Action.
 - 1) This is at the sole discretion of the Engineer.
 - 2) In this case, some Drawings may contain relatively few or no comments or the statement, "Resubmit to maintain a complete package."
 - 3) Distribution to the Owner and field will not be made (unless previously agreed to otherwise).
6. Failure to include any specific information specified under the submittal paragraphs of the Specifications will result in the submittal being returned to the Contractor with "C" or "D" Action.
7. Calculations required in individual Specification Sections will be received for information purposes only, as evidence calculations have been stamped by the professional as defined in the specifications and for limited purpose of checking conformance with given performance and design criteria. The Engineer is not responsible for checking the accuracy of the calculations and the calculations will be returned stamped "E. Engineer's Review Not Required" to acknowledge receipt.
8. Furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than [three] submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.
9. Transmittals of submittals which the Engineer considers as "Not Required" submittal information, which is supplemental to but not essential to prior submitted information, or items of information in a transmittal which have been reviewed and received "A" or "B" action in a prior submittal, will be returned with action "E. Engineer's Review Not Required."
10. Samples may be retained for comparison purposes.
 - a. Remove samples when directed.
 - b. Include in bid all costs of furnishing and removing samples.
11. Approved samples submitted or constructed, constitute criteria for judging completed work.
 - a. Finished work or items not equal to samples will be rejected.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION - (NOT USED)

END OF SECTION

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EXHIBIT A Shop Drawing Transmittal No.

 (Spec Section) (Series)

Project Name:		Date Received:
Project Owner:		Checked By:
Contractor:	HDR Engineering, Inc.	Log Page:
Address:	Address:	HDR No.:
		Spec Section:
		Drawing/Detail No.:
Attn:	Attn:	1st. Sub ReSub.
Date Transmitted:	Previous Transmittal Date:	

Item No.	No. Copies	Description	Manufacturer	Mfr/Vendor Dwg or Data No.	Action Taken*

Remarks:

* The Action designated above is in accordance with the following legend:

<p>A - Furnish as Submitted</p> <p>B - Furnish as Noted</p> <p>C - Revise and Submit</p> <ol style="list-style-type: none"> 1. Not enough information for review. 2. No reproducibles submitted. 3. Copies illegible. 4. Not enough copies submitted. 5. Wrong sequence number. 6. Wrong resubmittal number. 7. Wrong spec. section. 8. Wrong form used. 9. See comments. <p>D - Rejected</p>	<p>E - Engineer's review not required</p> <ol style="list-style-type: none"> 1. Submittal not required. 2. Supplemental Information. Submittal retained for informational purposes only. 3. Information reviewed and approved on prior submittal. 4. See comments. <p>Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Any deviation from plans or specifications not depicted in the submittal or included but not clearly noted by the Contractor may not have been reviewed. Review by the Engineer shall not serve to relieve the Contractor of the contractual responsibility for any error or deviation from contract requirements.</p>
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Comments:

	By		Date	
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Distribution: Contractor | File | Field | Owner | Other |

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Contractor's Submittal Certification

Shop Drawing Transmittal No.:

Contract/Project Name:

Company Name:

has

- 1. reviewed and coordinated this Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
- 2. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
- 3. determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
- 4. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

This Submittal **does not** contain any variations from the requirements of the Contract Documents.

This Submittal **does** contain variations from the requirements of the Contract Documents. A separate description of said variations and a justification for them is provided in an attachment hereto identified as:

"Shop Drawing Transmittal No. _____ Variation and Justification Documentation"

Insert picture file or electronic signature of Authorized Representative

Authorized Representative

Date

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SECTION 01 35 05
ENVIRONMENTAL PROTECTION AND SPECIAL CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Minimizing the pollution of air, water, or land; control of noise, the disposal of solid waste materials, and protection of deposits of historical or archaeological interest.
- B. Related Specification Sections include but are not necessarily limited to:
 - 1. Division 00 - Procurement and Contracting Requirements.
 - 2. Division 01 - General Requirements.

1.2 SUBMITTALS

- A. Shop Drawings:
 - 1. See Specification Section 01 33 00 for requirements for the mechanics and administration of the submittal process.
 - 2. Prior to the start of any construction activities submit:
 - a. A detailed proposal of all methods of control and preventive measures to be utilized for environmental protection.
 - b. A drawing of the work area, haul routes, storage areas, access routes and current land conditions including trees and vegetation.
 - c. A copy of the NPDES permit for storm water discharges from construction activities.
 - d. A copy of the approved pollution prevention plan.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Employ and utilize environmental protection methods, obtain all necessary permits, and fully observe all local, state, and federal regulations.
- B. Land Protection:
 - 1. Except for any work or storage area and access routes specifically assigned for the use of the Contractor, the land areas outside the limits of construction shall be preserved in their present condition.
 - a. Confine construction activities to areas defined for work within the Contract Documents.
 - 2. Manage and control all borrow areas, work or storage areas, access routes and embankments to prevent sediment from entering nearby water or land adjacent to the work site.
 - 3. Restore all disturbed areas including borrow and haul areas and establish permanent type of locally adaptable vegetative cover.
 - 4. Unless earthwork is immediately paved or surfaced, protect all side slopes and backslopes immediately upon completion of final grading.
 - 5. Plan and execute earthwork in a manner to minimize duration of exposure of unprotected soils.

6. Except for areas designated by the Contract Documents to be cleared and grubbed, do not deface, injure or destroy trees and vegetation, nor remove, cut, or disturb them without approval of the Engineer.
 - a. Any damage caused by the Contractor's equipment or operations shall be restored as nearly as possible to its original condition at no additional cost to the Owner.
- C. Surface Water Protection:
1. Utilize, as necessary, erosion control methods to protect side and backslopes, minimize and the discharge of sediment to the surface water leaving the construction site as soon as rough grading is complete.
 - a. These controls shall be maintained until the site is ready for final grading and landscaping or until they are no longer warranted and concurrence is received from the Engineer.
 - b. Physically retard the rate and volume of run-on and runoff by:
 - 1) Implementing structural practices such as diversion swales, terraces, straw bales, silt fences, berms, storm drain inlet protection, rock outlet protection, sediment traps and temporary basins.
 - 2) Implementing vegetative practices such as temporary seeding, permanent seeding, mulching, sod stabilization, vegetative buffers, hydroseeding, anchored erosion control blankets, sodding, vegetated swales or a combination of these methods.
 - 3) Providing Construction sites with graveled or rock access entrance and exit drives and parking areas to reduce the tracking of sediment onto public or private roads.
 2. Discharges from the construction site shall not contain pollutants at concentrations that produce objectionable films, colors, turbidity, deposits or noxious odors in the receiving stream or waterway.
- D. Solid Waste Disposal:
1. Collect solid waste on a daily basis.
 2. Provide disposal of degradable solid waste to an approved solid waste disposal site.
 3. Provide disposal of nondegradable solid waste to an approved solid waste disposal site or in an alternate manner approved by Engineer and regulatory agencies.
 4. No building materials wastes or unused building materials shall be buried, dumped, or disposed of on the site.
- E. Fuel and Chemical Handling:
1. Store and dispose of chemical wastes in a manner approved by regulatory agencies.
 2. Take special measures to prevent chemicals, fuels, oils, greases, herbicides, and insecticides from entering drainage ways.
 3. Do not allow water used in onsite material processing, concrete curing, cleanup, and other waste waters to enter a drainage way(s) or stream.
 4. Provide containment around fueling and chemical storage areas to ensure that spills in these areas do not reach waters of the state.
- F. Control of Dust:
1. The control of dust shall mean that no construction activity shall take place without applying all such reasonable measures as may be required to prevent particulate matter from becoming airborne so that it remains visible beyond the limits of construction.
 - a. Reasonable measures may include paving, frequent road cleaning, planting vegetative groundcover, application of water or application of chemical dust suppressants.
 - b. The use of chemical agents such as calcium chloride must be approved by the State of Iowa DOT.
 2. Utilize methods and practices of construction to eliminate dust in full observance of agency regulations.
 3. The Engineer will determine the effectiveness of the dust control program and may request the Contractor to provide additional measures, at no additional cost to Owner.

- G. Burning:
 - 1. Do not burn material on the site.
 - 2. If the Contractor elects to dispose of waste materials by burning, make arrangements for an off-site burning area and conform to all agency regulations.
- H. Control of Noise:
 - 1. Control noise by fitting equipment with appropriate mufflers.
- I. Completion of Work:
 - 1. Upon completion of work, leave area in a clean, natural looking condition.
 - 2. Ensure all signs of temporary construction and activities incidental to construction of required permanent work are removed.

END OF SECTION

SECTION 01 65 50
PRODUCT DELIVERY, STORAGE, AND HANDLING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Scheduling of product delivery.
 - 2. Packaging of products for delivery.
 - 3. Protection of products against damage from:
 - a. Handling.
 - b. Exposure to elements or harsh environments.
- B. Related Specification Sections include but are not necessarily limited to:
 - 1. Division 00 - Procurement and Contracting Requirements.
 - 2. Division 01 - General Requirements.
- C. Payment:
 - 1. No payment will be made to Contractor for equipment or materials not properly stored and insured or without approved Shop Drawings.
 - a. Previous payments for items will be deducted from subsequent progress estimate(s) if proper storage procedures are not observed.

1.2 DELIVERY

- A. Scheduling: Schedule delivery of products or equipment as required to allow timely installation and to avoid prolonged storage.
- B. Packaging: Deliver products or equipment in manufacturer's original unbroken cartons or other containers designed and constructed to protect the contents from physical or environmental damage.
- C. Identification: Clearly and fully mark and identify as to manufacturer, item, and installation location.
- D. Protection and Handling: Provide manufacturer's instructions for storage and handling.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION

3.1 PROTECTION, STORAGE AND HANDLING

- A. Manufacturer's Instruction:
 - 1. Protect all products or equipment in accordance with manufacturer's written directions.
 - a. Store products or equipment in location to avoid physical damage to items while in storage.
 - b. Handle products or equipment in accordance with manufacturer's recommendations and instructions.
 - 2. Protect equipment from exposure to elements and keep thoroughly dry.
 - 3. When space heaters are provided in equipment, connect and operate heaters during storage until equipment is placed in service.

3.2 STORAGE FACILITIES

A. Staging Area:

1. Provide a weatherproof temporary storage trailer specifically for the purpose of providing for protection of products and equipment.
2. Provide methods of storage of products and equipment off the ground.
3. Geosynthetics may not be stacked more than three rolls high.

3.3 FIELD QUALITY CONTROL

A. Inspect Deliveries:

1. Inspect all products or equipment delivered to the site prior to unloading.
 - a. Reject all products or equipment that are damaged, used, or in any other way unsatisfactory for use on Project.

B. Monitor Storage Area: Monitor storage area to ensure suitable temperature and moisture conditions are maintained as required by manufacturer or as appropriate for particular items.

END OF SECTION

SECTION 01 71 14
MOBILIZATION AND DEMOBILIZATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Project mobilization and demobilization.
- B. Related Sections include but are not necessarily limited to:
 - 1. Division 00 - Procurement and Contracting Requirements.
 - 2. Division 01 - General Requirements.

1.2 GENERAL

- A. Mobilization work shall consist of preparatory work and operations necessary to be ready to perform the Work required under the Contract, and for other work and operations which must be performed, or costs incurred prior to the beginning of the Work.
- B. Demobilization work shall consist of all activities and costs for transportation of personnel, equipment, and supplies necessary to demobilize the contractor from the site.
- C. Mobilization and Demobilization shall not include mobilization or demobilization for specific items of work for which payment is provided elsewhere in the Contract.
- D. When the Contract or proposed Schedule of Values includes a separate item for mobilization or demobilization, payment will include full compensation for the furnishings of all labor, materials, tools, equipment, administrative costs, and incidentals to mobilization or demobilization.
- E. If additional mobilization and demobilization activities and costs are required during the performance of the Contract as a result of the changed, deleted, or added items of work for which the Contractor is entitled to an adjustment in Contract price, compensation for such costs shall be included in the price adjustment for the item of Work changed or added.

1.3 ITEMS INCLUDED

- A. Mobilization costs shall be limited to the following items:
 - 1. Obtaining bonds and insurance.
 - 2. Obtaining required permits and licenses.
 - 3. Developing Project Work Schedule.
 - 4. Attending Preconstruction Conference.
 - 5. Processing Permits.
 - 6. Furnishing and installing signs.
 - 7. Any work that is necessary to provide access to the site, including, but not limited to, grading and clearing.
 - 8. Installing temporary construction power wiring.
 - 9. Necessary assembly and testing required prior to start of the Work.
 - 10. Establishment of all and other facilities necessary for the Work, including utilities and specified field offices.
 - 11. Providing for and establishing Contractor's work and storage yard.
 - 12. Movement of personnel, major equipment, supplies, and incidentals to the site.
 - 13. Cost incurred prior to the start of the Work which must be performed, such as a down payment on a long lead item.

- B. Demobilization costs shall be limited to the following items:
 - 1. Disassembly, removal and site cleanup/repair of offices, buildings, and other facilities assembled on the site for the Contract.
 - 2. Costs for final site cleanup, packaging of miscellaneous items for return to the yard and other project closeout related expenses.
 - 3. Cost for final payment documents, and provision of Acknowledgement Certification Request, Bond, and Certificate of Completion.

- C. The Owner will pay all costs for the Mobilization and Demobilization of all of the Contractor's personnel, equipment, supplies, and incidentals at the contract lump sum price as follows:
 - 1. The Owner will pay no greater than 5 PCT of the original Contract Amount as a separate pay item for mobilization.
 - 2. Owner will pay 50 PCT of the Mobilization/demobilization lump sum price when 5 PCT of the original Contract Amount is earned.
 - 3. Owner will pay 50 PCT of the Mobilization/Demobilization lump sum price when all closeout activities and documents are completed.
 - 4. Furnish cost data and documentation to justify this portion of the bid if Owner believes that the percentages in this paragraph do not bear a reasonable relation to the cost of the work in this contract.
 - 5. Failure to justify such price to the satisfaction of the Owner will result in payment as determined by the Owner, of:
 - a. Actual mobilization costs at completion of mobilization.
 - b. Actual demobilization costs at completion of demobilization; and.
 - c. The remainder of this item in the final payment under this contract.
 - 6. The Owner's determination of the actual costs in this paragraph is not subject to appeal.
 - 7. This schedule of mobilization progress payments will not limit or preclude progress payments otherwise provided by the Contract.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION - (NOT USED)

END OF SECTION

SECTION 01 77 19
CLOSEOUT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Administrative and procedural requirements for:
1. Substantial Completion.
 2. Final inspection.
 3. Request for final payment and acceptance of the Work.

1.2 SUBSTANTIAL COMPLETION

- A. Substantial Completion – General:
1. Prior to requesting inspect no for Substantial Completion, perform the following for the substantially completed Work:
 - a. Materials and equipment for which Substantial Completion is requested shall be fully ready for their intended use, including full operating and monitoring capability in automatic, manual, and other operating modes set forth in the Contract Documents.
 - b. Permanent provisions for safety and protection, shown and indicated in the Contract Documents and associated with the substantially completed Work or for personnel accessing and using the substantially completed Work, shall be in place and ready for their intended use.
 - c. Complete field quality control Work, including inspections and testing at the Site, indicated in Specifications sections for individual materials and equipment items and related Contract Documents. Submit results of, and obtain Engineer’s acceptance of, field quality control tests and inspections required by the Contract Documents.
 - d. Complete checkout and startup in accordance with requirements of the Specifications for the various materials and equipment in the substantially completed Work, and related Contract Documents.
 - e. Cleaning for Substantial Completion shall be completed in specifications.
 - f. Spare parts, tools, and extra materials shall be delivered and accepted in accordance with the Contract Documents and documentation of Owner’s acceptance thereof has been submitted to Engineer in acceptable form.
 - g. Training of the facility’s operations and maintenance personnel shall be completed in accordance with the Contract Documents.
 - h. Submit and obtain Engineer’s acceptance of final operations and maintenance manuals.
 - i. Obtain and submit to Engineer all required permits, inspections, and approvals of authorities having jurisdiction for the substantially completed Work to be occupied and used by Owner.
 - j. Complete other tasks that the Contract requires be completed prior to Substantial Completion.
 - k. [_____].
 2. Procedures for requesting and documenting Substantial Completion are in the General Conditions, as may be modified by the Supplementary Conditions.
 3. Sample letter for Contractor’s request for inspection for Substantial Completion is attached to this Specifications section. Use the model language of the sample letter, modified to suit the Project and the needs of Contractor’s request.
 4. Unless decided otherwise by Owner and Engineer, form of certificate of Substantial Completion will be EJCDC C-625, “Certificate of Substantial Completion” (2018 edition or later), prepared by Engineer.
 5. Refer to the Agreement Progress Payment Procedures, for requirements regarding consent of surety to partial release of or reduction in retainage.

1.3 FINAL INSPECTION

- A. Final Inspection – General:
1. Prior to requesting final inspection, verify that all the Work is fully complete and ready for final payment. Partial checklist for this purpose is attached to this Specifications section.
 2. Sample letter for Contractor to request final inspection is attached to this Specifications section. Use the model language of the sample letter, modified to suit the Project.
 3. Procedures for requesting and documenting the final inspection are in the General Conditions, as may be modified by the Supplementary Conditions, and as augmented in this Specifications section.

1.4 REQUEST FOR FINAL PAYMENT AND ACCEPTANCE OF THE WORK

- A. Procedure:
1. After successful completion of the final inspection, submit request for final payment in accordance with the Agreement and General Conditions, as may be modified by the Supplementary Conditions, and using procedure specified, and this Specifications section.
 2. Acceptance of the Work:
 - a. Upon Engineer’s concurrence that the Work is complete and ready for final payment (as a result of the final inspection and other communications between the parties and Engineer) and receipt of the final Application for Payment, accompanied by other required Contract closeout documentation, all in accordance with the Contract Documents, Engineer will issue to Owner and Contractor a notice of acceptability of the Work, in accordance with the General Conditions, as may be modified by the Supplementary Conditions.
 - b. Unless decided otherwise by Owner and Engineer, form of acceptance will be EJCDC C-626, “Notice of Acceptability of Work”, (2018 edition or later).
 - c. Nothing other than receipt of such notice of acceptability from Engineer constitutes acceptance of the Work.
 - d. Receipt of Engineer’s notice of acceptability of the Work does not relieve Contractor of Contractor’s continuing obligations under the Contract, including correction period obligations, warranty obligations, indemnification obligations, insurance requirements, and Contractor’s other obligations following acceptance of the Work by Engineer and final payment. Such obligations shall commence and remain in effect as indicated elsewhere in the Contract Documents.
- B. Request for final payment shall include:
1. Documents required for progress payments.
 2. Documents required in the General Conditions, as may be modified by the Supplementary Conditions.
 3. List, on Contractor’s letterhead, of all Change Proposals, Claims, and disputes that Contractor believes are unsettled. If there are no such Change Proposals, Claims, or disputes, so indicate in writing.
 4. Consent of Surety to Final Payment:
 - a. Acceptable form includes AIA G707, “Consent of Surety to Final Payment” (1994 or later edition), or other form acceptable to Owner.
 5. Releases of Liens:
 - a. Submit complete and legally effective releases (satisfactory to Owner) of all Liens filed in connection with the Work, regardless of whether such Lien was filed by Contractor, Subcontractor, or Supplier.
 - b. Each release of Lien shall be signed by an authorized representative of the entity submitting the release of Lien, and shall include Contractor’s, Subcontractor’s, or Supplier’s (as applicable) corporate seal, when applicable.
 6. Waivers of Lien Rights:
 - a. Submit legally-binding waivers of rights to file Liens, acceptable to Owner, as required in the General Conditions (as may be modified by the Supplementary Conditions) from

Contractor and each Subcontractor and Supplier that furnished or provided labor, material, or equipment totaling \$1,000 or more for the Work.

- b. Furnish final list of Subcontractors and Suppliers indicating final amount of the associated subcontract or purchase order for each. Include on the list all lower-tier Subcontractors and Suppliers retained by higher-tier Subcontractors and Suppliers.
- c. Each waiver of Lien rights shall be signed by an authorized representative of the entity submitting waiver of Lien rights, and shall include Contractor's, Subcontractor's, or Supplier's (as applicable) corporate seal, when applicable.
- d. Waiver of Lien rights may be conditional upon receipt of final payment.
- e. Required Affidavits: Submit the following:
 - 1) Affidavit of payment of debts and claims, submitted by Contractor. Acceptable form includes AIA G706, "Contractor's Affidavit of Payment of Debts and Claims" (1994 or later edition), or other form acceptable to Owner, and;
 - 2) Affidavit of release of Liens, submitted by Contractor. Acceptable form includes AIA G706A, "Affidavit of Release of Liens" (1994 or later edition).
 - 3) Each affidavit shall be signed by an authorized representative of Contractor and shall bear Contractor's corporate seal, as applicable.
- f. In the event Contractor is unable to obtain one or more required waivers of Lien rights, recourse is set forth in the General Conditions, as may be modified by the Supplementary Conditions.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION

3.1 ATTACHMENTS

- A. The documents listed below, following this Specification section's "End of Section" designation, are part of this Specifications section:
 1. Sample letter for Contractor's use in requesting inspection for Substantial Completion (two pages).
 2. Sample partial checklist to identify readiness for final inspection (four pages).
 3. Sample letter for Contractor's use in requesting final inspection (one page).
 4. [_____].
- B. In the model language of the attached sample letters for Contractor to request inspection for Substantial Completion and the final inspection, italicized language in brackets, e.g., "[insert date]" indicates instructions to the drafter of the letter and often indicates specific information to be inserted by Contractor; do not include bracketed, italicized text in the final version of the letter(s) prepared for the Project. Non-italicized language in brackets is optional language; use the appropriate language to complete the actual letter for the Project and edit where required to suit the specific circumstances.

END OF SECTION

**SAMPLE LETTER FOR CONTRACTOR'S USE IN
REQUESTING INSPECTION FOR SUBSTANTIAL COMPLETION**

SENT VIA E-MAIL AND U.S. CERTIFIED MAIL/RETURN RECEIPT REQUESTED

[Date]

[Name of Engineer's contact person]

HDR

[Street address]

[City, state, postal code]

Subject:

[Project name, Contract designation]

Request for Inspection for Substantial Completion

Dear [addressee]:

In our opinion, [all of] [or] [a portion of] the Work under the above-referenced Contract is substantially complete as of [insert month, day, year on which Substantial Completion was achieved]. [The specific portion of the Work that we believe is substantially complete is [insert identification of that portion of the Work that is substantially complete].]

Enclosed is our listing of uncompleted Work items ("punch list"). In accordance with Paragraph 15.03.A of the General Conditions, we hereby request: (1) That the Engineer schedule and perform the inspection for Substantial Completion as soon as possible, and (2) Issuance of the certificate of Substantial Completion.

In accordance with Paragraph 15.03.D of the General Conditions, upon Substantial Completion, we propose the following relative to apportionment of responsibilities between the Owner and the Contractor:

1. Security, Protection, Insurance:
 - a. Site Security: [insert proposal; address whether Owner or Contractor will be responsible for security of the Site].
 - b. Protection of the Substantially Completed Work: [insert proposal; address whether Owner or Contractor will be responsible for protection].
 - c. Property Insurance: [insert proposal; typically Owner assumes responsibility for property insurance upon Substantial Completion]
2. Operation and Maintenance:
 - a. Operation: [insert proposal; address whether Owner or Contractor will be responsible for operating the substantially completed Work].
 - b. Maintenance: [insert proposal; address whether Owner or Contractor will be responsible for maintaining the substantially completed Work].
3. Utilities: [for each of the following, indicate whether Owner or Contractor will be responsible for utilities and services, or whether responsibility will be shared; if shared, indicate proposed cost-sharing]
 - a. Electricity: [insert proposal].
 - b. Natural Gas/Fuel/Heating: [insert proposal].
 - c. Water Supply: [insert proposal].

- d. Wastewater: [insert proposal].
- e. Communications (Telephone, Internet, Video): [insert proposal].

In accordance with Paragraph 15.08.A of the General Conditions, we understand that the Contract's correction period for the Work covered by the certificate of Substantial Completion commences on the Substantial Completion date documented in said certificate. [Drafter: Also see Paragraph 15.04 ("Partial Utilization") of the General Conditions and, where necessary, edit this paragraph of the letter accordingly.]

Should you have questions or comments regarding this notice, please contact [the undersigned] [or] [insert other contact person's name], at [insert telephone number and e-mail address].

Sincerely,

[Contractor's company name]

[Signatory name]
[Signatory's title]

Attachments:

Preliminary list of uncompleted Work items ("punch list"; [##] pages)

Copies:

[Owner's project manager]

SAMPLE PARTIAL CHECKLIST TO IDENTIFY READINESS FOR FINAL INSPECTION

Project: _____

Contract: _____

Contractor: _____

Item No./Description	Completed/Date	In Progress	Not Started	Not Applicable	Target Date	Responsible Entity/Person
1. All Submittals, including all Shop Drawings and Samples, approved or accepted by Engineer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<i>Remarks:</i>						
1. Final services completed by Suppliers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<i>Remarks:</i>						
2. Final Work completed by Subcontractors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<i>Remarks:</i>						
3. Permits closed out and regulatory compliance transitioned from construction to operations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<i>Remarks:</i>						
4. All outstanding change issues are addressed and all Change Proposals submitted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<i>Remarks:</i>						
5. All Change Proposals and Claims are resolved	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<i>Remarks:</i>						

Item No./Description	Completed/Date	In Progress	Not Started	Not Applicable	Target Date	Responsible Entity/Person
6. All defective Work of which Contractor is aware has been corrected in accordance with the Contract Documents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<i>Remarks:</i>						
7. Issues related to Constituents of Concern and potential Hazardous Environmental Condition have been fully addressed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<i>Remarks:</i>						
8. All spare parts, tools, and extra materials have been furnished in accordance with the Contract Documents, and documentation thereof submitted to Engineer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<i>Remarks:</i>						
9. All final operations & maintenance manuals have been submitted and accepted by Engineer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<i>Remarks:</i>						
10. Manufacturer warranties and software license(s) furnished	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<i>Remarks:</i>						
11. Instruction and training of operations and maintenance personnel is complete and records of training submitted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<i>Remarks:</i>						

Item No./Description	Completed/Date	In Progress	Not Started	Not Applicable	Target Date	Responsible Entity/Person
12. MBE/WBE/DBE/VBE compliance report(s) submitted (when applicable)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<i>Remarks:</i>						
13. All field engineering Submittals, including survey data, furnished	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<i>Remarks:</i>						
14. All Work on "punch list" is complete in accordance with the Contract Documents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<i>Remarks:</i>						
15. All record documents submitted to and accepted by Engineer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<i>Remarks:</i>						
16. Contractor is fully demobilized from the Site	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<i>Remarks:</i>						
17. All Site restoration is complete	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<i>Remarks:</i>						
18. Final cleaning of all work areas is complete	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<i>Remarks:</i>						
19. Releases of Liens and waivers of Lien rights (or acceptable alternative) obtained from Subcontractors and Suppliers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<i>Remarks:</i>						

Item No./Description	Completed/Date	In Progress	Not Started	Not Applicable	Target Date	Responsible Entity/Person
20. Evidence of Contractor liability insurance furnished for correction period	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<i>Remarks:</i>						
21. All other required Contract closeout documents obtained	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<i>Remarks:</i>						
<i>Remarks:</i>						
22. All other Work and documentation required prior to final payment is complete and provided in accordance with the Contract Documents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
<i>Remarks:</i>						

**SAMPLE LETTER FOR CONTRACTOR'S USE IN
REQUESTING FINAL INSPECTION**

SENT VIA E-MAIL AND U.S. CERTIFIED MAIL/RETURN RECEIPT REQUESTED

[Date]

[Name of Engineer's contact person]

HDR

[Street address]

[City, state, postal code]

Subject:

[Project name, Contract designation]

Request for Final Inspection

Dear [addressee]:

The Work under the above-referenced Contract is complete and ready for final payment as of [insert month, day, year on which final completion was achieved]. In accordance with Paragraph 15.05 of the General Conditions, we hereby request that the Engineer schedule and perform the final inspection as soon as possible. Upon successful completion of the final inspection, we will submit our final Application for Payment accompanied by the required Contract closeout documentation in accordance with the Contract Documents.

Should you have questions or comments regarding this notice, please contact [the undersigned] [or] [insert other contact person's name], at [insert telephone number and e-mail address].

Sincerely,

[Contractor's company name]

[Signatory name]

[Signatory's title]

Attachments:

None

Copies:

[Owner's project manager]



DIVISION 03

CONCRETE



SECTION 03 00 05
CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Cast-in-place concrete and grout.
- B. Related Specification Sections include but are not necessarily limited to:
 - 1. Division 00 - Procurement and Contracting Requirements.
 - 2. Division 01 - General Requirements.

1.2 QUALITY ASSURANCE

- A. Referenced Standards:
 - 1. American Concrete Institute (ACI):
 - a. 117, Specification for Tolerances for Concrete Construction and Materials.
 - b. 211.1, Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
 - c. 212.3R, Chemical Admixtures for Concrete.
 - d. 304R, Guide for Measuring, Mixing, Transporting, and Placing Concrete.
 - e. 304.2R, Placing Concrete by Pumping Methods.
 - f. 305.1, Hot Weather Concreting.
 - g. 306.1, Cold Weather Concreting.
 - h. 318, Building Code Requirements for Structural Concrete.
 - i. 347, Guide to Formwork for Concrete.
 - j. CT-13, Concrete Terminology.
 - 2. ASTM International (ASTM):
 - a. A82, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
 - b. A185, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
 - c. A615, Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 - d. A1064, Standard Specification for Steel Wire and Welded Wire Replacement, Plain and Deformed, for Concrete.
 - e. C31, Standard Practice for Making and Curing Concrete Test Specimens in the Field.
 - f. C33, Standard Specification for Concrete Aggregates.
 - g. C39, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 - h. C94/C94M, Standard Specification for Ready-Mixed Concrete.
 - i. C138, Standard Method of Test for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete.
 - j. C143, Standard Test Method for Slump of Hydraulic Cement Concrete.
 - k. C150, Standard Specification for Portland Cement.
 - l. C172, Standard Practice for Sampling Freshly Mixed Concrete.
 - m. C173, Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
 - n. C231, Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
 - o. C260, Standard Specification for Air-Entraining Admixtures for Concrete.
 - p. C309, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 - q. C494, Standard Specification for Chemical Admixtures for Concrete.

- r. C618, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
 - s. C1293, Standard Test Method for Determination of Length Change of Concrete Due to Alkali-Silica Reaction.
 - t. C1315, Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
 - u. D882, Standard Test Method for Tensile Properties of Thin Plastic Sheeting.
 - v. D994, Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
 - w. D1056, Standard Specification for Flexible Cellular Materials-Sponge or Expanded Rubber.
 - x. D1709, Standard Test Methods for Impact Resistance of Plastic Film by the Free-Falling Dart Method.
 - y. D1751, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
 - z. E96, Standard Test Methods for Water Vapor Transmission of Materials.
 - aa. E329, Standard Specification for Agencies Engaged in Construction Inspection and/or Testing.
- 3. Corps of Engineers (COE):
 - a. CRD-C621, Standard Specification for Packaged, Dry, Hydraulic-Cement Grout (Nonshrink).
 - 4. National Ready Mixed Concrete Association (NRMCA).
 - 5. National Sanitation Foundation (NSF):
 - a. 61, Drinking Water System Components - Health Effects.
- B. Quality Control:
- 1. Concrete testing agency:
 - a. Contractor to employ and pay for services of a testing laboratory to:
 - 1) Perform materials evaluation.
 - 2) Design concrete mixes.
 - b. Concrete testing agency to meet requirements of ASTM E329.
 - 2. Do not begin concrete production until proposed concrete mix design has been approved by Engineer.
 - a. Approval of concrete mix design by Engineer does not relieve Contractor of his responsibility to provide concrete that meets the requirements of this Specification.
 - 3. Adjust concrete mix designs when material characteristics, job conditions, weather, strength test results or other circumstances warrant.
 - a. Do not use revised concrete mixes until submitted to and approved by Engineer.
 - 4. Perform structural calculations as required to prove that all portions of the structure in combination with remaining forming and shoring system has sufficient strength to safely support its own weight plus the loads placed thereon.
- C. Qualifications:
- 1. Ready mixed concrete batch plant certified by NRMCA.
 - 2. Formwork, shoring and reshoring for slabs and beams except where cast on ground to be designed by a professional engineer currently registered in the state where the Project is located.

1.3 DEFINITIONS

- A. Per ACI CT-13 except as modified herein:
- 1. Concrete fill: Non-structural concrete.
 - 2. Concrete Testing Agency: Testing agency employed to perform materials evaluation, design of concrete mixes or testing of concrete placed during construction.
 - 3. Exposed concrete: Exposed to view after construction is complete.
 - 4. Indicated: Indicated by Contract Documents.
 - 5. Nonexposed concrete: Not exposed to view after construction is complete.

6. Required: Required by Contract Documents.
7. Specified strength: Specified compressive strength at 28 days.
8. Submitted: Submitted to Engineer.

1.4 SUBMITTALS

- A. Shop Drawings:
1. See Specification Section 01 33 00 for requirements for the mechanics and administration of the submittal process.
 2. Concrete mix designs proposed for use.
 - a. Concrete mix design submittal to include the following information:
 - 1) Sieve analysis and source of fine and coarse aggregates.
 - 2) Test for aggregate organic impurities.
 - 3) Test for deleterious aggregate per ASTM C1293.
 - 4) Proportioning of all materials.
 - 5) Type of cement with mill certificate for cement.
 - 6) Type of fly ash with certificate of conformance to specification requirements.
 - 7) Slump.
 - 8) Air content.
 - 9) Brand, type, ASTM designation, and quantity of each admixture proposed for use.
 - 10) 28-day cylinder compressive test results of trial mixes per ACI 318 and as indicated herein.
 3. Product technical data including:
 - a. Acknowledgement that products submitted meet requirements of standards referenced.
 - b. Manufacturer's installation instructions.
 - c. Manufacturers and types:
 - 1) Joint fillers.
 - 2) Curing agents.
 - 3) Chemical sealer.
 - 4) Bonding and patching mortar.
 - 5) Construction joint bonding adhesive.
 - 6) Nonshrink grout with cure/seal compound.
 4. Reinforcing steel:
 - a. Show grade, sizes, number, configuration, spacing, location and all fabrication and placement details.
 - b. In sufficient detail to permit installation of reinforcing without having to make reference to Contract Drawings.
 - c. Obtain approval of Shop Drawings by Engineer before fabrication.
 - d. Mill certificates.
 5. Scaled (minimum 1/8 IN per foot) drawings showing proposed locations of construction joints, control joints, expansion joints (as applicable) and joint dimensions.
 6. Strength test results of in place concrete including slump, air content and concrete temperature.
 7. Certifications:
 - a. Certification of standard deviation value in psi for ready mix plant supplying the concrete.
 - b. Certification that the material and sources submitted in the mix design will be used in the concrete for this project.
 8. Test reports:
 - a. Cement mill reports for all cement to be supplied.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Storage of Material:
1. Cement and pozzolan:
 - a. Store in moistureproof, weathertight enclosures.
 - b. Do not use if caked or lumpy.

2. Aggregate:
 - a. Store to prevent segregation and contamination with other sizes or foreign materials.
 - b. Obtain samples for testing from aggregates at point of batching.
 - c. Do not use frozen or partially frozen aggregates.
 - d. Do not use bottom 6 IN of stockpiles in contact with ground.
 - e. Allow sand to drain until moisture content is uniform prior to use.
 3. Admixtures:
 - a. Protect from contamination, evaporation, freezing, or damage.
 - b. Maintain within temperature range recommended by manufacturer.
 - c. Completely mix solutions and suspensions prior to use.
 4. Reinforcing steel: Support and store all rebars above ground.
- B. Delivery:
1. Concrete:
 - a. Prepare a delivery ticket for each load for ready-mixed concrete.
 - b. Truck operator shall hand ticket to Engineer at the time of delivery.
 - c. Ticket to show:
 - 1) Mix identification mark.
 - 2) Quantity delivered.
 - 3) Amount of each material in batch.
 - 4) Outdoor temp in the shade.
 - 5) Time at which cement was added.
 - 6) Numerical sequence of the delivery.
 - 7) Amount of water added.
 2. Reinforcing steel:
 - a. Ship to jobsite with attached plastic or metal tags with permanent mark numbers.
 - b. Mark numbers to match Shop Drawing mark number.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with the Contract Documents, the following products and manufacturers are acceptable:
1. Nonshrink, nonmetallic grout:
 - a. Sika "SikaGrout 212."
 - b. Euclid Chemical "NS Grout."
 - c. BASF Admixtures, Inc. "Masterflow 713."
 2. Expansion joint fillers:
 - a. Permaglaze Co.
 - b. Rubatex Corp.
 - c. Williams Products, Inc.
 3. Form coating:
 - a. Richmond "Rich Cote."
 - b. Industrial Lubricants "Nox-Crete Form Coating."
 - c. Euclid Chemical "Kurez DR VOX."
 4. Cementitious concrete coating:
 - a. Aquafin International.
 - b. BASF Building Systems.
 - c. Euclid Chemical Company.
 5. Chemical sealer:
 - a. L&M Construction Chemicals, Inc.
 - b. Euclid Chemical Company.
 - c. Dayton Superior.
- B. Submit request for substitution in accordance with Specifications.

2.2 MATERIALS

- A. Portland Cement: Conform to ASTM C150 Type 1A.
- B. Fly Ash:
 - 1. ASTM C618, Class F or Class C.
 - 2. Nonstaining.
 - a. Hardened concrete containing fly ash to be uniform light gray color.
 - 3. Maximum loss on ignition: 4 PCT.
 - 4. Compatible with other concrete ingredients.
 - 5. Obtain proposed fly ash from a source approved by the State Highway Department in the state where the Project is located for use in concrete for bridges.
- C. Admixtures:
 - 1. Air entraining admixtures: ASTM C260.
 - 2. Water reducing, retarding, and accelerating admixtures:
 - a. ASTM C494 Type A through E.
 - b. Conform to provisions of ACI 212.3R.
 - c. Do not use retarding or accelerating admixtures unless specifically approved in writing by Engineer and at no cost to Owner.
 - d. Follow manufacturer's instructions.
 - e. Use chloride free admixtures only.
 - 3. Maximum total water soluble chloride ion content contributed from all ingredients of concrete including water, aggregates, cementitious materials and admixtures by weight percent of cement:
 - a. 0.10 all concrete.
 - 4. Do not use calcium chloride.
 - 5. Pozzolanic admixtures: ASTM C618.
 - 6. Provide admixtures of same type, manufacturer and quantity as used in establishing required concrete proportions in the mix design.
- D. Water: Potable, clean, free of oils, acids and organic matter.
- E. Aggregates:
 - 1. Normal weight concrete: ASTM C33, except as modified below.
 - 2. Fine aggregate:
 - a. Clean natural sand.
 - b. No manufactured or artificial sand.
 - 3. Coarse aggregate:
 - a. Crushed rock, natural gravel, or other inert granular material.
 - b. Maximum amount of clay or shale particles: 1 PCT.
 - 4. Gradation of coarse aggregate:
 - a. Lean concrete and concrete topping: Size #7.
 - b. All other concrete: Size #57 or #67.
- F. Concrete Grout:
 - 1. Nonshrink, nonmetallic grout:
 - a. Nonmetallic, noncorrosive, nonstaining, premixed with only water to be added.
 - b. Grout to produce a positive but controlled expansion.
 - c. Mass expansion not to be created by gas liberation.
 - d. Minimum compressive strength of nonshrink grout at 28 days: 6500 PSI.
 - e. In accordance with COE CRD-C621.
- G. Reinforcing Steel:
 - 1. Reinforcing bars: ASTM A615, Grade 60.
 - 2. Welded wire reinforcement:
 - a. ASTM A185 or ASTM A1064.
 - b. Minimum yield strength: 60,000 PSI.
 - 3. Column spirals: ASTM A82 or ASTM A1064.

- H. Forms:
 - 1. Prefabricated or job built.
 - 2. Wood forms:
 - a. 5/8 or 3/4 IN 5-ply structural plywood of concrete form grade.
 - b. Built-in-place or prefabricated type panel.
 - 3. Metal forms:
 - a. Metal forms may be used except for aluminum in contact with concrete.
 - b. Forms to be tight to prevent leakage, free of rust and straight without dents to provide members of uniform thickness.
 - 4. Chamfer strips: Clear white pine, surface against concrete planed.
- I. Form Ties:
 - 1. Commercially fabricated for use in form construction.
 - a. Field fabricated ties are unacceptable.
 - 2. Constructed so that ends or end fasteners can be removed without causing spalling at surfaces of the concrete.
 - 3. 3/4 IN minimum to 1 IN maximum diameter cones on both ends.
 - 4. Embedded portion of ties to be not less than 1-1/2-IN from face of concrete after ends have been removed.
 - 5. Cone size:
 - a. 3/4 IN minimum to 2-1/2 IN maximum diameter cones on both ends.
 - b. Depth of cone not to exceed the concrete reinforcing cover.
 - 6. Form release: Nonstaining and shall not prevent bonding of future finishes to concrete surface.
- J. Chairs, Runners, Bolsters, Spacers, and Hangers:
 - 1. Stainless steel, epoxy coated, or plastic coated metal.
 - a. Plastic coated: Rebar support tips in contact with the forms only.
- K. Chemical Floor Sealer:
 - 1. Colorless low VOC water-based solution containing acrylic copolymers.
 - a. ASTM C1315, Class B, minimum 30 PCT solids.
 - 2. L&M Construction Chemicals Inc. Dress & Seal WB 30.
- L. Cementitious Concrete Coating:
 - 1. Polymer modified Portland cement based coating for concrete and masonry.
 - a. Waterproof.
 - b. Resistant to both positive and negative hydrostatic pressure.
 - c. Breathable.
 - 2. BASF "Masterseal 581 Thoroseal".
 - a. Color:
 - 1) Interior surfaces: Standard gray.
 - 2) Exterior surfaces: Custom color to match concrete surface.
 - 3) Texture: Fine.
- M. Membrane Curing Compound:
 - 1. ASTM C309, Type 1D, Class A or B.
 - 2. Fugitive dye shall dissipate over time and exposure.
 - 3. Curing compound shall not prevent bonding of any future coverings, coatings or finishes.
- N. Expansion Joint Filler:
 - 1. In contact with water or sewage:
 - a. Closed cell neoprene.
 - b. ASTM D1056, Class SC (oil resistant and medium swell) of 2 to 5 PSI compression deflection (Grade SCE41).
 - 2. Exterior driveways, curbs and sidewalks:
 - a. Asphalt expansion joint filler.
 - b. ASTM D994.

3. Other use:
 - a. Fiber expansion joint filler.
 - b. ASTM D1751.

2.3 CONCRETE MIXES

A. General:

1. All concrete to be ready mixed concrete conforming to ASTM C94/C94M.
2. Concrete shall be EARLY-HIGH strength.
3. Provide concrete of specified quality capable of being placed without segregation and, when cured, of developing all properties required.
4. All concrete to be normal weight concrete.
5. Provide pozzolan content for all cast-in-place construction.

B. Strength:

1. Provide specified strength and type of concrete for each use in structure(s) as follows:

TYPE	WEIGHT	SPECIFIED STRENGTH*
All other general use concrete	Normal weight	4000 PSI

* Minimum 28-day compressive strength.

C. Air Entrainment:

1. Provide air entrainment in all concrete resulting in a total air content percent by volume as follows:

MAX AGGREGATE SIZE	TOTAL AIR CONTENT PERCENT
1 IN or 3/4 IN	6 ±1-1/2
<3/4 IN	6-1/2 ±1-1/2

2. Air content to be measured in accordance with ASTM C231, ASTM C173, or ASTM C138.

D. Slump - 4 IN maximum, 1 IN minimum:

1. Measured at point of discharge of the concrete into the concrete construction member.
2. 8 IN maximum after addition of superplasticizer (if used).
3. Concrete of lower than minimum slump may be used provided it can be properly placed and consolidated.
4. Pumped concrete:
 - a. Provide additional water at batch plant to allow for slump loss due to pumping.
 - b. Provide only enough additional water so that slump of concrete at discharge end of pump hose does not exceed maximum slump specified and the maximum specified water-cement ratio is not exceeded.
5. Slump may be adjusted in the field through the use of water reducers.
 - a. Coordinate dosage and mixing requirements with concrete supplier.
6. Determine slump per ASTM C143.

E. Selection of Proportions:

1. General:
 - a. Proportion ingredients to:
 - 1) Produce proper workability, durability, strength, and other required properties.
 - 2) Prevent segregation and collection of excessive free water on surface.

2. Minimum cement contents and maximum water cement ratios for concrete to be as follows:

SPECIFIED STRENGTH	TARGET CEMENT, MAXIMUM AGGREGATE SIZE			MAXIMUM WATER CEMENT RATIO BY WEIGHT
	1/2 IN	3/4 IN	1 IN	
4000	564	564	564	0.45

3. Fly ash:
- a. For cast-in-place concrete only, a maximum of 25 PCT by weight of Portland cement content per cubic yard may be replaced with fly ash at rate of 1 LB fly ash for 1 LB of cement.
 - b. When fly ash is used, the water to cementitious materials ratio shall not exceed the maximum value specified herein.
4. Concrete mix proportioning methods for normal weight concrete:
- a. Proportion mixture to provide desired characteristics using one of methods described below:
 - 1) Method 1 (Trial Mix):
 - a) Per ACI 318, Chapter 5, except as modified herein.
 - b) Air content within range specified above.
 - c) Record and report temperature of trial mixes.
 - d) Proportion trial mixes per ACI 211.1.
 - 2) Method 2 (Field Experience):
 - a) Per ACI 318, Chapter 5, except as modified herein:
 - b) Field test records must be acceptable to Engineer to use this method.
 - c) Test records shall represent materials, proportions and conditions similar to those specified.
5. Required average strength to exceed the specified 28-day compressive strength by the amount determined or calculated in accordance with the requirements of Chapter 5 of ACI 318 using the standard deviation of the proposed concrete production facility.

PART 3 - EXECUTION

3.1 FORMING AND PLACING CONCRETE

- A. Formwork:
1. Contractor is responsible for design and erection of formwork.
 2. Construct formwork so that concrete members and structures are of correct size, shape, alignment, elevation and position.
 - a. Allowable tolerances: As recommended in ACI 347.
 3. Provide slabs and beams of minimum indicated depth when sloping foundation base slabs or elevated floor slabs to drains.
 - a. For slabs on grade, slope top of subgrade to provide floor slabs of minimum uniform indicated depth.
 - b. Do not place floor drains through beams.
 4. Openings:
 - a. Provide openings in formwork to accommodate work of other trades.
 - b. Accurately place and securely support items built into forms.
 5. Chamfer strips: Place 3/4 IN chamfer strips in forms to produce 3/4 IN wide beveled edges on permanently exposed corners of members.
 6. Clean and adjust forms prior to concrete placement.
 7. Tighten forms to prevent mortar leakage.
 8. Coat form surfaces with form release agents prior to placing reinforcing bars in forms.

- B. Reinforcement:
1. Position, support and secure reinforcement against displacement.
 2. Locate and support with chairs, runners, bolsters, spacers and hangers, as required.
 3. Set wire ties so ends do not touch forms and are directed into concrete, not toward exposed concrete surfaces.
 4. Lap splice lengths: ACI 318 Class B top bar tension splices unless indicated otherwise on the Drawings.
 5. Extend reinforcement to within 2 IN of concrete perimeter edges.
 - a. If perimeter edge is earth formed, extend reinforcement to within 3 IN of the edge.
 6. Minimum concrete protective covering for reinforcement: As shown on Drawings.
 7. Do not weld reinforcing bars.
 8. Welded wire reinforcement:
 - a. Install welded wire reinforcement in maximum practical sizes.
 - b. Splice sides and ends with a splice lap length measured between outermost cross wires of each fabric sheet not less than:
 - 1) One spacing of cross wires plus 2 IN.
 - 2) 1.5 x development length.
 - 3) 6 IN.
 - c. Development length: ACI 318 basic development length for the specified fabric yield strength.
- C. Construction, Expansion, and Contraction Joints:
1. Locate joints as indicated on Contract Drawings or as shown on approved Shop Drawings.
 - a. Where construction joint spacing shown on Drawings exceeds the joint spacing indicated in Paragraph below, submit proposed construction joint location in conformance with this Specification Section.
 2. Unplanned construction joints will not be allowed.
 3. Locate wall vertical construction joints at 30 FT maximum.
 4. Locate construction joints in floor slabs and foundation base slabs so that concrete placements are approximately square and do not exceed 2500 SQFT.
 5. Locate construction joints in columns and walls:
 - a. At the underside of beams, girders, haunches, drop panels, column capitals, and at floor panels.
 - b. Haunches, drop panels, and column capitals are considered part of the supported floor or roof and shall be placed monolithically therewith.
 - c. Column based need not be placed monolithically with the floor below.
 6. Install construction joints perpendicular to main reinforcement with all reinforcement continued across construction joints.
 7. At least 48 HRS shall elapse between placing of adjoining concrete construction.
 8. Thoroughly clean and remove all laitance and loose and foreign particles from construction joints.
 9. Before new concrete is placed, dampen concrete surfaces.
- D. Embedments:
1. Set and build in anchorage devices and other embedded items required for other work that is attached to, or supported by concrete.
 - 2.
 3. Use setting diagrams, templates and instructions for locating and setting.
- E. Placing Concrete:
1. Place concrete in compliance with ACI 304R and ACI 304.2R.
 2. Place in a continuous operation within planned joints or sections.
 3. Begin placement when work of other trades affecting concrete is completed.
 4. Place concrete by methods which prevent aggregate segregation.
 5. Do not allow concrete to free fall more than 4 FT.
 6. Where free fall of concrete will exceed 4 FT, place concrete by means of tremie pipe or chute.

- F. Consolidation: Consolidate all concrete using mechanical vibrators supplemented with hand rodding and tamping, so that concrete is worked around reinforcement and embedded items into all parts of forms.
- G. Protection:
1. Protect concrete from physical damage or reduced strength due to weather extremes.
 2. In cold weather comply with ACI 306.1 except as modified herein.
 - a. Do not place concrete on frozen ground or in contact with forms or reinforcing bars coated with frost, ice or snow.
Do not place heated concrete that is warmer than 80 DEGF.
 - b. If freezing temperatures are expected during curing, maintain the concrete temperature at or above 50 DEGF for seven days or 70 DEGF for 3 days.
 - c. Do not allow concrete to cool suddenly.
 3. In hot weather comply with ACI 305.1 except as modified herein.
 - a. At air temperature of 90 DEGF and above, keep concrete as cool as possible during placement and curing.
 - b. Do not allow concrete temperature to exceed 90 DEGF at placement.
 - c. Prevent plastic shrinkage cracking due to rapid evaporation of moisture.
 - d. Do not place concrete when the actual or anticipated evaporation rate equals or exceeds 0.2 LBS/SF/HR as determined from ACI 305.1, Figure 2.1.5.
- H. Curing:
1. Begin curing concrete as soon as free water has disappeared from exposed surfaces.
 2. Cure concrete by use of moisture retaining cover, burlap kept continuously wet or by membrane curing compound.
 3. Provide protection as required to prevent damage to concrete and to prevent moisture loss from concrete during curing period.
 4. Provide curing for minimum of 14 days.
 5. Form materials left in place may be considered as curing materials for surfaces in contact with the form materials except in periods of hot weather.
 6. In hot weather follow curing procedures outlined in ACI 305.1.
 7. In cold weather follow curing procedures outlined in ACI 306.1.
 8. Curing vertical surfaces with a curing compound:
 - a. Cover vertical surfaces with a minimum of two coats of the curing compound.
 - b. Allow the preceding coat to completely dry prior to applying the next coat.
 - c. Apply the first coat of curing compound immediately after form removal.
 - d. Vertical surface at the time of receiving the first coat shall be damp with no free water on the surface.
 - e. A vertical surface is defined as any surface steeper than 1 vertical to 4 horizontal.
- I. Form Removal:
1. Remove forms after concrete has hardened sufficiently to resist damage from removal operations or lack of support.
 2. Where no reshoring is planned, leave forms and shoring used to support concrete until it has reached its specified 28-day compressive strength.

3.2 CONCRETE FINISHES

- A. Tolerances:
1. Class A: 1/8 IN in 10 FT.
 2. Class B: 1/4 IN in 10 FT.
- B. Surfaces Exposed to View:
1. Provide a smooth finish for exposed concrete surfaces and surfaces that are:
 - a. To be covered with a coating or covering material applied directly to concrete.
 - b. Scheduled for grout cleaned finish.
 2. Remove fins and projections, and patch voids, air pockets, and honeycomb areas with cement grout.

3. Cementitious concrete coating:
 - a. Form facing material shall produce a smooth, hard, uniform texture.
 - 1) Use forms specified for surfaces exposed to view.
 - b. Prepare the surface in accordance with manufactures printed installation instructions.
 - c. Brush on coating to entire surface.
 - 1) As a mixing liquid for the coating, use bonding agent and water mixture as recommended by the manufacture.
 - 2) Apply two (2) coats at 2 LB/SQYD per coat.
 - d. When second coat is set, float to a uniform texture with a sponge coat.
 - e. Provide this finish at the following locations:
 - 1) Walls, columns, exposed to view.
- C. Surfaces Not Exposed to View:
 1. Patch voids, air pockets and honeycomb areas with cement grout.
 2. Fill tie holes with nonshrink, nonmetallic grout.
- D. Slab Float Finish:
 1. After concrete has been placed, consolidated, struck off, and leveled, do no further work until ready for floating.
 2. Do not use water to aid in finishing.
 3. Begin floating when water sheen has disappeared and surface has stiffened sufficiently to permit operation.
 4. During or after first floating, check planeness of entire surface with a 10 FT straightedge applied at not less than two different angles.
 5. Cut down all high spots and fill all low spots during this procedure to produce a surface within Class B tolerance throughout.
 6. Refloat slab immediately to a uniform sandy texture.
- E. Troweled Finish:
 1. Float finish surface.
 2. Next power trowel, and finally hand trowel.
 3. Do not use water to aid in finishing.
 4. Produce a smooth surface which is relatively free of defects with first hand troweling.
 5. Perform additional trowelings by hand after surface has hardened sufficiently.
 6. Final trowel when a ringing sound is produced as trowel is moved over surface.
 7. Thoroughly consolidate surface by hand troweling.
 8. Leave finished surface essentially free of trowel marks, uniform in texture and appearance and plane to a Class A tolerance.
 9. On surfaces intended to support floor coverings remove any defects of sufficient magnitude that would show through floor covering by grinding.
- F. Broom Finish: Immediately after concrete has received a float finish as specified, give it a transverse scored texture by drawing a broom across surface.

3.3 GROUT

- A. Preparation:
 1. Nonshrinking, nonmetallic grout:
 - a. Clean concrete surface to receive grout.
 - b. Saturate concrete with water for 24 HRS prior to grouting.
- B. Application:
 1. Nonshrinking, nonmetallic grout:
 - a. Mix in a mechanical mixer.
 - b. Use no more water than necessary to produce flowable grout.
 - c. Place in accordance with manufacturer's instructions.
 - d. Completely fill all spaces and cavities below the bottom of baseplates.
 - e. Provide forms where baseplates and bedplates do not confine grout.
 - f. Where exposed to view, finish grout edges smooth.

- g. Except where a slope is indicated on Drawings, finish edges flush at the baseplate, bedplate, member, or piece of equipment.
- h. Protect against rapid moisture loss by covering with wet rags or polyethylene sheets.
- i. Wet cure grout for seven days, minimum.

3.4 FIELD QUALITY CONTROL

- A. Owner will employ and pay for services of a concrete testing laboratory to perform testing of concrete placed during construction.
 - 1. Contractor to cooperate with Owner in obtaining and testing samples.
- B. Tests During Construction:
 - 1. Strength test:
 - a. For each strength test, mold and cure cylinders from each sample in accordance with ASTM C31.
 - 1) Cylinder size: Per ASTM C31.
 - a) 4 IN cylinders may not be used for concrete mixes with concrete aggregate size larger than 1 IN.
 - 2) Quantity:
 - a) 6 IN DIA by 12 IN high: Four cylinders.
 - b) 4 IN DIA by 8 IN high: Six cylinders.
 - b. Field cure one (1) cylinder for the seven day test.
 - 1) Laboratory cure the remaining.
 - c. Test cylinders in accordance with ASTM C39.
 - 1) 6 IN DIA cylinders:
 - a) Test two cylinders at 28 days for strength test result and the one field cured sample at seven days for information.
 - b) Hold remaining cylinder in reserve.
 - 2) 4 IN DIA cylinders:
 - a) Test three cylinders at 28 days for strength test result and the one field cured cylinder at seven days for information.
 - b) Hold remaining cylinders in reserve.
 - d. Strength test result:
 - 1) Average of strengths of two 6 IN DIA cylinders or three 4 IN DIA cylinders from the same sample tested at 28 days.
 - 2) If one cylinder in a test manifests evidence of improper sampling, molding, handling, curing, or testing, discard and test reserve cylinder(s); average strength of remaining cylinders shall be considered strength test result.
 - 3) Should all cylinders in any test show any of above defects, discard entire test.
 - e. Frequency of tests:
 - a) One strength test to be taken not less than once a day, nor less than once for each 60 CUYD or fraction thereof placed in any one day.
 - b) Once for each 5000 SQFT of slab or wall surface area placed each day.
 - c) If total volume of concrete on Project is such that frequency of testing required in above paragraph will provide less than five strength tests for each concrete mix, tests shall then be made from at least five randomly selected batches or from each batch if fewer than five batches are provided.
 - 2. Slump test:
 - a. Per ASTM C143.
 - b. Determined for each strength test sample.
 - c. Additional slump tests may be taken.
 - 3. Air content:
 - a. Per ASTM C231, ASTM C173, and ASTM C138.
 - b. Determined for each strength test sample.
 - 4. Temperature: Determined for each strength test sample.

- C. Evaluation of Tests:
 - 1. Strength test results:
 - a. Average of 28-day strength of two cylinders from each sample.
 - 1) If one cylinder manifests evidence of improper sampling, molding, handling, curing or testing, strength of remaining cylinder will be test result.
 - 2) If both cylinders show any of above defects, test will be discarded.
- D. Acceptance of Concrete:
 - 1. Strength level of each type of concrete shall be considered satisfactory if both of the following requirements are met:
 - a. Average of all sets of three consecutive strength tests equals or exceeds the required specified 28-day compressive strength.
 - b. No individual strength test falls below the required specified 28-day compressive strength by more than 500 PSI.
 - 2. If tests fail to indicate satisfactory strength level, perform additional tests and/or corrective measures as directed by Engineer.
 - a. Perform additional tests and/or corrective measures at no additional cost to Owner.
- E. Concrete tolerances per ACI 117.

3.5 SCHEDULES

- A. Form Types:
 - 1. Surfaces exposed to view:
 - a. Prefabricated or job-built wood forms.
 - b. Laid out in a regular and uniform pattern with long dimensions vertical and joints aligned.
 - c. Produce finished surfaces free from offsets, ridges, waves, and concave or convex areas.
 - d. Construct forms sufficiently tight to prevent leakage of mortar.
 - 2. Surfaces normally submerged or not normally exposed to view: Wood or steel forms sufficiently tight to prevent leakage of mortar.
 - 3. Other types of forms may be used:
 - a. For surfaces not restricted to plywood or lined forms.
 - b. As backing for form lining.
- B. Grout:
 - 1. Nonshrinking, nonmetallic grout: General use.
- C. Concrete:
 - 1. Normal weight concrete: all concrete
- D. Concrete Finishes:
 - 1. Slab finishes:
 - a. Use following finishes as applicable, unless otherwise indicated:
 - 1) Broom finish: Sidewalks, docks, concrete stairs, and ramps.

END OF SECTION



DIVISION 31

EARTHWORK



SECTION 31 22 00

SITE GRADING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Earthwork - site excavation, grading, compaction, disposal of waste and surplus materials, construction of berms, dewatering and other Earthwork related work.
- B. Related Specification Sections include but are not necessarily limited to:
 - 1. Division 00 - Procurement and Contracting Requirements.
 - 2. Division 01 - General Requirements.
 - 3. Section 31 25 00 - Soil Erosion and Sediment Control.
 - 4.

1.2 QUALITY ASSURANCE

- A. Referenced Standards:
 - 1. ASTM International (ASTM):
 - a. C33, Standard Specification for Concrete Aggregates.
 - b. D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 FT-LBF/CUFT).
 - c. D1241, Standard Specification for Material for Soil-Aggregate Subbase, Base, and Surface Courses.
 - d. D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 FT-LBF/CUFT (2,700 kN-M/M)).
 - e. D2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
 - f. D3786, Standard Test Method for Bursting Strength of Textile Fabrics--Diaphragm Bursting Strength Tester Method.
 - g. D4253, Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
 - h. D4254, Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
 - i. D4632, Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
 - 2. American Association of State Highway and Transportation Officials (AASHTO)
 - a. M 43, Standard Specification for Sizes of Aggregate for Road and Bridge Construction.
 - b. M 57, Standard Specification for Materials for Embankment and Subgrades.
 - c. M 147, Standard Specification for Materials for Aggregate and Soil-Aggregate Subbase, Base, and Surface Courses.
 - 3. Federal Regulations:
 - a. Occupational Safety and Health Administration (OSHA):
 - 1) 29 CFR Part 1926.650, Occupational Safety and Health Standards, referred to herein as OSHA Standards.

1.3 DEFINITIONS

- A. Excavation:
 - 1. Consists of removal of material encountered to subgrade or rough grade elevations required or indicated.
 - 2. Includes excavation of soils; pavements and other obstructions visible on surface; underground structures, utilities, and other items indicated to be demolished and removed; boulders; and rock.

- B. Geotechnical Engineer: Independent geotechnical specialist providing field quality control for the project.
- C. Non-Structural Fill/Backfill: Soil materials placed and compacted to achieve finish grade elevations that do NOT support foundations, slabs, paving, or other flatwork.
- D. Finish Grade: The earth or soil layer immediately below the surfacing material of the site.
- E. Rough Grade: The earth or soil layer immediately below the finish grade surface.
- F. Subgrade: The earth or soil layer immediately below foundation bearing elevation, subbase material, fill material, backfill material, or topsoil materials.
- G. Unauthorized Excavation:
 - 1. Consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of Engineer.
 - a. Unauthorized excavation, as well as associated remedial work as directed by Engineer or Geotechnical Engineer, shall be at Contractor's expense.
 - 2. Unsuitable Soil Materials: Soil materials encountered at or below subgrade elevation of insufficient strength and stiffness to support construction as determined by the Geotechnical Engineer.

1.4 SUBMITTALS

- A. See Section 01 33 00 for requirements for the mechanics and administration of the submittal process.
- B. Product Data:
 - 1. Acknowledgement that products submitted meet requirements of standards referenced.
 - 2. Manufacturer's installation instructions.
 - 3. Certifications.
- C. Samples:
 - 1. Assist Engineer in collection of samples as requested.

1.5 PROJECT CONDITIONS

- A. Salvageable Items: Carefully remove items to be salvaged, and store on Owner's premises unless otherwise directed.
- B. Dispose of waste materials, legally, off site.
 - 1. Burning, as a means of waste disposal, is not permitted.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Fill:
 - 1. Selected on-site material from site excavation or stockpiles approved by Geotechnical Engineer.
- B. Geotextile Filter Fabric:
 - 1. Nonwoven type. 8 OZ/SQYD.

PART 3 - EXECUTION

3.1 PROTECTION

- A. Erosion Control:
 - 1. See Specification Section 31 25 00.
 - 2. Clean paved roadways daily of any spillage of dirt, rocks or debris from vehicles and equipment entering or leaving site.

3. Conduct work to minimize erosion of site. Remove eroded material washed off site.
 - a. If necessary or requested by Engineer, construct stilling areas to settle and detain eroded material.
- B. Protect existing surface and subsurface features on-site and adjacent to site as follows:
 1. Provide barricades, coverings, or other types of protection necessary to prevent damage to existing items indicated to remain in place.
 2. Protect and maintain bench marks, monuments or other established reference points and property corners.
 - a. If disturbed or destroyed, replace at own expense to full satisfaction of Owner and controlling agency.
 3. Maintain free of damage, existing sidewalks, structures, and pavement, not indicated to be removed.
 - a. Protect new and existing structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
 - b. Any item known or unknown or not properly located that is inadvertently damaged shall be repaired to original condition.
 - c. All repairs to be made and paid for by Contractor.
 4. Provide full access to public and private premises, fire hydrants, street crossings, sidewalks and other points as designated by Owner to prevent serious interruption of travel.
 5. Maintain stockpiles and excavations in such a manner to prevent inconvenience or damage to structures on-site or on adjoining property.
 6. Avoid surcharge or excavation procedures which can result in heaving, caving, or slides.

3.2 SITE EXCAVATION AND GRADING

- A. The site excavation and grading work includes the onsite disposition of all material:
 1. That exceed quantities required for earthwork on the project.
 2. That the Geotechnical engineer classifies as unclassified excavation.
 3. That the Geotechnical engineer classifies as unacceptable.
 4. That the Geotechnical engineer classifies as potentially contaminated.
- B. Excavation and Grading:
 1. Contract Drawings may indicate both existing grade and finished grade required for construction of Project.
 - a. Stake all units, structures, piping, roads, parking areas and walks and establish their elevations.
 - b. Perform other layout work required.
 - c. Replace property corner markers to original location if disturbed or destroyed.
 2. Preparation of ground surface for embankments or fills:
 - a. Before fill is started, scarify to a minimum depth of 6 IN in all proposed embankment and fill areas.
 - b. Where ground surface is steeper than one vertical to four horizontal, plow surface in a manner to bench and break up surface so that fill material will bind with existing surface.
 3. Protection of finish grade:
 - a. During construction, shape and drain embankment and excavations.
 - b. Maintain ditches and drains to provide drainage at all times.
 - c. Protect graded areas against action of elements prior to acceptance of work.
 - d. Reestablish grade where settlement or erosion occurs.
- C. Borrow:
 1. Provide necessary amount of approved fill compacted to density equal to that indicated in this Specification.
 2. Include cost of all borrow material in original proposal.
 3. Fill material to be approved by Geotechnical Engineer prior to placement.

- D. Construct embankments and fills as required by the Contract Drawings:
 - 1. Construct embankments and fills at locations and to lines of grade indicated.
 - a. Completed fill shall correspond to shape of typical cross section or contour indicated regardless of method used to show shape, size, and extent of line and grade of completed work.
 - 2. Provide approved fill material which is free from roots, organic matter, trash, frozen material, and stones having maximum dimension greater than 6 IN.
 - a. Ensure that stones larger than 4 IN are not placed in upper 6 IN of fill or embankment.
 - b. Do not place material in layers greater than 8 IN loose thickness.
 - c. Place layers horizontally and compact each layer prior to placing additional fill.
 - 3. Compact soils as required to obtain specified density. Selection of appropriate equipment is the Contractor's responsibility.
 - a. In general, compact cohesive soils by sheepsfoot, and granular soils by pneumatic rollers, vibrators, or by other equipment as required to obtain specified density.
 - b. Control moisture for each layer necessary to meet requirements of compaction.
- E. Grading Tolerances: ± 0.1 IN except for top of clay liner where tolerance is $+0.1$ IN.

3.3 USE OF EXPLOSIVES

- A. Blasting with any type of explosive is prohibited.

3.4 COMPACTION DENSITY REQUIREMENTS

- A. Obtain approval from Geotechnical Engineer with regard to suitability of soils and acceptable subgrade prior to subsequent operations.
- B. Remove frozen, loose, wet, or soft material and replace with approved material as directed by Geotechnical Engineer.
- C. Stabilize subgrade with well graded granular materials as directed by Geotechnical Engineer.
- D. Assure by results of testing that compaction densities comply with the requirements as described in the CQA Plan.

3.5 FIELD QUALITY CONTROL

- A. All excavation, trenching, and related sheeting, bracing, etc. shall comply with the requirements of OSHA standards 29 CFR Part 1926.650 Subpart P, and state requirements. Where conflict between OSHA and state regulations exists, the more stringent requirements shall apply.
- B. Responsibilities of Testing Agency for Site Excavation and Grading:
 - 1. All testing, observation and work indicated as being performed by the Geotechnical Engineer in other than Article 3.5 of this Specification Section.
 - 2. Services will include verification and documentation of satisfactory soil materials, subgrade quality, sampling, placement, moisture conditioning, compaction and testing of proposed soil materials, and field testing for quality control.
 - 3. Moisture density relations, to be established by the Geotechnical Engineer required for all materials to be compacted.
 - 4. Extent of compaction testing will be as necessary to assure compliance with specifications.

END OF SECTION

SECTION 31 23 00 EARTHWORK

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Earthwork - excavation, backfilling, grading, compaction, disposal of waste and surplus materials, placing crushed stone, construction of berms, sheeting, bracing, dewatering and other Earthwork related work.
- B. Related Specification Sections include but are not necessarily limited to:
 - 1. Division 00 - Procurement and Contracting Requirements.
 - 2. Division 01 - General Requirements.
 - 3.
 - 4. Section 31 25 00 - Soil Erosion and Sediment Control.

1.2 QUALITY ASSURANCE

- A. Referenced Standards:
 - 1. ASTM International (ASTM):
 - a. C33/C33M, Standard Specification for Concrete Aggregates.
 - b. D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 FT-LBF/FT³).
 - c. D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 FT-LBF/FT³(2,700 kN-M/M³)).
 - d. D2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
 - e. D3786, Standard Test Method for Bursting Strength of Textile Fabrics--Diaphragm Bursting Strength Tester Method.
 - f. D4253, Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
 - g. D4254, Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
 - h. D4632, Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
 - 2. Occupational Safety and Health Administration (OSHA):
 - a. 29 CFR Part 1926.650, Safety and Health Regulations for Construction - Excavations, referred to herein as OSHA Standards.

1.3 DEFINITIONS

- A. Excavation:
 - 1. Consists of removal of material encountered to subgrade elevations required or indicated.
 - 2. Includes excavation of soils; pavements and other obstructions visible on surface; underground structures, utilities, and other items indicated to be demolished and removed; boulders; and rock.
- B. Foundations: Footings, base slabs, foundation walls, mat foundations, grade beams, piers and any other support placed directly on soil or rock.
- C. Geotechnical Engineer: Independent geotechnical specialist providing field quality control for the project.
- D. Non-Structural Fill/Backfill: Soil materials placed and compacted to achieve finish grade elevations that do NOT support foundations, slabs, paving, or other flatwork.

- E. Structure: Buildings, foundations, slabs, tanks, curbs, or other man-made stationary features occurring above or below ground surface.
- F. Subgrade: The earth or soil layer immediately below foundation bearing elevation, subbase material, fill material, backfill material, or topsoil materials.
- G. Unauthorized Excavation:
 - 1. Consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of Engineer.
 - a. Unauthorized excavation, as well as associated remedial work as directed by Engineer or Geotechnical Engineer, shall be at Contractor's expense.
 - 2. Unsuitable Soil Materials: Soil materials encountered at or below subgrade elevation of insufficient strength and stiffness to support construction as determined by the Geotechnical Engineer.

1.4 SUBMITTALS

- A. Shop Drawings:
 - 1. See Specification Section 01 33 00 for requirements for the mechanics and administration of the submittal process.
 - 2. Product technical data including:
 - a. Acknowledgement that products submitted meet requirements of standards referenced.
 - b. Manufacturer's installation instructions.
 - 3. Certifications.
- B. Samples:
 - 1. Coordinate samples and testing for approval of materials with the Geotechnical Engineer.
 - 2. Test reports.

1.5 PROJECT CONDITIONS

- A. Salvageable Items: Carefully remove items to be salvaged, and store on Owner's premises unless otherwise directed.
- B. Dispose of waste materials, legally, off site.
 - 1. Burning, as a means of waste disposal, is not permitted.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Fill and Backfill:
 - 1. Selected material approved by Geotechnical Engineer from stockpiles and site borrow.
 - a. Material to be approved by engineer for structural fill, non structural fill, and clay liner material use.
 - b. Materials must meet requirements specified in the CQA Plan.
- B. Granular Fill Under Building Floor Slabs-On-Grade and footings:
 - 1. Clean, granular material.
 - 2. Less than 5 PCT fines passing the No. 200 sieve.
 - 3. ASTM C33/C33M gradation size No. 67, 3/4 IN to No. 4 or other material acceptable to Geotechnical Engineer.
- C. Geotextile Filter Fabric:
 - 1. Nonwoven type. 8 OZ.

PART 3 - EXECUTION

3.1 PROTECTION

- A. Erosion Control:
 - 1. See Specification Section 31 25 00.
 - 2. Clean paved roadways daily of any spillage of dirt, rocks or debris from vehicles and equipment entering or leaving site.
 - 3. Conduct work to minimize erosion of site. Remove eroded material washed off site.
 - a. If necessary or requested by Engineer, construct stilling areas to settle and detain eroded material.
- B. Protect existing surface and subsurface features on-site and adjacent to site as follows:
 - 1. Provide barricades, coverings, or other types of protection necessary to prevent damage to existing items indicated to remain in place.
 - 2. Protect and maintain bench marks, monuments or other established reference points and property corners.
 - a. If disturbed or destroyed, replace at own expense to full satisfaction of Owner and controlling agency.
 - 3. Verify location of utilities.
 - a. Omission or inclusion of utility items does not constitute nonexistence or definite location.
 - b. Secure and examine local utility records for location data.
 - c. Take necessary precautions to protect existing utilities from damage due to any construction activity.
 - 1) If utilities are indicated to remain in place, provide adequate means of support and protection during earthwork operations.
 - 2) Do not interrupt existing utilities serving facilities occupied by Owner or others, during occupied hours, except when permitted in writing by Owner and then only after acceptable temporary utility services have been provided.
 - 3) Obtain Owner's approval prior to disconnecting any utility service.
 - d. Repair damages to utility items at own expense.
 - e. In case of damage, notify Engineer at once so required protective measures may be taken.
 - 4. Maintain free of damage, existing sidewalks, structures, and pavement, not indicated to be removed.
 - a. Protect new and existing structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
 - b. Any item known or unknown or not properly located that is inadvertently damaged shall be repaired to original condition.
 - c. All repairs to be made and paid for by Contractor.
 - 5. Provide full access to public and private premises, fire hydrants, street crossings, sidewalks and other points as designated by Owner to prevent serious interruption of travel.
 - 6. Maintain stockpiles and excavations in such a manner to prevent inconvenience or damage to structures on-site or on adjoining property.
 - 7. Avoid surcharge or excavation procedures which can result in heaving, caving, or slides.

3.2 SITE EXCAVATION AND GRADING

- A. The site excavation and grading work includes the onsite disposition of all material:
 - 1. That exceed quantities required for earthwork on the project.
 - 2. That the Geotechnical engineer classifies as unclassified excavation.
 - 3. That the Geotechnical engineer classifies as unacceptable.
 - 4. That the Geotechnical engineer classifies as potentially contaminated.

- B. Excavation and Grading:
 - 1. Perform as required by the Contract Drawings.
 - 2. Contract Drawings may indicate both existing grade and finished grade required for construction of Project.
 - a. Stake all units, structures, piping, roads, parking areas and walks and establish their elevations.
 - b. Perform other layout work required.
 - c. Replace property corner markers to original location if disturbed or destroyed.
 - 3. Preparation of ground surface for embankments or fills:
 - a. Before fill is started, scarify to a minimum depth of 6 IN in all proposed embankment and fill areas.
 - b. Where ground surface is steeper than one vertical to four horizontal, plow surface in a manner to bench and break up surface so that fill material will bind with existing surface.
 - 4. Protection of finish grade:
 - a. During construction, shape and drain embankment and excavations.
 - b. Maintain ditches and drains to provide drainage at all times.
 - c. Protect graded areas against action of elements prior to acceptance of work.
 - d. Reestablish grade where settlement or erosion occurs.
- C. Borrow:
 - 1. Provide necessary amount of approved fill compacted to density equal to that indicated in this Specification.
 - 2. Include cost of all borrow material in original proposal.
 - 3. Fill material to be approved by Geotechnical Engineer prior to placement.
- D. Construct embankments and fills as required by the Contract Drawings:
 - 1. Construct embankments and fills at locations and to lines of grade indicated.
 - a. Completed fill shall correspond to shape of typical cross section or contour indicated regardless of method used to show shape, size, and extent of line and grade of completed work.
 - 2. Provide approved fill material which is free from roots, organic matter, trash, frozen material, and stones having maximum dimension greater than 6 IN.
 - a. Ensure that stones larger than 4 IN are not placed in upper 6 IN of fill or embankment.
 - b. Do not place material in layers greater than 8 IN loose thickness.
 - c. Place layers horizontally and compact each layer prior to placing additional fill.
 - 3. Compact soils as required to obtain specified density. Selection of appropriate equipment is the Contractor's responsibility.
 - a. In general, compact cohesive soils by sheepsfoot, and granular soils by pneumatic rollers, vibrators, or by other equipment as required to obtain specified density.
 - b. Control moisture for each layer necessary to meet requirements of compaction.
- E. Grading Tolerances: 0.1 ±IN except for top of clay grades where tolerance will be +0.1-IN.

3.3 USE OF EXPLOSIVES

- A. Blasting with any type of explosive is prohibited.

3.4 COMPACTION DENSITY REQUIREMENTS

- A. Obtain approval from Geotechnical Engineer with regard to suitability of soils and acceptable subgrade prior to subsequent operations.
- B. Provide dewatering system necessary to successfully complete compaction and construction requirements.
- C. Remove frozen, loose, wet, or soft material and replace with approved material as directed by Geotechnical Engineer.
- D. Stabilize subgrade with well graded granular materials as directed by Geotechnical Engineer.

- E. Assure by results of testing that compaction densities comply with the requirements as outlined in the CQA Plan. Compacted material is required for structural fill, clay liner, and fill around structures and under concrete, and in the anchor trench backfill.

3.5 EXCAVATION, FILLING, AND BACKFILLING FOR STRUCTURES

A. General:

- 1. In general, work includes, but is not necessarily limited to, excavation for structures and retaining walls, removal of underground obstructions and undesirable material, backfilling, filling, and fill, backfill, and subgrade compaction.
- 2. Obtain fill and backfill material necessary to produce grades required.
 - a. Materials and source to be approved by Geotechnical Engineer.
 - b. Excavated material approved by Geotechnical Engineer may also be used for fill and backfill.
- 3. In the paragraphs of this Specification Section, the word "soil" also includes any type of rock subgrade that may be present at or below existing subgrade levels.

B. Excavation Requirements for Structures:

- 1. General:
 - a. Do not commence excavation for foundations for structures until Geotechnical Engineer approves:
 - 1) The removal of topsoil and other unsuitable and undesirable material from existing subgrade.
 - 2) Density and moisture content of site area compacted fill material meets requirements of specifications.
 - 3) Site surcharge or mass fill material can be removed from entire construction site or portion thereof.
 - 4) Surcharge or mass fill material has been removed from construction area or portions thereof.
 - b. Engineer grants approval to begin excavations.
- 2. Dimensions:
 - a. Excavate to elevations and dimensions indicated or specified.
 - b. Allow additional space as required for construction operations and inspection of foundations.
 - c. Slope sides of excavations to comply with local codes, ordinances, and requirements of agencies having jurisdiction.
 - d. Maintain sides and slopes of excavations in safe condition until completion of backfilling.
- 3. Removal of obstructions and undesirable materials in excavation includes, but is not necessarily limited to, removal of old foundations, existing construction, unsuitable subgrade soils, expansive type soils, and any other materials which may be concealed beneath present grade, as required to execute work indicated on Contract Drawings.
 - a. If undesirable material and obstructions are encountered during excavation, remove material and replace as directed by Geotechnical Engineer.
 - b. Remove unsuitable subgrade soils located below foundations. The bottom of the overexcavation shall be located outside the exterior limits of foundations around the perimeter of structure the following horizontal distance, whichever is greater:
 - 1) Distance equal to depth of overexcavation below bottom of foundations.
 - 2) 5- FT.
 - 3) As directed by Geotechnical Engineer.
 - c. When excavation has reached required subgrade elevations, notify Geotechnical Engineer, who will make an inspection of conditions.
 - 1) If Geotechnical Engineer determines that bearing materials at required subgrade elevations are unsuitable, provide Subgrade Stabilization as specified herein.
- 4. Install working surface over approved subgrade.
 - a. Minimum thickness: 6-inches.

5. Level off bottoms of excavations to receive foundations, floor slabs, equipment support pads, or compacted fill.
 - a. Remove loose materials and bring excavations into approved condition to receive concrete or fill material.
 - b. Where compacted fill material must be placed to bring subgrade elevation up to underside of construction, scarify existing subgrade upon which fill material is to be placed to a depth of 6 IN and then compact to density stated in this Specification Section before fill material can be placed thereon.
 - c. Do not carry excavations lower than shown for foundations except as directed by Geotechnical Engineer or Engineer.
 - d. If any part of excavations is carried below required depth without authorization, notify Engineer and correct unauthorized excavation as directed. Corrections may include:
 - 1) Under soil supported footings, foundation bases, or retaining walls, fill unauthorized excavation by extending indicated bottom elevation of footing or base to excavation bottom, without altering required top elevation.
 - a) Concrete fill may be used to bring elevations to proper position.
 - 2) In locations other than those above, including slabs on grade and pile supported foundations, backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed by Geotechnical Engineer.
 - 3) No extra compensation will be made to Contractor for correcting unauthorized excavations.
6. Make excavations large enough for working space, forms, dampproofing, waterproofing, and inspection.
7. Notify Geotechnical Engineer and Engineer as soon as excavation is completed in order that subgrades may be inspected.
 - a. Do not commence further construction until subgrade under compacted fill material, under foundations, under floor slabs-on-grade, under equipment support pads, and under retaining wall footings has been inspected and approved by the Geotechnical Engineer as being free of undesirable material, being of compaction density required by this specification, and being capable of supporting the allowable foundation design bearing pressures and superimposed foundation, fill, and building loads to be placed thereon.
 - b. Geotechnical Engineer shall be given the opportunity to inspect subgrade below fill material both prior to and after subgrade compaction.
 - c. Place fill material, foundations, retaining wall footings, floor slabs-on-grade, and equipment support pads as soon as weather conditions permit after excavation is completed, inspected, and approved and after forms and reinforcing are inspected and approved.
 - d. Before concrete or fill material is placed, protect approved subgrade from becoming loose, wet, frozen, or soft due to weather, construction operations, or other reasons.
8. Dewatering:
 - a. Where groundwater is or is expected to be encountered during excavation, install a dewatering system to prevent softening and disturbance of subgrade below foundations and fill material, to allow foundations and fill material to be placed in the dry, and to maintain a stable excavation side slope.
 - b. Groundwater shall be maintained at least 3 FT below the bottom of any excavation.
 - c. Review Geotechnical investigation before beginning excavation and determine where groundwater is likely to be encountered during excavation.
 - d. Employ dewatering specialist for selecting and operating dewatering system.
 - e. Keep dewatering system in operation until dead load of structure exceeds possible buoyant uplift force on structure.
 - f. Dispose of groundwater to an area which will not interfere with construction operations or damage existing construction.
 - 1) Install groundwater monitoring wells as necessary.

- g. Shut off dewatering system at such a rate to prevent a quick upsurge of water that might weaken the subgrade.
9. Subgrade stabilization:
- a. If subgrade under foundations, fill material, floor slabs-on-grade, or equipment support pads is in a frozen, loose, wet, or soft condition before construction is placed thereon, remove frozen, loose, wet, or soft material and replace with approved compacted material as directed by Geotechnical Engineer.
 - b. Provide compaction density of replacement material as stated in this Specification Section.
 - c. Loose, wet, or soft materials, when approved by Geotechnical Engineer, may be stabilized by a compacted working mat of well graded crushed stone.
 - d. Compact stone mat thoroughly into subgrade to avoid future migration of fines into the stone voids.
 - e. Remove and replace frozen materials as directed by Geotechnical Engineer.
 - f. Method of stabilization shall be performed as directed by Geotechnical Engineer.
 - g. Do not place further construction on the repaired subgrades, until the subgrades have been approved by the Geotechnical Engineer.
10. Do not place floor slabs-on-grade including equipment support pads until subgrade below has been approved, piping has been tested and approved, reinforcement placement has been approved, and Contractor receives approval to commence slab construction.
- a. Do not place building floor slabs-on-grade including equipment support pads when temperature of air surrounding the slab and pads is or is expected to be below 40 DEGF before structure is completed and heated to a temperature of at least 50 DEGF.
11. Protection of structures:
- a. Prevent new and existing structures from becoming damaged due to construction operations or other reasons.
 - b. Prevent subgrade under new and existing foundations from becoming wet and undermined during construction due to presence of surface or subsurface water or due to construction operations.
12. Shoring:
- a. Shore, slope, or brace excavations as required to prevent them from collapsing.
 - b. Remove shoring as backfilling progresses but only when banks are stable and safe from caving or collapse.
 - c. Construct shoring that is required to retain water as part of the dewatering system, using non-permeable details such as interlock sealant for sheet piles.
13. Drainage:
- a. Control grading around structures so that ground is pitched to prevent water from running into excavated areas or damaging structures.
 - b. Maintain excavations where foundations, floor slabs, equipment support pads or fill material are to be placed free of water.
 - c. Provide pumping required to keep excavated spaces clear of water during construction.
 - d. Should any water be encountered in the excavation, notify Engineer and Geotechnical Engineer.
 - e. Provide free discharge of water by trenches, pumps, wells, well points, or other means as necessary and drain to point of disposal that will not damage existing or new construction or interfere with construction operations.
14. Frost protection:
- a. Do not place foundations, slabs-on-grade, equipment support pads, or fill material on frozen ground.
 - b. When freezing temperatures may be expected, do not excavate to full depth indicated, unless foundations, floor slabs, equipment support pads, or fill material can be placed immediately after excavation has been completed and approved.
 - c. Protect excavation from frost if placing of concrete or fill is delayed.

- d. Where a concrete slab is a base slab-on-grade located under and within a structure that will not be heated, protect subgrade under the slab from becoming frozen until final acceptance of the Project by the Owner.
 - e. Protect subgrade under foundations of a structure from becoming frozen until structure is completed and heated to a temperature of at least 50 DEGF.
- C. Fill and Backfill Inside of Structure and Below Foundations, Base Slabs, Floor Slabs, Equipment Support Pads and Piping:
- 1. General:
 - a. Subgrade to receive fill or backfill shall be free of undesirable material as determined by Geotechnical Engineer and scarified to a depth of 6 IN and compacted to density specified herein.
 - b. Surface may be stepped by at not more than 12 IN per step or may be sloped at not more than 2 PCT.
 - c. Do not place any fill or backfill material until subgrade under fill or backfill has been inspected and approved by Geotechnical Engineer as being free of undesirable material and compacted to specified density.
 - 2. Obtain approval of fill and backfill material and source from Geotechnical Engineer prior to placing the material.
 - 3. Granular fill under floor slabs-on-grade: Place all floor slabs-on-grade on a minimum of 6 IN of granular fill unless otherwise indicated.
 - 4. Vapor barrier: Install a continuous vapor barrier under floor slabs-on-grade as applicable.
 - 5. Fill and backfill placement:
 - a. Prior to placing fill and backfill material, optimum moisture and maximum density properties for proposed material shall be obtained from Geotechnical Engineer.
 - b. Place fill and backfill material in 6 IN lifts.
 - c. Compact material by means of equipment of sufficient size and proper type to obtain specified density.
 - d. Use hand operated equipment for filling and backfilling within 5 FT of walls and less than 3 FT above pipes.
 - 1) Compaction equipment exceeding 3000 LBS dead weight shall not be used within 5 FT of the wall as a minimum
 - 2) Contractor is responsible for method of compaction so as not to damage wall.
 - e. Use hand operated equipment for filling and backfilling next to walls.
 - f. Do not place fill and backfill when the temperature is less than 40 DEGF and when subgrade to receive fill and backfill material is frozen, wet, loose, or soft.
 - g. Use vibratory equipment to compact granular material; do not use water.
 - 6. Where fill material is required below foundations, place fill material, conforming to the required density and moisture content as required to fill the specified overexcavation to bottom of foundation.
- D. Filling and Backfilling Outside of Structures:
- 1. This paragraph of this Specification applies to fill and backfill placed outside of structures above bottom level of both foundations and piping but not under paving.
 - 2. Provide material as approved by Geotechnical Engineer for filling and backfilling outside of structures.
 - 3. Fill and backfill placement:
 - a. Prior to placing fill and backfill material, obtain optimum moisture and maximum density properties for proposed material from Geotechnical Engineer.
 - b. Place fill and backfill material to maximum allowable lift thickness indicated in Paragraph 3.5, C, 5, b of this Section.
 - c. Compact material with equipment of proper type and size to obtain density specified.
 - d. Use hand operated equipment for filling and backfilling within 5 FT of walls and less than 3 FT above pipes.
 - 1) Compaction equipment exceeding 3000 LBS dead weight shall not be used within 5 FT of the wall as a minimum

- 2) Contractor is responsible for method of compaction so as not to damage wall.
- e. Use only hand operated equipment for filling and backfilling next to walls and retaining walls.
- f. Do not place fill or backfill material when temperature is less than 40 DEGF and when subgrade to receive material is frozen, wet, loose, or soft.
- g. Use vibratory equipment for compacting granular material; do not use water.
- 4. Backfilling against walls:
 - a. Do not backfill around any part of structures until each part has reached specified 28-day compressive strength and backfill material has been approved.
 - b. Do not start backfilling until concrete forms have been removed, trash removed from excavations, pointing of masonry work, concrete finishing, dampproofing and waterproofing have been completed.
 - c. Do not place fills against walls until floor slabs at top, bottom, and at intermediate levels of walls are in place and have reached 28-day required compressive strength to prevent wall movement.
 - 1) See Contract Drawings for specific exceptions.
 - d. Bring backfill and fill up uniformly around the structures and individual walls, piers, or columns.
- E. Backfilling Outside of Structures Under Piping or Paving:
 - 1. When backfilling outside of structures requires placing backfill material under piping or paving, the material shall be placed from bottom of excavation to underside of piping or paving at the density required for fill under piping or paving as indicated in this Specification Section.
 - 2. This compacted material shall extend transversely to the centerline of piping or paving a horizontal distance each side of the exterior edges of piping or paving equal to the depth of backfill measured from bottom of excavation to underside of piping or paving.
 - 3. Provide special compacted bedding or compacted subgrade material under piping or paving as required by other Specification Sections for the Project.

3.6 FIELD QUALITY CONTROL

- A. All excavation, trenching, and related sheeting, bracing, etc. shall comply with the requirements of OSHA Standards, and state requirements. Where conflict between OSHA and state regulations exists, the more stringent requirements shall apply.
- B. All earthwork to be completed in accordance with the CQA Plan. Contractor to assist Engineer in collection of samples and coordinate schedule to accommodate testing.
- C. Responsibilities of Testing Agency for Site Excavation and Grading:
 - 1. All testing, observation and work indicated as being performed by the Geotechnical Engineer in other than Article 3.5 of this Specification Section.
 - 2. Services will include verification and documentation of satisfactory soil materials, subgrade quality, sampling, placement, moisture conditioning, compaction and testing of proposed soil materials, and field testing for quality control.
 - 3. Moisture density relations, to be established by the Geotechnical Engineer required for all materials to be compacted.
 - 4. Extent of compaction testing will be as necessary to assure compliance with specifications.

END OF SECTION

SECTION 31 25 00
SOIL EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Soil erosion and sediment control.
- B. Related Specification Sections include but are not necessarily limited to:
 - 1. Division 00 - Procurement and Contracting Requirements.
 - 2. Division 01 - General Requirements.

1.2 QUALITY ASSURANCE

- A. Referenced Standards:
 - 1. Erosion control standards: Standards and Specifications for Soil Erosion and Sediment Control in Developing Areas by the United States Department of Agriculture (USDA), Soil Conservation Service, College Park, Maryland.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Straw bales, twine tied.
- B. Pipe Riser and Barrel: 16 GA corrugated metal pipe (CMP) of size indicated.
- C. Stone for Stone Filter: 2 IN graded gravel or crushed stone.
- D. Grass Seed: Annual ryegrass.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prior to General Stripping Topsoil and Excavating:
 - 1. Install perimeter dikes and swales.
 - 2. Excavate and shape sediment basins and traps.
 - 3. Construct pipe spillways and install stone filter where required.
 - 4. Machine compact all berms, dikes and embankments for basins and traps.
 - 5. Install straw bales where indicated.
 - a. Provide two stakes per bale.
 - b. First stake angled toward previously installed bale to keep ends tight against each other.
- B. Construct sediment traps where indicated on Drawings during rough grading as grading progresses.
 - 1. Seeding, fertilizing, and topsoil to be completed by Owner.

3.2 DURING CONSTRUCTION PERIOD

- A. Maintain Basins, Dikes, Traps, Stone Filters, Straw Bales, etc.:
 - 1. Inspect regularly especially after rainstorms.
 - 2. Repair or replace damaged or missing items.
- B. Grade to drain and maintain positive drainage with no ponding on any project areas outside the pond.

- C. Construct inlets as soon as possible.
 - 1. Excavate and tightly secure straw bales completely around inlets as detailed on Drawings.
- D. Provide necessary swales and dikes to direct all water towards and into sediment basins and traps.
- E. Do not disturb existing vegetation (grass and trees).
- F. Excavate sediment out of basins and traps when capacity has been reduced by 50 PCT.
 - 1. Remove sediment from behind bales to prevent overtopping.

3.3 NEAR COMPLETION OF CONSTRUCTION

- A. Eliminate basins, dikes, traps, etc.
- B. Grade to finished or existing grades.
- C. Fine grade all remaining earth areas.

END OF SECTION

SECTION 31 37 00
STONE REVETMENT (RIP RAP)

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Stone revetment (riprap) for protection of slopes and drainage ways against erosion.
 - a. Channel protection.
 - b. Embankment protection.
 - c. Bridge abutments.
 - d. Culvert outlets.
 - e. Hydraulic structures.
- B. Related Specification Sections include but are not necessarily limited to:
 - 1. Division 00 - Procurement and Contracting Requirements.
 - 2. Division 01 - General Requirements.
 - 3. Section 31 23 00 - Earthwork.
 - 4. Section 31 25 00 - Soil Erosion and Sediment Control.
 - 5.

1.2 QUALITY ASSURANCE

- A. Referenced Standards:
 - 1. ASTM International (ASTM):
 - a. C127, Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate.
 - b. D3744/D3744M, Standard Test Method for Aggregate Durability Index.
 - c. D5312/D5312M, Standard Test Method for Evaluation of Durability of Rock for Erosion Control Under Freezing and Thawing Conditions.
 - d. D5313/D5313M, Standard Test Method for Evaluation of Durability of Rock for Erosion Control Under Wetting and Drying Conditions.
 - e. D5519, Standard Test Methods for Particle Size Analysis of Natural and Man-Made Riprap Materials.

1.3 SUBMITTALS

- A. Shop Drawings:
 - 1. See Specification Section 01 33 00 for requirements for the mechanics and administration of the submittal process.
 - 2. Product technical data including:
 - a. Acknowledgement that products submitted meet requirements of standards referenced.
 - 3. Certifications.
 - 4. Test reports.
 - 5. Submit all tests and certification in a single coordinated submittal.
 - a. Partial submittals will not be accepted.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Riprap shall be made up of durable angular quarry stone.
- B. Individual stones making up the riprap shall be resistant to weathering and shall not contain cracks, non-mineralized defects, shale, unsound sandstone, or organic material.

- C. Neither the width nor thickness of any stone shall be less than one-third of the stone's length.
- D. Gradation of the material: per plan drawings.

2.2 MATERIAL QUALITY CONTROL

- A. Geotextile:
 - 1. 8 OZ non-woven.
- B. Riprap:
 - 1. Riprap material quality shall be evaluated using one of the following two methods:
 - a. Specific rock properties:
 - 1) Quarry rock tests completed on rock that is representative of the material to be used on the project may be submitted for review if the testing was completed by a reputable testing company for State or Federal agency certification purposes within the last five years. The material testing requirements are as follows:
 - a) Minimum Specific Gravity 2.5 per (ASTM C127).
 - b) Durability Absorption Ratio less than 10 fails, greater than 23 passes, between 10 and 23 passes only if the Durability Index is greater than 52.
 - (1) Durability Absorption Ratio = Durability Index / (PCT Absorption+1), Durability Index test ASTM D3744, Absorption test ASTM C127
 - c) Maximum of 1 PCT loss due to Wetting and Drying test ASTM D5313/D5313M.
 - d) Maximum of 5 PCT loss due to Freeze Thaw test ASTM D5312/D5312M.
 - b. Ability of rock to perform.
 - 1) The Contractor may propose to use material from a source that has a documented track record of acceptable performance for comparable applications and exposure conditions. If requesting approval of materials using this method, provide the following information for the Engineer to review to determine if the riprap is of acceptable quality:
 - a) As-built plans for a project where riprap has been in place a minimum of 20 years.
 - b) Documentation of the riprap material source.
 - c) Installation performance data.
 - d) Available material testing data.
 - e) Maintenance records for the riprap installation.
 - f) Recent photos of riprap installation.
 - g) Contact information for the Owner of the project.
 - 2) The Engineer shall review the provided information to determine whether the in place material was subjected to conditions expected for the project and if the rock performed satisfactorily as determined by the Owner and Engineer.
 - 3) A minimum of two months shall be allowed after the information has been submitted by the Contractor for review of data with the Owner, a site visit, and material determination.

PART 3 - EXECUTION

3.1 MATERIAL ACCEPTANCE

- A. Final acceptance is determined at the in-place riprap installation which shall consist of a homogenous mass with a distribution of rock sizes that meets the specified gradation. Riprap transport, handling, and placement methods shall not cause breakage of individual rocks or segregation of riprap gradation.
- B. Rock quality shall be determined at the quarry. Stone with a coloration or appearance dissimilar to the accepted material shall be rejected.
- C. A representative gradation sample shall be located adjacent to the stockpile locations at both the quarry and project stockpile area for the duration of the project.

- D. Arriving loads of material not bearing reasonable similarity to the representative gradation sample shall be rejected. The Contractor may arrange for gradation measurements of rejected loads at the project site. If the analysis proves the rejected stone meets the project requirements, then the Contractor shall be reimbursed for the gradation measurements.
- E. The representative gradation sample must be of adequate size to demonstrate compliance with the specified gradation. The Contractor may use test Method A or B as defined in ASTM D5519 to determine the gradation. The minimum sample size shall be 20 times the largest individual stone of the gradation, unless a smaller sample size is approved by the Engineer.
- F. The gradation test shall be performed by the Contractor or qualified geotechnical testing company, with the Engineer present, for each class of installed riprap and repeated for every 50,000 tons of placed material. If the gradation of installed riprap is questioned, then the Engineer may use ASTM D5519 Test Method D to determine if the installed material meets the specification.
- G. The riprap gradation shall be produced at the quarry and shall not be accomplished by mixing at the project site.
- H. The representative gradation sample may be incorporated into the project during final placement upon notification and approval by the Engineer.

3.2 PREPARATION

- A. Submit a construction plan for review and approval by the engineer prior to starting grading. The construction plan must demonstrate knowledge of site constraints, design requirements, and permitting restrictions. The following components are required at a minimum:
 1. Staging area layout with adequate area for stockpile area.
 2. Ground preparation for the staging and stockpile area.
 3. Location of worksite stockpile area and acceptance areas.
 4. Erosion and sediment control measures.
 5. Description of work.
 6. Haul pattern.
 7. Schedule.
 8. Description of restoration plan to preconstruction conditions for staging area, stockpile area, and work site.

3.3 STOCKPILE AREAS

- A. Riprap stockpiles shall be a maximum of 12 FT high and placed so rock does not roll down the slope. The stockpile areas shall have a compacted surface with a minimum 6 IN thick sand-clay-gravel or crushed stone pad to provide for storage of riprap without fines being introduced to the riprap gradation. Any riprap or stone which has become contaminated with topsoil, fines, or debris shall not be used unless the contaminating material has been removed from the riprap prior to placement at no additional cost the Owner.

3.4 PLACEMENT

- A. Provide at least 24 HR notice for the Engineer to review the work in the field including the subgrade, geotextile fabric, and aggregate bedding. Do not place any geotextile fabric, aggregate bedding, or stone material on prepared base prior to the Engineer's review by Engineer. Placement of bedding, fabric, or riprap on ice or snow is not permitted.
- B. Subgrade:
 1. Compact fill areas to density specified for backfill in accordance with Specification Section 31 23 00 - Earthwork.
 2. Grade subgrade to elevations indicated in the plans within plus or minus 0.1 FT in dry areas and ± 0.3 FT in areas that are underwater and do not require dewatering for construction.
 3. The subgrade shall be smooth and free of topsoil, organic material, roots, sticks, debris, yielding material or other materials that would prevent meeting the specified subgrade elevation tolerance.

4. The Contractor, at no additional cost to the Owner, may decide to not grade the subgrade to the specified tolerance and increase the riprap layer thickness. The lack of subgrade preparation shall not result in a decreased riprap layer thickness or change in the top of riprap elevation unless the change is requested in writing and approved in writing by the Engineer.
- C. Geotextile Fabric:
1. Place geotextile fabric only after inspection of subgrade by Engineer.
 2. Place geotextile fabric in accordance with manufacturer specifications.
 3. The ends of the geotextile fabric shall be buried and the placement sequence shall result in overlaps, with the upstream fabric overlapping the downstream fabric.
 4. Fabric must be secured using pins or weights to prevent displacement by water, wind, or riprap placement.
 5. Place a protective aggregate bedding layer over the geotextile fabric prior to placement of riprap to protect against punctures or tearing of the fabric.
- D. Riprap:
1. Place riprap on prepared bedding only after the Engineer has reviewed the work.
 2. Place riprap on prepared foundation per line and grade shown on the plans. The riprap thickness tolerance is +0.5 FT and -0 FT as measured over an area of 200 SQFT when placed in the dry, and 400 SQFT when placed underwater.
 3. Riprap material shall be placed to result in a homogenous mass with a minimum of voids. Rearranging of individual rock may be required to obtain a suitable distribution of rock sizes.
 4. Riprap placement methods shall not result in the following: cause breakage of individual rocks, result in segregation of riprap gradation, result in introduction of fines, or impact the filter material.
 5. Individual stones making up the riprap shall not be dropped from a height greater than 1 FT above the geotextile, unless it can be demonstrated to the satisfaction of the Engineer that the geotextile fabric will not be damaged.
 6. When placing riprap on a slope, start placement from the bottom of slope and proceed to top of slope.
 7. Place rock to full thickness in a single operation to avoid displacing the underlying material.
 8. The top of riprap shall match adjoining grades and allow for positive drainage.
 9. Maintain the riprap until acceptance at project completion.

PART 4 - MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

- A. Survey:
1. Provide surveys of the preconstruction surface, interim condition, and post construction as defined below. The survey shall be on the same horizontal and vertical control as the project plans.
 2. Pre-Construction:
 - a. A pre-construction survey shall be submitted prior to the start of geotextile placement following clearing and grubbing for the area where construction is expected to occur for the next 30 days. The submittal shall include paper copies, an edited point file of the horizontal and vertical survey data, and an AutoCAD file. The survey shall consist of cross sections at 100 FT spacing with enough survey shots to define the break lines with survey shots every 25 FT at a minimum.
 3. Interim Condition:
 - a. An Interim Condition survey shall be performed at a minimum of every two weeks where material is being placed to verify construction is per plan and define the subgrade fill (if applicable), granular bedding thickness, granular bedding volume, riprap thickness, and riprap volume. Only the sections altered during the two week time frame need to be included in the Interim Condition survey and shall include the surface

following clearing and grubbing, water levels (if applicable), pay items, and plan surfaces for pay items. The cross sections and plan view of the surveyed area shall be submitted to the Engineer within one week of completion of the survey with paper copies, an edited point file of horizontal and vertical survey data, and an AutoCAD file.

4. Post Construction:
 - a. A post construction survey shall be submitted within two weeks of completion of riprap placement. Provide cross sections of the placed material and plan surfaces on the same axis, scale, and spacing as the construction plan set and volume difference between the pre-construction and post construction surface calculated to the nearest CUYD by the average end volume method. The placed and plan surfaces shall have different line types. The area in SQFT between the pre and post construction surfaces shall be listed on each cross section.

OR

- B. Rock rip rap will not be measured for payment and payment will be by neat line to the thickness shown in the plans for the accepted work. If the riprap thickness is changed and approved in writing by the Engineer, a mutually agreed pre-determined payment amount will be determined prior to the work being performed. Additional riprap volume due to inaccurate subgrade or bedding preparation will be at the Contractor's expense. Truck tickets for material delivered to the project will be collected for backup documentation.

4.2 METHOD OF PAYMENT

- A. Pay Items:

Pay Item	Pay Unit
Granular Bedding	CUYD
Riprap	CUYD

END OF SECTION

SECTION 31 38 10
RECOMPACTED CLAY LINER

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Soils used in the construction of the barrier soil recompacted clay liner component of a landfill containment system.
 - 2. Soil permeability requirements of less than 1E-7 cm/sec on prepared subgrade.
- B. Related Specification Sections include but are not necessarily limited to:
 - 1. Division 00 - Procurement and Contracting Requirements.
 - 2. Division 01 - General Requirements.
 - 3. Section 31 23 00 - Earthwork.
 - 4. Section 33 47 14 - High-Density Polyethylene (HDPE) Geomembrane.

1.2 QUALITY ASSURANCE

- A. Construction Quality Assurance Plan.
- B. Reference Standards:
 - 1. ASTM International (ASTM):
 - a. D75, Standard Practice for Sampling Aggregates.
 - b. D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort.
 - c. D1140, Standard Test Methods for Determining the Amount of Material Finer than 75- μ m (No. 200) Sieve in Soils by Washing.
 - d. D1556, Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method.
 - e. D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.
 - f. D2216, Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.
 - g. D2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
 - h. D2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure).
 - i. D2937, Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method.
 - j. D4318, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
 - k. D4767, Standard Test Method for Consolidated Undrained Triaxial Compression Test for Cohesive Soils.
 - l. D5084, Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter.
 - m. D5321, Standard Test Method for Determining the Shear Strength of Soil-Geosynthetic and Geosynthetic-Geosynthetic Interfaces by Direct Shear.
 - n. D6913, Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis.
 - o. D6938, Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

- p. D7928, Standard Test Method for Particle-Size Distribution (Gradation) of Fine-Grained Soils Using the Sedimentation (Hydrometer) Analysis.
- 2. Environmental Protection Agency (EPA):
 - a. EPA/600/R-93/182, Quality Assurance and Quality Control for Waste Containment Facilities, September, 1993.
- 3. American Society of Civil Engineers (ASCE):
 - a. Paper No. 25333, Water Content – Density Criteria for Compacted Soil Liners (Daniel et al, 1990), Published in the ASCE Journal of Geotechnical Engineering.
 - b. Paper No. 23827, In-Site Hydraulic Conductivity for Compacted Clay (Daniel et al, 1989).

1.3 SUBMITTALS

- A. Test Reports –by Engineer:
 - 1. Narrative.
 - 2. Field density test results.
 - 3. Permeability test results.
 - 4. Map of all field test (density, permeability, thickness, etc.) locations.
 - 5. Sealed by a licensed professional.
- B. As-Built Drawings –by Surveyor:
 - 1. Sealed topographic survey of subgrade prior to soil barrier placement.
 - 2. Sealed topographic survey of soil barrier to confirm thickness and record permeability test locations.
- C. Miscellaneous:
 - 1. Soil samples for independent testing as requested by Owner’s representative.
 - 2. A written certification, by the contractor installing the materials, that lists and states that the work was performed to the specifications and tolerances. This document is complementary to the set of sealed surveys.

1.4 JOB CONDITIONS

1.5 TOLERANCES

- A. The barrier soil system must meet the following tolerances:
 - 1. The saturated hydraulic conductivity of the barrier soil must be equal to or less than 1E-7 CM/SEC, as determined by ASTM D5084.
 - 2. The work should be constructed to lines, grades, and control points indicated on the Drawings, and shall be controlled and documented with survey methods.
 - 3. The thickness of the barrier soil must be equal to or greater than 24 IN, with any excess beyond the grading tolerance located below the design subgrade (on the bottom of the layer).
 - 4. The grading tolerance for the finished surface of barrier soil (including control points and lines) in relation to the design elevation for the completed surface shall be as follows:
 - a. All Areas: 0 to 1 IN above.
- B. Global positioning system (GPS) based survey systems are required for grading.
- C. All field test locations shall be documented by survey, GPS or other approved method demonstrated to be accurate to within 10 FT horizontally.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Materials may be stockpiled on-site in designated areas approved by the Engineer. Each type of material shall be stockpiled separately. Removal and placement of material shall be done in a manner to prevent contaminating stockpiled soils with soils adjacent to and beneath the stockpile that do not meet the specifications.
- B. The bentonite storage sites should be cleared and level. Bentonite material shall be contained and covered to preserve the fitness and quality of the material.

1.7 QUALIFICATIONS

- A. The work shall be managed by personnel that have at least five years of relevant experience and at least five projects of similar nature and size in processing and installation of a compacted barrier soil.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. All soils must be approved for use by the Engineer prior to use in the Work.
- B. Low Permeability Soil - General:
 - 1. Provide natural, fine-grained soil or bentonite amended soil that is capable of being worked to produce a soil layer of thickness shown on the Drawings that meets the hydraulic conductivity requirements.
 - 2. Provide the CQA Consultant and Owner access to information about the borrow source of the low permeability soil and certify that it is not contaminated with hazardous materials or hazardous wastes.
 - 3. The soil shall be relatively homogeneous in color and texture and shall be free from roots, stones, foreign objects, and other deleterious materials.
 - 4. Some soils not meeting the requirements for Natural Fine-Grained Soil Items 1 and 4 below may be acceptable for use in the Work at the sole discretion of the Engineer. To gain approval for soils not meeting the definition of Natural Fine-Grained Soil, the Contractor must submit data on soils for the Engineer’s review. The submittal should contain: a statement signed by a Geotechnical professional engineer that the proposed soils will meet the grain size and hydraulic conductivity requirements and are otherwise suitable for use in the Work; and supporting geotechnical test data and results.
- C. Natural Fine-Grained Soil:
 - 1. Classification: Natural fine-grained soil shall have a classification of SC, SM, CH, CL, MH, or ML as determined by ASTM D2487.
 - 2. Grain sizes shall be within the following gradation:

Sieve Size	Percent Passing by Weight
3/4 IN	100
No. 4	>90
No. 200	>30

- 3. Hydraulic Conductivity: The saturated hydraulic conductivity of the natural fine-grained soil shall meet the stated tolerances, when compacted in accordance with requirements established by the CQC Consultant and Contractor on the basis of the barrier soil test strip as specified herein.
 - 4. Other Barrier soil Properties:
 - a. The liquid limit shall be at least 25 as measured by ASTM D4318.
 - b. The plasticity index shall be at least 10 and less than 30 as measured by ASTM D4318.
- D. Permeability Test:
 - 1. Laboratory permeability tests (ASTM D5084) shall be conducted in constant head, triaxial type permeameters. The specimens shall be consolidated under an isotropic effective consolidation stress not to exceed 10 PSI. The inflow to and outflow from the specimens shall be monitored with time and the coefficient of permeability calculated for each recorded flow increment. The test shall continue until steady state flow is achieved and relatively constant values of coefficient of permeability are measured.

- E. All soil to be provided by the Contractor from an on-site source.

2.2 BARRIER SOIL MATERIAL ACCEPTANCE

A. General:

1. Notify the CQA Consultant at least 24 HRS prior to sampling so that they may observe the sampling procedures.
2. Contractor to furnish samples to CQA/Engineer upon request without charge.
3. All samples required in this Section shall be representative and be clearly marked to show the source of the material and the intended use on the project. Sampling of the material source shall be done by the CQC Consultant in accordance with ASTM D75.
4. Tentative acceptance of the material source shall be based on an inspection of the source by the CQA Consultant and the certified test results of the Borrow Source Characterization Study (BSCS). No imported materials shall be delivered to the site until the proposed source and materials tests have been accepted in writing by the CQA Consultant and or Engineer.
5. Final acceptance of any material will be based on results of tests made on material samples taken from the completed barrier soil test strip, combined with the results of the BSCS. If tests conducted by the CQA Consultant indicate that the material does not meet Specification requirements, material placement will be terminated until corrective measures are taken. Material which does not conform to the Specification requirements and is placed in the work shall be removed and replaced at the Contractor's sole expense.
6. Contractor is solely responsible for obtaining all permits required to obtain acceptable sources of materials for use in the work.

B. Sampling and testing required herein shall be done at the Contractor's sole expense.

C. Borrow Source Characterization Study:

- a. Engineer shall complete soil pre-qualification in accordance with the CQA Plan and develop an acceptable zone.
- b. If contractor performs separate testing, they shall provide the test data and graphs for review.

D. Soils Conformance Testing:

1. Engineer shall perform soil testing during construction to demonstrate compliance with the CQA Plan.
2. Any failing test by either CQC or CQA, shall be treated as a failure of the material to meet specifications.
3. If tests indicate material does not meet Specification requirements, Terminate material placement until corrective measures are taken.
4. Remove and replace material which does not meet Specification requirements at no additional cost to the Owner.

2.3 EQUIPMENT

A. Compaction Equipment:

1. The compaction equipment shall be of a suitable type, adequate to obtain the permeability specified, that provides a kneading action, such as a wobble-wheeled roller or a sheepsfoot roller having tines as long as the maximum loose lift thickness to ensure proper lift interface compaction free of voids.
2. The CQA Consultant shall confirm compaction equipment adequacy, and recommend changes if required, based on the barrier soil test strip. Such additional equipment will be provided by Contractor at no additional cost.
3. The compaction equipment shall be maintained and operated in a condition that will deliver manufacturer's rated compactive effort.
4. Hand-operated equipment shall be capable of achieving specified soil densities.
5. The finished surface of the final lift shall be rolled with a smooth steel drum roller or rubber-tired roller to eliminate tine or roller marks and provide a smooth, dense surface for geomembrane placement.

- B. Moisture Control Equipment:
1. Equipment for applying water shall be of a type and quality adequate for the work, shall not leak, and shall be equipped with a distributor bar or other approved device to assure uniform application.
 2. Equipment for mixing and drying out material shall consist of blades, discs, or other equipment defined by the CQA Consultant.
 3. Mixing of natural fine-grained soils may also be required to get even distribution of moisture.
 4. Allow sufficient time for adjustment of soil water content to fully saturate the lift prior to applying compaction effort, unless otherwise approved by CQA consultant.
 5. At a minimum, a water truck, disc, GPS enabled bulldozer, and smooth drum roller shall be on site for the duration of clay liner placement.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Refer to CQA Plan.

3.2 FIELD QUALITY CONTROL AND QUALITY ASSURANCE

- A. Refer to the CQA Plan.
- B. All CQC testing is the responsibility of the Contractor.
- C. Confirm specified thickness by survey at points defined and any additional as requested by Engineer.
- D. Test frequencies may be modified by the Engineer. If there are indications of declining or failing test results, frequencies may be increased. If hydraulic conductivity test results are well above acceptable, the frequency for Atterberg limit and fine content testing may be waived by the Engineer.
- E. Holes in the compacted barrier soil, such as those created as a result of destructive testing (e.g. thin-walled Shelby tube sampling and nuclear gauge, field density determinations), shall be backfilled and tamped by rod uniformly in 2 IN thick lifts. The backfill material shall be the same material or hydrated bentonite powder, if approved by the CQA Consultant. On the surface, the backfill material shall extend slightly beyond the holes to make sure that a good tie-in with the surrounding barrier soil is achieved. Repaired areas shall be observed and documented by the CQC Consultant.
- F. Give minimum of 24 HR advance notice to CQA Consultant when ready for soil testing and inspection in completed area of the barrier soil.
- G. For areas not meeting field and laboratory testing criteria, scarify the full depth of the lift or replace the material as needed. The material shall be reshaped, rewetted as needed, rehomogenized and recompacted to the specified density. Areas not meeting the thickness requirements shall be augmented with additional materials. The added materials shall be reworked with the soil layer to ensure homogeneity and proper bonding. This may be done by scarification of the surface prior to addition of new material. The repaired area shall be properly documented, and field and laboratory quality control testing shall be performed to ensure the repaired barrier soil section meets the requirements specified herein.
- H. Pay for all costs associated with corrective work and retesting resulting from failing tests. The CQA Consultant shall be informed immediately of all failing tests.

- I. Plot all field density test locations by lift on an electronic drawing and provide engineers or surveyors certification of the accuracy of the locations.
- J. Field density test locations not accurately documented or precisely located may not be counted towards the required testing frequency.

END OF SECTION



DIVISION 33

UTILITIES



SECTION 33 47 14
HIGH-DENSITY POLYETHYLENE (HDPE) GEOMEMBRANE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Furnishing, installation, quality control, and testing of a HDPE geomembrane.
- B. Related Specification Sections include but are not necessarily limited to:
 - 1. Division 00 - Procurement and Contracting Requirements.
 - 2. Division 01 - General Requirements.
 - 3.
 - 4. Section 31 23 00 - Earthwork.
 - 5. Section 31 38 10 - Recompacted Clay Liner.
 - 6. Construction Quality Assurance Plan.

1.2 QUALITY ASSURANCE

- A. Contractor to meet all requirements of drawings, specifications, and CQA Plan.
- B. Referenced Standards:
 - 1. ASTM International (ASTM):
 - a. D413, Standard Test Methods for Rubber Property-Adhesion to Flexible Substrate.
 - b. D638, Standard Test Method for Tensile Properties of Plastics.
 - c. D792, Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement.
 - d. D816, Standard Test Methods for Rubber Cements.
 - e. D882, Standard Test Method for Tensile Properties of Thin Plastic Sheeting.
 - f. D1004, Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting.
 - g. D1505, Standard Test Method for Density of Plastics by the Density-Gradient Technique.
 - h. D1603, Standard Test Method for Carbon Black Content in Olefin Plastics.
 - i. D3895, Standard Test Method for Oxidative-Induction Time of Polyolefins by Differential Scanning Calorimetry.
 - j. D4218, Standard Test Method for Determination of Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique.
 - k. D4437/D4437M, Standard Practice for Nondestructive Testing (NDT) for Determining the Integrity of Seams Used in Joining Flexible Polymeric Sheet Geomembranes.
 - l. D4833/D4833M, Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products.
 - m. D4873/D4873M, Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples.
 - n. D5199, Standard Test Method for Measuring the Nominal Thickness of Geosynthetics.
 - o. D5397, Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test.
 - p. D5596, Standard Test Method For Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics.
 - q. D5641/D5641M, Standard Practice for Geomembrane Seam Evaluation by Vacuum Chamber.
 - r. D5721, Standard Practice for Air-Oven Aging of Polyolefin Geomembranes.
 - s. D5820, Standard Practice for Pressurized Air Channel Evaluation of Dual-Seamed Geomembranes.

- t. D5885/D5885M, Standard Test Method for Oxidative Induction Time of Polyolefin Geosynthetics by High-Pressure Differential Scanning Calorimetry.
 - u. D5994/D5994, Standard Test Method for Measuring Core Thickness of Textured Geomembranes.
 - v. D6392, Standard Test Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods.
 - w. D7238, Standard Test Method for Effect of Exposure of Unreinforced Polyolefin Geomembrane Using Fluorescent UV Condensation Apparatus.
 - x. D7466/D7466M, Standard Test Method for Measuring Asperity Height of Textured Geomembranes.
2. Environmental Protection Agency (EPA):
 - a. 530/SW-91/051, Inspection Techniques for the Fabrication of Geomembrane Field Seams.
 - b. 600/R-93/182, Quality Assurance and Quality Control for Waste Containment Facilities.
 3. Geosynthetic Research Institute (GRI):
 - a. GM6, Pressurized Air Channel Test for Dual Sound Geomembranes.
 - b. GM10, The Stress Crack Resistance of HDPE Geomembrane Sheet.
 - c. GM11, Accelerated Weathering of Geomembranes Using a Fluorescent UVA Device.
 - d. GM12, Asperity Measurement of Textured Geomembranes Using a Depth Gage.
 - e. GM13, Test Methods, Properties and Testing Frequency for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes.
 - f. GM14, Selecting Variable Intervals for Taking Geomembrane Destructive Seam Samples Using the Method of Attributes.
 - g. GM20, Selecting Variable Intervals for Taking Geomembrane Destructive Seam Samples Using Control Charts.
- C. Quality Assurance:
1. The Owner or Engineer's representative will conduct independent testing to support construction quality assurance program and to provide documentation of such to appropriate regulatory agencies.
 - a. Facilitate and provide opportunities as required.
 2. Unless specifically superseded by these Contract Documents or approved plans submitted by the Contractor, the geosynthetic materials shall be manufactured, stored, placed, seamed, tested and protected as described in the CQA Plan.
 - a. This specifically includes:
 - 1) Material Composition.
 - 2) Manufacturing.
 - 3) Handling and Packaging.
 - 4) Shipment.
 - 5) Storage (Manufacturer and Site).
 - 6) Placement:
 - a) Seaming and Joining.
 - b) Destructive and Nondestructive Testing.
 - c) Protection, Backfilling and Covering.
 - 7) Conformance Testing.
 - 8) Anchoring and Anchor Trenches.
- D. Qualifications:
1. Each manufacturing and fabricating firm shall demonstrate five years continuous experience with a minimum of 10,000,000 SQFT of HDPE geomembranes.
 2. Installer:
 - a. Demonstrate five years continuous experience with a minimum 10,000,000 SQFT of HDPE geomembranes.
 - b. Trained and certified by at least one of the named manufacturers in this Specification (not necessarily the manufacturer supplying materials for this Project).

- c. Geomembrane Installer Personnel:
 - 1) Installation Superintendent shall have worked in a similar capacity on at least five HDPE geomembrane liner jobs similar in size and complexity to the project described in the Contract Documents.
 - 2) The Master Welder shall have completed a minimum of 5,000,000 SQFT of HDPE geomembrane seaming work using the type of seaming apparatus proposed for use on this Project.
 - 3) Other welders shall have seamed a minimum of 1,000,000 SQFT of HDPE geomembrane.
 - 3. Inspectors:
 - a. Demonstrate three years continuous experience with a minimum 3,000,000 SQFT in similar geosynthetic materials installation.
 - b. Remain on the project throughout the entire construction and covering of the HDPE geomembrane.
 - 4. Independent Testing Laboratory shall demonstrate three years of continuous experience in similar geosynthetic materials testing.
- E. Certifications:
- 1. Certifications are required for various aspects of the project related to the HDPE geomembrane system construction.

1.3 DEFINITIONS

- A. Manufacturer:
 - 1. Manufacturer producing geomembrane sheets from resin and additives.
- B. Installer:
 - 1. The Installers is the company actually performing the hands-on work in the field.
- C. Inspector:
 - 1. Inspectors of HDPE geomembrane are the individuals responsible for observing field installation of the geosynthetic materials and providing the Manufacturer, Fabricator, Installer and Owner with verbal and written documentation of the compliance of the installation with this specification and with written procedures manuals prepared by the Manufacturer or Installer.
- D. Independent Testing Laboratory:
 - 1. The firm hired to perform destructive testing of the HDPE geomembrane.
 - 2. Firm shall be acceptable to Engineer and Owner.

1.4 SUBMITTALS

- A. See Specification Section 01 33 00 for requirements for the mechanics and administration of the submittal process.
- B. Shop Drawings:
 - 1. Submit for Engineer's approval Shop Drawings, including:
 - a. Manufacturer's certification that raw materials and sheet materials comply with required materials, mil thickness, and material properties.
 - 1) Original certificates are required.
 - b. Manufacturer/Fabricator/Installer quality control requirements.
 - c. Qualifications and experience of key personnel involved in installation/inspection of the geosynthetic materials and geosynthetic system.
 - d. HDPE Geomembrane layout plan with proposed size, number, position and sequencing of panels and showing the location and direction of all field or factory joints.
 - 1) Proposed details for connecting the geosynthetic materials to appurtenances.
 - 2) Proposed methods of welding, seaming or jointing geosynthetic materials.
 - 3) Proposed method and sequencing for placement of drainage layer on top of the HDPE geomembrane.

- 4) Proposed method of testing HDPE geomembrane and other geosynthetic materials, joints and connections at appurtenances for continuity.
- 5) Location and configuration of haul roads and access points.
- 6) Proposed details for anchor trench if different than included in Contract Documents.

C. Informational Submittals:

1. Test results:
 - a. Resin test, tests of sheet material and factory seam tests at frequency specified in respective quality control manuals.
 - 1) Results shall include or bracket the rolls delivered for use in the Work.
 - b. Daily test seam results.
 - c. Daily results of production seam testing.
2. Warranties
3. Submit written certifications that:
 - a. The HDPE geomembrane material delivered to site meets the requirements of this Specification.
 - b. The HDPE geomembrane were received and accepted in undamaged condition from shipper.
 - c. The subgrade has been properly prepared and acceptable for the placement of the HDPE geomembrane.
 - d. The HDPE geomembrane was installed in accordance with this Specification and with approved Shop Drawings.
 - e. The HDPE geomembrane joints were inspected, tested for strength and continuity, and passed all inspections, tests, or retests.
 - 1) Incorporate all test and inspection data into this certification.
 - f. The drainage layer, geotextiles and protective soil cover layer on top of the HDPE geomembrane was placed properly and carefully.
4. Manufacturer/Installer's Field Installation Procedures Manual shall clearly identify and exceptions take to the specified execution of the Work.
5. Record Drawings: Submit reproducible drawings of record showing changes from the approved installation drawings. The record drawings shall include the identity and location of each repair, cap strip, penetration, boot, and sample taken from the installed geosynthetic for testing. The record drawings shall show locations of each type of material, anchor trenches and the construction baseline.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Handle and store HDPE geomembrane shall be stored in accordance with the manufacturer's recommendations and ASTM D4873.
- B. Label each roll with the manufacturer's name, type, lot number, roll number, and roll dimensions (length, width, gross weight).
 1. HDPE geomembrane or plastic wrapping damaged as a result of storage or handling shall be repaired or replaced, as directed.
 2. HDPE geomembrane shall not be exposed to temperatures in excess of 60 DEGC (140 DEGF) or less if recommended by the Manufacturer.
- C. No hooks, tongs or other sharp instruments shall be used for handling the HDPE geomembrane.
 1. Rolls shall not be lifted by use of cables or chains in contact with the HDPE geomembrane.
 2. HDPE geomembrane shall not be dragged along the ground.

1.6 PROJECT/SITE CONDITIONS

- A. When the weather is of such a nature as to endanger the integrity and quality of the installation whether this is due to rain, high winds, cold temperatures, or other weather elements, the installation shall be halted until the weather conditions are satisfactory.

- B. Ensure that adequate dust control methods are in effect to prevent the unnecessary accumulation of dust and dirt on surfaces which hamper efficient field seaming or performance.
- C. Maintain surface water drainage diversions around the work area and provide for the disposal of water which may collect in the work area directly from precipitation falling within the area or from inadequate diversion structures or practices.
- D. Coordinate the installation of leachate collection lines which shall be in accordance with HDPE geomembrane Manufacturer's recommendation and as specified in the Contract Documents and shown on the Drawings.
- E. Vehicles, other than those specifically approved, will not be allowed on HDPE membrane unless at least 18 IN of protective soil cover or 6 IN of gravel plus 1 FT of protective soil cover have been placed over these materials.
 - 1. No vehicle shall access the completed Work unless it can be demonstrated that its weight, movement or activities will not damage the Work.
 - 2. When damage is suspected, uncover area, repair damage if required, and recover area at no cost to Owner.
 - 3. Suspect areas may be identified by Owner or Engineer.

1.7 WARRANTY

- A. Written warranties addressing HDPE geomembrane material and installation workmanship shall be furnished by the Contractor and shall be made to the Owner.
- B. Submit material samples and warranties prior to shipment.
- C. Suitability of geosynthetic system shall be subject to Owner approval of warranty.
 - 1. The Manufacturer's warranty shall state that the furnished material meets all requirements of the Contract Drawings and Specifications, and that under leachate and local atmospheric conditions the sheet material is warranted for 20 years, prorated.
 - 2. The Installer's warranty shall state that the materials were properly installed, properly (field and factory) welded, seamed and jointed and will not fail within two years of the installation under similar conditions.
 - a. Warranty shall not be prorated.
- D. Warranties shall provide for complete repair/replacement at no additional cost to the Owner for the warranty period.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:
 - 1. HDPE Geomembrane:
 - a. AGRU America, 500 Garrison Road, Georgetown, SC 29440.
 - b. Solmax, 19103 Gundle Rd., Houston, Texas 77073.
 - c. Poly-Flex, Inc., 2000 West Marshall Drive, Grand Prairie, Texas 75051.
- B. Submit request for substitution in accordance with Specifications.

2.2 MATERIALS

- A. HDPE Geomembrane:
 - 1. Consist of unreinforced polyethylene.
 - a. Thickness: 60 MILS.
 - b. Manufactured from virgin, first quality resin designed and formulated specifically for liquid containment in hydraulic structures.

- c. Reclaimed polymer shall not be added to the resin; except use of polymer recycled during the manufacturing process shall be allowed provided that recycled polymer shall be clean and shall not exceed 2 PCT by weight.
- d. No additives or fillers may be added to the resin prior to or during manufacture of the HDPE geomembrane.
- 2. Manufactured to be free of holes, blisters, undispersed raw materials, or any sign of contamination by foreign matter.
 - a. Any such defects shall be cause for rejection of the material.
 - b. Minor defects may be repaired in accordance with Manufacturer's recommendations if approved by the Engineer.
- 3. Manufactured as seamless rolls or as prefabricated panels.
 - a. Minimum width: 15 FT as delivered to the site.
 - b. All factory seams shall be inspected and tested for strength and continuity prior to delivery to the site.
- 4. Specifications:
 - a. Textured HDPE geomembrane shall possess properties which meet or exceed the minimum requirements per GRI GM13.
- 5. Extrusion rod shall be manufactured from resin identical to that used in geomembrane manufacture. Manufactured extrusion rod shall be tested for carbon black content and dispersion, specific gravity, and melt index at a frequency of not less than one test per batch.

2.3 EQUIPMENT AND ACCESSORIES

- A. Welding and Seaming Equipment:
 - 1. Equipped with gages showing temperatures at the nozzle (extrusion welder) or at the wedge (wedge welder).
 - 2. Maintained in adequate numbers to avoid delaying work.
 - 3. Supplied by a power source capable of providing constant voltage under a combined-line load.
 - 4. Electric generator shall not be placed on the HDPE geomembrane.
- B. Field Tensiometer:
 - 1. Provide a tensiometer for on-site shear and peel testing of HDPE geomembrane seams.
 - a. Tensiometer shall be in good working order.
 - b. Built to ASTM specifications.
 - c. Accompanied by evidence of calibration of equipment and gages within the past six months.
 - d. Motor driven.
 - e. Jaws capable of traveling a measure rate of 2 IN per minute.
 - f. Equipped with a gauge that measures the force in unit pounds exerted between the jaws.
 - g. Digital readout.
- C. Punch Press:
 - 1. Provide a punch press for the onsite preparation of specimens for testing.
 - 2. Capable of cutting specimens in accordance with ASTM D4437.
- D. Vacuum Box:
 - 1. Provide a vacuum box for onsite testing of HDPE geomembrane seams in accordance with ASTM D5641.
- E. Equipment necessary to perform "Pressurized Air Channel Evaluation of Dual Seamed Geomembranes" in accordance with ASTM D5820.
- F. Gages:
 - 1. Calibrated within past six months.
 - 2. Specified test values reading near mid-range of the gage scale.

2.4 FABRICATION

- A. Produce geomembrane sheet which complies with this Specification Section.

- B. Provide resin and additive quality control:
 - 1. Test raw resin and additives to ensure compliance with the Manufacturer's specifications and with this Specification Section.
 - 2. Test sheet material to ensure compliance with Manufacturer's specification and this Specification Section.
 - 3. Provide certification of the raw materials and finished sheet demonstrating compliance with this Specification Section.
 - 4. Provide certification of Fabricator's and Installer's training (unless Installer is certified by other acceptable manufacturer list herein), experience and methods for welding, seaming, jointing and inspecting geosynthetic materials installations in compliance with Manufacturer's standards and with Quality Assurance requirements of this Specification Section.
- C. Fabricated Specials:
 - 1. Subject to same level of manufacturer's quality control.
 - 2. Fabricated from project rolls.
 - a. Provide traceability of resin and roll stock.

PART 3 - EXECUTION

3.1 GEOSYNTHETIC SYSTEM

- A. Geomembrane Subgrade:
 - 1. Protect subgrade at all times from damage until such time as the placement of HDPE geomembrane and other components of the geosynthetic system are complete.
 - 2. The subgrade shall be prepared in a manner consistent with proper subgrade preparation techniques for the installation of HDPE Geomembrane.
 - a. The subgrade shall be properly compacted so as not to settle and cause excessive strains in the HDPE Geomembrane or other synthetic materials.
 - b. Prior to installation, ensure a surface free of debris, roots, or angular stones larger than 1/2 IN.
 - c. In addition, ensure that the subgrade has been rolled to provide a uniform surface.
 - d. During installation, ensure that rutting or raveling is not caused by installation equipment or weathering.
- B. Anchor Trenches:
 - 1. Geosynthetic materials placed on side slopes shall be anchored into trenches as detailed on the Contract Drawings.
 - 2. Excavation, backfill and compaction shall be in accordance with Specification Section 31 23 00.
- C. HDPE Geomembrane:
 - 1. General:
 - a. Installer of HDPE geomembranes is responsible for handling, fitting, welding, seaming, jointing and testing of geosynthetic materials sheets or blankets in the field.
 - b. These responsibilities include but are not limited to:
 - 1) Acceptance (in writing) of the geosynthetic materials sheets or blankets from the transporter.
 - 2) Acceptance (in writing) of the soil or geosynthetic clay liner subgrade which will serve as a base for the HDPE geomembrane.
 - a) This acceptance shall precede installation of the HDPE geomembrane.
 - b) Shall state that the Installer has inspected the surface, and reviewed the Specifications for material and placement, and finds all conditions acceptable for placement of HDPE geomembrane.
 - c) Shall explicitly state any and all exceptions to acceptance.

- 3) Handling, welding, seaming, jointing, testing and repair of HDPE geomembrane and other geosynthetic materials in compliance with this Specification and with written procedures manuals prepared by the Manufacturer or Fabricator.
 - a) Manual shall be submitted to the Engineer together with Shop Drawings showing the layout of HDPE geomembrane within the facility.
 - (1) Do not deviate from the procedures included in the manual.
 - b) HDPE Geomembrane shall not be placed upon frozen foundation, standing water or other conditions which will result in deterioration of the foundation.
 - c) HDPE Geomembrane materials shall be laid out according to plans previously approved by the Engineer.
 - d) Adjacent rolls of HDPE geomembrane shall overlap a minimum of 3 IN, provided that greater overlap may be required to allow seaming in accordance with the Manufacturer's instructions.
 - 4) Repair or replacement of defects in the geosynthetic materials as required by the Inspector or the Owner.
 - 5) Installer and Manufacturer may be the same firm.
2. Panel deployment:
- a. Only those panel/sheets that can be seamed in one day shall be deployed.
 - b. Place panels with minimal handling.
 - 1) Orient sheets to eliminate or minimize number of horizontal seams on side slopes.
 - 2) Protect panels from tear, puncture or abrasion.
 - 3) No seams will be permitted in the leachate collection trench.
 - c. Equipment used to deploy the geomembrane shall not rut the recompacted clay liner, or damage the Geosynthetic Clay Liner.
 - 1) A rut is defined as a 1/4 IN depression over a 10 FT straight-edged length.
 - d. No vehicular traffic is permitted on unprotected HDPE geomembrane.
 - e. Minimize foot traffic.
 - 1) Do not allow personnel access to wet or slippery liners without adequate safety precautions.
 - f. Ballast with sandbags to prevent wind uplift as recommended by Manufacturer and Fabricator and based on local climatic conditions.
 - 1) Remove and replace all wind damaged panels at no additional cost to Owner.
 - 2) If wind causes panels to be displaced, displaced panel may not be reused.
 - g. Install HDPE geomembrane in stress free, tension free and relaxed condition.
 - 1) Account for temperature and weather-related impacts when deploying and covering.
 - 2) Stretching to fit and folding are not permitted.
 - h. Do not allow HDPE geomembrane to bubble, fold, or create ripples as a result of deployment of drainage layer or protective soil cover placement.
 - 1) Except as noted on Contract Drawings no folds in HDPE geomembrane will be allowed.
 - i. Any panel exhibiting stretching caused by placement, covering techniques, or wind shall be removed and may not be incorporated in the final construction.
 - j. Field seaming:
 - 1) Field seaming shall be done in accordance with seaming recommendations furnished by the geomembrane Manufacturer and referenced EPA documents.
 - 2) Each piece of seaming equipment and each operator shall perform demonstration seams at the start of a shift, whenever equipment is switched on or seaming is interrupted for more than ten minutes, and at other times at the discretion of the Installer and Inspector.
 - 3) Demonstration seams shall use the same seaming materials and methods to be used in the actual construction.
 - 4) Surfaces to be seamed shall be clean and dry at the time of seaming.
 - a) Precipitation and ponding of water on the HDPE geomembrane shall cause termination of seaming operations.

- b) HDPE geomembrane shall not be seamed when ambient temperatures are below 41 DEGF or above 104 DEGF, without written consent of HDPE geomembrane Manufacturer or Fabricator, and Engineer.
- 5) HDPE geomembrane sheets shall be seamed continuously without fishmouths or breaks in the seam.
 - a) Where fishmouths are unavoidable, the sheet shall be slit to a point such that the sheet lies flat and with no remaining wrinkle.
 - b) The two edges of the slit shall be seamed together provided that the overlap for this seam shall be a minimum of 6 IN.
 - c) Areas of the slit which do not achieve an overlap of 6 IN, including the terminus of the slit, shall be provided with a patch as discussed below.
- 6) All HDPE geomembranes shall be seamed by thermal fusion methods as recommended by the HDPE geomembrane Manufacturer.
 - a) HDPE geomembrane seaming shall be double wedge weld unless otherwise approved or prohibited by construction.
- 7) Manufacturer's or Fabricator's seaming instructions shall specifically address subgrade preparation, seaming materials, temporary and permanent jointing, seaming temperatures including temperatures for seaming materials, seam finishing and curing.
- 8) A copy of Manufacturer's or Fabricator's seaming instructions shall be available on site at all times and shall not be deviated from without written approval of the Manufacturer and Engineer.
- 9) All panels/sheets should be overlapped a minimum of 3 IN.
 - a) If horizontal seams are required on side slopes, the upper panel should be lapped over the lower panel.
- 10) Seaming shall not be conducted in the presence of standing water and/or soft subgrades.
 - a) The seamed area shall be cleaned of dust, dirt and foreign material prior to and during the seaming operation.
- 11) Seaming shall extend to the outside edge of panels/sheets to be placed in anchor and/or drainage trenches.
- 12) Tack welds shall conform with manufacturers seaming techniques and shall not damage underlying membrane.
- k. Patching:
 - 1) Defects in and damage to HDPE geomembrane sheets shall be repaired by seaming a patch over the defect.
 - a) The patch material shall consist of an undamaged piece of HDPE geomembrane cut to provide a minimum of 6 IN of overlap in all directions from the defect.
 - b) Round corners shall be utilized on all patches.
 - (1) No bead or spot patching will be accepted.
 - c) Torn or permanently twisted HDPE geomembrane shall be replaced at no expense to the Owner.
 - 2) Test all patch seams using one of the following nondestructive tests: Vacuum tests; spark tests; or ultrasonic tests.
 - a) Test patch seams destructively at a frequency of ten percent or a minimum of one test per seaming personnel per day.
 - b) This destructive testing may be accomplished using demonstration seams performed adjacent to the installation.

3.2 FIELD QUALITY CONTROL

- A. Inspector shall not be a part of the installation program and shall not serve as a substitute for performing the duties or certification required of the Fabricator and Installer.
 - 1. Inspector's responsibilities include, but are not limited to:
 - a. Inspection of the material and the handling and field installation of the geomembranes.
 - 1) Inspection of all welds, repairs and quality control test results.
 - b. All exceptions to material or installation shall be documented and furnished to the Engineer in writing within 48 HRS of discovery.
 - c. Inspection and Certification of HDPE geomembrane integrity until completion of placement of protective soil cover.
- B. Trial Seam Testing:
 - 1. Trial seams shall be made each half-day prior to production seaming.
 - a. The location of trial seam shall be in an area proposed for the day's production seaming.
 - b. Equipment, methods and personnel shall be the same as proposed for the day's seaming.
 - 2. Samples shall be tested in accordance with ASTM D413 and ASTM D882.
 - a. To be acceptable, five of five replicate test specimens must meet specified seam strength requirements and failures shall be Film Tear Bond.
 - b. If the field tests fail to meet these requirements, the entire operation shall be repeated.
 - c. If the additional test seams fail, the seaming apparatus or seamer shall not be accepted or used for seaming until the deficiencies are corrected and two consecutive successful test seams are achieved.
- C. Nondestructive Seam Testing:
 - 1. All field seams shall be nondestructively tested over their full length.
 - a. Seam testing shall be performed as the seaming work progresses, not at the completion of field seaming.
 - b. All testing shall be documented.
 - 1) Any seams which fail shall be repaired and documented.
 - 2. Nondestructively test all field seams continuously using one of the following nondestructive seam tests: Vacuum box; ultrasonic tests; spark tests; and pressurized air channel test.
- D. Destructive Seam Testing:
 - 1. A minimum of one test per 500 LF of seaming per welder per day.
 - a. Sample locations shall not be identified prior to seaming. CQA consultant to identify sample locations to be cut by installer.
 - b. The samples shall be a minimum of 12 IN wide by 48 IN long with the seam centered lengthwise.
 - c. Each sample shall be cut into three equal pieces with one piece retained by the Installer, one piece given to an Independent Testing Laboratory, and the remaining piece given to the Engineer for quality assurance testing and/or permanent record.
 - 2. If the field tests pass, five specimens shall be tested at the Independent Testing Laboratory for shear strength and five for peel adhesion in accordance with ASTM D4437.
 - 3. If the field or laboratory tests fail, the seam shall be repaired in accordance with the Manufacturer's Quality Control manual.
 - 4. In addition, all destructive seam sample holes shall be repaired the same day as cut.
 - 5. Certified test results on all field seams shall be submitted to and approved by the Engineer prior to acceptance of the seam.
 - 6. Ten percent of all repaired areas shall be destructively tested.
 - 7. All repaired areas shall be nondestructively tested.
 - 8. The Owner may separately conduct destructive testing for quality assurance.
 - a. If samples tested by Owner fail, based on above criteria, seam will be classified as failed.
 - 9. A map showing the locations, number and type of all patches shall be prepared and provided to the Owner.

3.3 GEOSYNTHETIC SYSTEM ACCEPTANCE

- A. Retain all ownership and responsibility for the geosynthetic system until final acceptance by the Owner.
 - 1. Owner will accept the geosynthetic system installation when the installation is finished and all required warranties, test results, and documentation from the Contractor, Manufacturer, Inspector and Installer has been received and approved, and verification of the adequacy of all field seams and repairs, including associated testing, is complete.

END OF SECTION



DIVISION 40

PROCESS INTERCONNECTIONS



SECTION 40 05 33
PIPE - POLYETHYLENE (HDPE)

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Polyethylene pipe.
- B. Related Specification Sections include but are not necessarily limited to:
 - 1. Division 00 - Procurement and Contracting Requirements.
 - 2. Division 01 - General Requirements.
 - 3. Section 40 05 00 - Pipe and Pipe Fittings - Basic Requirements.

1.2 QUALITY ASSURANCE

- A. Referenced Standards:
 - 1. ASTM International (ASTM):
 - a. A53, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - b. A197, Standard Specification for Cupola Malleable Iron.
 - c. D638, Standard Test Method for Tensile Properties of Plastics.
 - d. D1248, Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable.
 - e. D1693, Standard Test Method for Environmental Stress-Cracking of Ethylene Plastics.
 - f. D2240, Standard Test Method for Rubber Property-Durometer Hardness.
 - g. D2513, Standard Specification for Thermoplastic Gas Pressure Pipe, Tubing, and Fittings.
 - h. D2683, Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing.
 - i. D3261, Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.
 - j. D3350, Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.
 - 2. Society for Protective Coatings (SSPC):
 - a. SP 3, Power Tool Cleaning.

1.3 DEFINITIONS

- A. SDR: Standard Dimension Ratio.
- B. IPS: Iron Pipe Size.
- C. CTS: Copper Tube Size.
- D. ESCR: Environmental Stress Crack Resistance.

1.4 SUBMITTALS

- A. Full materials take-off with pipe lengths, material types, planned scrap material, and fittings.
- B. Shop Drawings:
 - 1. See Specification Section 01 33 00 for requirements for the mechanics and administration of the submittal process.
 - 2. See Specification Section 40 05 00.
 - 3. Certifications:
 - a. Installer certification.
 - 4. Field quality control documents.

5. Pipe shop drawings include: pond perforated section, cleanout assemblies, and any other pre-fabricated HDPE structures.

PART 2 - PRODUCTS

2.1 4710 HDPE

- A. All HDPE shall be 4710 HDPE unless written approval is given for an alternative material. Forcemain and gravity lines are to be SDR-11, and carrier pipe SDR-17.
- B. Fittings shall match the associated SDR of piping.

2.2 MANUFACTURERS

- A. Subject to compliance with the Contract Documents, the following manufacturers of PE pipe are acceptable:
 1. Phillips Driscopipe.
 2. Plexco.
 3. Polypipe.
- B. See Specification Section 40 05 00.
- C. Submit request for substitution in accordance with Specification Section 01 25 13.

PART 3 - EXECUTION

3.1 IDENTIFICATION

- A. Identify each length of pipe clearly at intervals of 5 FT or less.
 1. Include manufacturer's name and trademark.
 2. Nominal size of pipe, appurtenant information regarding polymer cell classification and critical identifications regarding performance specifications, and "NSF" approvals when applicable.

3.2 INSTALLATION

- A. See Specification Section 40 05 00.
- B. General:
 1. Install buried pipe as indicated on Drawings.
 2. Insure that kinking or excessive bend diameters of the pipe do not occur during the installation process.
 3. Insure that the pipe installed in the trench is firmly supported.
 4. Cap all open pipe ends at the end of the work day.
 5. All installed valves shall be tested in the presence of the Engineer.
 - a. All repairs deemed necessary by the Engineer shall be made by the Contractor.
 6. Remove any cave-in portions of the trench prior to placing sand bagging around the pipe.
 7. HDPE pipe and fittings shall be by the same manufacturer.
 - a. The minimum strength of the fittings shall not be less than that of the pipe.
 8. Service taps shall be installed as shown on the Drawings.
 9. Changes in direction of PE Pipe:
 - a. Pipe may be cold-bent to minimum radius of 20 times the pipe diameter as it is installed.
 - b. If fittings or fusions are present in the bend, the minimum recommended cold bending radius is 125 times the outside diameter of the pipe.
 10. Remove cutting and threading burrs.
- C. Joining Procedures:
 1. HDPE pipe joints shall be fused on the surface prior to installation into the trench.
 - a. Alternative methods of fusing shall be approved by the Engineer.

- b. No electrofusion couplers shall be allowed.
- c. PE pipe joints shall be buttfused.
- 2. Fusion joiner must be qualified by type of fusion (i.e., butt fusion, socket fusion or sidewall fusion) and fuse pipe only as qualified.
- 3. Each joint must be visually inspected inside and outside for damage, dirt, moisture, or any other abnormalities prior to fusing.
- 4. Installer shall clean out any shavings and dispose of appropriately. No shavings can be left in the pipes.
- 5. All HDPE piping shall be pressure tested in the presence of the CQA consultant for 1 HR at 10 PSI. Tests may be completed on sections out of the trench provided a full system test once placed in the trench is completed.
- 6. All joint fusion shall be performed in strict accordance with the manufacturer's specifications.
- 7. All fusion equipment must be approved by the manufacturer and operated by qualified and certified operators.
 - a. Cost for testing and certifying personnel shall be born by the Contractor.

END OF SECTION

SECTION 40 05 51
VALVES - BASIC REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Valving, actuators, and valving appurtenances.
- B. Related Sections include but are not necessarily limited to:
 - 1. Division 00 - Procurement and Contracting Requirements.
 - 2. Division 01 - General Requirements.
 - 3.

1.2 QUALITY ASSURANCE

- A. Referenced Standards:
 - 1. American Society of Mechanical Engineers (ASME):
 - a. B1.20.1, Pipe Threads, General Purpose.
 - b. B16.1, Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250.
 - c. B16.18, Cast Copper Alloy Solder Joint Pressure Fittings.
 - 2. ASTM International (ASTM):
 - a. A126, Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
 - b. D256, Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics.
 - c. D638, Standard Test Method for Tensile Properties of Plastics.
 - d. D648, Standard Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position.
 - e. D695, Standard Test Method for Compressive Properties of Rigid Plastics.
 - f. D2240, Standard Test Method for Rubber Property-Durometer Hardness.
 - 3. American Water Works Association (AWWA):
 - a. C207, Standard for Steel Pipe Flanges for Waterworks Service - Sizes 4 IN through 144 IN.
 - b. C500, Standard for Metal-Seated Gate Valves for Water Supply Service.
 - c. C504, Standard for Rubber-Seated Butterfly Valves.
 - d. C507, Standard for Ball Valves, 6 IN through 48 IN (150 MM through 1200 MM).
 - e. C509, Standard for Resilient-Seated Gate Valves for Water Supply Service.
 - f. C550, Standard for Protective Coatings for Valves and Hydrants.
 - g. C606, Standard for Grooved and Shouldered Joints.
 - 4. American Water Works Association/American National Standards Institute (AWWA/ANSI):
 - a. C111/A21.11, Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
 - 5. National Electrical Manufacturers Association (NEMA):
 - a. 250, Enclosures for Electrical Equipment (1000 Volts Maximum).
 - b. MG 1, Motors and Generators.
 - 6. National Fire Protection Association (NFPA):
 - a. 70, National Electrical Code (NEC).

1.3 DEFINITIONS

- A. The following are definitions of abbreviations used in this Specification Section or one of the individual valve sections:

1. CWP: Cold water working pressure.
2. SWP: Steam working pressure.
3. WOG: Water, oil, gas working pressure.
4. WWP: Water working pressure.

1.4 SUBMITTALS

- A. Shop Drawings:
 1. See Section 01 33 00 for requirements for the mechanics and administration of the submittal process.
 2. Product technical data including:
 - a. Acknowledgement that products submitted meet requirements of standards referenced.
 - b. Manufacturer's installation instructions.
 - c. Valve pressure and temperature rating.
 - d. Valve material of construction.
 - e. Special linings.
 - f. Valve dimensions and weight.
 - g. Valve flow coefficient.
 - h. Wiring and control diagrams for electric or cylinder actuators.
 - i. Short Circuit Current Rating (SCCR) nameplate marking per NFPA 70. Include any required calculations
 3. Test reports.
- B. Contract Closeout Information:
 1. Operation and Maintenance Data.
- C. Informational Submittals:
 1. Verification from valve actuator manufacturer that actuators have been installed properly, that all limit switches and position potentiometers have been properly adjusted, and that the valve actuator responds correctly to the valve position command.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with the Contract Documents, refer to individual valve Specification Sections for acceptable manufacturers.

2.2 MATERIALS

- A. Ball Valves – ASAHI or approved equal.
- B. Check Valves –ASAHI or approved equal ball valve. No wafer valves may be used due to restriction of flow. Check valves may not significantly restrict the flow on the forcemain.

2.3 FABRICATION

- A. End Connections:
 1. Provide the type of end connections for valves as required in the Piping Schedules as shown on the Drawings.
 2. Comply with the following standards:
 - a. Threaded: ASME B1.20.1.
 - b. Flanged: ASME B16.1, Class 125 unless otherwise noted or AWWA C207.
 - c. Bell and spigot or mechanical (gland) type: AWWA/ANSI C111/A21.11.
 - d. Soldered: ASME B16.18.
 - e. Grooved: Rigid joints per Table 5 of AWWA C606.
- B. Refer to individual valve Specification Sections for specifications of each type of valve used on Project.
- C. Nuts, Bolts, and Washers:

1. Wetted or internal to be bronze or stainless steel.
 - a. Exposed to be zinc or cadmium plated.
- D. On Insulated Piping: Provide valves with extended stems to permit proper insulation application without interference from handle.
- E. Epoxy Interior Coating: Provide epoxy interior coating for all ferrous surfaces in accordance with AWWA C550.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Setting Buried Valves:
 1. Locate valves installed in pipe trenches where buried pipe indicated on Drawings.
 2. Set valves and valve boxes plumb.
 3. Place valve boxes directly over valves with top of box being brought to surface of finished grade.
 4. Install in closed position.
 5. Place valve on firm footing in trench to prevent settling and excessive strain on connection to pipe.
 6. After installation, backfill up to top of box for a minimum distance of 4 FT on each side of box.
- C. Support exposed valves and piping adjacent to valves independently to eliminate pipe loads being transferred to valve and valve loads being transferred to the piping.
- D. For grooved coupling valves, install rigid type couplings or provide separate support to prevent rotation of valve from installed position.
- E. Install valves accessible for operation, inspection, and maintenance.

3.2 ADJUSTMENT

- A. Adjust valves, actuators and appurtenant equipment to meet design and specifications.
 1. Operate valve, open and close at system pressures.

END OF SECTION



DIVISION 43

PROCESS GAS AND LIQUID HANDLING,
PURIFICATION, AND STORAGE EQUIPMENT



SECTION 43 25 15
PUMPING EQUIPMENT - SLOPED WELL SUBMERSIBLE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Submersible non-clog pumps:
 - a. Leachate pumps.
- B. Related Specification Sections include but are not necessarily limited to:
 - 1. Division 00 - Procurement and Contracting Requirements.
 - 2. Division 01 - General Requirements.

1.2 QUALITY ASSURANCE

- A. Referenced Standards:
 - 1. American Bearing Manufacturers Association (ABMA).
 - 2. American National Standards Institute (ANSI).
 - 3. ASTM International (ASTM):
 - a. A48, Standard Specification for Gray Iron Castings.
 - 4. FM Global (FM).
 - 5. Hydraulic Institute (HI):
 - a. Standards for Centrifugal, Rotary and Reciprocating Pumps.
 - 6. National Electrical Manufacturers Association (NEMA):
 - a. 250, Enclosures for Electrical Equipment (1000 Volts Maximum).
 - b. ICS 6, Industrial Controls and Systems: Enclosures.
 - 7. National Fire Protection Agency (NFPA):
 - a. 70, National Electrical Code (NEC):
 - 1) Article 500, Hazardous (Classified) Locations, Classes I, II, and III, Divisions 1 and 2.
 - 8. Underwriters Laboratories, Inc. (UL).
 - a. 44, Standard for Thermoset-insulated Wires and Cables.
 - b. 62, Standard for Safety Flexible Cords and Cables.

1.3 SYSTEM DESCRIPTION

- A. Leachate pumps utilizing transducer level controls for a simplex system.
- B. Provide single source coordination responsibility through the pump manufacturer for the entire system including but not limited to the following:
 - 1. Pumps.
 - 2. Motors.
 - 3. Instrumentation and controls.
 - 4. Electrical equipment.

1.4 SUBMITTALS

- A. Shop Drawings:
 - 1.
 - 2. Submit drawings of pump in operating position within riser pipe and appropriate level set points.
- B. Contract Closeout Information:
 - 1. Operation and Maintenance Data.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:
 - 1. Submersible leachate pumping system:
 - a. EPG.
 - b. Gunnco.
 - c. Integrated Environmental Technologies.
 - d. Myles Industries.
 - 2. Stainless Steel Shank Type Cam and Groove coupler assemblies:
 - a. Andrews/Dixon.
 - b. Or approved equal.
 - 3. Flexible Secondary Containment Hose:
 - a. Parker Hannifin Corporation, Gully Washer heavy duty lay flat PVC hose, 6IN size, Part No 7545-6001.
 - b. Or approved equal.

2.2 MATERIALS

- A. Wet Applications [Pump Service Category and/or Tag Number]:
 - 1. Pump case: 304 Stainless Steel.
 - 2. Motor housing: 304 Stainless Steel.
 - 3. Impeller: 304 Stainless Steel.
 - 4. Shaft: Stainless Steel, ANSI Series 300 or 400.
 - 5. Bushings: PTFE
 - 6. Wear ring: Corrosion and wear resistant materials.
 - 7. O-rings: Buna-N or Nitrile rubber or Viton.
 - 8. Bolts and nuts: Stainless Steel.
 - 9. Fasteners: Stainless steel.
 - 10. Lifting chains and cables: Stainless steel.
 - 11. Lower ring seal: Silicon-Carbon.
 - 12. Upper ring seal: Carbon-Ceramic.
 - 13. Seal metal parts: Stainless steel.

2.3 PERFORMANCE AND DESIGN REQUIREMENTS

2.4 EPG 77-3 25-HP 3 PH 460 VAC COMPONENTS

- A. General:
 - 1. Provide pumps capable of handling [municipal solid waste leachate, CCR leachate, LFG condensate].
 - 2. Where watertight sealing is required, machine and fit mating surfaces with O-rings.
 - 3. Provide with heavy duty lift lugs or hoisting bail designed for lifting the entire pump and motor assembly.
- B. Impeller:
 - 1. Provide nonclog-type dynamically balanced impeller in accordance with HI standards.
 - 2. [Provide adjustable impeller that will provide effective sealing between the suction cover and impeller] [Provide impeller and volute wear rings as necessary to assure efficient sealing between volute and impeller].
- C. Shaft:
 - 1. Design shaft for a maximum deflection of 0.004 IN at the stuffing box as calculated at the design condition.
- D. Mechanical Seal:
 - 1. Seal shaft with double mechanical seal running in an oil filled chamber.

2. Provide seals requiring neither routine maintenance nor adjustment, but capable of being easily inspected and replaced.
 3. Hold interface in contact by its own spring system.
- E. Motors:
1. Provide pump with FM, UL, or CSA listed motor approved for [explosion-proof atmospheres] [area classification shown on Drawings].
 2. Provide induction type motor with a squirrel cage rotor, of totally submersible design without loss of watertight integrity to a depth of at least 65 FT, constructed with epoxy or poly-seal encapsulated windings, air-filled or dielectric oil filled, with Class H insulation rated for 180 DEGC and rated for continuous duty operation.
 3. Motor shall be [1] [3] PH, 60 cycle, [230] [460] V.
 4. Motor shall be capable of running continuously in an unsubmerged condition while pumping under load without damage to motor or seal.
 5. The motor horsepower provided shall be adequate so that the pump is non-overloading throughout the entire pump performance curve from shut-off through runout.
- F. Power and Control Cables:
1. Provide power and control cables which are listed per NEC requirements and approved for the installation types indicated on the drawings. As a minimum the cable shall be suitable for installation in conduit, submersible applications, and cable tray.
 2. Size cables in accordance with applicable NFPA 70 specifications.
 3. Provide power cable and control cable of sufficient length to install without splicing.
 4. Provide each cable with a strain relief, cord grip, and explosion proof seal installed in accordance with NFPA 70, Article 500.
 5. Minimum acceptable cable type: TC-ER.
- G. Temperature Monitor:
1. Furnish each phase of the motor with thermal switches embedded in the motor windings.
 2. Should high temperature be sensed in the windings, the thermal switch will open, shut the pump down, and sound an alarm. Should any one of the thermal switches detect high temperature, it will [automatically] [require manual] reset once the stator temperature returns to normal.
 3. Set temperature of the temperature monitors not higher than 90 PCT of insulation temperature rating.
- H. Connections:
1. Design pump to allow for system removal without entering the riser.

2.5 ACCESSORIES

- A. Carriage:
1. Each pump shall be mounted in a 300 series stainless steel carriage sized for use in the specified HDPE riser pipe with a constant inside diameter set at a 3:1 slope.
 2. The carriage shall provide a low center of gravity and all wheels shall remain in contact with the contour of the riser pipe.
 3. The carriage shall be designed to allow removal of pump and motor should be required.
 4. Provide a retrieval cable of 300 series stainless steel complete with stainless steel snap hook and associated hardware.
 5. An inlet strainer and level sensor clamp shall be provided. The level sensor shall be installed without disassembly of the pump.
- B. Discharge Hose/Pipe Fittings:
1. All fittings shall be 300 series stainless steel and as recommended by hose manufacturer.
 2. Connect 2 FT length of stainless steel double braided metal hose with threaded ends to pump.
 3. Connect metal hose to 4 IN HDPE discharge pipe.
 4. Use pitless adapter or other quick connection at riser exit.

- C. Control Panel:
1. Furnish and install locally mounted control panel at location shown on Drawings and rated for area classification.
 2. Provide combination magnetic motor starter(s) with Motor Circuit Protector (MCP) type circuit breaker, NEMA full size contactor with three overload relays and control power transformer (CPT) with two fuses on the primary side and one fuse on the secondary side, for [120] VAC control circuits.
 3. Include a terminal board for connection of level sensors.
 4. Provide the following features:
 - a. Hand-Off-Automatic selector switches.
 - b. Automatic alternator.
 - c. Pump sequence selector switch which overrides automatic alternator.
 - d. High level alarm with alarm horn, silence pushbutton, and alarm light.
 - e. Low level alarm with silence pushbutton and alarm light.
 - f. Pump running lights.
 - g. Elapsed time meters.
 - h. Overload reset button to reset overload relays.
 - i. Transient Voltage Surge Suppression (TVSS):
 - 1) UL 1449 listed.
 - 2) Maximum lead length 6 IN.
 - j. Moisture detector alarm light and pump shutdown.
 - k. Motor over-temperature alarm and shutdown.
 - l. 100 watt utility light outlet.
 - m. Level switch test pushbuttons.
 - n. Auxiliary contacts wired to terminal blocks.
 - o. Power ON control relay.
 - p. Remote telemetering contact.
 - q. Normal emergency power transfer switch.
 - r. Inner door in cabinet-mounted on a continuous vertical stainless steel hinge; size to completely cover wiring and components mounted on the back panel; provide for mounting of controls and instruments on inner door.
 - s. Door shall be able to remain in open position while work is being performed.
 - t. Provide door and hardware (including latching mechanism and hinges) of stainless steel materials.
 - u. Wallmounting.
 5. See Electrical Design for electrical requirements.
- D. Level Control:
1. A panel mounted controller digital readout display shall provide level indication of each sump. The pump “ON-OFF-HIGH-LEVEL” selection shall be through level indicating/controller that allows check/adjustment of level settings and screwdriver adjustment operation. The controller unit will accept a 4 to 20 mA signal from the transducer and provide a level indication readout of 0 to 138 IN of liquid.
 2. A submersible transducer shall be provided with a suitable cable. The transducer shall be all 316 stainless steel and shall be mounted to the carriage of each pump. The unit shall provide a 4-20 mA signal output to the control unit over the entire range at levels encountered in the basin. Static accuracy rating shall be no less than 0.25 PCT. Provide sensor mounted surge arrestor.
 3. A permanent bellows level sensor breathing device, or approved equal, shall be provided to be mounted in control panel or junction box to prevent moisture in the vent tube.
- E. Cable Fittings. Non-metallic gas tight cable exit fittings properly sized for the power and control cables shall be provided.

2.6 SOURCE QUALITY CONTROL

- A. Secure from the pump manufacturer the following inspections and tests on each pump before shipment from factory:
 - 1. Check impeller, motor rating and electrical connections for compliance with this Specification Section.
 - 2. Test motor and cable insulation for moisture content or insulation defects.
 - 3. Prior to submergence, run pump dry to establish correct rotation and mechanical integrity.
 - 4. Run pump submerged for 30 minutes.
 - 5. After operational test #4, perform insulation test (#2) again.
- B. Factory test of head (FT) versus flow (GPM)

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Seal pump cable end with a high quality protective covering, to make it impervious to moisture or water seepage prior to electrical installation.

3.2 FIELD QUALITY CONTROL

- A. Pump Set Points.
 - 1. Base pump set points on the level sensor readings for the locations specified by owner.
- B. Start-Up Training.
 - 1. The manufacturer of the system shall provide field supervision/assistance for installation and start-up of the system. This service shall take place after the riser is in place and the control panel is connected to power.
 - 2. A start-up report shall be provided to include all component settings and motor operating characteristics data. The report shall certify the system is properly installed. Any deficiencies found shall be corrected.
 - 3. At the time of installation, coordinate with the system supplier and owner to provide operator training and troubleshooting in the field.
 - 4. At the time of installation, coordinate with the system supplier and owner to provide operator training and troubleshooting in the field.
 - 5. A complete operations and maintenance manual for the system shall be provided. Information shall include installation and removal procedures, system operation explanation, equipment lists, bill of materials, parts information, service contact information, and instruction for each component provided. The manual shall have an index to reference location of each document.

END OF SECTION



ADDITIONAL INFORMATION





CQA PLAN





Con 12-1-1
Doc # 82455

STATE OF IOWA

TERRY E. BRANSTAD, GOVERNOR
KIM REYNOLDS, LT. GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
CHUCK GIPP, DIRECTOR

February 16, 2015

RICK HURT
SOUTH CENTRAL IOWA SOLID WASTE AGENCY
1736 HIGHWAY T17
TRACY IA 50256

RE: South Central Iowa Solid Waste Agency Landfill (Marion Co.)
Permit No. 63-SDP-02-77
Amendment #4

Dear Mr. Hurt:

Enclosed is Amendment #4 to the permit issued on April 14, 2014, for the South Central Iowa Solid Waste Agency Landfill (Marion Co.). The amendment and approved plans must be kept with the permit and the approved plans at the sanitary disposal project in accordance with paragraph 113.11(1)"a". Please review this amendment with your operators, as they must become familiar with it.

The permit amendment approves the revision of the quality control and assurance plan for Cell 4F.

Please note that the amendment contains conditions that require a response or action by you, which if not properly complied with, may prompt enforcement action by this department.

If you have any questions, please contact me at 515/2725-8345.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael B. Leat".

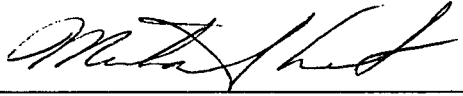
Michael B. "Mick" Leat
Land Quality Bureau

Attachment

copy: John Hartwell, P.E.
SCS Aquaterra
14755 Grover Street
Omaha, NE 68144

DNR Field Office #5

**IOWA DEPARTMENT OF NATURAL RESOURCES
AMENDMENT #4**

Issued by: 
Michael Leat
Department of Natural Resources

Date Issued: February 16, 2015

Permit number 63-SDP-02-77P, issued on April 14, 2014, for the South Central Iowa Solid Waste Agency Landfill (Marion Co.) is hereby amended by the following:

1. The Construction Quality Control and Assurance Plan Cell 4F, dated February 13, 2015, as submitted by SCS Aquaterra, is approved and incorporated into the permit. Observation, evaluation, documentation, and reporting of the construction of Cell 4F shall be performed in accordance with this plan.



Construction Quality Control and Assurance Plan Cells 4F

Presented to:



1736 Highway T17
Tracy, Iowa 50256
(641) 828-8545

Presented by:

SCS AQUATERRA
14755 Grover Street
Omaha, NE 68144
(402) 884-6202

January 2015
File No. 27214085.03

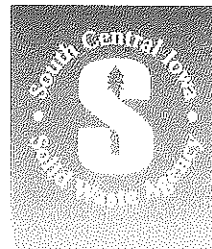
SCS AQUATERRA



Construction Quality Control and Assurance Plan Cells 4F

PLANS AND SPECIFICATIONS APPURTENANT TO
PERMIT FOR SANITARY DISPOSAL PROJECT
NO. 63-SDP-02-77
DATED April 14, 2014
IOWA DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL SERVICES DIVISION
By *[Signature]*

Presented to:



1736 Highway T17
Tracy, Iowa 50256
(641) 828-8545

Presented by:

SCS AQUATERRA
14755 Grover Street
Omaha, NE 68144
(402) 884-6202

January 2015
File No. 27214085.03

SDP AMENDMENT # 4
Date: Feb. 16, 2015

Construction Quality Control and Assurance Plan Cell 4F

Presented to:

South Central Iowa Solid Waste Agency
1736 Highway T17
Tracy, Iowa 50256

Presented by:

SCS AQUATERRA
14755 Grover Street
Omaha, NE 68144
(402) 884-6202

January 2015
File No. 27214085.03

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Appendix A Sample Documentation Forms

EXECUTIVE SUMMARY

The following Construction Quality Control and Assurance Plan establishes the process to evaluate and document that the construction of Cell 4F at the South Central Iowa Solid Waste Agency landfill conforms to the drawings, specifications, contract documents, and Iowa Department of Natural Resources requirements for landfill cell construction.

This document is a supplement to the plans and specifications to detail testing and documentation requirements for landfill cell construction. This document addresses both soil and geosynthetic components of the cell construction and the acceptable criteria. Sample documentation forms are provided in Appendix A.

LIST OF ABBREVIATIONS, ACRONYMS, AND SYMBOLS

CQ&A	Construction Quality Control & Assurance Plan
CQA	Construction Quality Assurance
DNR	Iowa Department of Natural Resources
IAC	Iowa Administrative Code
RCL	Recompacted Clay Liner
RPR	Resident Project Representative
SCISWA	South Central Iowa Solid Waste Agency

DEFINITIONS

Manufacturing Quality Control (MQC): A planned system of inspections that is used to directly monitor and control the manufacture of a material which is factory originated. MQC is normally performed by the manufacturer of geosynthetic materials and is necessary to ensure minimum (or maximum) specified values in the manufactured product. MQC refers to measures taken by the manufacturer to determine compliance with the requirements for materials and workmanship as stated in certification documents and contract plans.

Manufacturing Quality Assurance (MQA): A planned system of activities that provides assurance that the materials were constructed as specified in the certification documents and contract plans. MQA includes manufacturing facility inspection, verifications, audits and evaluations of the raw materials and geosynthetic products to assess the quality of the manufactured materials. MQA refers to measures taken by the MQA organization to determine if the manufacturer is in compliance with the product certification and contract plans for a project.

Construction Quality Control (CQC): A planned system of inspections that is used to directly monitor and control the quality of a construction project. Construction quality control is normally performed by the geosynthetics installer or for natural soil materials by the earthwork contractor, and is necessary to achieve quality in the constructed or installed system. Construction quality control (CQC) refers to measures taken by the installer or contractor to determine compliance with the requirements for materials and workmanship as stated in the plans and specifications for the project.

Construction Quality Assurance (CQA): A planned system of activities that provides the owner and permitting agency assurance that the facility was constructed as specified in the design (EPA, 1986). Construction quality assurance includes inspections, verifications, audits, and evaluations of materials and workmanship necessary to determine and document the quality of the constructed facility. CQA refers to measures taken by the CQA organization to assess if the installer or contractor is in compliance with the plans and specifications for a project.

Owner: This is the organization that will own and operate the disposal unit. The owner/operator for this project is the South Central Iowa Solid Waste Agency.

Owner's Representative: The owner/operator usually has an official representative who is responsible for coordinating schedules, meetings and field activities.

Design Engineer: The design engineer's primary responsibility is to design a waste containment facility that fulfills the operations requirement of the owner/operator, complies with accepted design practices for waste containment facilities, and meets or exceeds the minimum requirements of the permitting agency. The design Engineer is SCS Aquaterra.

General Contractor: The general contractor has overall responsibility for construction of a waste containment facility and for CQC during construction.

Installation Contractor: Manufactured products (such as geosynthetics) are placed and installed in the field by an installation contractor who is the general contractor, a subcontractor to the general contractor, or is a specialty contractor hired directly by the owner/operator.

Earthwork Contractor: The earthwork contractor is responsible for grading the site to elevations and grades shown on the plans and for constructing earthen components of the waste containment facility.

CQC Personnel: Construction quality control personnel are individuals who work for the general contractor, installing contractor, or earthwork contractor and whose job it is to ensure that construction is taking place in accord with the plans and specifications approved by the permitting agency.

Testing Laboratory: The testing laboratory is responsible for ensuring that tests are performed in accordance with applicable methods and standards, for following internal QC procedures, for maintaining sample chain-of-custody records, and for reporting data.

Certifying Engineer: The certifying engineer is responsible for certifying to the owner/operator and permitting agency that, in his or her opinion, the facility has been constructed in accord with plans and specifications.

1.0 GENERAL

1.1 INTRODUCTION

The Construction Quality Control and Quality Assurance Plan (CQ&A Plan) for this project shall include the construction quality assurance procedures for the subgrade preparation, landfill clay liner installation, geomembrane installation, leachate drainage layer installation, and landfill leak location testing.

All definitions, references, submittals and work required by the Contractor, Geomembrane Manufacturer, Geosynthetics Installer, and leak location testing firm discussed throughout this CQ&A Plan will be required by the Contractor as referred to in the Drawings and Specifications.

Should a conflict arise, the Drawings and Specifications shall take precedence over the requirements of this document, provided that such requirements meet the applicable minimum regulatory standards.

1.2 PURPOSE AND SCOPE

The purpose of this document is to provide high quality construction and installation of the various components of the composite liner system. This document describes the construction quality assurance procedures required to evaluate and document the proper construction of the components of these systems. The work shall be performed to conform to the Contract Documents, including all project-specific addenda and construction change orders. All parties involved in the project shall comply with the responsibilities presented in Section 1.3. A typical project organizational chart depicting the various parties and the lines of authority is presented as Figure 1-1.

1.3 RESPONSIBILITY AND AUTHORITY

1.3.1 General

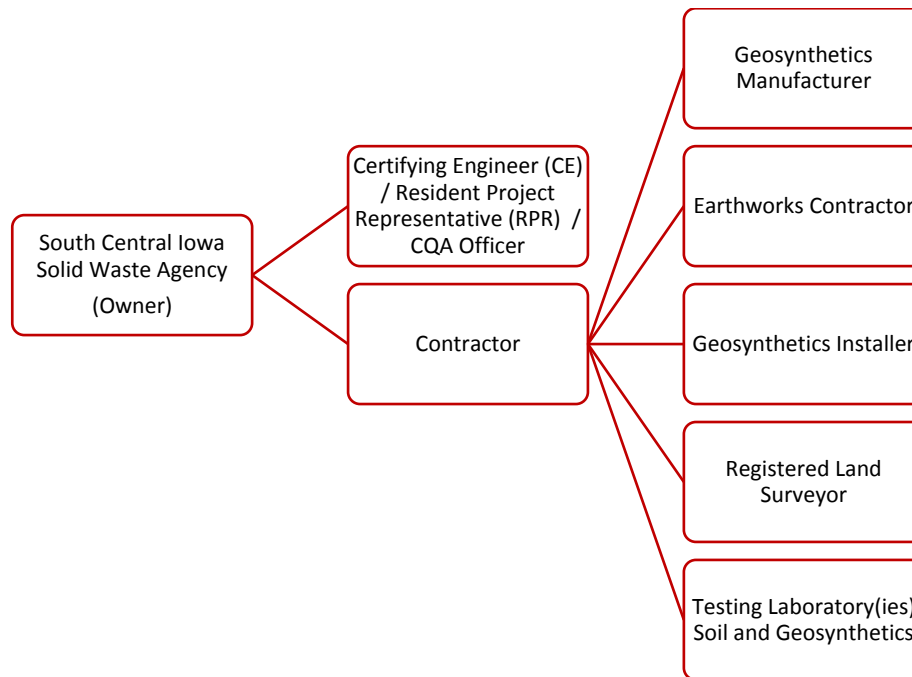
Unless otherwise stipulated by the Contract Documents, the responsibility and authority of each party involved in the work shall follow the lines set forth in the following sections and the applicable regulations and/or permit conditions.

1.3.2 Permitting Agencies

The Iowa Department of Natural Resources (DNR) has the regulatory authority for approval of the development and operational permits required for the project and the authority to authorize waste placement in Cells 4F upon completion and approval of the Construction Documentation Report.

Figure 1-1

Project Organizational Chart



1.3.3 Facility Owner/Operator

The South Central Iowa Solid Waste Agency (Owner/Agency) shall be responsible for awarding bids, coordinating communication for the project, and other responsibilities as defined in the Contract Documents. The Agency will designate a representative who shall assume the duties and responsibilities as assigned to the Engineer in the Contract Documents. All reference to Agency in the document shall implicitly include the Agency's representative.

1.3.4 Engineer

The individual or firm designated as the Engineer shall be responsible for the Contract Documents including, unless otherwise designated by the Agency, the Drawings and Specification. The design shall fulfill the operational and performance requirements of the owner, comply with accepted design practice, and, at a minimum, meet the applicable regulatory requirements. The Engineer shall also be responsible for review, generation, and approval of all design and/or specification modifications and clarifications which pertain to the design services provided. These modifications and clarifications may occur prior to and/or during construction. The Engineer shall report directly to the Agency.

1.3.5 Construction Contractor

The Construction Contractor (Contractor) shall be responsible for completing all work as specified or indicated in the Contract Documents. All definitions, references, submittals and work required by the subcontractors, manufacturers and installers as specified in the Contract Documents and this CQ&A Plan will be the responsibility of the Contractor as referred to in the

Contract Documents. Additionally, the Contractor will be responsible for the development and implementation of a site specific Health and Safety Plan prior to initiating any work. The Health and Safety Plan shall cover all aspects of the work and any emergencies that may arise along with specific actions necessary to address safety and emergency situations. A copy of the Contractor's Health and Safety Plan shall be submitted to the Agency prior to the start of work.

1.3.6 Earthwork Contractor

The Earthwork Contractor shall be responsible for proper construction of the earthwork related portions of the landfill lining systems. Typical landfill lining earthwork activities include:

- Site clearing and grubbing
- Pre-processing of soils
- Backfilling and/or structural fill
- Placement and compaction of soils
- Grading
- Protection of materials placed

The Earthwork Contractor shall provide the equipment and labor necessary to complete the construction in accordance with the Contract Documents. The Earthwork Contractor may also be the Contractor or a subcontractor. The responsibilities of the Earthwork Contractor, if a subcontractor, shall also be the responsibility of the Contractor.

1.3.7 Construction Quality Assurance (CQA) Consultant

The CQA Consultant shall be responsible for the implementation of the CQ&A Plan Implementation including:

- Observing and documenting construction activities.
- Sampling and testing soils (unless otherwise assigned in the Contract Documents).
- Verifying geosynthetic properties conform to the specifications.
- Observing and documenting QC procedures and testing performed by the Contractor.
- Sampling and testing geosynthetics (unless otherwise assigned in the Contract Documents).
- Reporting construction progress directly to the Agency.

- Making recommendations to facilitate compliant construction.
- Documenting and informing the Agency and Contractor of non-compliant construction and/or materials.
- Preparing the Construction Observation Report, sealed by a Professional Engineer licensed in Iowa, which documents the construction of the project according to the Contract Documents.

1.3.8 Geosynthetics Manufacturer

The Geosynthetics Manufacturer(s) are responsible for manufacturing and supplying a geo-grid, geotextile, and geomembrane (when required) that, at a minimum, meets the requirements of the work as set forth in the Contract Documents. The Geosynthetics Manufacturer shall provide the required documentation and perform the quality control/quality assurance procedures as detailed in the Contract Documents, this CQ&A Plan, and the Manufacturer's quality control plan. The Geosynthetics Manufacturer(s) shall report directly to the Contractor.

1.3.9 Geosynthetics Installer

The Geosynthetics Installer shall provide all materials, equipment, and labor necessary to complete the installation of the geosynthetic materials which, at a minimum, meets the standards of the Contract Documents. The Geosynthetics Installer shall provide the required documentation, including the certifications for subgrade acceptance, material and workmanship and perform the quality control/quality assurance procedures as detailed in the Contract Documents, and the Geosynthetics Installer's quality control plan. The Geosynthetics Installer shall report directly to the Contractor.

1.3.10 Testing Laboratory(ies)

The Testing Laboratory(ies) shall be responsible for providing soil and geosynthetic testing services that are required by the Contract Documents. The Testing Laboratory(ies) shall have an internal quality control plan to assure procedures conform to the appropriate standards. This plan shall include information on chain of custody procedures, reporting of data, qualifications and experience of laboratory personnel, and the handling and storage of samples.

The Testing Laboratory(ies) shall provide the required documentation and perform the quality control/quality assurance procedures as detailed in this CQ&A Plan and the Testing Laboratory(ies) quality control plan. The Testing Laboratory(ies) may be physically located at an on-site or off-site location. The Testing Laboratory(ies) may be affiliated with the CQA Consultant and shall report directly to the party with whom contracted to provide the soil and/or geosynthetic testing services as specified in the Contract Documents.

1.3.11 Licensed Land Surveyor or Professional Engineer

The individual or firm designated as the Licensed Land Surveyor or Professional Engineer shall be responsible for the measurement and verification of soil and geosynthetic components of the landfill lining system as required by the Contract Documents. The Licensed Land Surveyor or Professional Engineer shall be licensed in the State of Iowa. The Licensed Land Surveyor or Professional Engineer may be hired and paid for by the Contractor according to the Contract Documents and may report directly to the Contractor.

1.3.12 Resident Project Representative & Quality Control & Assurance Officer

The Resident Project Representative (RPR) shall be an employee of the CQA Consultant and shall perform the field functions of the CQA Consultants. The RPR shall report to the Owner discrepancies or deficiencies in the construction of the project. The RPR will document work conducted, review work for conformance to the Contract Documents, and will coordinate materials sampling for soils, geosynthetics, and other materials as required in the Contract Documents. Additional responsibilities of the RPR may be stipulated by the Agency and are as outlined in the Contract Documents.

1.4 LINES OF COMMUNICATION

The typical lines of communication necessary during the construction activities are illustrated in Figure 1-1.

1.5 MEETINGS

The meetings described below are recommendations only, and the actual meetings held may vary to meet the needs of the project and as authorized by the Agency. The following meetings are for CQA purposes and are not intended to coincide with other project meetings described in the Contract Documents. However, CQA meetings and general construction meetings may be held concurrently.

1.5.1 Preconstruction Meeting

After selection of the Contractor and prior to the initiation of any construction activities, a Preconstruction Meeting shall be conducted. This meeting shall be attended by the Agency (or designee), Engineer, Contractor, Geosynthetics Installer, QC&A Officer and RPR. Other parties may be invited to attend based upon their responsibilities and authority. If appropriate, based upon the construction sequence and the division of the work (soils and geosynthetic components), more than one such meeting may be held at the discretion of the Owner / Engineer. Issues to be addressed during this meeting shall include, but not be limited to:

Responsibilities of all parties as defined in the Contract Documents and this CQ&A Plan.

- Lines of communication and authority.
- Testing frequencies and procedures.
- Modifications to the Contract Documents and/or this CQ&A Plan (e.g., change orders).
- Procedures for soil material processing (i.e., moisture content, layer bonding, and mixture blending, etc.)
- Procedures for documentation and report submittals.
- Procedures for delivery and proper unloading/stockpiling of materials.
- Coordination of all work, particularly that between the Earthwork Contractor and the Geosynthetics Installer.
- Procedures for dust control, protection of stockpiled and installed materials, desiccation crack control and repair, erosion control and repair, and housekeeping requirements.
- Project schedule and hours of work.
- Identification of stockpile areas and areas to be used for temporary storage/stockpiling.
- Conduct site walk-over to discuss proposed construction sequence, initial start-up, inspect borrow area, and establish traffic routes.
- Work area security and health and safety procedures applicable to all parties.
- Site-specific addenda for the project.
- Soil maximum particle size acceptance/rejection criteria.
- Geosynthetic wrinkle acceptance/rejection criteria.
- Prefabricated or field-fabricated portions of the geomembrane liner which represent special concerns or problems.
- Areas which represent expected difficulties with non-destructive testing.
- Level of CQA monitoring required for nondestructive testing.
- Writing on the geomembrane, acceptable colors, and required information.
- Requirements of materials, deviation from specifications.
- Procedures for documenting tests and repairs performed on geomembranes.

- Coordination and communication of completion of a geosynthetics layer, or portions thereof, and placement of overlaying layers.
- Allowable equipment and usage.
- Procedures for final acceptance of geomembrane prior to completion, so as to allow covering for protection of the geomembrane as soon as possible.
- Procedures in the event of subgrade precipitation damage and other instances which may occur during the construction process.
- Testing Laboratory(ies) to receive and test soil and geosynthetic samples.
- Confirm the schedule of job site meetings.
- Review site facility license/permit conditions.

This meeting shall be documented by the RPR and/or the QC&A Officer. Minutes of the meeting shall be prepared and provided to all parties in attendance.

1.5.2 Weekly Progress Meeting

Weekly progress meetings shall be held and attended by the Contractor, Agency, and RPR. At a minimum, the issues to be addressed during these meetings are:

- Review of the construction progress of the previous week.
- Status of project schedule.
- Any construction deficiencies and/or proposed corrective actions.
- Anticipated construction problems.
- Proposed construction activities and locations for the upcoming week.

This meeting shall be documented by the RPR and included in the weekly report to the Agency.

1.5.3 Problem or Deficiency Resolution Meeting

Should a construction problem or deficiency occur or is anticipated to occur, a notice of defect shall be issued in accordance with the Contractor Documents and a problem or deficiency resolution meeting shall be held as soon as possible. This meeting shall be attended by the appropriate parties (Contractor, Geosynthetics Installer, Agency, Design Engineer and RPR) as determined by the CQA Officer. The intent of this meeting shall be to identify, isolate, and resolve the problem or deficiency to the satisfaction of the Contract Documents, and to all

parties, to the extent possible. This meeting shall be documented by the RPR and included in the weekly report to the Agency and distributed.

1.6 CONSTRUCTION OBSERVATION – RECORD KEEPING

1.6.1 Monitoring of the Work

The following construction activities shall be monitored and the results recorded by the RPR:

- Field testing.
- Visual examination of the subgrade for unacceptable areas.
- Method of subgrade preparation.
- Loose lift thickness prior to compaction.
- Volume of soils placed and compacted from each borrow source and corresponding soil sampling frequencies.
- Identification of borrow source location, soil description, and specific borrow area maximum dry density and optimum moisture content.
- Compaction equipment (type and weight) and method.
- Removal of organic material, rocks, and other materials which do not meet the Contract Documents.
- Compacted lift thickness.
- General observation of the number of equipment passes during compaction of each lift.
- Area or units of work being tested, identifying lift or elevation, and location. Test locations shall be designated by increasing chronological order and coordinates.
- Failed test areas by coordinate boundaries, corrective action taken in these areas and results of retests. Retests shall cross-reference the numbers and dates of failed tests.
- Actions of the compaction and heavy equipment (i.e., loaded scrapers) on the compacted soil liner/cover (i.e., pumping, approximate depth of sheep's foot penetrations, etc.).
- Leaks or spills from equipment or activities and corrective actions taken.
- Effectiveness of corrective actions for deficient work.
- Methods of adjusting soil moisture and controlling desiccations cracking.
- Documentation of recompacted soil liner repair.

1.6.2 Documentation

The implemented CQ&A Plan shall recognize and assign monitoring tasks to all construction activities. The RPR shall document that quality assurance requirements have been addressed and satisfied. Further, the RPR shall provide field reports, data sheets and checklists to substantiate that requisite monitoring tasks have been implemented. The RPR shall maintain a job site file of Contract Documents, drawings, checklists, test procedures, daily reports, logs and other project relevant documents.

1.6.2.1 Daily Record Keeping

Daily record keeping shall, at a minimum, include (as applicable):

- Daily summary, reporting meetings and/or discussions with the Contractor, or geosynthetic installer and summarizing RPR daily activities.
- Daily field test result data sheets describing observations of construction activities and CQA monitoring/testing.
- Conformance tests results data sheets.
- Laboratory test result data sheets.
- Installation problem and resolution reports and summaries.
- Installation progress reports.
- Reduced scale site plan showing locations of tests and procured samples.
- Equipment calibration or recalibration forms.
- Design and specification modification/clarification documentation.
- Weather conditions, including monitoring of minimum and maximum ambient temperatures and precipitation, as required by the Contract Documents and this CQ&A Plan.

These documents shall be accessible by the Agency for review. Copies of daily reports shall be submitted to the Agency as requested. The RPR's daily summary shall include:

- Date, project name, project number, and location.
- Parties on-site or participating in meetings and discussions.
- Activities completed that day.
- A summary of the quality assurance tests performed and an indication of the results (pass/fail criteria).
- Proposed activities.
- Relevant discussions and the outcome of each.

The RPR shall document that the requirements of the Contract Documents and this CQ&A Plan have been addressed and satisfied. To this end, the RPR shall provide field reports, data sheets and checklists to substantiate that the monitoring tasks have been implemented. The RPR shall maintain a job site file of the Contract Documents, drawings, checklists, test procedures, daily reports, photographs and other project documents.

1.6.3 Installation Problem Resolution

Installation problem resolution document shall reference specific observations and test result data forms. These documents shall include, as a minimum, the following information:

- A description of the problem, non-conformance, or deficiency.
- Location and probable cause of the problem.

- Description of how and when the problem was identified.
- Description of how the problem, non-conformance or deficiency was resolved or corrected.
- Reference to results of any tests or retest performed.
- Description of measures implemented to prevent recurrence of the problem.

Installation problem resolution documentation only needs to occur as a result of consistent deficiencies. Routine failures of geosynthetic product installation (weld failure, air channel test failure, etc.) need only be document on the appropriate forms and repairs to correct the failures referenced on the forms.

These documents or descriptions shall be incorporated as part of the daily summary reports. Any resulting modifications or clarification to the Contract Documents shall be documented and approved by the Agency and Engineer.

1.6.4 Design and Specification Modifications or Clarifications

During the course of installation, modifications or clarifications to the Contract Documents shall be documented by the RPR. These documents shall, in general, be submitted to the Agency or Design Engineer, as appropriate, for review and approval prior to implementation. To expedite the process, it may be necessary for the Agency and Engineer to grant verbal approval prior to completion of the formal, written documentation. Such approval shall be documented by the RPR. A Work Change Directive form is provided in the Contract Documents.

1.6.5 Photographs Record

Photographs shall be taken to show construction methods, assemblies, deficiencies, etc., and will be the responsibility of the RPR. A sufficient number of photographs shall be obtained to document the construction of each construction item (e.g., each manhole, each type of pipeline, each method of anchoring geomembranes, etc.). Panoramic views of prepared subbase and completed liner and cover will be included. Improvements that will be covered during construction shall be photographed while exposed.

The photographs shall include features or objects that will allow relative size of improvements to be indicated in the photograph.

A photo log containing the following information will be maintained:

- Date, time, location and orientation of photograph.
- Name of photographer.

- Location and description of the work.

Additionally, each photograph shall be labeled. Each label shall supply the same information as the photo log.

Construction problems and non-conforming work shall be documented with photographs taken before and after the problem or when the non-conforming work has been corrected.

The Construction Contractor shall not backfill piping, fittings, structures, etc., before construction photographs have been obtained.

1.6.6 Final Report

Upon completion of the work, the CQA Consultant shall submit a final report, entitled Construction Observation Report as described in Section 5.0 below.

1.7 SURVEY VERIFICATION

At a minimum, the record surveys shall document the following:

Composite Liner

- Subbase of clay liner on 100-foot grid and at grade breaks.
- Top of clay liner on 100-foot grid and at grade breaks.
- Trench undercuts elevations every 50 feet.
- Trench elevations every 50 feet.

1.7.1 Tolerances

Tolerances for each phase of construction are listed in Table 1-1. Areas which do not meet the tolerances listed in Table 1-1 will be re-graded, or removed and replaced, until the tolerances are met and are verified by resurvey.

**Table 1-1
Summary of Tolerance**

Item	Tolerance ¹
1. Clay liner	
a) Subbase grade	0.0 to -0.2 ft ^{2,3}
b) Top of clay liner	0.0 to +0.2 ft ²
2. Leachate Extraction System	
a) Collection piping	±0.05 ft / 100 ft ²
b) Header piping	±0.05 ft / 100 ft ²
c) Top of drainage layer	0.0 to +0.2 ft ⁴
3. Final Cover System	
a) Top of clay liner	0.0 to 0.2 ft ⁵
b) Top of drainage layer	0.0 to 0.2 ft
c) Top of rooting zone layer	0.0 to 0.2 ft
d) Top of topsoil layer	0.0 to 0.2 ft

1.8 THICKNESS VERIFICATION

The RPR shall verify the thickness of the soil components indicated in Table 1-2. The method of verification may include survey, hand augers, hand shoveling, or other CQ&A Officer approved method.

**Table 1-2
Summary of Minimum Thickness**

Item	Frequency	Minimum Thickness	Tolerance
1. Clay liner	100 ft grid	2.0 ft	0.0 to +0.2 ft
2. Leachate Collection Drainage Layer	100 ft grid	1.0 ft	0.0 to +0.2 ft
3. Final Cover System			
a) Clay cover	100 ft grid	1.5 ft	0.0 to +0.2 ft
b) Rooting zone layer	100 ft grid	1.5 ft	0.0 to +0.2 ft
c) Topsoil layer	100 ft grid	0.5 ft	0.0 to +0.2 ft

¹ At each survey location.

² Positive drainage shall be maintained at each location.

³ Minimum clay thickness must be two (2) feet.

⁴ Minimum drainage layer thickness to be one (1) foot.

⁵ Minimum clay thickness to be 1.5 feet.

2.0 SOIL COMPONENTS

2.1 SUBGRADE

Table 2-1
Summary of Subgrade Proof Rolling

Test	Minimum Frequency	Acceptable Test Values
Subgrade proof roll – with a heavily loaded wheeled piece of construction equipment such as a fully loaded (minimum 20 ton) tandem axle dump truck.	Lined Area	Test roll area to verify no yielding greater than two (2) inches

2.1.1 QC&A Officer Inspection of Subgrade and Foundation

- Verify that all trees, stumps, roots, boulders and detrimental debris are removed.
- Verify that placement of frozen soil, or soil onto frozen ground, does not occur.
- Verify that the subgrade is constructed and graded to provide a smooth, workable surface on which to construct the liner
- Verify proofroll exhibits an appropriate surface for compacted clay liner placement

2.2 RECOMPACTED SUBGRADE

2.2.1 General

All fill materials placed for liner and/or cover and support structure construction (i.e., subgrade, berms, etc.) shall be tested in accordance with the following schedule:

**Table 2-2
Summary of Subgrade Testing**

Test	Minimum Frequency	Acceptable Test Values
Soil Material Characteristics (USCS Classification)	1 each/7,500 CY (in-Place) / material	SC, SM, ML, ML-CL, CL, CL-CH, or CH
Compactive Characteristics (ASTM D-698)		NA
In-Place Density, Percent Compaction, and Moisture Content	1 each/10,000 SF / 6 inch compacted lift	Minimum 95% of the Maximum laboratory dry density

2.3 SUBGRADE ELEVATION

2.3.1 Suitability

Structural components and liners shall be placed on subgrade soils that will provide suitable support. The RPR shall determine the suitability of the exposed subgrade prior to allowing placement of subgrade backfill, liner or structural components.

2.3.2 Subgrade Prep

Subgrade Preparation – Following excavation of subgrade materials to the design subgrade, and a visual evaluation by the RPR and the over-excavation of unsuitable soils the site shall be proof-rolled to detect localized zones of excessively wet, unstable, organic, or low bearing capacity materials to the extent as follows:

2.3.2.1 Proof Rolling

Proof rolling is a single-pass operation with conventional compaction equipment (such as a fully loaded tandem axle dump truck weighing at least 20 tons) during subgrade preparation and prior to placement of fill, and shall be observed by the RPR. Soft spots shall be over-excavated, backfilled, and compacted with suitable material.

2.3.2.1.1 Waste Overlay

Where construction of structural or liner components is positioned over waste fill (such as the overlay construction in Cell 4F) and in areas where waste is encountered within 2 feet of the recompacted clay liner (RCL) design subgrade elevation, waste shall be exhumed to that depth and backfilled with at least 2 feet of structural subgrade fill.

Exhumed waste shall be transferred to and incorporated into the active working face. Backfill shall be placed on the exposed waste surface in maximum 8 inch loose lifts and compacted to the Acceptable Test Values in section 2.2.1. The recompacted backfill placed over waste shall be a minimum of 2 feet thick. Note that this may require the contractor to construct a sufficient bridging layer(s) to achieve the acceptable density of fill over a minimum 2 foot compacted thickness.

2.3.3 Subgrade Fill

2.3.3.1 Definition

Subgrade fill materials will refer to materials used for the construction of the Cell 4F or leachate pond subgrade.

2.3.3.2 Borrow Area

Subgrade fill materials will be removed from the borrow area as directed by the Owner or the CQA Engineer.

2.3.3.3 Soil Conditioning

The subgrade fill materials will be prepared by the Contractor and tested by the RPR to verify compliance with the Technical Specifications, Construction Drawings and this CQ&A Plan.

2.3.3.4 Suitability

Subgrade fill soil will be free of debris, roots, organic matter, frozen matter, wood, peat, cinders, rubbish, and stones having any dimension greater than three (3) inches or any other deleterious materials. The fill shall have a Unified Soil Classification consistent with the Acceptable Test Values noted in Section 2.2.1.

2.4 RECOMPACTED CLAY LINER

During the construction of the recompacted clay liner, the RPR, under the supervision of the CQA Officer, shall verify the following:

- Uniformity of coverage by compaction equipment.
- Consistent achievement of density, moisture content, and hydraulic conductivity of each successive lift.
- Constructed to line and grades of leachate collection trenches, sumps and other critical elements of liner and cover system.
- Use of methods to bond successive lifts together.
- Connection (splices) with previously placed clay liners/covers
- Preparation of the upper layer to verify smoothness of surface, removal of rocks and other foreign objects and repairs of damage due to rain or other factors.

- Contemporaneous placement of protective covering to prevent drying and desiccation of clay where necessary.
- There is no placement of frozen material or the placement of material on frozen ground.
- There is no damage to completed liner sections.

2.4.1 Recompacted Clay Liner Quality

Recompacted clay liner (RCL) construction shall meet the specifications and be tested in accordance with the following schedule. The acceptance zone established for determining the satisfactory preparation of the recompacted clay liner shall be established by the Certifying Engineer with the use of historical moisture content / density, permeability and soil classification test results, similar geotechnical test results obtained / performed for proposed borrow area(s) using the method established by USEPA by D.E. Daniel and C.H. Benson⁶.

For each RCL construction project the project maximum Acceptance Zone (AZ) shall be established such that the minimum dry density allowed shall be 95% of Standard Proctor, and within a moisture content range of optimum moisture to 5 % above optimum for each type of soil material employed in the construction of the RCL. This efficacy of the maximum AZ shall be demonstrated by laboratory permeability testing of at least one soil specimen prepared at or near the optimum moisture content, at or near the 95% of the maximum laboratory dry density using Standard Proctor methodology for each soil type proposed for use.

It should be noted the Certifying Engineer may restrict the maximum AZ depending upon laboratory test results, historic test results or his/her professional judgment so that that the permeability requirement of a maximum hydraulic conductivity of 1×10^{-7} cm/sec will be obtained.

Table 2-3
Recompacted Clay Liner Quality Testing

Test	Method	Frequency	Passing Criteria ⁷
<i>Source Testing</i>			
1. Compactive Characteristics	ASTM D698	7,500 CY /Material	≥95% Max. Dry Density and 0% to 5% above Optimum Moisture Content (OMC)
2. Grain Size	ASTM D422	7,500 CY /Material	P200 ≥ 50%; 100% passing 1" sieve
3. Atterberg Limits	ASTM D4318	7,500 CY /Material	LL ≥ 25%; PI ≥ 12%
4. Hydraulic Conductivity	ASTM D5084	7,500 CY /Material	≤ 1×10^{-7} cm/sec
5. Soil Classification	ASTM D2487	7,500 CY /Material	CL, CH

⁶ Daniel, D.E., and Benson, C. H., "Water Content-Density Criteria for Compacted Soil Liners", Journal of Geotechnical Engineering, ASCE, Vol. 116, No. 12, Dec 1990.

⁷ Review Contract Documents for project specific acceptance criteria.

<i>Field Testing</i>			
1. In-place density, percent compaction and moisture content (Nuclear Testing)	ASTM D6938	1 /10,000 SF per compacted 6" lift	Acceptance Zone criteria for material
2. Shelby Tube	ASTM D1587	1 test 12" per acre	3 inch nominal diameter
3. Permeability*	ASTM D5084	1 test 12" per acre	$\leq 1 \times 10^{-7}$ cm/sec
Note*: Verification of liner placement permeability testing performed on each Shelby tube by geotechnical testing laboratory All volumes are in-place volumes			

2.5 DRAINAGE LAYERS

All drainage layer construction for the leachate collection system shall be tested in accordance with the following schedule:

**Table 2-4
Granular Drainage Layer Quality Testing**

Test	Method	Minimum Frequency	Acceptance Criteria ⁸
Grain Size	ASTM D422	1/Source	P200 \leq 5%
Hydraulic Conductivity	ASTM D2434	1/Source	$\geq 1 \times 10^{-1}$ cm/sec

2.6 QUALITY ASSURANCE

2.6.1 General

Construction evaluation shall consist of monitoring the daily construction activities for compliance with the Contract Documents and verification of material placement. In addition to conducting construction evaluations, the RPR is responsible for sampling and testing soils in accordance with the Contract Documents and the CQ&A Plan.

2.6.2 Borrow Source Evaluation

The RPR shall observe and document that all recompacted soil liner materials are obtained from on site or an approved borrow source which has been evaluated in accordance with the Contract Documents.

⁸ Ibid.

2.6.3 Laboratory Testing

The laboratory test methods which shall be utilized to develop data upon which evaluations of construction shall be based are detailed in the appropriate sections of the Specifications. The laboratory test results shall be evaluated and compacted with the field test results to confirm that the materials being placed and the installation procedure used are in accordance with the Contract Documents. The RPR shall confirm that the required testing frequencies are satisfied. Soils placed which do not meet the specifications in the Contract Documents shall not be acceptable. Testing frequencies and material properties are presented in the appropriate sections of the Contract Documents.

2.6.4 Field Testing

Unless soil characteristics preclude its use, nuclear density meter test methods shall be used to determine the in-place moisture/density of the placed soils (ASTM D6938). The nuclear density meter should be checked in accordance with the manufacturer's recommendations on a daily basis. When a nuclear density meter is used, penetrations shall be backfilled with bentonite or recompacted using a sheep's foot.

If field testing result indicate densities or moisture contents not in accordance with the Contract Documents, the failing areas shall be reworked to meet Contract Documents.

2.6.5 Hydraulic Conductivity Evaluations

Hydraulic conductivity testing shall be conducted on materials placed during construction which have hydraulic conductivity requirements specified in the design. The hydraulic conductivity of each sample collected shall be determined as specified in the appropriate section of the Contract Documents. Confining pressures shall be specified by the Engineer.

Hydraulic conductivity testing for in-place compacted soil liner material shall be performed on undisturbed samples procured from the field using minimum 3 inch diameter Shelby tubes at a frequency specified in the Contract Documents. The RPR shall first take a moisture/density test (ASTM D6938) in the area of the in-place test. After the undisturbed test specimen is taken, it shall be sent to the geotechnical test laboratory. The in-place sample is tested for moisture content, dry unit weight and permeability. Hole shall be filled in accordance with Section 2.6.8. These laboratory test results shall be compared with the project Contract Documents to determine acceptability.

2.6.6 Quality Assurance Testing

The terms "layer" and "lift" used throughout this document are defined as follows:

- A “layer” is compacted strata constructed of several lifts with no horizontal or vertical construction joints. Layer bonding between each lift shall be evaluated by visual review of the aforementioned undisturbed samples procured from the field.
- A “lift” is a segment of a soil layer compacted in general to a nominal loose thickness not exceeding eight (8) inches, and a maximum compacted thickness of six (6) inches.

Increased testing frequencies shall be instituted if observations by the RPR of normal testing frequency results indicate potential problems. Additional testing may be warranted when:

- The material repeatedly fails to meet the requirements in the Contract Documents.
- The degree of compaction is doubtful.
- The materials appear to differ from those specified.
- Less than the required number of compaction equipment passes is made.
- The material moisture contents differ from those specified.
- The penetrating foot compactor is dirt clogged during compactions.
- The lift thickness differs from those specified.
- Adverse weather conditions occur.
- Directed by the Agency.

2.6.7 Field Testing Sample Locations

Grid pattern sampling strategies shall be used on in-place and compacted material. Grids shall be based on a 100-foot grid system superimposed on the construction drawings. Sample locations shall be selected at random and coordinates identified on a daily field test result form and a reduced scale site plan.

Samples shall be randomly located within a grid section and offset with each lift. Elevations of lift number shall be identified.

A Density Test of Compacted Fill Form is provided in Appendix A. This form shall be used to document each nuclear density meter test. A new form shall be started each day.

2.6.8 Penetrations

Penetrations into or through the recompacted soil layers shall be backfilled, preferably with bentonite. Penetrations include the following:

- Nuclear density test probe locations.
- Hydraulic conductivity sample locations.
- Grade stake locations.

The backfilled material shall be compacted in place with a tamping rod, modified or standard Proctor hammer or hand tamper, depending on the size of the penetration. Penetrations may be backfilled with a bentonite or a soil/bentonite admixture.

2.6.9 Defective Work

The extent and nature of defective work shall be determined through additional tests, observations, review of records and test results or other means that the RPR deems appropriate. After the extent and nature of the deficiency has been ascertained, the Contractor shall institute corrective actions required to satisfy the Contract Documents or as approved by the Agency. Areas that have been reworked shall be further retested. All retests must verify that the entire defective area has been corrected prior to additional work being performed in that area.

3.0 GEOSYNTHETICS

3.1 INSTALLATION SUBMITTALS

The RPR shall report installation activities and progress to the Owner on a weekly basis. Section 3.3.5.4 details the documentation and submittals required from the RPR during the installation process.

3.2 PROJECT COMPLETION REQUIREMENTS

Section 3.4 details the documentation and submittals required from the RPR.

3.3 QUALITY ASSURANCE

3.3.1 General

The work shall be conducted in accordance with the Contract Documents. To accomplish this, this CQ&A Plan shall be implemented by the RPR.

3.3.2 Delivery Evaluation

The RPR shall document the arrival of all geosynthetics delivered to the site. At a minimum, the RPR shall document the roll numbers, product identification name/number, thickness, the date of delivery and the condition of the geosynthetics upon receipt at the site. Rolls, or portions of rolls, which are unacceptable to the Agency as determined by the RPR, shall be removed from the project site by the Contractor.

3.3.3 Installation Evaluation

The surface upon which the geosynthetic material is to be installed shall be visually observed to document that no obviously harmful objects are present and that the surface complies with the Contract Documents. Installation evaluation shall consist of visual examination of the material surface and seam/joining methods to assure overlap/seam dimensions and material quality, space continuity and integrity.

3.3.4 Conformance Testing

Manufacturer's product certification reports will be submitted for review, for rolls(s) from each lot delivered to the site. Product certification reports must accompany material(s) when shipment arrives onsite. The RPR will review this data to determine if the product(s) comply with project specifications. Verbal acceptance must be given prior to deployment of materials. Material specifications can be found in the Contract Documents. Conformance testing requirements to be conducted by the RPR and the Contractor can be found in the Contract Documents.

3.3.5 Monitoring of the Work

Tests performed to evaluate the integrity of geomembrane seams will be both “destructive” and “non-destructive.”

3.3.5.1 Trial Seams

Trial seams will be done every 4 operating hours per installer or when a piece of equipment is changed out during installation to demonstrate prequalifying experience for personnel, equipment, and procedures. Trial seams will be performed on the identical geomembrane material under the same climatic conditions as the actual field production seams will be made. Trial seams will also be made whenever personnel or equipment are changed and when climatic conditions reflect wide changes in geomembrane temperature or when other conditions occur that could affect seam quality.

3.3.5.2 Non-Destructive Seam Testing

Non-destructive test methods will be conducted in the field on an in-place geomembrane. These test methods determine the integrity of the geomembrane field seams. Non-destructive test methods may include vacuum box or pressurized dual seam tests. Seam sections that fail non-destructive tests will be carefully delineated, patched or re-seamed, and retested. Large patches or re-seamed areas may be subjected to destructive test procedures for quality assurance purposes. The final plans and specifications will describe the degree to which non-destructive and destructive test methods will be used in evaluating failed portions of non-destructive seam tests. For the HDPE, double-wedge thermal seams will be pressure tested in accordance with GRI GM6. Other fusion- or extrusion-welded seams will be tested in accordance with ASTM D5641.

3.3.5.3 Destructive Seam Testing

Quality control testing of geomembranes generally includes peel and shear testing of weld sections prior to commencing seaming activities and at periodic intervals throughout the day. Additionally, destructive peel and shear field tests are performed on samples from the installed seams.

Quality assurance testing will generally require that an independent laboratory perform peel and shear tests of samples from installed seams. The samples may be collected randomly or in areas of suspect quality. HDPE seams will generally be tested at intervals equivalent to one sample per every 500 feet of welded seam and shall be performed on the sideslope of the cell rather than the base of the cell when seams are continuous across the base of the cell.

For dual hot wedge seams in HDPE, both the inner and outer seam may be subjected to destructive shear tests at the independent laboratory. Destructive samples of installed seam welds will generally be cut into several pieces and distributed to the following:

- The installer to perform CQC field testing
- SCISWA to retain and appropriately catalog or archive
- An independent laboratory for CQA peel and shear testing

Minimum peel and shear strength values for the HDPE will be based on compliance with GRI GM19. Minimum acceptable values for peel and shear strength of other geomembranes will conform to recommended minimum values in GRI GM19.

If the test results for a seam sample do not pass the acceptance/rejection criteria, then samples will be cut from the same field seam on both sides of the rejected sample location. Samples will be collected and tested until the area limits of the low quality seam are defined. Corrective measures may involve seaming a cap over the length of the rejected seam or re-seaming. Approximately 10 percent of all corrective measures for geomembranes will be retested.

**Table 3-1
Geomembrane (HDPE and LLDPE) Quality Testing**

Test	Method	Frequency	Passing Criteria ⁹
• <i>Denotes In-Field Testing</i>			
1. Material Thickness	ASTM D5199	1/roll	GRI GM 13
2. Leaking Seam*	ASTM D5641 and ASTM D5820	100% of all field welded seams	Note 9
3. Defects / Punctures*	Visual Inspection	100% of all seams and liner surface	100% Repair
4. Peel and Shear*	ASTM D6392	1/500 LF of seam plus every 6 (six) hours of operation per installer, or change in equipment or procedure during installation	Note 9

3.3.5.4 Geomembrane CQA Observation

The responsibilities of the CQA personnel (RPR) for the installation of the geomembrane are generally the same as the responsibilities for the construction of a soil liner with the following additions:

- Observation and documentation of liner storage area and liners in storage as well as handling of the liner as the panels are positioned on-site.

⁹ Review Contract Documents for project specific acceptance criteria. (Div II – Specification 02600)

- The installation activities shall be monitored by the RPR, during which the following tasks shall be performed:
- Conformance testing as described in the Contract Documents.
- Visual examination of the subgrade for acceptable areas as described in the Contract Documents.
- Observation of equipment operation to confirm that none is allowed directly on the geomembrane without adequate protection.
- Observation and documentation of material panel locations and compliance of the installation with the proposed panel layout provided by the installer.
- Observation of seam overlap, seam preparation prior to seaming, and material underlying the liner, and condition of seam areas.
- Observation and documentation of field testing of trial seams and seaming operations.
- Observation of all pipe penetrations, boots, and welds in the liner.
- Observation and documentation of welding equipment and procedures, temperatures, speeds, etc.
- Observation and documentation of the non-destructive testing procedures employed.
- Observations and documentation of the locations of cuts, tears, holes or irregularities and the repair of such as described in the Contract Documents.
- Observation of destructive testing conducted on trial welds.
- Observation of destructive seam sampling, submission of the samples to an independent testing laboratory, and review of results for conformance to specifications.
- Observation of seams and panels for defects due to manufacturing and/or handling and placement.
- Observation and documentation of temporary and permanent anchoring systems.
- Locate and sample destructive tests as described in the Contract Documents.
- Observation of the Geosynthetic Installer's workmanship and performance of required tasks.
- Preparation of reports indicating sampling conducted and sampling results, locations of destructive samples, locations of patches, locations of seams constructed, and any problems encountered during installation. The final panel plan indicating panel layout, seams, test locations, and repairs shall be provided by the geomembrane installer as a CQC requirement.

3.3.6 Geomembrane Electrical Leak Location Survey (Optional)

Quality assurance associated with an electronic leak location survey shall include the following:

- Determine suitability of site conditions for electrical leak location survey.
- Conduct leak location survey in accordance with ASTM D7007, identifying potential leak locations visually with flags or paint and document location.
- Observe and document Contractor geomembrane repairs in accordance with the Contract Documents.
- Following repairs to initially identified perforations, re-survey at and generally around the repair areas to determine repair success as well as to identify potential for additional perforations previously unidentified.
- Repeat steps 2 through 5 until identified perforations have been repaired and pass retesting.

4.0 ACCEPTABILITY OF THE WORK

It shall be the responsibility of the RPR and the QC&A Officer to determine whether the work, or a portion of the work, has been completed in substantial compliance with the Contract Documents and prevailing industry practice. Portions of the material installed shall be cleaned to remove debris, scrap, mud or other material resulting from installation activities which would interfere with the observation of the material. The RPR shall observe the geomembrane for damage that may have occurred during or after the installation activities. The RPR shall verify that identified repairs have been completed, non-destructive testing has been performed and destructive test samples from the area to be approved have either been passed or are bound by passing destructive tests and the failed seams reconstructed.

5.0 CONSTRUCTION OBSERVATION REPORT

Upon final completion of the construction, the QC&A Officer shall submit a Construction Observation Report to the Agency and DNR within 60 days. Based on the Agency's/Contractor's records and a system designed to confirm that the RPR properly gathered and evaluated the information and supporting documentation, the QC&A Officer shall certify that the construction has been prepared and constructed in substantial conformance with the Contract Documents and permit approval conditions.

This report contains, at a minimum, the following information:

- A title page and index.
- The name and permit number of the facility.
- Contact information for the CQA Officer and persons delegated by the QC&A Officer to supervise or implement any aspects of the QC&A program.
- Contact information for the Contractor.
- Copies of the daily field reports containing the information described in Section 1.6.1.
- A copy of as-built drawings with supporting documentation and photographic evidence. This copy shall also include a narrative explanation of changes from the original regulatory agency-approved plans and specifications.
- Analysis and discussion of QA/QC testing performed with summaries of test results.
- Raw data and test results reports performed during construction.
- Description and documentation of material and equipment types and specifications.
- Discussion of any construction material or equipment which deviated from the Contract Documents, reasons for deviation, and resolutions.
- Photographs documenting construction.
- Certification by a Professional Engineer licensed in the State of Iowa that the project unit was constructed in accordance with the requirements and the approved plans and specifications and this CQ&A Plan.



APPENDIX A

Sample Documentation Forms

DESTRUCTIVE TEST RECORD

Client Name: 0
 SCS Aquaterra Project Name: 0
 SCS Aquaterra Project Number: 0
 Project Location: 0

Specifications: 50 mil
 Material Type: HDPE

	Fusion	Extrusion	
Peel (P)	≥ 76	≥ 65	lb/in
Shear (S)	≥ 100	≥ 100	lb/in

SCS Aquaterra CQA Technician: _____

Max # of Failing Tests Allowed per P/S Set: 0 ea Set on Trial Weld Worksheet

NOTE: ALWAYS CHECK FAILURE CODES ON LAB TEST TOO

Sample ID	Date dd-mmm-yy	Time hhmm (24)	Installer's QC	Seam Number	Seamers Initials	Machine Number	Weld Type	Field Test Values (lbs/in)					Field Pass/Fail	Lab Pass/Fail	Repair Number	Location
								Coupon 1	Coupon 2	Coupon 3	Coupon 4	Coupon 5				
							P									
							S									
							P									
							S									
							P									
							S									
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GCL INSTALLATION

Client Name: 0 _____

Project Location: 0 _____

SCS Aquaterra Project Name: 0 _____

Note: >> indicates Add a dimension in the following Cell.

SCS Aquaterra Project Number: 0 _____

SCS Aquaterra CQA Technician: 0 _____

Item #	Panel Number	Shape	Side Length (ft)				Overlap OK	Bentonite OK	Comments
			Side 1	Side 2	Side 3	Side 4			
1			>>	>>	>>				
2			>>	>>	>>				
3			>>	>>	>>				
4			>>	>>	>>				
5			>>	>>	>>				
6			>>	>>	>>				
7			>>	>>	>>				
8			>>	>>	>>				
9			>>	>>	>>				
10			>>	>>	>>				
11			>>	>>	>>				
12			>>	>>	>>				
13			>>	>>	>>				
14			>>	>>	>>				
15			>>	>>	>>				
16			>>	>>	>>				
17			>>	>>	>>				
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87			>>		>>		>>								
88			>>		>>		>>								

ADDITIONAL NON-DESTRUCTIVE TEST RECORD

Client Name: 0
Project Location: 0

SCS Aquaterra CQA Technician: 0
SCS Aquaterra Project Name: 0
SCS Aquaterra Project Number: 0.00

Max Pressure Drop: 3.0 psi
Test Standard Elapsed Time: 5 min

Test Number	Test Date dd-mm-yy	Seam Number				Tester Initials	Pressure			Time (hhmm 0 to 24 hr)		Pressure Test P/F	Vacuum Box P/F	Location/Comments
							Start	End	+/-	Start	End			

GEOSYNTHETIC PANEL PLACEMENT RECORD

SCS Aquaterra CQA Technician: 0 _____

Client Name: 0 _____
 Project Location: 0 _____

SCS Aquaterra Project Name: 0 _____

 SCS Aquaterra Project Number: 0.00 _____

Date dd-mmm-yy	Time hhmm (24)	Panel Number	Roll Number	Panel Length (feet)	Panel Width (feet)	Panel Location/Comments
		1				
		2				
		3				
		4				
		5				
		6				
		7				
		8				
		9				
		10				
		11				
		12				
		13				
		14				
		15				
		16				
		17				
		18				

REPAIR RECORD

Client Name: 0
 Project Location: 0

SCS Aquaterra CQA Technician: 0

Date of Interest:
 enter mm-dd-yy Note if blank will consider all dates.

"x" indicates criteria applies to this project

	x	x
Population:	Total Seam	Machine
Destruct Test Frequency (1 per)	500 ft	500 ft
Number of Required Destructs	0 ea	0 ea

Minimum # of Destructs Required
0 ea
For Project Period

SCS Aquaterra Project Name: 0

SCS Aquaterra Project Number: 0

Repair Number	Panel/Seam				Repairer Initials	Machine Number	Repair Type	Repair size		Trial Weld Number	Test Date dd-mm-yy	Tester Initials	Test P/F	Location/Comments
								Length (ft)	Width (ft)					
								x						
								x						
								x						
								x						
								x						
								x						
								x						
								x						
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SCS AQUATERRA - Nuclear Density Gauge Test Record

ver 2014 - v6 Beta 1b jfh 22 April 2104

CCL

Client Name: _____
 SCS Aquaterra Project Name: _____
 SCS Aquaterra Project Number: _____
 Project Location: _____

Material Designation

Description: USCS / Color
 ASTM Test
 Max Proctor Dry Density
 Optimum Moisture Content

Plot Failures Only insert (x)

Mat #	Source Area	% Max DD for ET Cover
1		
2		
3		
4		
5		
6		

Test Number Formatting Notes
 Test Designation Legend 0001 - 5199
 Lift Designation 000.01 - 000.99
 Test Designation Legend 000.00.01 - 000.00.99
 Retest Designation 000.00.00.1 - 000.00.00.9

Acceptance Zone Point Limits

	1	2	3	4	5	6
SpGr						
MC ₁						
γ _{d1}						
MC ₂						
γ _{d2}						
MC ₃						
γ _{d3}						
MC ₄						
γ _{d4}						
MC ₅						
γ _{d5}						
MC ₆						
γ _{d6}						

Note: Comments on this row apply to the last data density entry above if 6 data sets are not entered.>>>

Item	Date	Numeric Input	Test Number	Retest #	Material Designation	Lift (6-inch In-place)	Probe Depth	Wet Density	Water Weight	Dry Density	Moisture Content	Percent Compaction	Pass / Fail	Comments: (Automatic and Manual)		
														MC or DD	Retest	Manual comments here
1						1 to 99	(in)	(pcf)	(pcf)	(pcf)	(%)	(%)				
2																
3																
4																
5																
6																
7																
8																
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Item	Date	Numeric Input	Test Number	Retest #	Material Designation	Lift (6-inch In-place)	Probe Depth	Wet Density	Water Weight	Dry Density	Moisture Content	Percent Compaction	Pass / Fail	Comments: (Automatic and Manual)			
	MM/DD/YY	GG.LL.TTRR	GG.LL.TT.R			1 to 99	(in)	(pcf)	(pcf)	(pcf)	(%)	(%)		MC or DD	Retest	Manual comments here	ET cover
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TRIAL WELD RECORD

Client Name: 0
 SCS Aquaterra Project Name: 0
 SCS Aquaterra Project Number: 0.00
 Project Location: 0

Specifications: 50 mil
 Material Type: HDPE

SCS Aquaterra
 CQA Technician: 0

	Fusion	Extrusion
Peel (P)	≥ 76 lb/in	≥ 65 lb/in
Shear (S)	≥ 100 lb/in	≥ 100 lb/in

Max # of Failing Tests Allowed per P/S Set: 0 ea

Trial Weld Number	Date dd-mmm-yy	Time hhmm (24)	Ambient Temp (F°)	Installer QC	Seamers Initials	Machine Number	Machine Properties	Weld Type	Test Values (lbs/in)					Pass/Fail	Material (Top 1st)	Comments	
									Coupon 1	Coupon 2	Coupon 3	Coupon 4	Coupon 5				
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TRIAL WELD RECORD

Client Name: 0
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 Material Type: HDPE

SCS Aquaterra
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									Coupon 1	Coupon 2	Coupon 3	Coupon 4	Coupon 5			
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DAILY FIELD ACTIVITIES REPORT

Client Name: _____
SCS Aquaterra Project Name: _____
SCS Aquaterra Project Number: _____
Project Location: _____

Date: _____
Start Time: _____
Stop Time: _____
Miles: _____

Task: _____

Weather Information

Contractors, Personnel, and Equipment On Site

Work Areas/Boundaries

Testing Equipment Used

Tests Completed

Work Comments/Observations and Test Results

Material(s) Delivered to Site

Signature - CQA Monitoring Technician

Signature - QA/QC Engineer



WORK CHANGE DIRECTIVE

No. 1

Date of Issuance: _____ Effective Date: _____

Owner:	Owner's Contract No.:
Project:	Date of Contract:
Contractor:	Engineer's Project No.:

You are directed to proceed promptly with the following change(s):

Item No.	Description

Attachments (list documents supporting change):

Purpose for Work Change Directive:

- Authorization for Work described herein to proceed on the basis of Cost of the Work due to:

- Nonagreement on pricing of proposed change.

- Necessity to expedite Work described herein prior to agreeing to changes on Contract Price and Contract Time.

Estimated change in Contract Price and Contract Times:

Contract Price \$ _____ (increase/decrease) Contract Time _____ (increase/decrease)
Days

If the change involves an increase, the estimated amounts are not to be exceeded without further authorization.

Recommended for Approval by Engineer:	Date
Authorized for Owner by:	Date
Accepted for Contractor by:	Date
Approved by Funding Agency (if applicable):	Date:



Construction Quality Control and Assurance Plan

Cell 4E Addendum

South Central Iowa Solid Waste Agency

Permit No. 63-SDP-02-77P

October 2018



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Certification

	<p>I hereby certify that these engineering documents were prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.</p> <p style="text-align: center;"><i>Megan Seymour</i></p>
	<p style="text-align: right;">12-31-2018</p> <hr/> <p>Megan B. Seymour Date Iowa License No. P24975 My license renewal date is December 31, 2019.</p> <p>Pages or sheets covered by this seal: All.</p>

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Table of Contents

Certification.....	0
Tables.....	2
1 Introduction	3
1.1 Purpose.....	3
2 Updated CQA Plan for Cell 4E	3
2.1 Updated Quality Testing Table.....	3

Tables

Table 1: Material Testing Methods and Frequency

1 Introduction

1.1 Purpose

The purpose of this document is to provide an addendum to the Construction Quality Control and Assurance (CQA) Plan Cell 4F that was approved by the Iowa Department of Natural Resources (IDNR) (docDNA 82454) in Permit Amendment #4, issued February 16, 2015. This addendum is necessary to update the testing methods and frequencies to be consistent with current practice at landfills within Iowa.

The addendum serves to completely replace the following portions of the CQA Plan Cell 4F:

- Table 2-3: Recompacted Clay Liner Quality Testing on pages 16-17
- Table 2-4: Granular Drainage Layer Quality Testing on page 17
- Table 3-1: Geomembrane (HDPE and LLDPE) Quality Testing on page 23

The remaining portions of the CQA Plan Cell 4F remain valid and unchanged.

2 Updated CQA Plan for Cell 4E

2.1 Updated Quality Testing Table

Table 1: Material Testing Methods and Frequency¹

Material Tested	Parameter	Test Method	Minimum Testing Frequency
On-Site Soil Source Development and Stockpile from Off-Site Material ^{2,3}	Visual Classification	ASTM D2488	1 per 5,000 cubic yards
	Atterberg Limits	ASTM D4318	1 per 10,000 cubic yards
	% Fines	ASTM D1140	1 per 10,000 cubic yards
	Moisture-Density Relationship	ASTM D698 or D1557	1 per material type
Recompacted Clay Layer (including Test Pad)	Atterberg Limits	ASTM D4318	1 per 1,000 cubic yards
	% Fines	ASTM D1140	1 per 1,000 cubic yards
	Moisture-Density Relationship	ASTM D698 or D1557	1 per 10,000 cubic yards or as soil type changes
	Density	ASTM D6938, D1587, D2167, or D1556	Liner – 5 per acre per 6" lift Cap – 5 per acre per 6" lift
	Water Content	ASTM D6938 or D2216	Liner – 5 per acre per 6" lift Cap – 5 per acre per 6" lift
	Total Thickness	Survey	100' grids and at 100' intervals at all changes in grade and terminations
	Soil Placement & Compaction	Visual Observation	Full Coverage
Erosion Layer	Total Thickness	Measurement or Survey	100' grids and at 100' intervals at all changes in grade and terminations
Geomembrane ⁴	Seam Continuity	ASTM D5641 and GRI GM6	100% of all field welded seams

Material Tested	Parameter	Test Method	Minimum Testing Frequency
Geomembrane ⁴	Defect/Punctures	Visual inspection	100% of all seams and liner surface
	Peel and Shear	ASTM D6392	Minimum 500 feet plus twice daily during installation
Granular Drainage Layer	Sieve Analysis (Drainage Layer only)	ASTM C136	1 per 1,500 cubic yards
	% Fines	ASTM D1140	1 per 1,500 cubic yards
	Aggregate Soundness	ASTM C88	1 per source
	Total Thickness	Measurement or Survey	100' grids and at 100' intervals at all changes in grade and terminations
	Placement & Compaction	Visual Observation	Full Coverage (compaction if required)
	Hydraulic Conductivity	ASTM D5084	1 per source
Coarse Aggregate	Sieve Analysis (Drainage Layer only)	ASTM C136	1 per 1,500 cubic yards
	% Fines	ASTM D1140	1 per 1,500 cubic yards
Piping	Leakage on non-pressure pipe	Low pressure air	All non-slotted sections
	Leakage on pressure pipe	Hydrostatic	All sections of pressure pipe
	Alignment	Visual Observation	All sections of pipe
Material Tested	Parameter	Test Method	Minimum Testing Frequency
Concrete (Structural)	Slump	ASTM C143	1 per placement or once per 60 cubic yards
	Strength	ASTM C39	1 per placement or once per 60 cubic yards

Notes:

¹ Tests listed are for major components. Additional material standards and CQC/CQA tests will be specified in final design, including CQC and CQA for other components of the construction.

² If material is not covered by previous Acceptable Zone testing, additional testing (including ASTM D5084 hydraulic conductivity) will be required to establish a material-specific Acceptable Zone. Refer to Section 3.2.2 of the CQA Plan Cell 4F.

³ Storage handling preservation and transport of soil samples will be done in accordance with ASTM D4220.

⁴ See project specifications for pass/fail criteria on geosynthetic components.



DRAWINGS





Contract Drawings For

South Central Iowa Solid Waste Agency

Leachate Pond and Loadout Construction

1736 County Hwy T17,
Tracy, IA 50256

Issued for Bid

HDR Project No.
10232961

October 2020

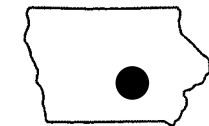
INDEX OF DRAWINGS

GENERAL

00G00 COVER SHEET AND INDEX
00G01 EXISTING SITE PLAN AND NOTES

CIVIL

00C01 OVERALL GRADING PLAN
00C02 OVERALL UTILITY PLAN
00C03 LEACHATE POND SUBGRADE GRADING PLAN
00C04 LEACHATE POND LINER GRADING PLAN
00C05 LEACHATE POND DETAILS
00C06 LEACHATE POND AND PIPING DETAILS
00C07 LEACHATE POND AND PUMPHOUSE DETAILS
00C08 LEACHATE LOADOUT AND TIE-IN DETAILS
00C09 STORMWATER DETAILS



SCISWA LANDFILL SITE LOCATION MAP
SCALE 1:500

	I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.	
	<i>Katie Kinley</i> KATHRYN KINLEY, P.E.	10/9/2020 (DATE)
	MY LICENSE RENEWAL DATE IS DECEMBER 31, 2021.	
PAGES OR SHEETS COVERED BY THIS SEAL: ALL SHEETS		

PROJECT DESCRIPTION

THE PROJECT CONSISTS OF THE FOLLOWING MAJOR ELEMENTS:

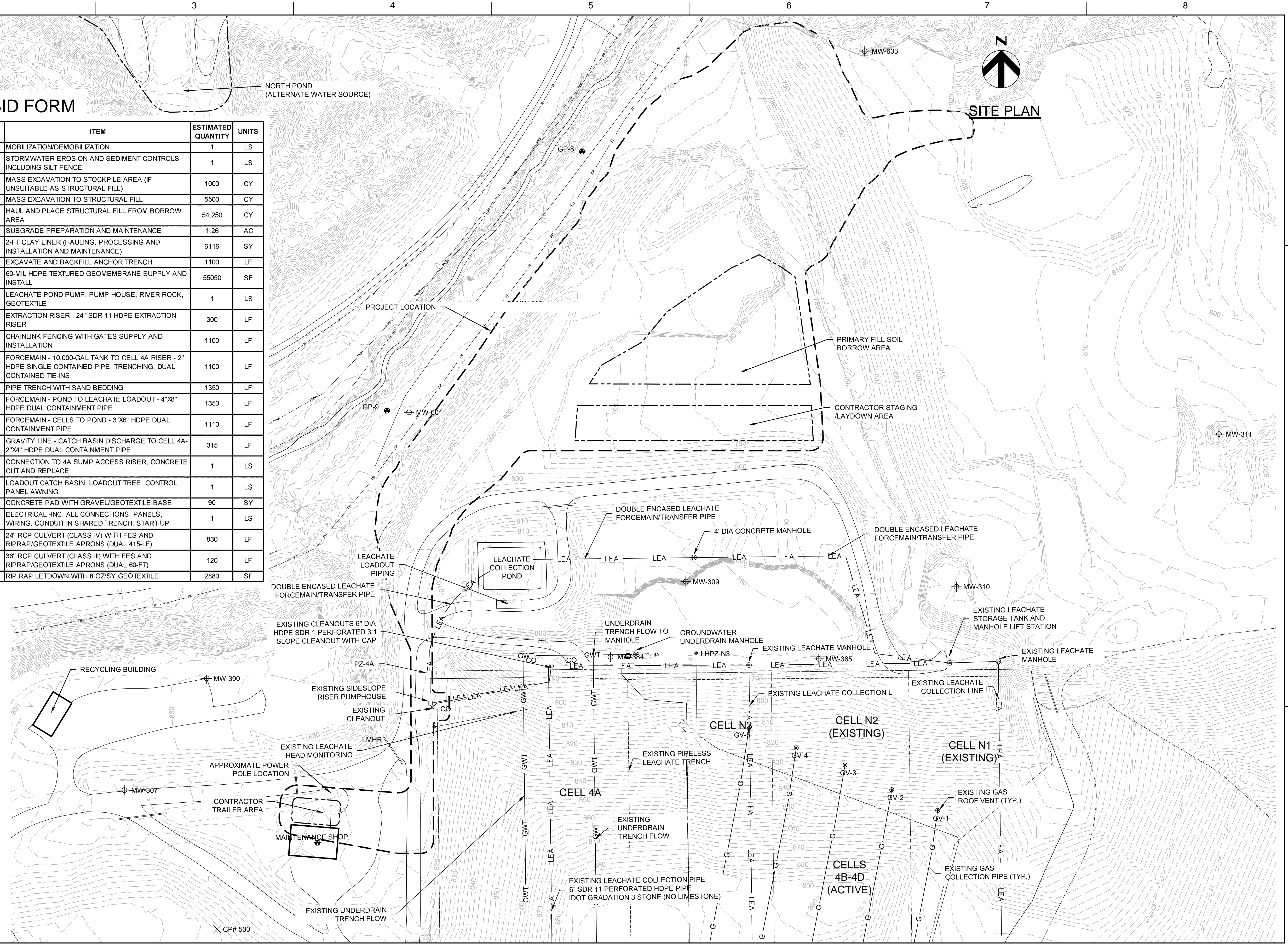
1. LEACHATE POND AND LOADOUT, INCLUDING:
 - a. SITE PREPARATION
 - b. EARTHWORK
 - c. STORM WATER IMPROVEMENTS
 - d. EXCAVATION AND FINE GRADING TO BASE GRADES OF POND
 - e. RECOMPACTED CLAY LINER
 - f. 60-MIL TEXTURED GEOMEMBRANE
 - g. LEACHATE LOADOUT PUMP
 - h. LEACHATE CONVEYANCE PIPE AND TRENCH
 - i. ACCESS ROAD

GENERAL NOTES

1. SITE INFORMATION AND TOPOGRAPHY WITHIN EXISTING LEACHATE POND AREA WERE PROVIDED BY VOBR NIEMEYER, LLC, DATED JUNE 25, 2020. ALL OTHER TOPOGRAPHY SHOWN IS BASED ON HISTORIC SURVEY DATA PROVIDED BY SOUTH CENTRAL IOWA SOLID WASTE AGENCY.
2. SITE COORDINATES ARE BASED UPON IOWA STATE PLANE SOUTH, NAVD88. THIS SYSTEM SHALL BE USED FOR ALL PROJECT SURVEYING AND RECORD DOCUMENT PRODUCTION.
3. WHERE DESIGNATED ACCESS ROADS TO SPECIFIC CONSTRUCTION AREAS ARE NOT SHOWN, COORDINATE PLANNED ACCESS ROUTES WITH OWNER AND ENGINEER AT THE PRE-CONSTRUCTION CONFERENCE. DO NOT OBSTRUCT LANDFILL SITE ACCESS ROADS, MAIN ACCESS ROADS, OR PROJECT ACCESS/EGRESS ROUTE. COORDINATE ALL ROADWAY WORK TO ENSURE CONTINUOUS SITE ACCESS. SEE PROJECT SPECIFICATIONS.
4. OBTAIN ALL REQUIRED BORROW FROM WITHIN APPROVED SOIL BORROW AREAS, UNLESS OTHERWISE APPROVED BY OWNER. POST CONSTRUCTION, GRADE BORROW AREAS TO DRAIN WITH MIN 2% GRADE AND SLOPES NOT EXCEEDING 3H:1V. THESE AREAS ARE TO BE SEEDED. COORDINATE BORROW WITHIN APPROVED AREAS WITH OWNER PRIOR TO INITIATION OF BORROW ACTIVITIES.
5. PROVIDE AND MAINTAIN PUMPS THROUGHOUT CONSTRUCTION TO REMOVE ALL ACCUMULATED STORM WATER FROM WITHIN THE CONSTRUCTION AREA. NON-COMPLIANCE WITH THIS REQUIREMENT WILL RESULT IN OWNER HIRING A THIRD-PARTY TO COMPLETE CONSTRUCTION DEWATERING AT CONTRACTOR'S SOLE COST.
6. LOCATE AND PROTECT SITE UTILITIES AND STRUCTURES (INCLUDING MONITORING WELLS, PIEZOMETERS, GROUNDWATER CONTROL STANDPIPES, RISERS, TRENCHES, BURIED UTILITIES, LEACHATE MANHOLES, ELECTRICAL, ETC.) ANY STRUCTURES REMOVED OR DAMAGED SHALL BE REPAIRED AND REPLACED AT CONTRACTOR'S EXPENSE.
7. PROTECT ALL WORK FROM EROSION AND SEDIMENT CAUSED BY CONSTRUCTION. SEDIMENT ACCUMULATION WITHIN THE LIMITS OF CONSTRUCTION SHALL BE REMOVED AT CONTRACTOR'S EXPENSE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE EROSION CONTROL MEASURES MEET MINIMUM FEDERAL, STATE, AND LOCAL REGULATIONS.
8. MAINTAIN EXISTING DRAINAGE CHANNELS, CULVERTS, SEDIMENT BASINS, AND TRAPS AFFECTED BY THE WORK. CONTRACTOR SHALL REMOVE ACCUMULATED SEDIMENT AND DEBRIS FROM THE CONTROL MEASURES FOLLOWING COMPLETION OF THE WORK AND PLACE AT LOCATION APPROVED BY OWNER.
9. IN ALL CASES CONTRACTOR SHALL TAKE CARE TO PREVENT DAMAGE TO ESTABLISHED VEGETATION DUE TO CONTRACTOR VEHICLE TRAFFIC. CONTRACTOR SHALL REPAIR ALL VEGETATION AND SOIL DAMAGE (I.E. RUTTING) CAUSED BY CONSTRUCTION ACTIVITIES IN MANNER SUITABLE TO OWNER PRIOR TO COMPLETION OF PROJECT WORK.
10. MAINTAIN INTEGRITY OF EXISTING LANDFILL LINER SYSTEMS. ANY DAMAGE TO EXISTING LINER SYSTEMS CAUSED BY THE CONTRACTOR SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
11. EXISTING UTILITIES ARE TO BE LOCATED, VERIFIED, AND PROTECTED BY CONTRACTOR THROUGHOUT CONSTRUCTION. ONE-CALL AND PRIVATE UTILITY SHALL BE NOTIFIED AND CLEARED PRIOR TO START OF CONSTRUCTION.

BID FORM

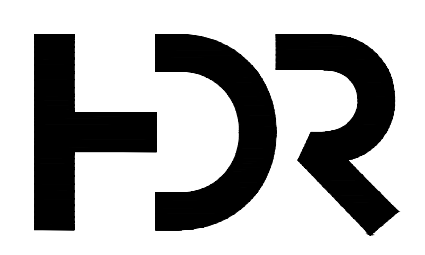
BID ITEM	ITEM	ESTIMATED QUANTITY	UNITS
1	MOBILIZATION/DEMOBILIZATION	1	LS
2	STORMWATER EROSION AND SEDIMENT CONTROLS - INCLUDING SILT FENCE	1	LS
3	MASS EXCAVATION TO STOCKPILE AREA (IF UNSUITABLE AS STRUCTURAL FILL)	1000	CY
4	MASS EXCAVATION TO STRUCTURAL FILL	5500	CY
5	HAUL AND PLACE STRUCTURAL FILL FROM BORROW AREA	54,250	CY
6	SUBGRADE PREPARATION AND MAINTENANCE	1.26	AC
7	2-FT CLAY LINER (HAULING, PROCESSING AND INSTALLATION AND MAINTENANCE)	6116	SY
8	EXCAVATE AND BACKFILL ANCHOR TRENCH	1100	LF
9	60-MIL HDPE TEXTURED GEOMEMBRANE SUPPLY AND INSTALL	55050	SF
10	LEACHATE POND PUMP, PUMP HOUSE, RIVER ROCK, GEOTEXTILE	1	LS
11	EXTRACTION RISER - 24" SDR-11 HDPE EXTRACTION RISER	300	LF
12	CHAINLINK FENCING WITH GATES SUPPLY AND INSTALLATION	1100	LF
13	FORCEMAIN - 10,000-GAL TANK TO CELL 4A RISER - 2" HDPE SINGLE CONTAINED PIPE, TRENCHING, DUAL CONTAINED TIE-INS	1100	LF
14	PIPE TRENCH WITH SAND BEDDING	1350	LF
15	FORCEMAIN - POND TO LEACHATE LOADOUT - 4"X8" HDPE DUAL CONTAINMENT PIPE	1350	LF
16	FORCEMAIN - CELLS TO POND - 3"X6" HDPE DUAL CONTAINMENT PIPE	1110	LF
17	GRAVITY LINE - CATCH BASIN DISCHARGE TO CELL 4A - 2"X4" HDPE DUAL CONTAINMENT PIPE	315	LF
18	CONNECTION TO 4A SUMP ACCESS RISER, CONCRETE CUT AND REPLACE	1	LS
19	LOADOUT CATCH BASIN, LOADOUT TREE, CONTROL PANEL AWNING	1	LS
20	CONCRETE PAD WITH GRAVEL/GEOTEXTILE BASE	90	SY
21	ELECTRICAL - INC. ALL CONNECTIONS, PANELS, WIRING, CONDUIT IN SHARED TRENCH, START UP	1	LS
22	24" RCP CULVERT (CLASS IV) WITH FES AND RIPRAP/GEOTEXTILE APRONS (DUAL 415-LF)	830	LF
23	36" RCP CULVERT (CLASS III) WITH FES AND RIPRAP/GEOTEXTILE APRONS (DUAL 60-FT)	120	LF
24	RIP RAP LETDOWN WITH 8 OZ/SY GEOTEXTILE	2880	SF



CONTROL POINTS

ID	NORTHING	EASTING	ELEVATION	DESCRIPTION
CP# 500	464174.13	1790404.77	842.82	FOUND 5/8" BAR
CP# 1003	467344.96	1791632.33	787.70	FOUND 5/8" BAR
CP# 1009	468396.11	1789715.62	836.77	FOUND 5/8" BAR
CP# 1012	461638.53	1789830.21	790.50	FOUND 5/8" BAR
CP# 1019	462548.44	1792549.57	768.14	FOUND 5/8" BAR
CP# 1029	463072.28	1794222.68	749.55	FOUND 5/8" BAR

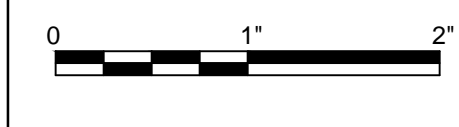
CONTROL POINTS ABOVE MAY NOT BE SHOWN ON THIS MAP, BUT ARE LOCATED ON SCISWA PROPERTY. CONTRACTOR TO CONFIRM LOCATION AND ELEVATIONS WITH OWNER PRIOR TO CONSTRUCTION



PROJECT MANAGER		G. WILLIAMS
CIVIL		K. KINLEY
DRAWN BY		L. CUNNINGHAM
ISSUE		0 10/09/2020 ISSUED FOR BID
DATE	DESCRIPTION	
PROJECT NUMBER		10232961



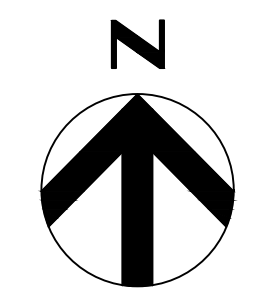
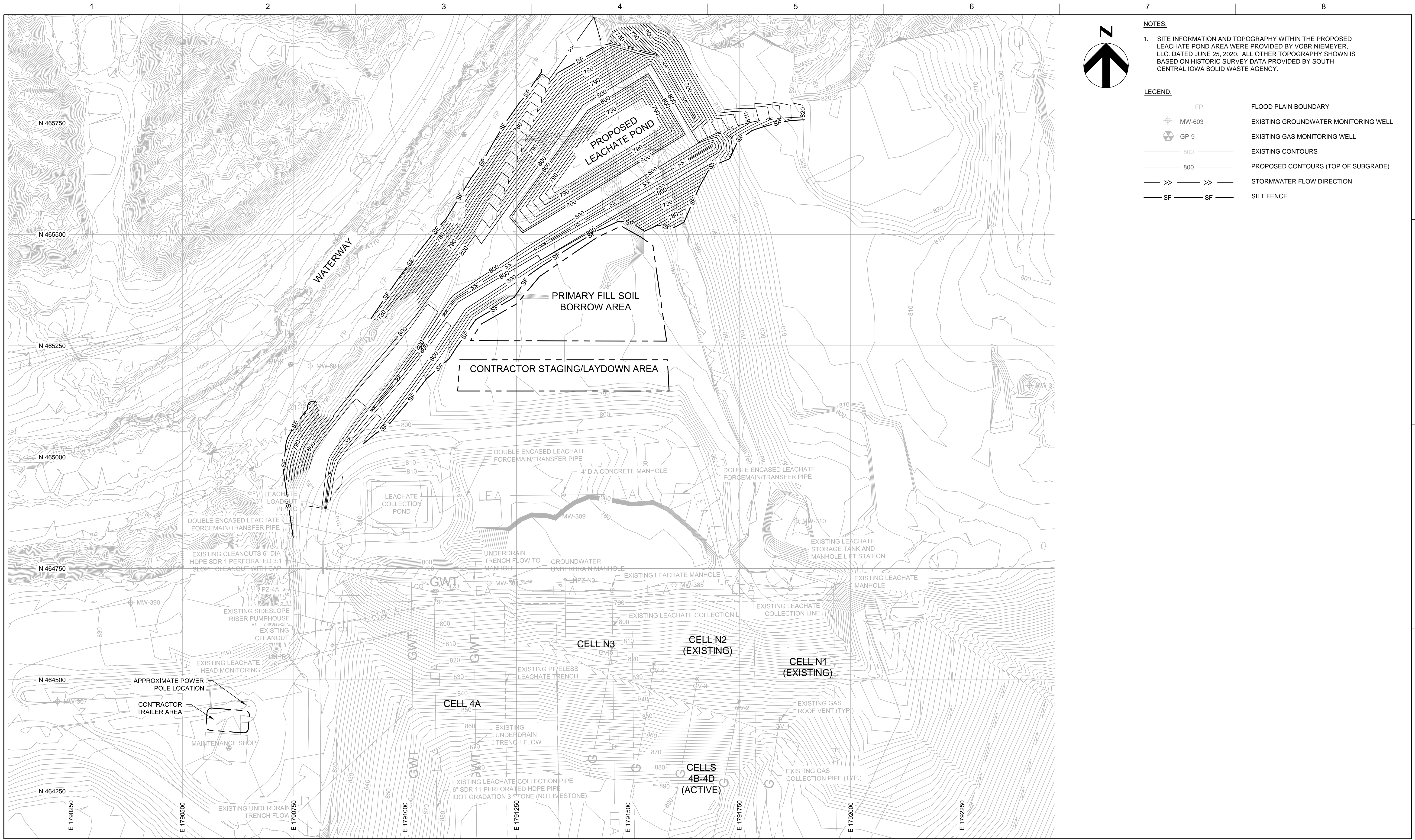
SOUTH CENTRAL IOWA SOLID WASTE AGENCY
LEACHATE POND AND
LOADOUT CONSTRUCTION



EXISTING SITE PLAN AND NOTES

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 SCALE | 1" = 100'

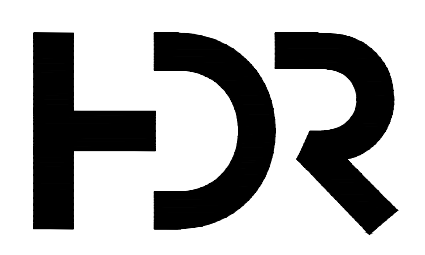
SHEET
00G01



NOTES:
 1. SITE INFORMATION AND TOPOGRAPHY WITHIN THE PROPOSED LEACHATE POND AREA WERE PROVIDED BY VOBR NIEMEYER, LLC, DATED JUNE 25, 2020. ALL OTHER TOPOGRAPHY SHOWN IS BASED ON HISTORIC SURVEY DATA PROVIDED BY SOUTH CENTRAL IOWA SOLID WASTE AGENCY.

- LEGEND:**
- FP FLOOD PLAIN BOUNDARY
 - MW-603 EXISTING GROUNDWATER MONITORING WELL
 - GP-9 EXISTING GAS MONITORING WELL
 - 800 EXISTING CONTOURS
 - 800 PROPOSED CONTOURS (TOP OF SUBGRADE)
 - >> STORMWATER FLOW DIRECTION
 - SF SF SILT FENCE

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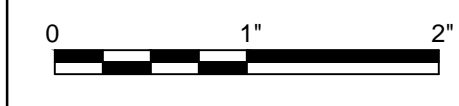


ISSUE	DATE	DESCRIPTION
0	10/09/2020	ISSUED FOR BID

PROJECT MANAGER	G. WILLIAMS
CIVIL	K. KINLEY
DRAWN BY	L. CUNNINGHAM
PROJECT NUMBER	10232961



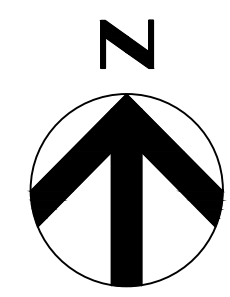
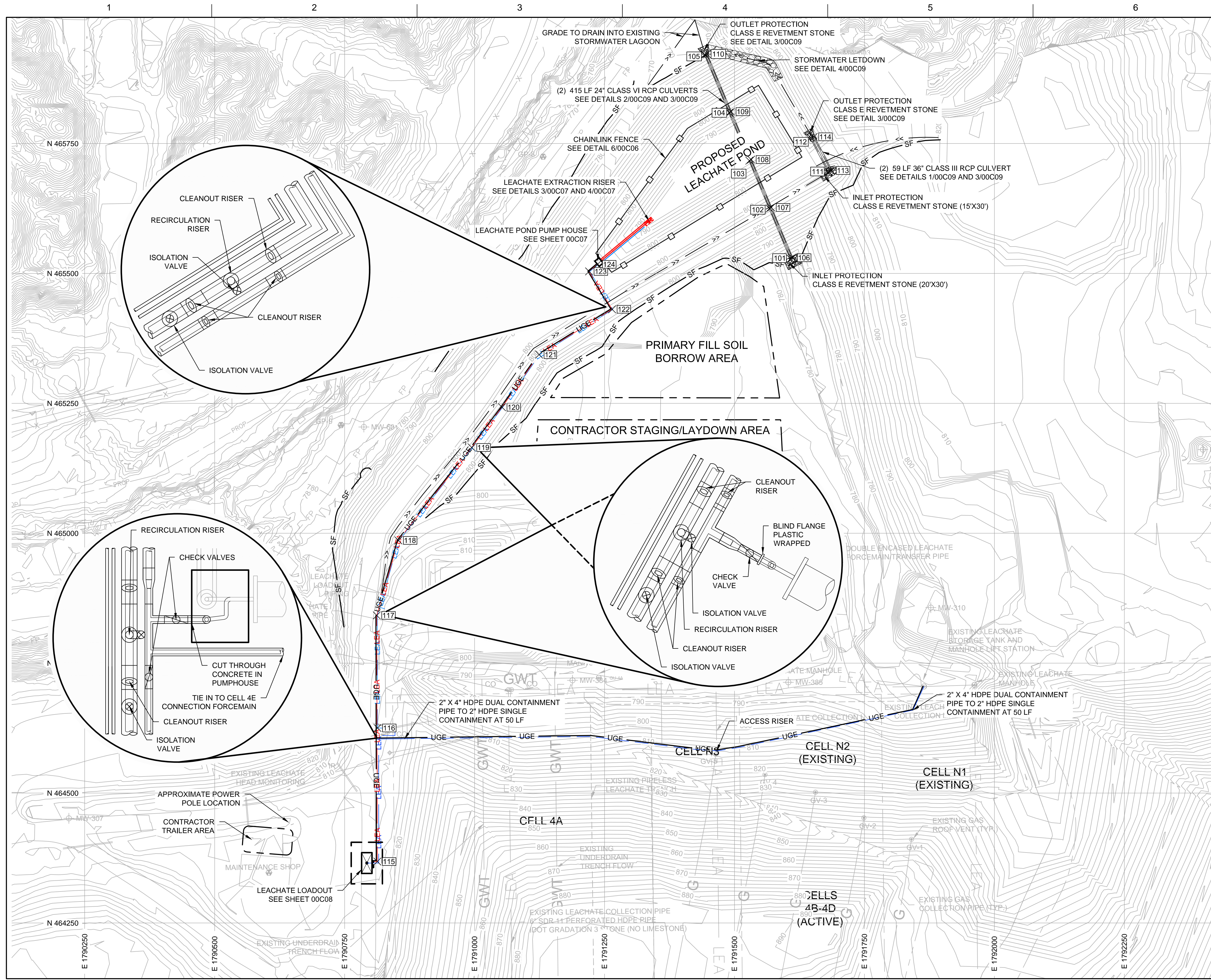
**SOUTH CENTRAL IOWA SOLID WASTE AGENCY
 LEACHATE POND AND
 LOADOUT CONSTRUCTION**



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 SCALE | 1" = 100'

SHEET
00C01

OVERALL GRADING PLAN

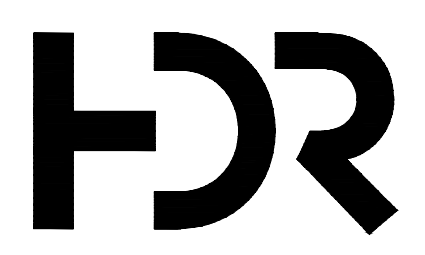


- NOTES:**
- SITE INFORMATION AND TOPOGRAPHY WITHIN THE PROPOSED LEACHATE POND AREA WERE PROVIDED BY VOBR NIEMEYER, LLC. DATED JUNE 25, 2020. ALL OTHER TOPOGRAPHY SHOWN IS BASED ON HISTORIC SURVEY DATA PROVIDED BY SOUTH CENTRAL IOWA SOLID WASTE AGENCY.
 - SEE SHEET 00C06 FOR MORE INFORMATION IN REGARDS TO LEACHATE CLEANOUTS, ACCESS RISERS, AND CONVEYANCE TRENCHES

- LEGEND:**
- FP FLOOD PLAIN BOUNDARY
 - MW-603 EXISTING GROUNDWATER MONITORING WELL
 - GP-9 EXISTING GAS MONITORING WELL
 - 800 EXISTING SURVEY GRADES WITH DESIGN GRADES FROM SHEETS 00C03 AND 00C04
 - >> STORMWATER FLOW DIRECTION
 - SF SILT FENCE
 - UGE ELECTRICAL CONDUIT LINE
 - LEA LEACHATE LOADOUT FORCEMAIN 4" X 8" HDPE DUAL CONTAINMENT PIPE
 - LEA FUTURE CELL LEACHATE FORCEMAIN 3" X 6" HDPE DUAL CONTAINMENT PIPE
 - LEA CATCH BASIN GRAVITY LINE 2" X 4" HDPE DUAL CONTAINMENT PIPE
 - LEA CELL 4E CONNECTION FORCEMAIN 2" X 4" HDPE DUAL CONTAINMENT PIPE
 - LEA CELL 4E CONNECTION FORCEMAIN 2" HDPE SINGLE CONTAINMENT PIPE
 - RIP RAP
 - CLASS B REVETMENT STONE
 - INLET AND OUTLET PROTECTION CLASS E REVETMENT STONE
 - CULVERT
 - CHAINLINK FENCE


POINT TABLE				
POINT NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
101	465528.17	1791607.94	775.00	CULVERT 1 (24" RCP) - INLET
102	465624.89	1791567.32	773.91	CULVERT 1 (24" RCP) - STAKING POINT
103	465717.10	1791528.62	772.82	CULVERT 1 (24" RCP) - STAKING POINT
104	465809.30	1791489.92	771.73	CULVERT 1 (24" RCP) - STAKING POINT
105	465920.70	1791443.17	770.50	CULVERT 1 (24" RCP) - OUTLET
106	465530.16	1791611.44	775.00	CULVERT 2 (24" RCP) - INLET
107	465626.87	1791570.82	773.91	CULVERT 2 (24" RCP) - STAKING POINT
108	465719.08	1791532.12	772.82	CULVERT 2 (24" RCP) - STAKING POINT
109	465811.29	1791493.43	771.73	CULVERT 2 (24" RCP) - STAKING POINT
110	465922.24	1791446.86	770.50	CULVERT 2 (24" RCP) - OUTLET
111	465695.35	1791681.05	793.85	CULVERT 3 (36" RCP) - INLET
112	465761.09	1791646.75	793.45	CULVERT 3 (36" RCP) - OUTLET
113	465698.12	1791686.37	793.85	CULVERT 4 (36" RCP) - INLET
114	465762.86	1791652.48	793.45	CULVERT 4 (36" RCP) - OUTLET
115	464368.27	1790812.93	810.50	PIPE TRENCH - PIPE INVERT ELEVATION
116	464625.26	1790813.37	806.13	PIPE TRENCH - PIPE INVERT ELEVATION
117	464841.96	1790811.90	802.50	PIPE TRENCH - PIPE INVERT ELEVATION
118	464986.27	1790853.43	801.13	PIPE TRENCH - PIPE INVERT ELEVATION
119	465165.11	1790994.62	799.31	PIPE TRENCH - PIPE INVERT ELEVATION
120	465242.54	1791052.85	798.61	PIPE TRENCH - PIPE INVERT ELEVATION
121	465343.70	1791124.14	797.57	PIPE TRENCH - PIPE INVERT ELEVATION
122	465430.95	1791264.67	796.31	PIPE TRENCH - PIPE INVERT ELEVATION
123	465503.92	1791220.30	796.10	PIPE TRENCH - PIPE INVERT ELEVATION
124	465517.42	1791236.55	796.00	PIPE TRENCH - PIPE INVERT ELEVATION

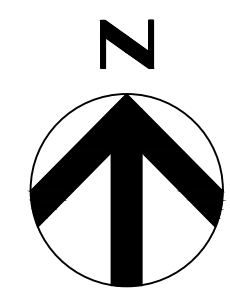
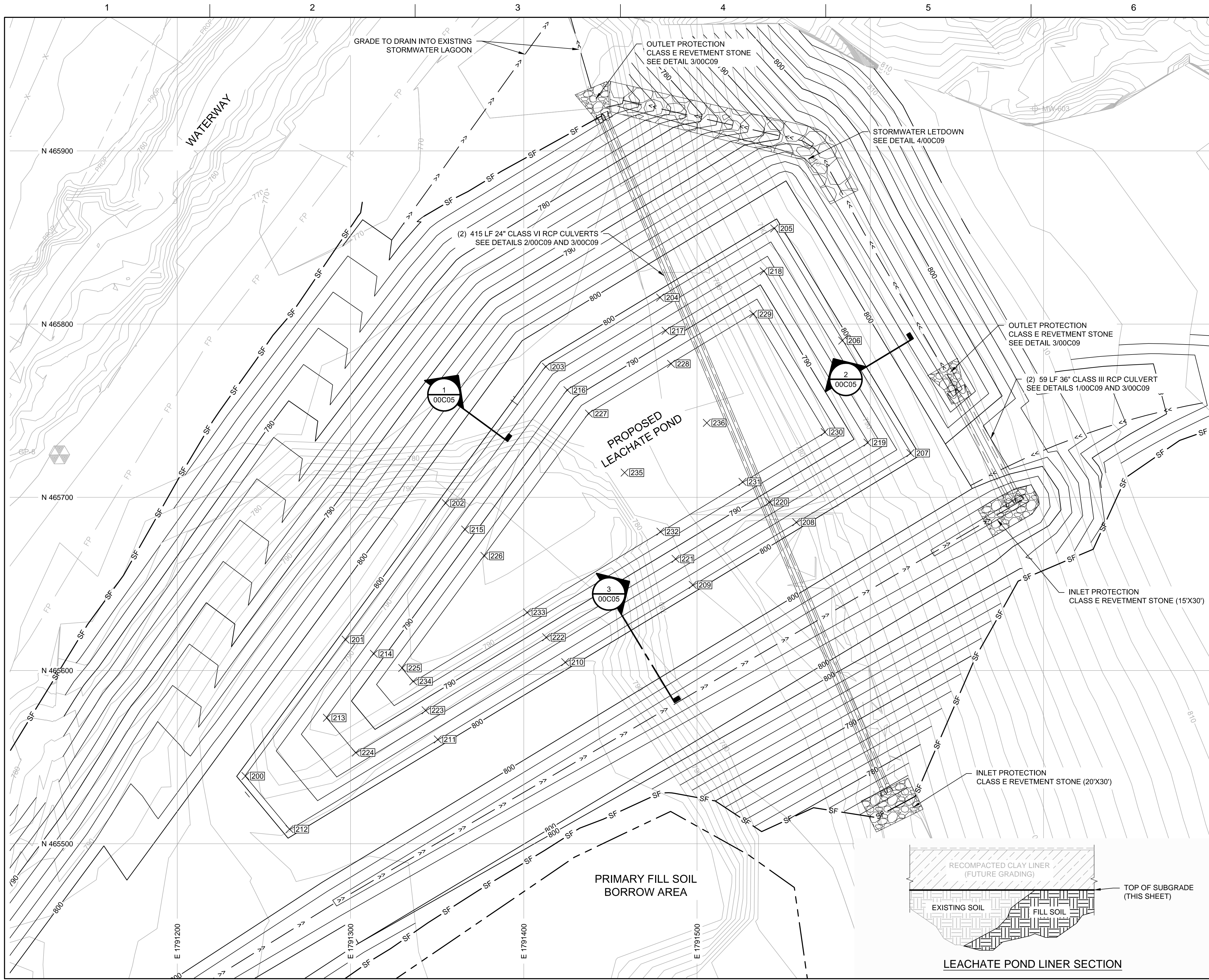
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PROJECT MANAGER G. WILLIAMS	
CIVIL	K. KINLEY
DRAWN BY	L. CUNNINGHAM
0	10/09/2020 ISSUED FOR BID
ISSUE	DATE DESCRIPTION
PROJECT NUMBER 10232961	


SOUTH CENTRAL IOWA SOLID WASTE AGENCY
LEACHATE POND AND
LOADOUT CONSTRUCTION

OVERALL UTILITY PLAN
 FILENAME 00C02.dwg SHEET **00C02**
 SCALE 1" = 100'



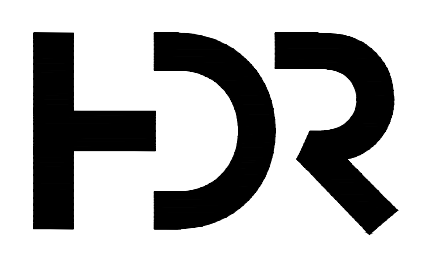
NOTES:
 1. SITE INFORMATION AND TOPOGRAPHY WITHIN THE PROPOSED LEACHATE POND AREA WERE PROVIDED BY VOBR NIEMEYER, LLC. DATED JUNE 25, 2020. ALL OTHER TOPOGRAPHY SHOWN IS BASED ON HISTORIC SURVEY DATA PROVIDED BY SOUTH CENTRAL IOWA SOLID WASTE AGENCY.

LEGEND:

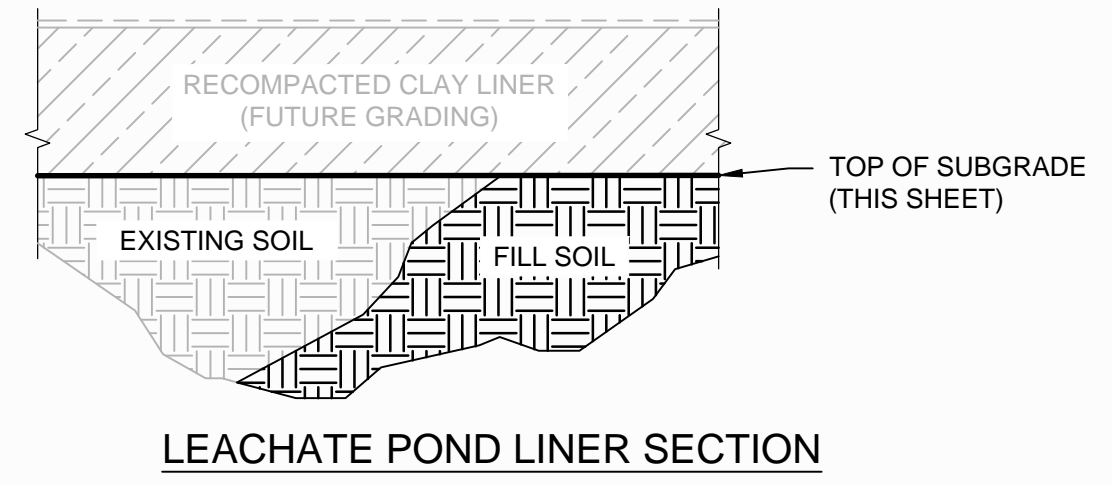
— FP —	FLOOD PLAIN BOUNDARY
⊕ MW-603	EXISTING GROUNDWATER MONITORING WELL
⊕ GP-9	EXISTING GAS MONITORING WELL
800	EXISTING CONTOURS
800	PROPOSED CONTOURS (TOP OF SUBGRADE)
>>	STORMWATER FLOW DIRECTION
SF	SILT FENCE
[Pattern]	RIP RAP
[Pattern]	CLASS B REVETMENT STONE
[Pattern]	INLET AND OUTLET PROTECTION CLASS E REVETMENT STONE
[Symbol]	CULVERT

POINT TABLE				
POINT NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
200	465539.07	1791239.36	797.99	LEACHATE POND - TOP OF SUBGRADE - TOP OF SLOPE
201	465617.84	1791297.17	797.89	LEACHATE POND - TOP OF SUBGRADE - TOP OF SLOPE
202	465696.61	1791354.99	797.89	LEACHATE POND - TOP OF SUBGRADE - TOP OF SLOPE
203	465775.38	1791412.80	797.89	LEACHATE POND - TOP OF SUBGRADE - TOP OF SLOPE
204	465815.30	1791478.69	797.89	LEACHATE POND - TOP OF SUBGRADE - TOP OF SLOPE
205	465855.21	1791544.57	797.89	LEACHATE POND - TOP OF SUBGRADE - TOP OF SLOPE
206	465790.48	1791583.79	797.89	LEACHATE POND - TOP OF SUBGRADE - TOP OF SLOPE
207	465725.53	1791623.14	797.89	LEACHATE POND - TOP OF SUBGRADE - TOP OF SLOPE
208	465685.61	1791557.26	797.89	LEACHATE POND - TOP OF SUBGRADE - TOP OF SLOPE
209	465649.41	1791497.50	797.89	LEACHATE POND - TOP OF SUBGRADE - TOP OF SLOPE
210	465604.83	1791423.93	797.89	LEACHATE POND - TOP OF SUBGRADE - TOP OF SLOPE
211	465560.25	1791350.35	797.89	LEACHATE POND - TOP OF SUBGRADE - TOP OF SLOPE
212	465508.44	1791264.82	797.99	LEACHATE POND - TOP OF SUBGRADE - TOP OF SLOPE
213	465572.71	1791286.38	791.98	LEACHATE POND - TOP OF SUBGRADE - MID SLOPE
214	465609.65	1791313.49	791.89	LEACHATE POND - TOP OF SUBGRADE - MID SLOPE
215	465681.39	1791366.14	791.89	LEACHATE POND - TOP OF SUBGRADE - MID SLOPE
216	465761.84	1791425.19	791.89	LEACHATE POND - TOP OF SUBGRADE - MID SLOPE
217	465796.17	1791481.85	791.89	LEACHATE POND - TOP OF SUBGRADE - MID SLOPE
218	465830.49	1791538.50	791.89	LEACHATE POND - TOP OF SUBGRADE - MID SLOPE
219	465731.60	1791598.42	791.89	LEACHATE POND - TOP OF SUBGRADE - MID SLOPE
220	465697.27	1791541.77	791.89	LEACHATE POND - TOP OF SUBGRADE - MID SLOPE
221	465664.46	1791487.61	791.89	LEACHATE POND - TOP OF SUBGRADE - MID SLOPE
222	465619.21	1791412.92	791.89	LEACHATE POND - TOP OF SUBGRADE - MID SLOPE
223	465577.04	1791343.31	791.89	LEACHATE POND - TOP OF SUBGRADE - MID SLOPE
224	465552.65	1791303.06	791.98	LEACHATE POND - TOP OF SUBGRADE - MID SLOPE
225	465601.47	1791329.81	786.00	LEACHATE POND - TOP OF SUBGRADE - TOE OF SLOPE
226	465666.16	1791377.30	786.00	LEACHATE POND - TOP OF SUBGRADE - TOE OF SLOPE
227	465748.31	1791437.59	786.00	LEACHATE POND - TOP OF SUBGRADE - TOE OF SLOPE
228	465777.04	1791485.01	786.00	LEACHATE POND - TOP OF SUBGRADE - TOE OF SLOPE
229	465805.77	1791532.43	786.00	LEACHATE POND - TOP OF SUBGRADE - TOE OF SLOPE
230	465737.66	1791573.70	786.00	LEACHATE POND - TOP OF SUBGRADE - TOE OF SLOPE
231	465708.93	1791526.27	786.00	LEACHATE POND - TOP OF SUBGRADE - TOE OF SLOPE
232	465680.20	1791478.85	786.00	LEACHATE POND - TOP OF SUBGRADE - TOE OF SLOPE
233	465633.59	1791401.92	786.00	LEACHATE POND - TOP OF SUBGRADE - TOE OF SLOPE
234	465593.78	1791336.21	786.00	LEACHATE POND - TOP OF SUBGRADE - TOE OF SLOPE
235	465714.25	1791458.22	786.00	LEACHATE POND - TOP OF SUBGRADE - POND FLOOR
236	465742.99	1791505.64	786.00	LEACHATE POND - TOP OF SUBGRADE - POND FLOOR

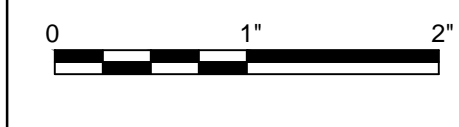
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PROJECT MANAGER G. WILLIAMS		
CIVIL	K. KINLEY	
DRAWN BY	L. CUNNINGHAM	
0	10/09/2020	ISSUED FOR BID
ISSUE	DATE	DESCRIPTION
PROJECT NUMBER 10232961		



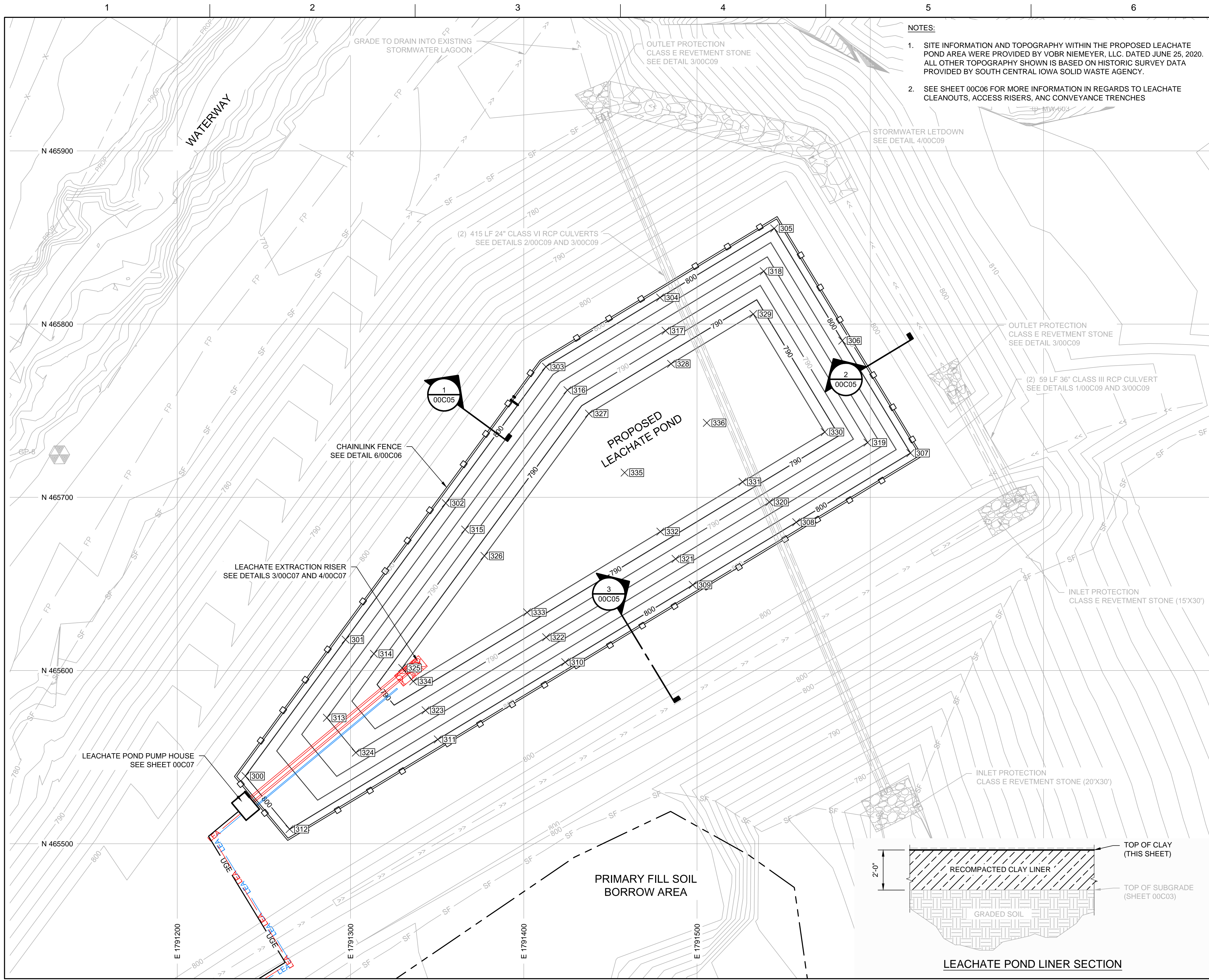
SOUTH CENTRAL IOWA SOLID WASTE AGENCY
LEACHATE POND AND
LOADOUT CONSTRUCTION



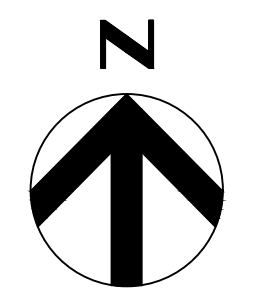
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 SCALE | 1" = 30'

LEACHATE POND
SUBGRADE GRADING PLAN

SHEET
00C03



- NOTES:**
1. SITE INFORMATION AND TOPOGRAPHY WITHIN THE PROPOSED LEACHATE POND AREA WERE PROVIDED BY VOBR NIEMEYER, LLC. DATED JUNE 25, 2020. ALL OTHER TOPOGRAPHY SHOWN IS BASED ON HISTORIC SURVEY DATA PROVIDED BY SOUTH CENTRAL IOWA SOLID WASTE AGENCY.
 2. SEE SHEET 00C06 FOR MORE INFORMATION IN REGARDS TO LEACHATE CLEANOUTS, ACCESS RISERS, AND CONVEYANCE TRENCHES

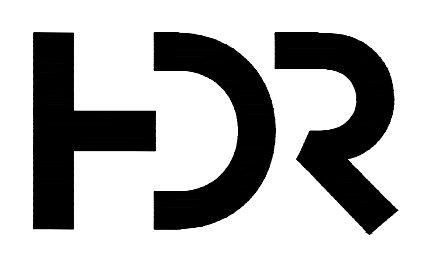
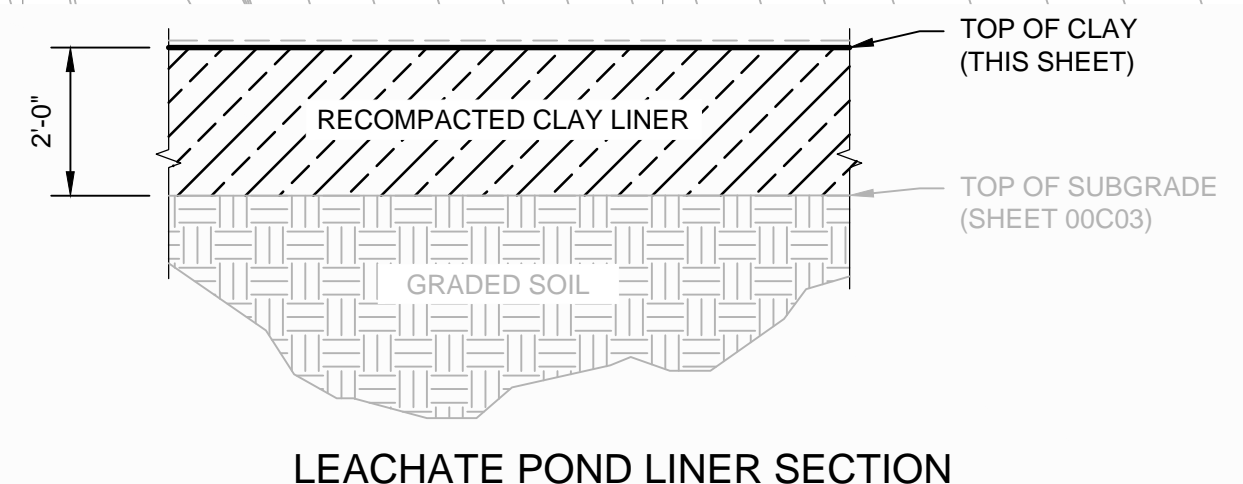


LEGEND:

FP	FLOOD PLAIN BOUNDARY
MW-603	EXISTING GROUNDWATER MONITORING WELL
GP-9	EXISTING GAS MONITORING WELL
800	EXISTING SURVEY GRADES WITH DESIGN GRADES FROM SHEETS 00C03
800	PROPOSED CONTOURS (TOP OF CLAY)
□	CHAINLINK FENCE
— UGE —	UNDERGROUND ELECTRICAL CONDUIT LINE
— LEA — LEA —	LEACHATE LOADOUT FORCEMAIN 4" X 8" HDPE DUAL CONTAINMENT PIPE
— LEA — LEA —	FUTURE CELL LEACHATE FORCEMAIN 3" X 6" HDPE DUAL CONTAINMENT PIPE
⊘	RIP RAP
⊘	CLASS B REVETMENT STONE
⊘	INLET AND OUTLET PROTECTION CLASS E REVETMENT STONE
→	STORMWATER FLOW DIRECTION
— SF — SF —	SILT FENCE
—	CULVERT

POINT TABLE

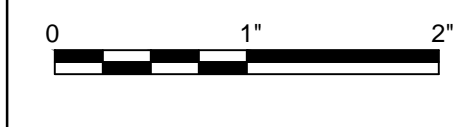
POINT NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
300	465539.07	1791239.36	800.00	LEACHATE POND - TOP OF CLAY - TOP OF SLOPE
301	465617.84	1791297.17	800.00	LEACHATE POND - TOP OF CLAY - TOP OF SLOPE
302	465696.61	1791354.99	800.00	LEACHATE POND - TOP OF CLAY - TOP OF SLOPE
303	465775.38	1791412.80	800.00	LEACHATE POND - TOP OF CLAY - TOP OF SLOPE
304	465815.30	1791478.69	800.00	LEACHATE POND - TOP OF CLAY - TOP OF SLOPE
305	465855.21	1791544.57	800.00	LEACHATE POND - TOP OF CLAY - TOP OF SLOPE
306	465790.48	1791583.79	800.00	LEACHATE POND - TOP OF CLAY - TOP OF SLOPE
307	465725.53	1791623.14	800.00	LEACHATE POND - TOP OF CLAY - TOP OF SLOPE
308	465685.61	1791557.26	800.00	LEACHATE POND - TOP OF CLAY - TOP OF SLOPE
309	465649.41	1791497.50	800.00	LEACHATE POND - TOP OF CLAY - TOP OF SLOPE
310	465604.83	1791423.93	800.00	LEACHATE POND - TOP OF CLAY - TOP OF SLOPE
311	465560.25	1791350.35	800.00	LEACHATE POND - TOP OF CLAY - TOP OF SLOPE
312	465508.44	1791264.82	800.00	LEACHATE POND - TOP OF CLAY - TOP OF SLOPE
313	465572.71	1791286.38	794.00	LEACHATE POND - TOP OF CLAY - MID SLOPE
314	465609.65	1791313.49	794.00	LEACHATE POND - TOP OF CLAY - MID SLOPE
315	465681.39	1791366.14	794.00	LEACHATE POND - TOP OF CLAY - MID SLOPE
316	465761.84	1791425.19	794.00	LEACHATE POND - TOP OF CLAY - MID SLOPE
317	465796.17	1791481.85	794.00	LEACHATE POND - TOP OF CLAY - MID SLOPE
318	465830.49	1791538.50	794.00	LEACHATE POND - TOP OF CLAY - MID SLOPE
319	465731.60	1791598.42	794.00	LEACHATE POND - TOP OF CLAY - MID SLOPE
320	465697.27	1791541.77	794.00	LEACHATE POND - TOP OF CLAY - MID SLOPE
321	465664.46	1791487.61	794.00	LEACHATE POND - TOP OF CLAY - MID SLOPE
322	465619.21	1791412.92	794.00	LEACHATE POND - TOP OF CLAY - MID SLOPE
323	465577.04	1791343.31	794.00	LEACHATE POND - TOP OF CLAY - MID SLOPE
324	465552.65	1791303.06	794.00	LEACHATE POND - TOP OF CLAY - MID SLOPE
325	465601.47	1791329.81	788.00	LEACHATE POND - TOP OF CLAY - TOE OF SLOPE
326	465666.16	1791377.30	788.00	LEACHATE POND - TOP OF CLAY - TOE OF SLOPE
327	465748.31	1791437.59	788.00	LEACHATE POND - TOP OF CLAY - TOE OF SLOPE
328	465777.04	1791485.01	788.00	LEACHATE POND - TOP OF CLAY - TOE OF SLOPE
329	465805.77	1791532.43	788.00	LEACHATE POND - TOP OF CLAY - TOE OF SLOPE
330	465737.66	1791573.70	788.00	LEACHATE POND - TOP OF CLAY - TOE OF SLOPE
331	465708.93	1791526.27	788.00	LEACHATE POND - TOP OF CLAY - TOE OF SLOPE
332	465680.20	1791478.85	788.00	LEACHATE POND - TOP OF CLAY - TOE OF SLOPE
333	465633.59	1791401.92	788.00	LEACHATE POND - TOP OF CLAY - TOE OF SLOPE
334	465593.78	1791336.21	788.00	LEACHATE POND - TOP OF CLAY - TOE OF SLOPE
335	465714.25	1791458.22	788.00	LEACHATE POND - TOP OF CLAY - POND FLOOR
336	465742.99	1791505.64	788.00	LEACHATE POND - TOP OF CLAY - POND FLOOR



PROJECT MANAGER G. WILLIAMS		
CIVIL	K. KINLEY	
DRAWN BY	L. CUNNINGHAM	
0	10/09/2020	ISSUED FOR BID
ISSUE	DATE	DESCRIPTION
PROJECT NUMBER 10232961		



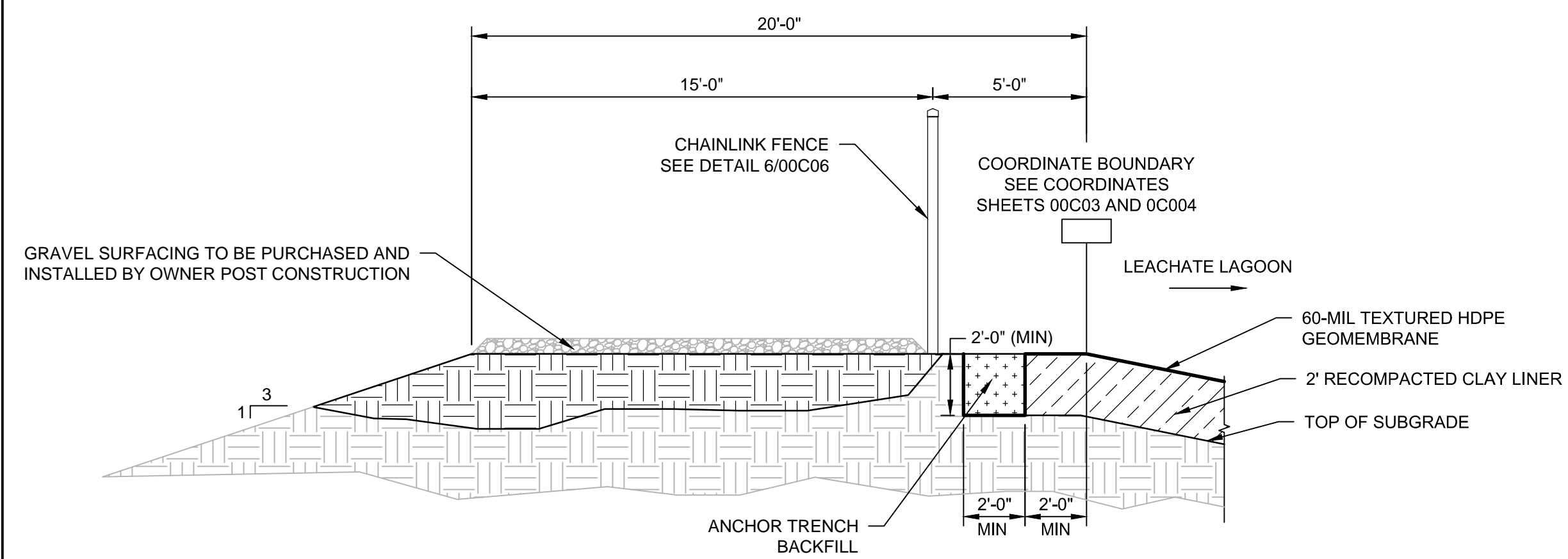
SOUTH CENTRAL IOWA SOLID WASTE AGENCY
LEACHATE POND AND
LOADOUT CONSTRUCTION



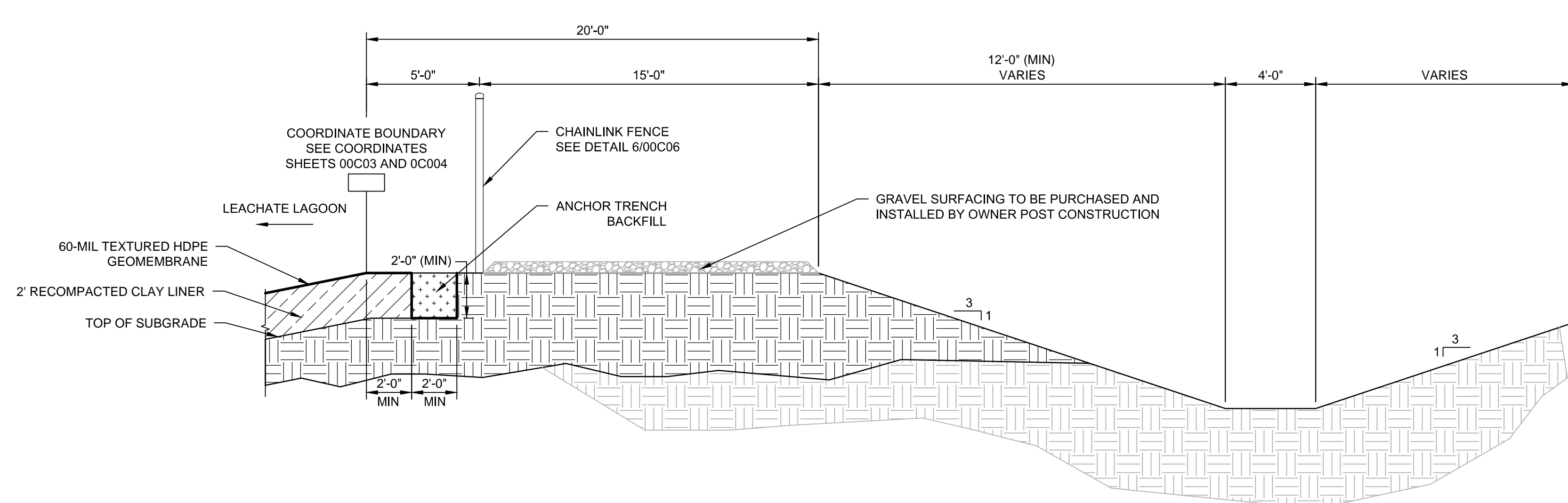
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SHEET
00C04

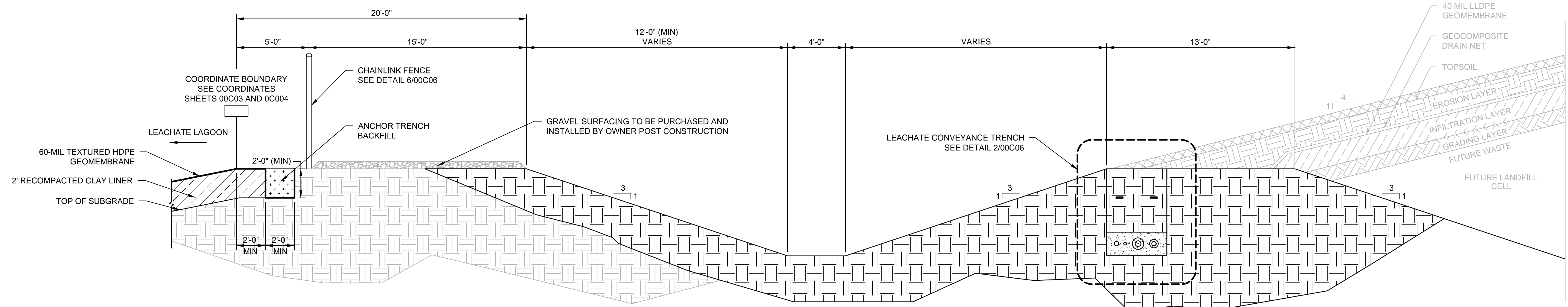
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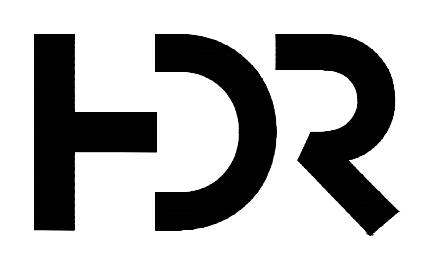
1 NORTHWEST ANCHOR TRENCH
NO SCALE



2 NORTHEAST ANCHOR TRENCH
NO SCALE



3 SOUTHEAST ANCHOR TRENCH
NO SCALE



ISSUE	DATE	DESCRIPTION
0	10/09/2020	ISSUED FOR BID

PROJECT MANAGER	G. WILLIAMS
CIVIL	K. KINLEY
DRAWN BY	L. CUNNINGHAM
PROJECT NUMBER	10232961



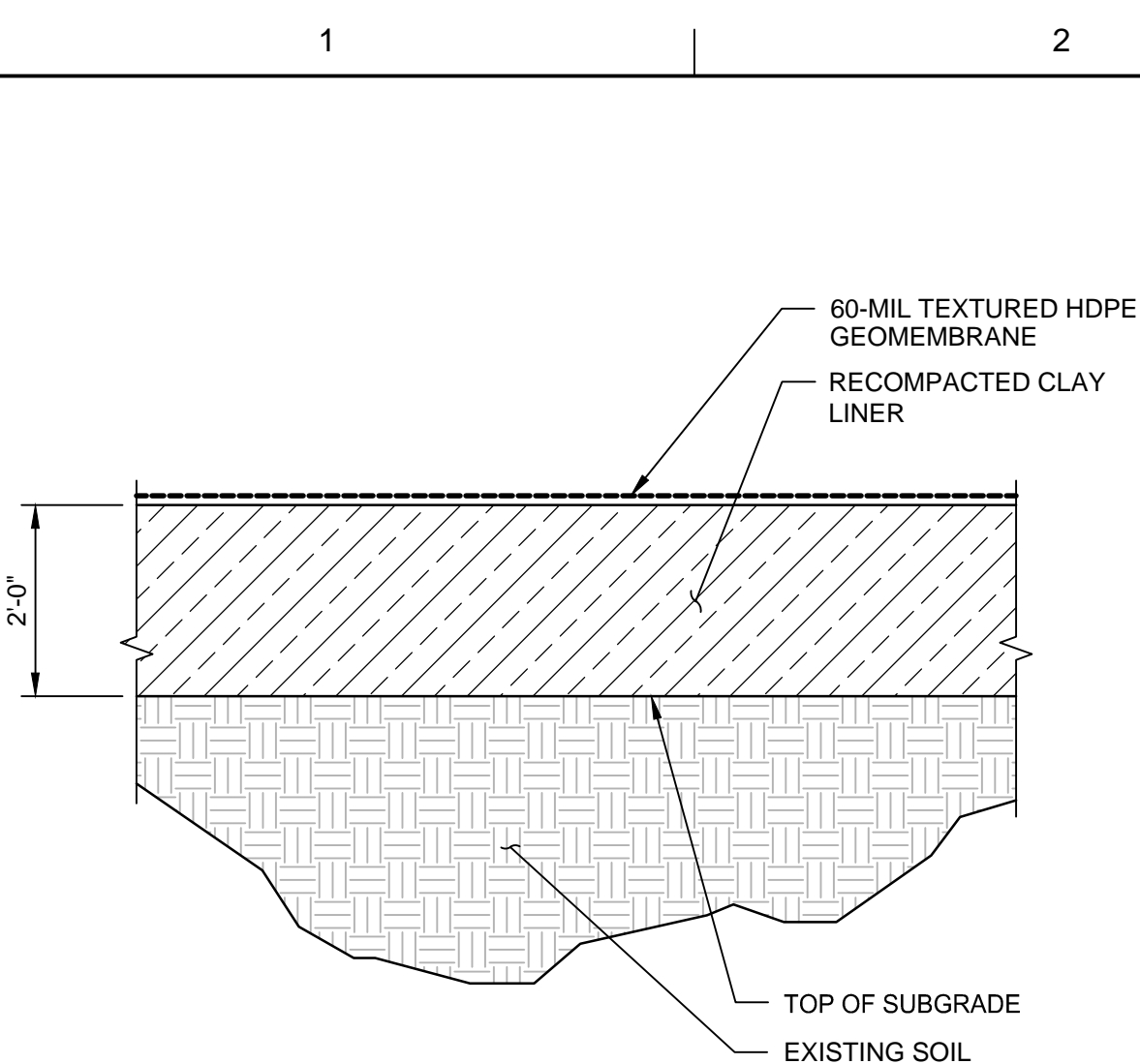
SOUTH CENTRAL IOWA SOLID WASTE AGENCY
LEACHATE POND AND
LOADOUT CONSTRUCTION



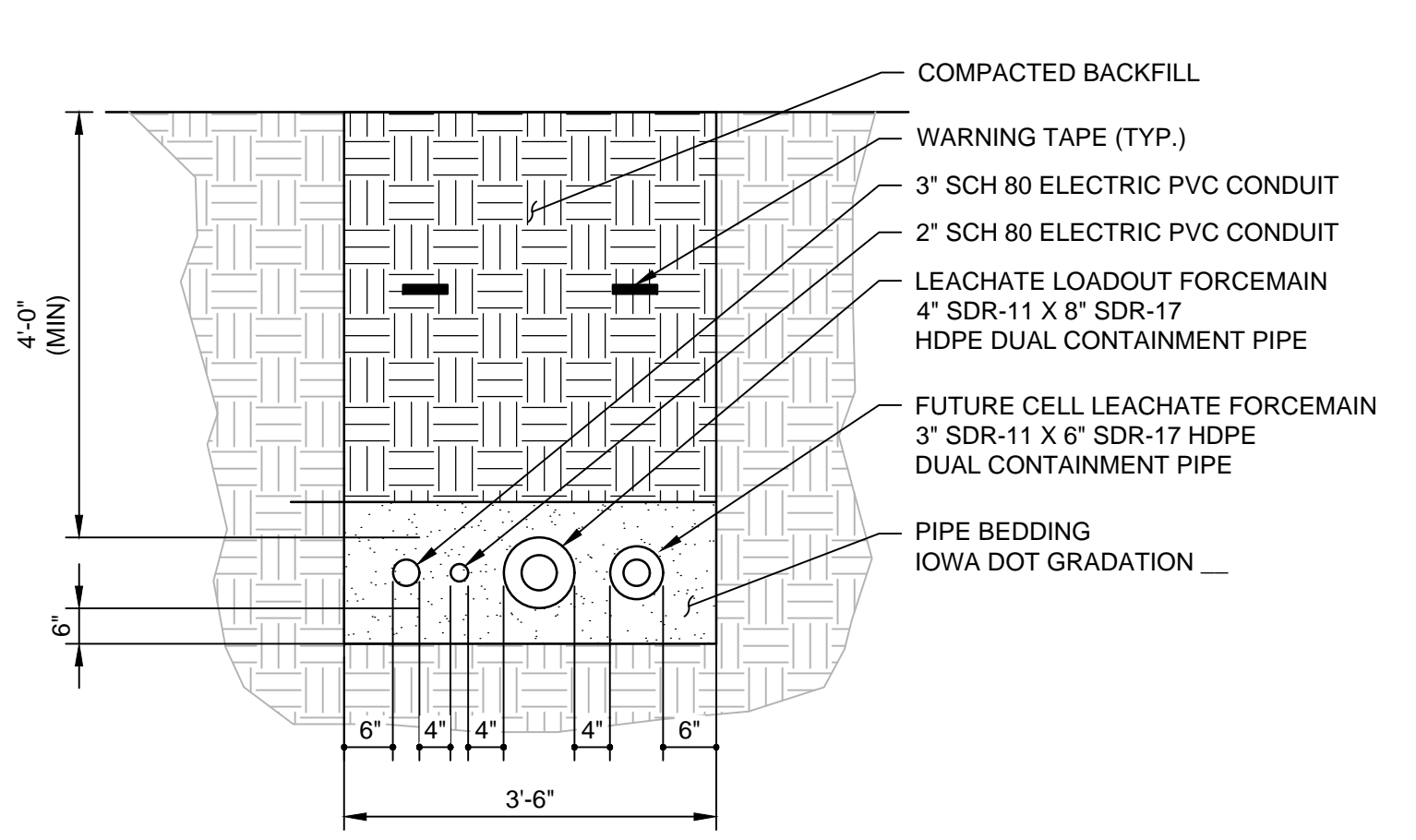
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SHEET
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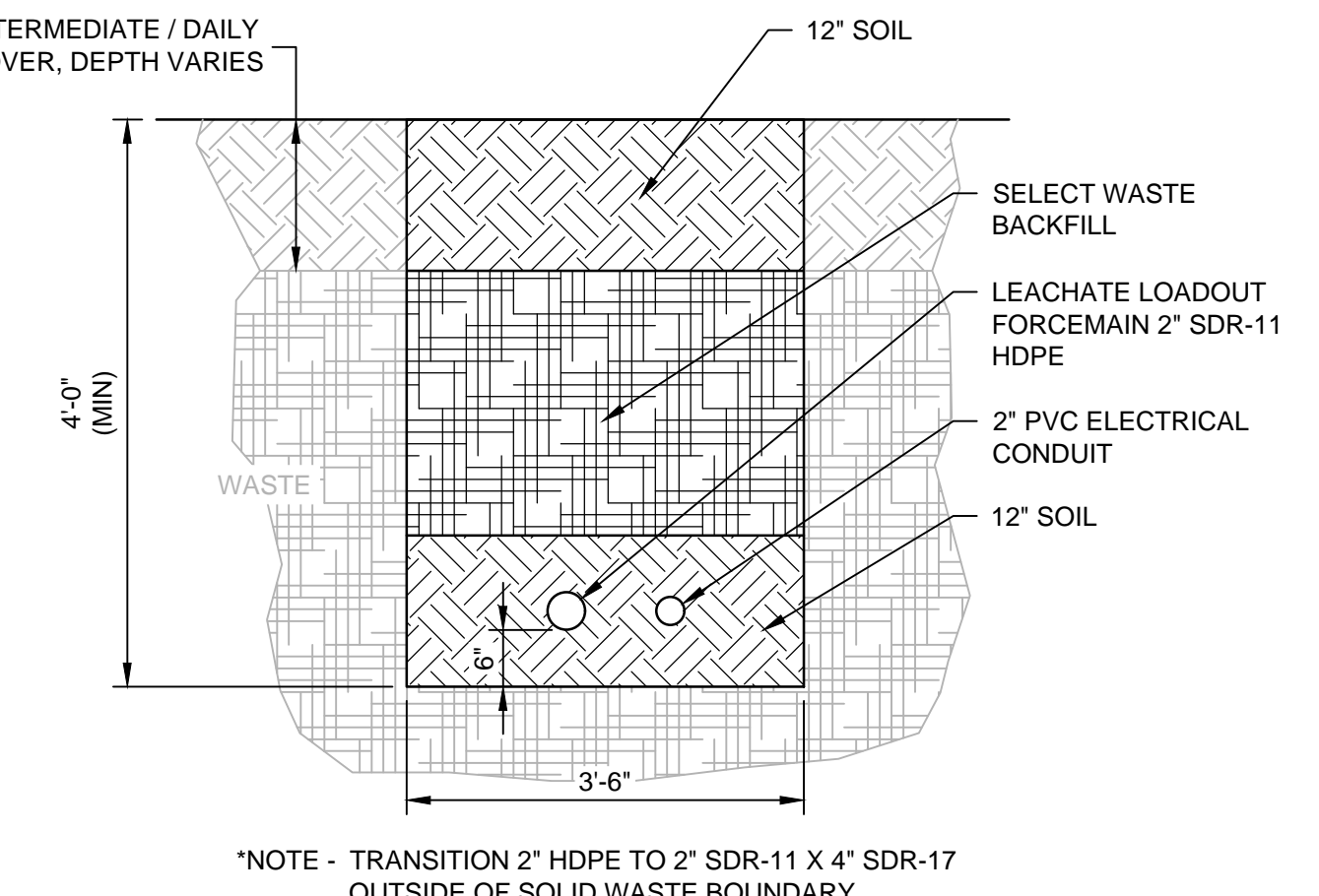
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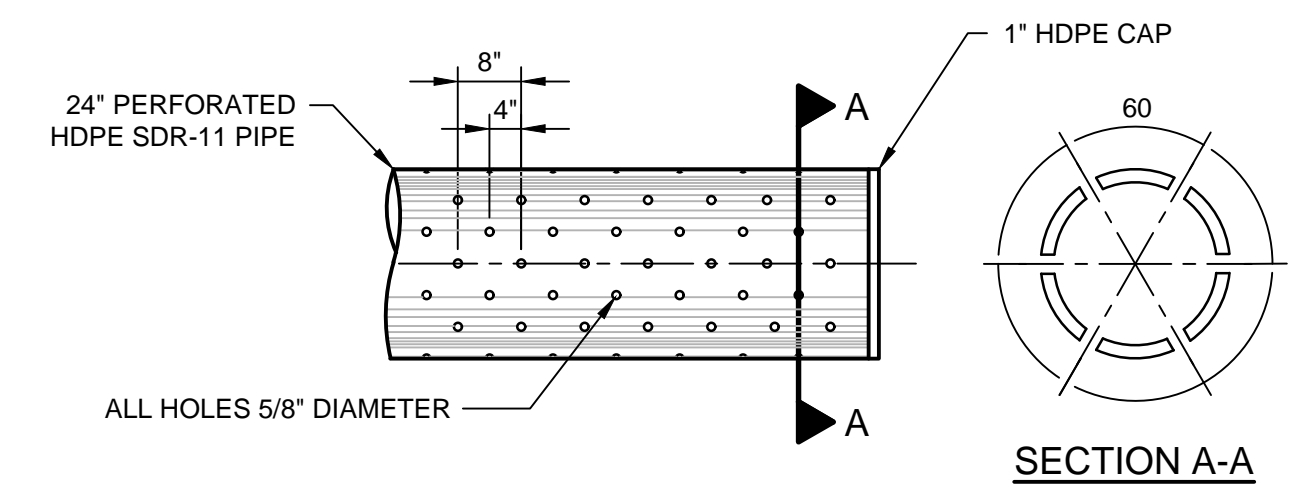
1 LEACHATE POND LINER
NO SCALE



2 LEACHATE CONVEYANCE TRENCH
NO SCALE

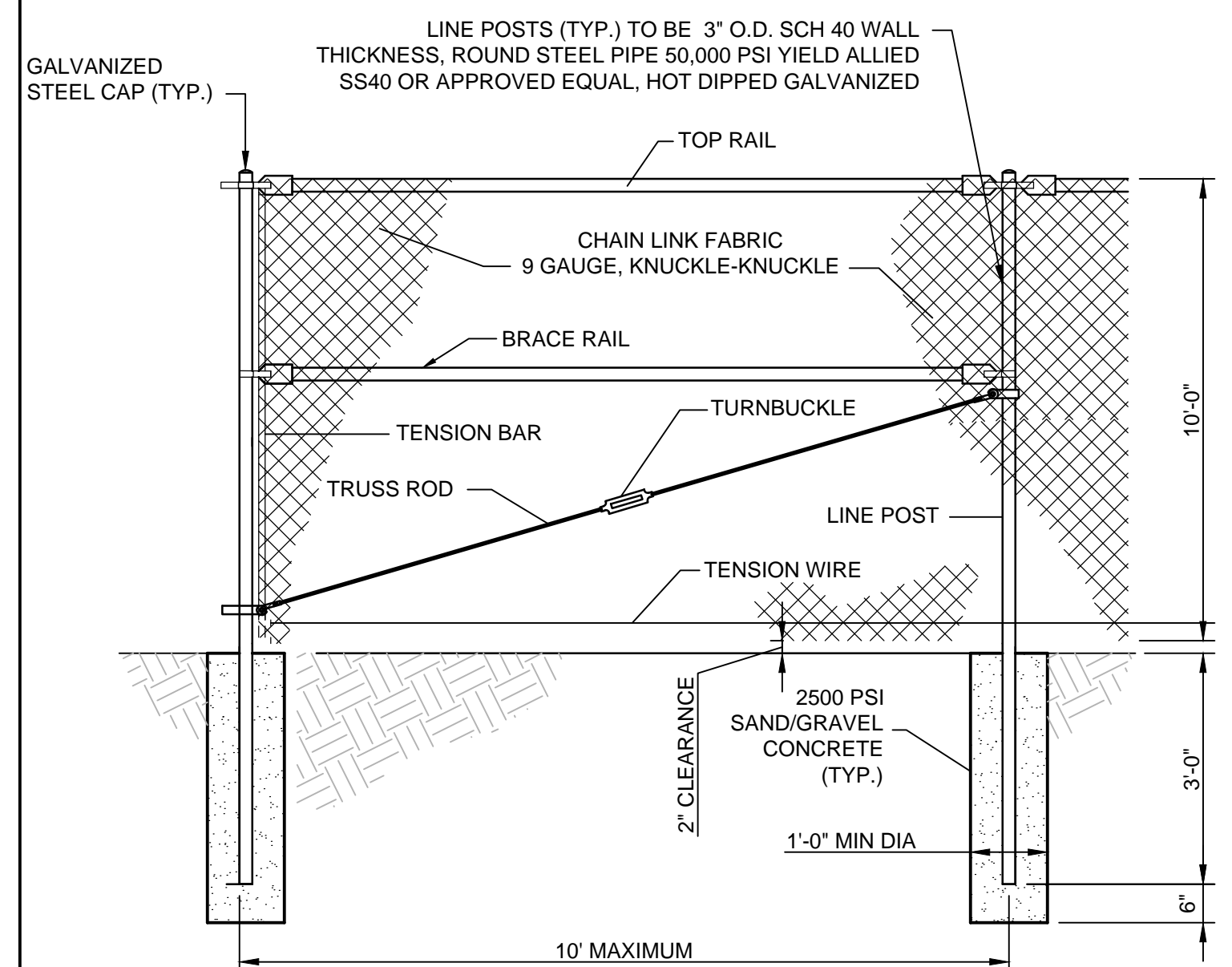


3 LEACHATE RISER AND DISCHARGE SLOPE SECTION
NO SCALE



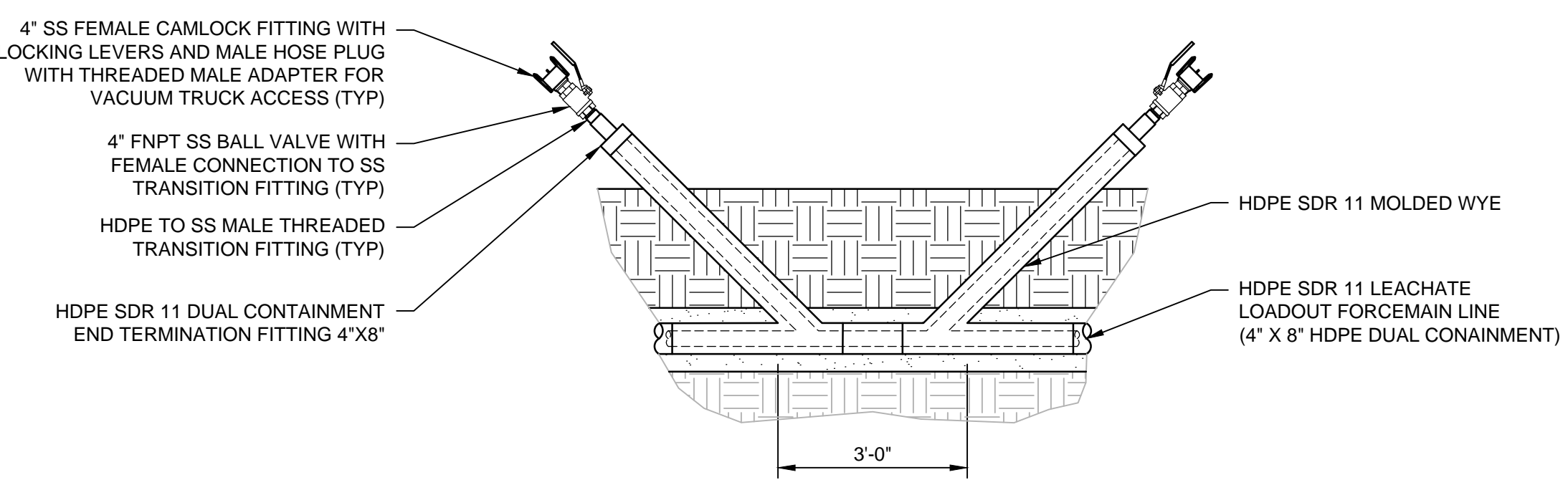
5 PERFORATED LEACHATE EXTRACTION PIPE
NO SCALE

- NOTES:**
- 0.5" DIAMETER HOLES, 6 ROWS EVENLY SPACED AROUND PERIMETER (60 DEGREES APART), 8" CENTER-TO-CENTER STAGGERED 4" BETWEEN ROWS.
 - SEE SPECIFICATIONS ON PIPE JOINTING, REMOVING BEADS AND CLEANING INSIDE OF ALL PIPES. FOR 24" LEACHATE EXTRACTION RISERS AND LEACHATE COLLECTION LINES (INCLUDING SLOPE RISERS) PROVIDE BEVELED EDGE ON INSIDE OF JOINT SUCH THAT JOINT HAS MINIMAL TO NO BEAD PROJECTION ON INSIDE OF PIPE. PIPE TO BE REAMED TO REMOVED EXCESS BEADS.

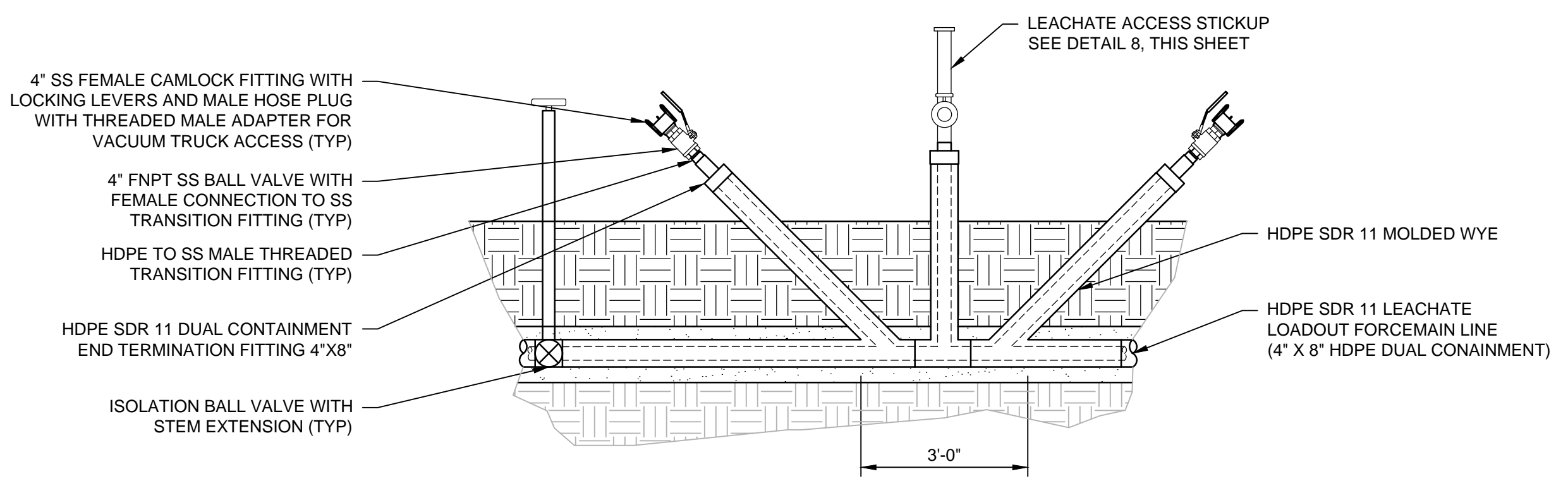


- FENCE NOTES:**
- INSTALL PULL POST AT HORIZONTAL BENDS, SHARP BREAKS IN VERTICAL GRADES, AT SPACED INTERVALS OF APPROXIMATELY 330' ON STRAIGHT RUNS, OR AS DIRECTED BY THE ENGINEER.
 - SPLICES IN WOVEN WIRE FABRIC SHALL ONLY BE ALLOWED AT CORNER, GATE END, OR PULL POSTS.
 - PROVIDE EQUAL BRACING ON BOTH SIDES OF CORNER OR PULL POST INSTALLATIONS.
 - PROVIDE EXPANSION COUPLINGS IN TOP RAILS AT NOT MORE THAN 20 FT INTERVALS
 - PROVIDE POST BRACES FOR EACH CORNER, PULL AND TERMINAL POST AND FIRST ADJACENT LINE POST.
 - INSTALL BRACING ASSEMBLIES AT ALL END POSTS, AS WELL AS SIDE, CORNER, AND PULL POSTS.
 - ALL FITTINGS, FASTENERS, AND HARDWARE SHALL BE OF A DESIGN AND STRENGTH COMPATIBLE WITH OTHER SPECIFIED ITEMS
 - (2) TWO GATES TO BE INSTALLED ON SOUTHEAST AND NORTHWEST SIDES.

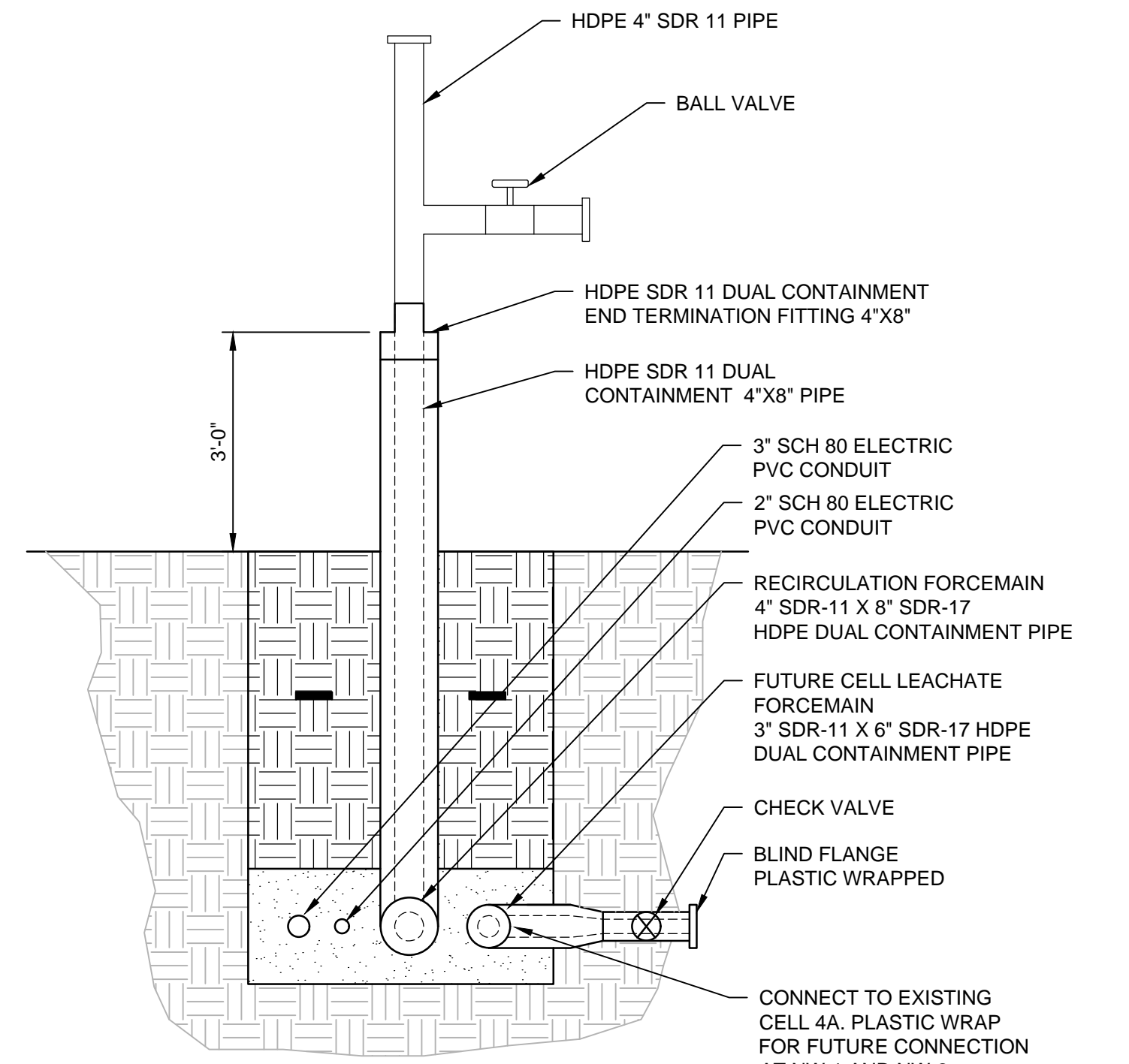
6 CHAIN LINK FENCE DETAIL
NO SCALE



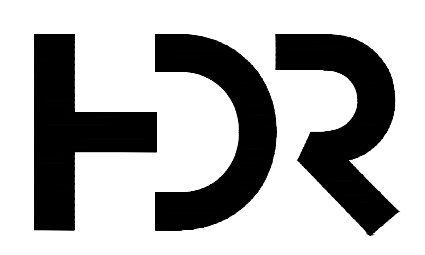
4 FUTURE CELL LEACHATE FORCEMAIN CLEANOUT DETAIL
NO SCALE



7 LEACHATE LOADOUT FORCEMAIN CLEANOUT DETAIL
NO SCALE



8 LEACHATE ACCESS STICKUPS
NO SCALE



ISSUE	DATE	DESCRIPTION
0	10/09/2020	ISSUED FOR BID

PROJECT MANAGER	G. WILLIAMS
CIVIL	K. KINLEY
DRAWN BY	L. CUNNINGHAM
PROJECT NUMBER	10232961

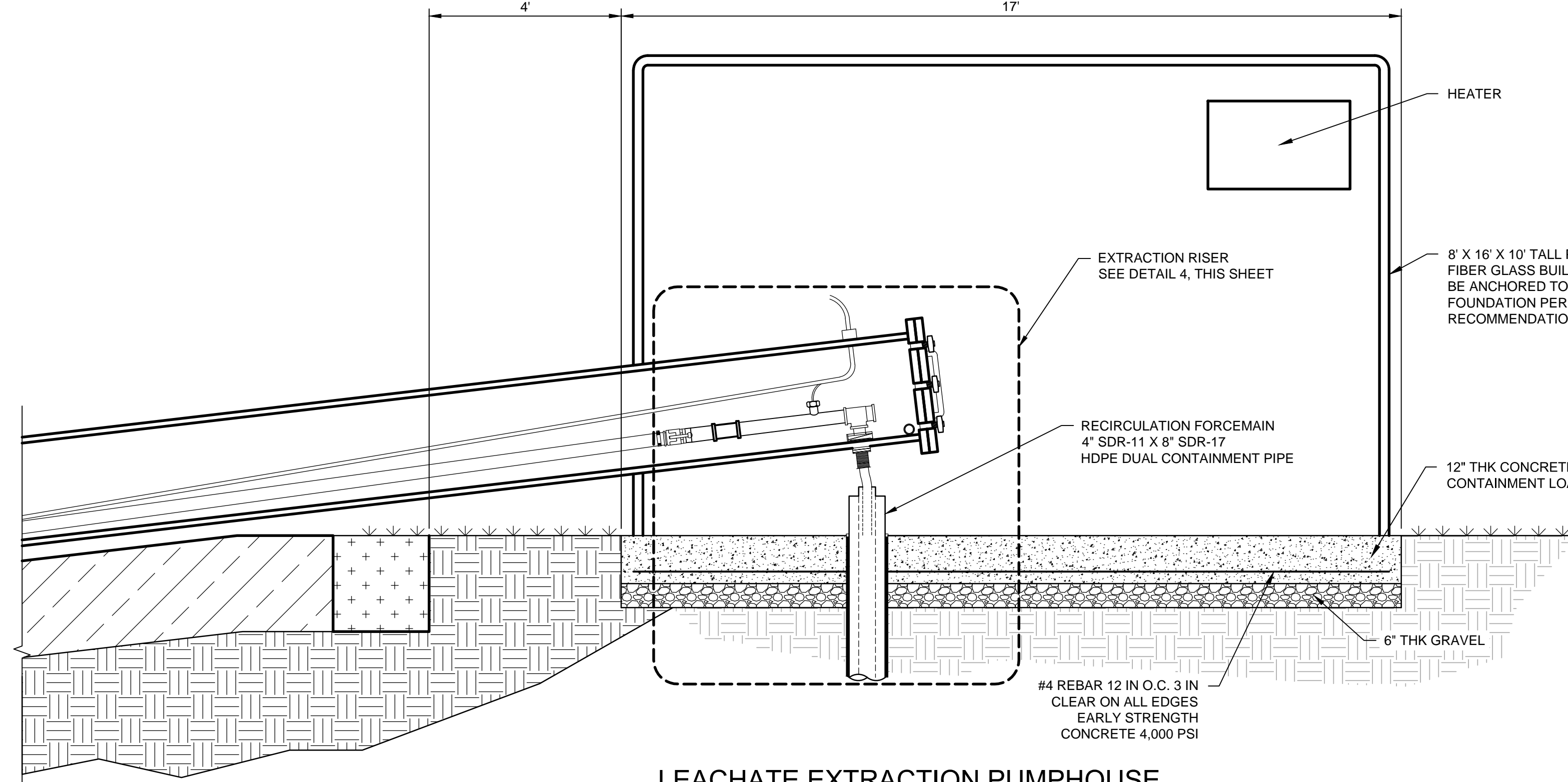


**SOUTH CENTRAL IOWA SOLID WASTE AGENCY
LEACHATE POND AND
LOADOUT CONSTRUCTION**

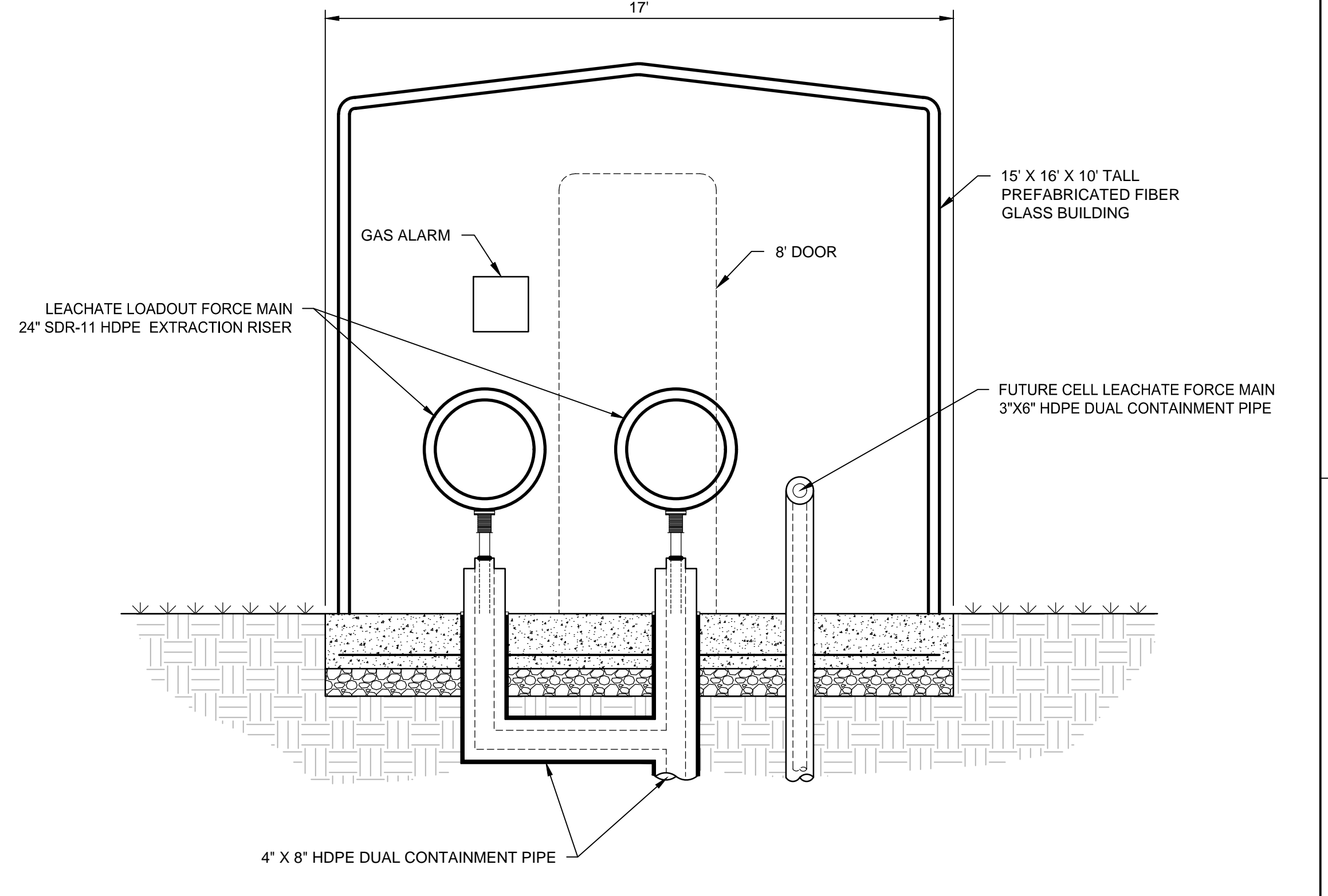


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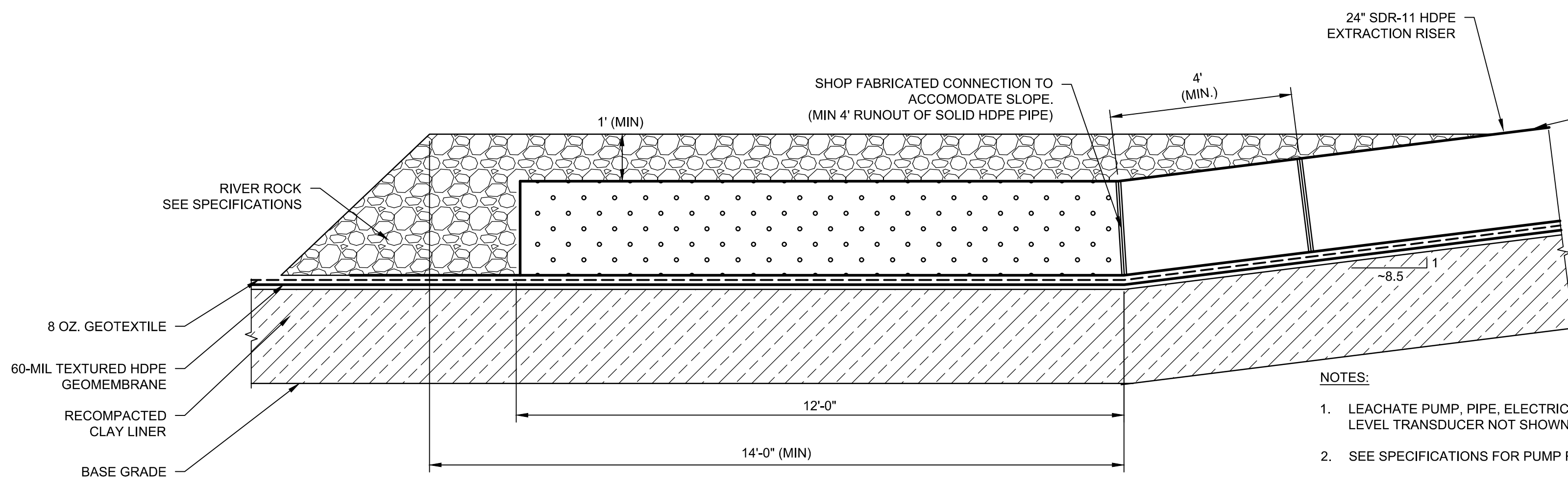
SHEET
00C06



1
-
LEACHATE EXTRACTION PUMPHOUSE
SOUTHWEST-NORTHEAST SECTION
NO SCALE

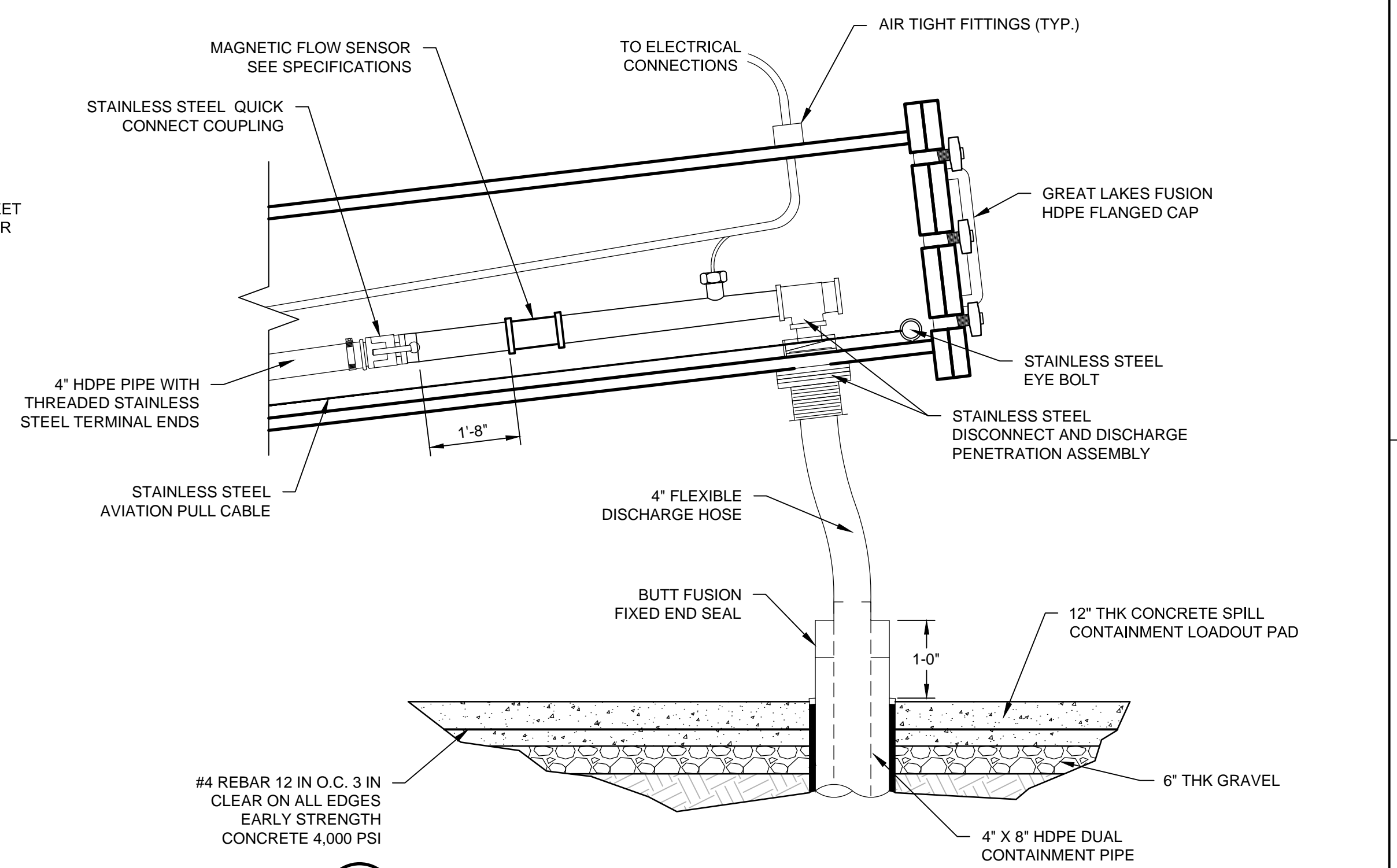


2
-
LEACHATE EXTRACTION PUMPHOUSE
NORTHWEST-SOUTHEAST SECTION
NO SCALE

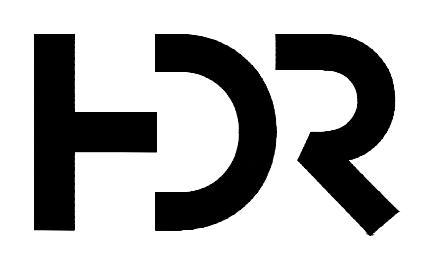


3
-
LEACHATE EXTRACTION RISER SECTION
NO SCALE

- NOTES:
1. LEACHATE PUMP, PIPE, ELECTRICAL, CONTROLS, AND LEVEL TRANSDUCER NOT SHOWN FOR CLARITY.
 2. SEE SPECIFICATIONS FOR PUMP REQUIREMENTS



4
-
LEACHATE EXTRACTION RISER DISCHARGE DETAIL
NO SCALE



ISSUE	DATE	DESCRIPTION
0	10/09/2020	ISSUED FOR BID

PROJECT MANAGER	G. WILLIAMS
CIVIL	K. KINLEY
DRAWN BY	L. CUNNINGHAM
PROJECT NUMBER	10232961



SOUTH CENTRAL IOWA SOLID WASTE AGENCY
LEACHATE POND AND
LOADOUT CONSTRUCTION

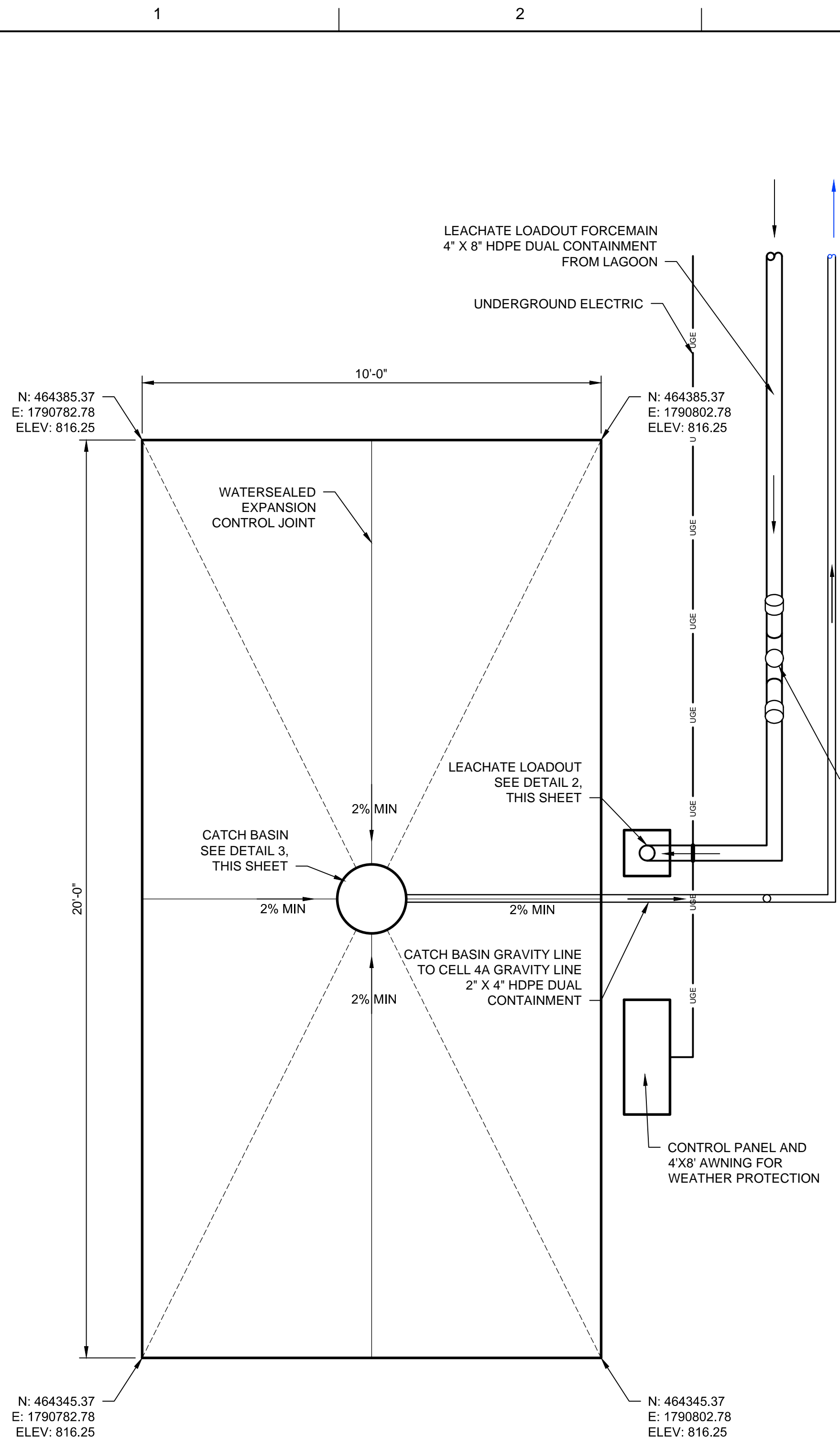
LEACHATE POND AND PUMPHOUSE DETAILS



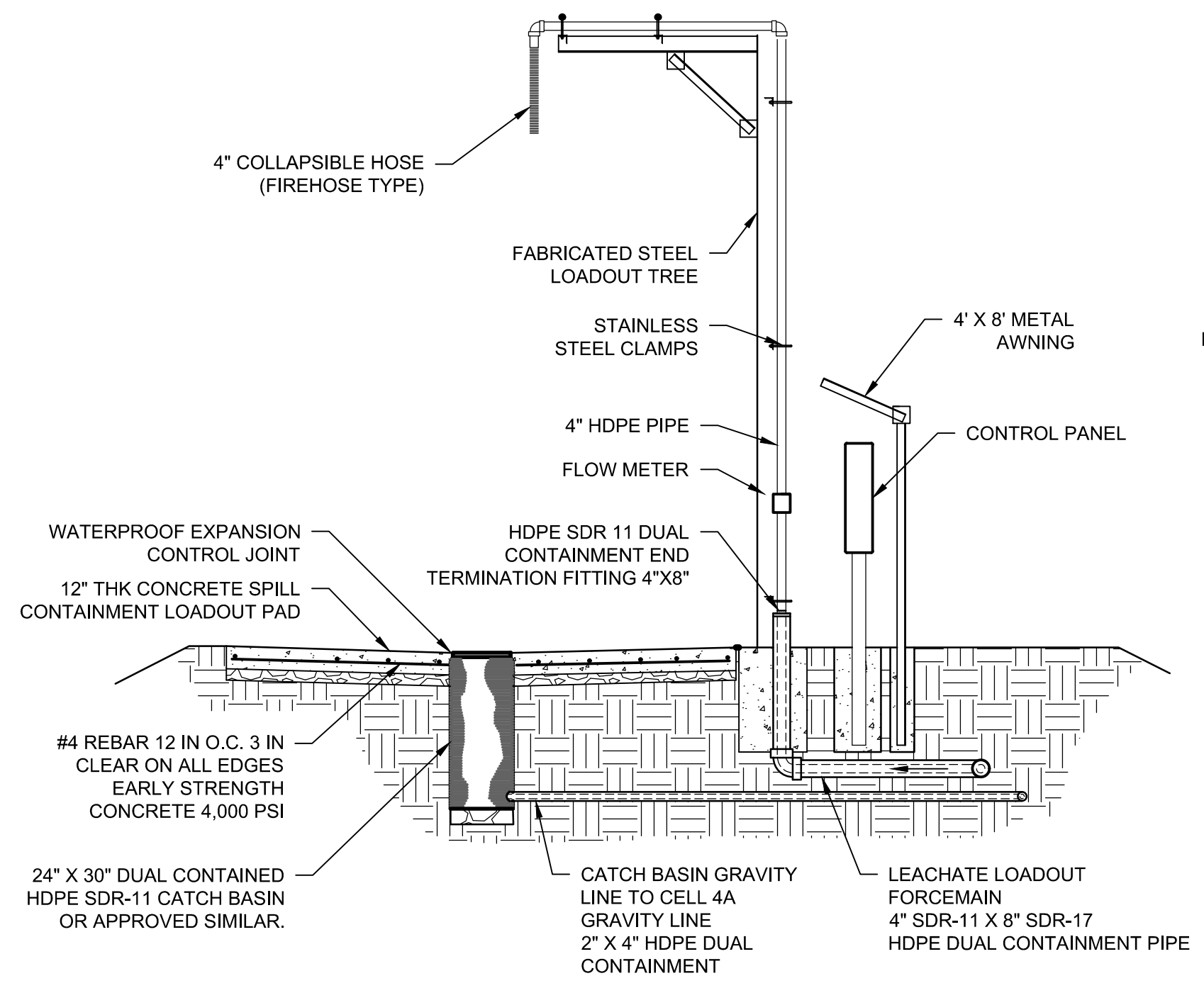
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SCALE | AS SHOWN

SHEET
00C07

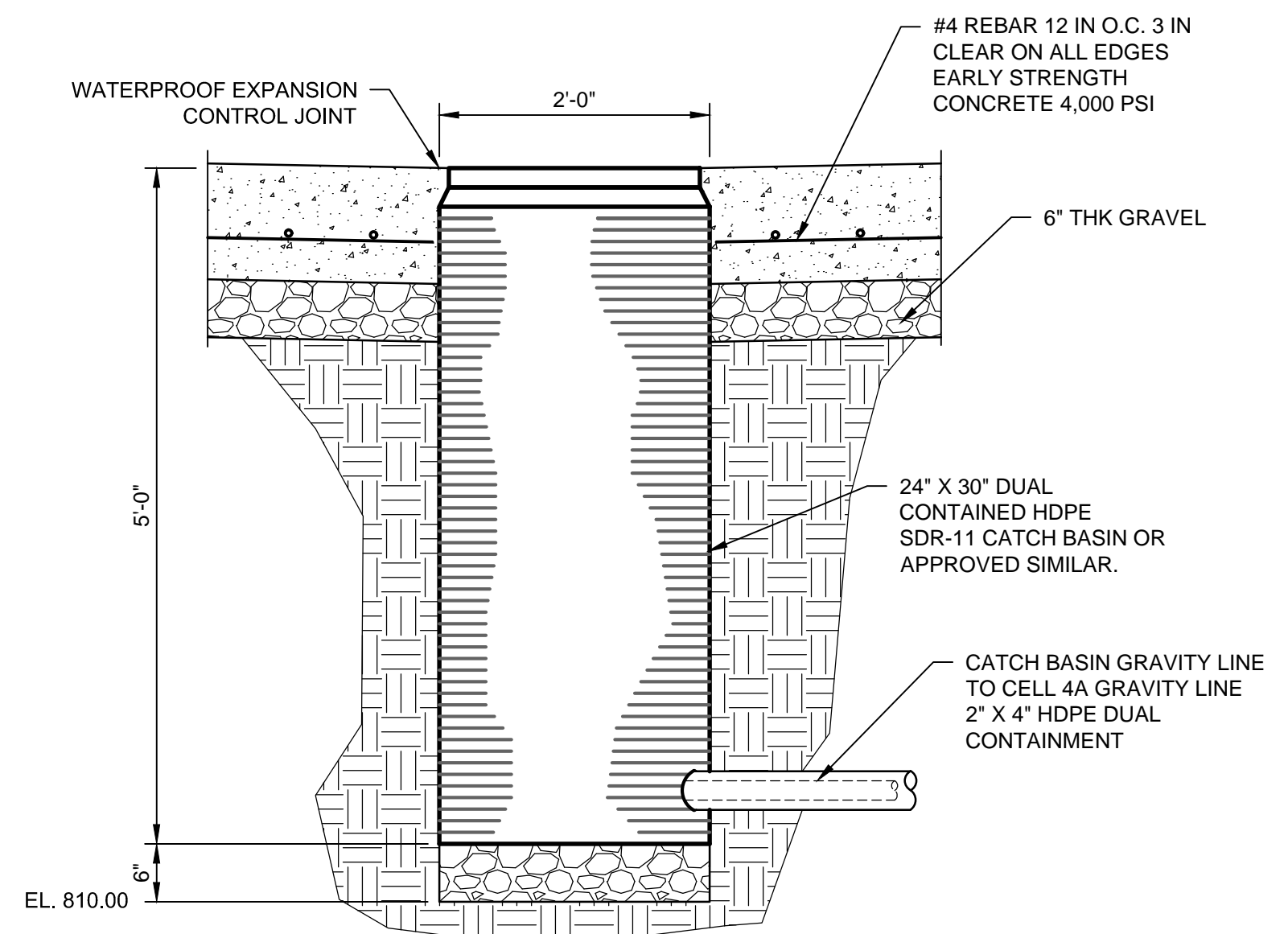
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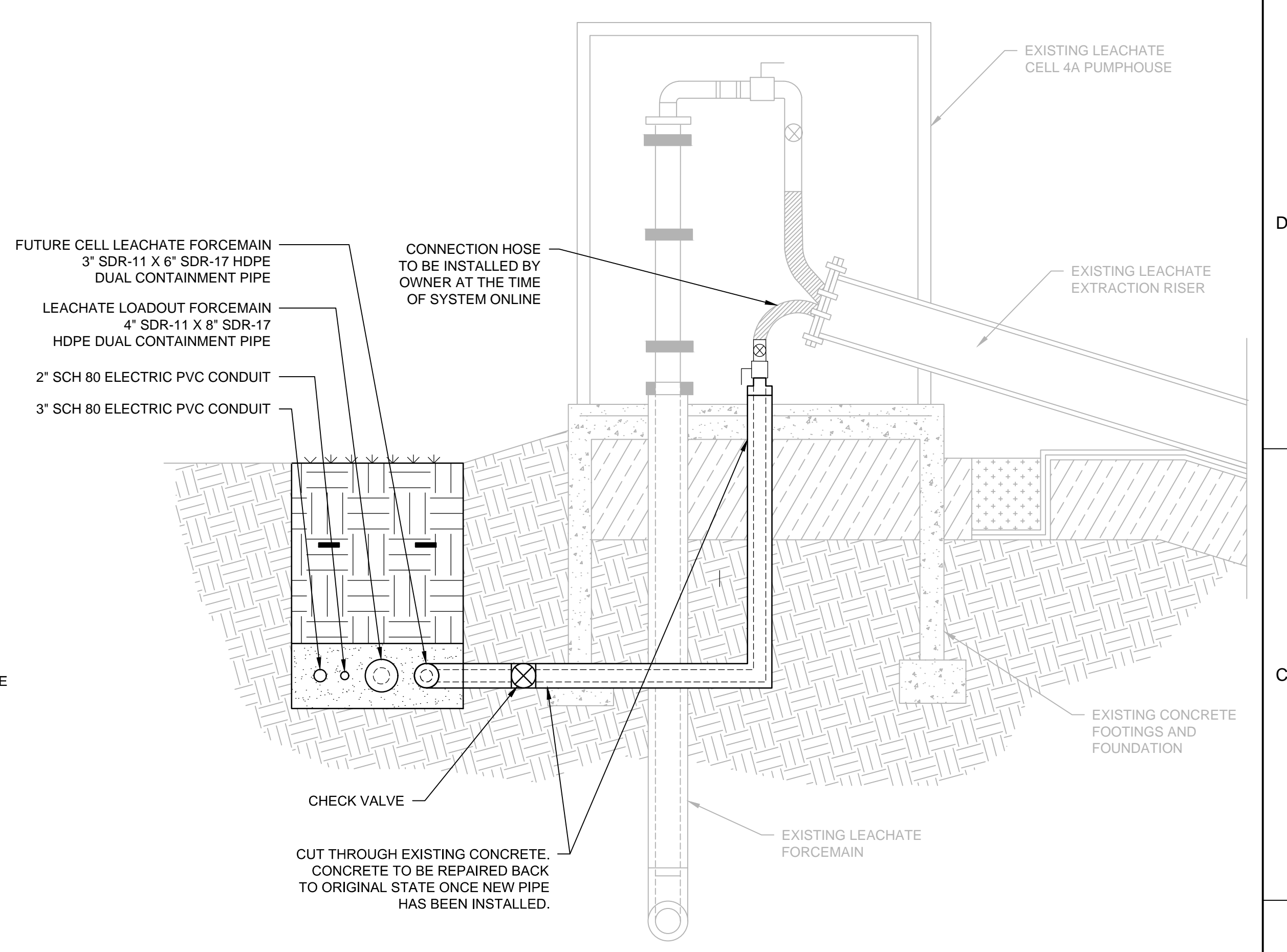
1 LEACHATE LOADOUT ENLARGED PLAN
NO SCALE



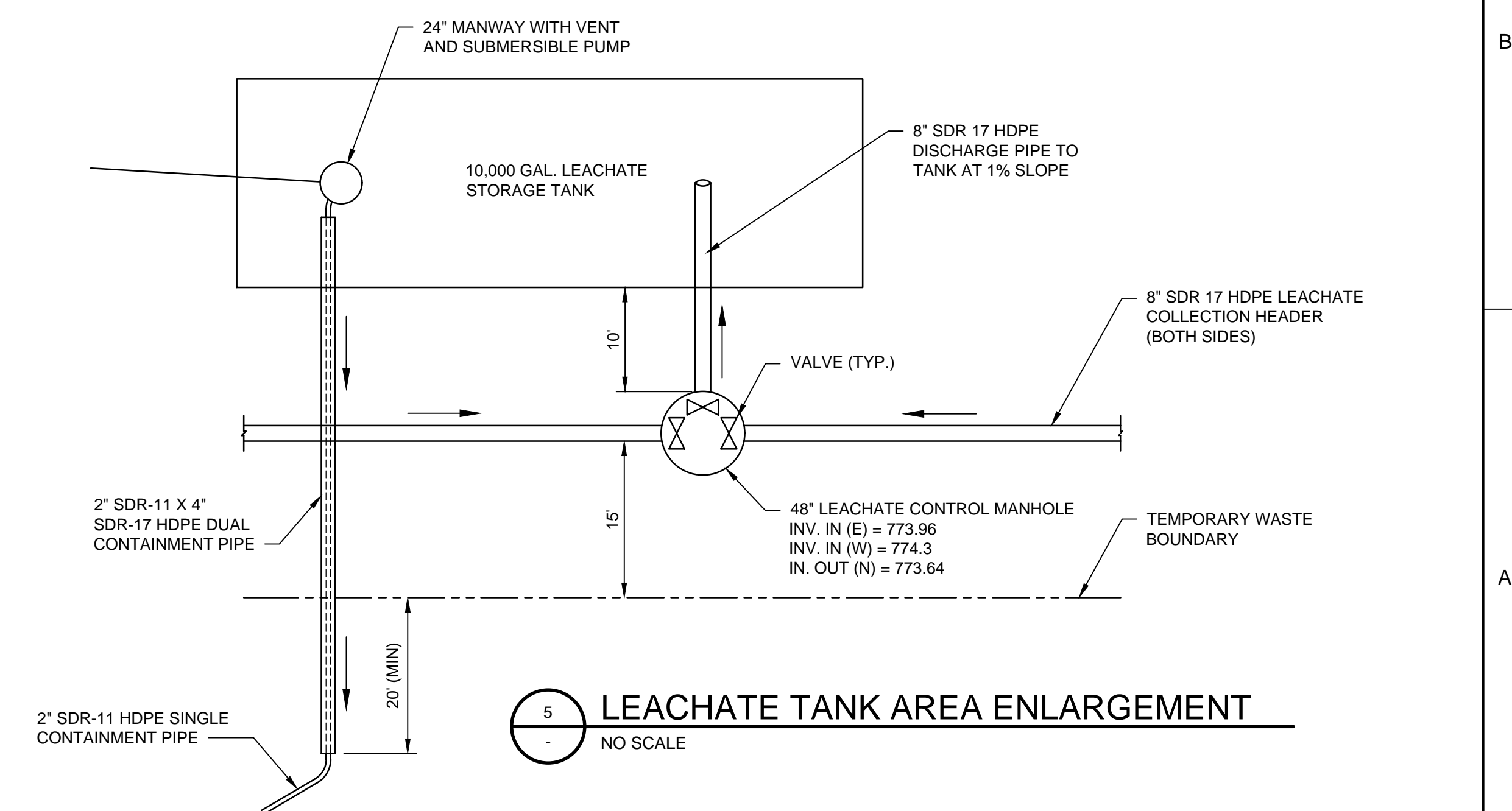
2 LEACHATE LOADOUT DETAIL
NO SCALE



3 CATCH BASIN DETAIL
NO SCALE



4 CELL 4A TIE-IN
NO SCALE



5 LEACHATE TANK AREA ENLARGEMENT
NO SCALE

N: 464385.37
E: 1790782.78
ELEV: 816.25

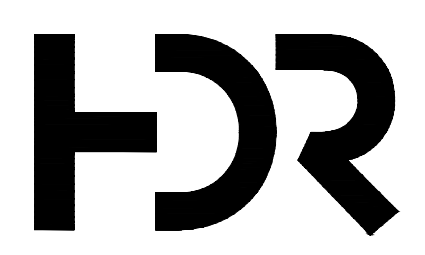
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E: 1790802.78
ELEV: 816.25

N: 464345.37
E: 1790782.78
ELEV: 816.25

N: 464345.37
E: 1790802.78
ELEV: 816.25

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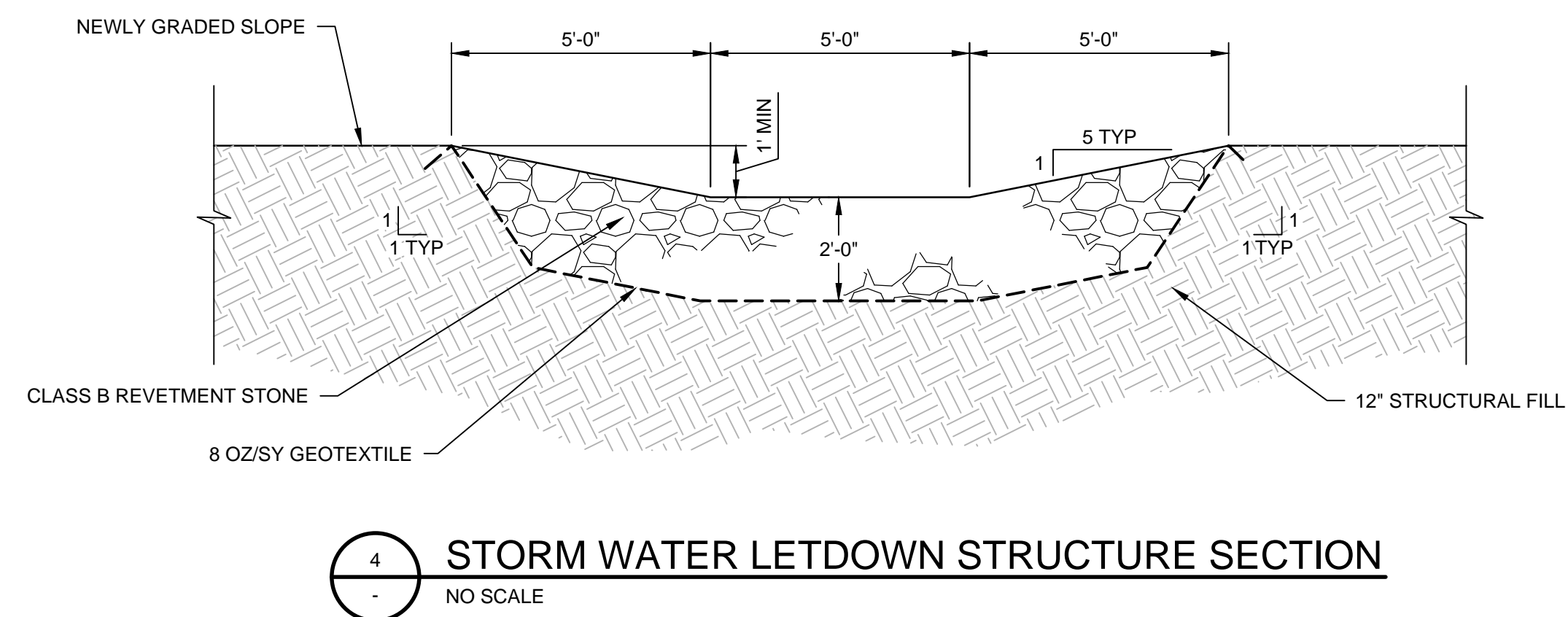
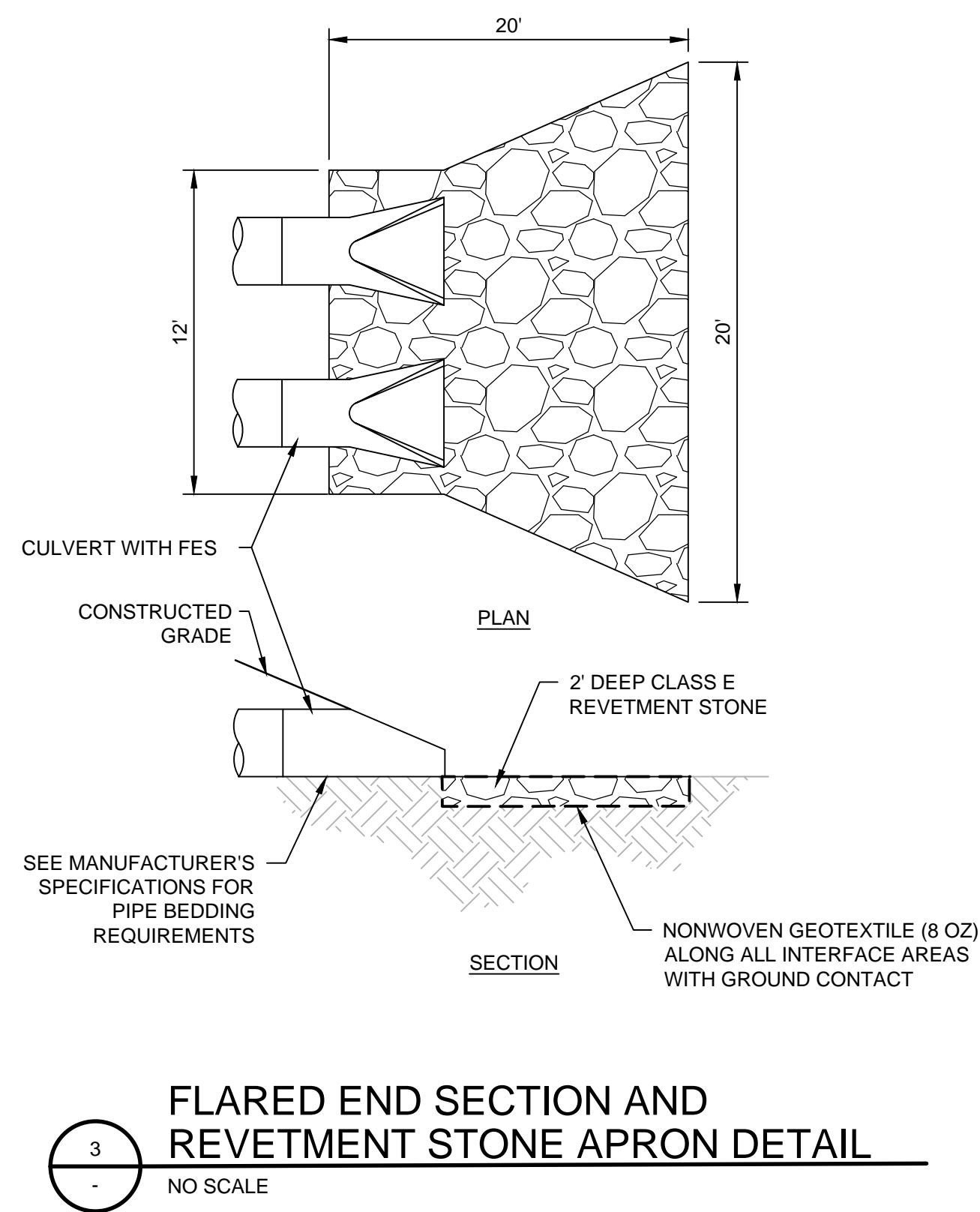
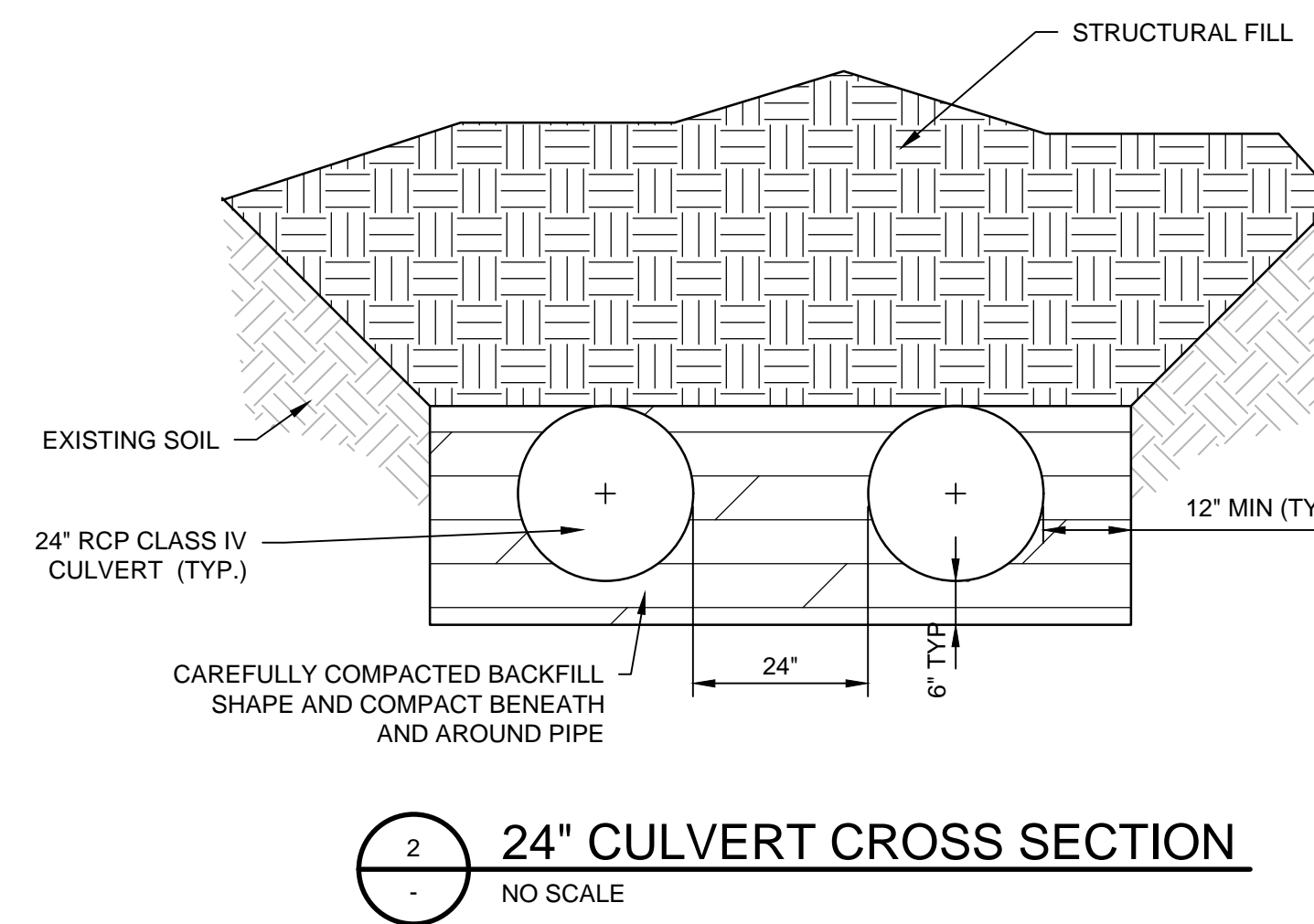
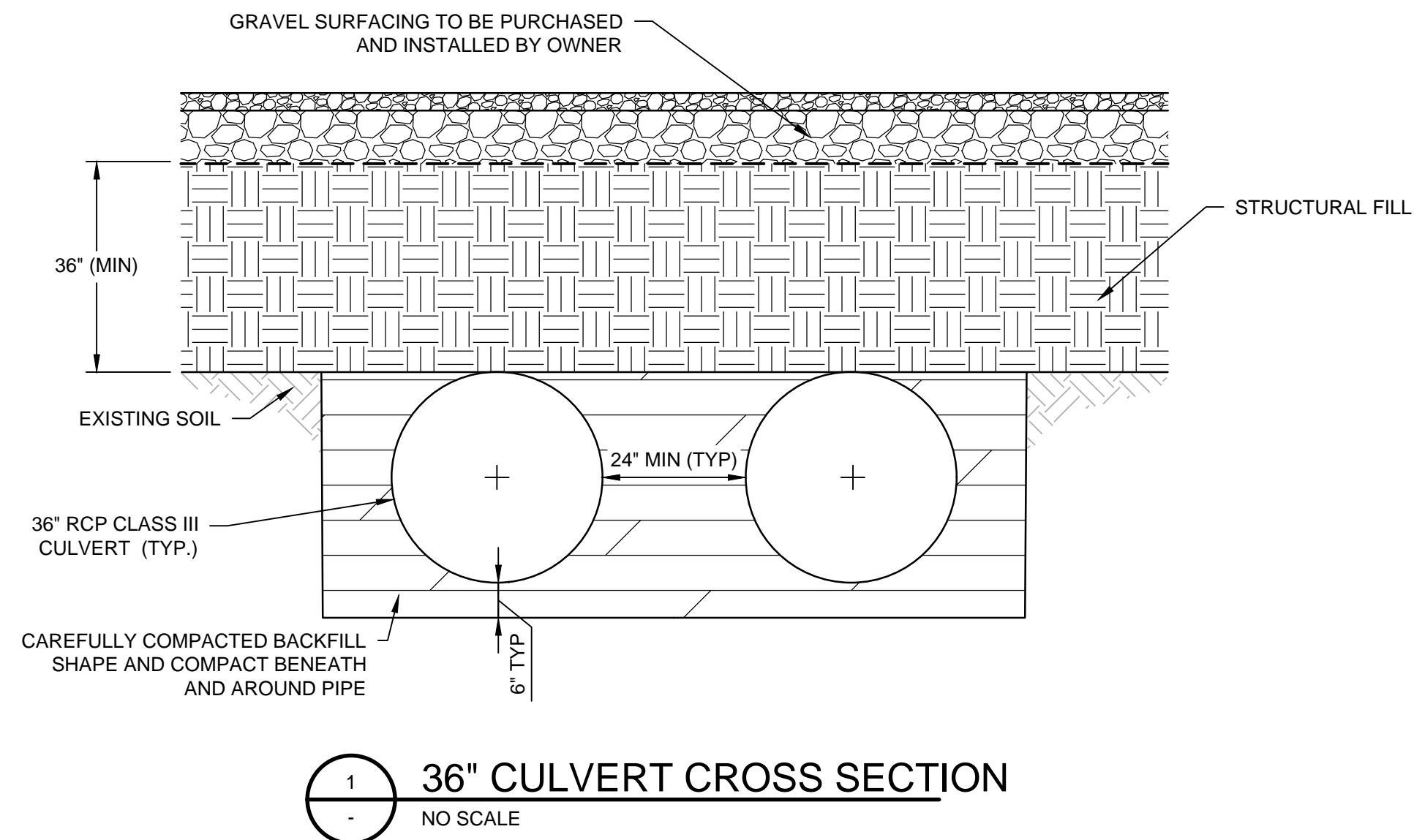
SOUTH CENTRAL IOWA SOLID WASTE AGENCY
LEACHATE POND AND
LOADOUT CONSTRUCTION



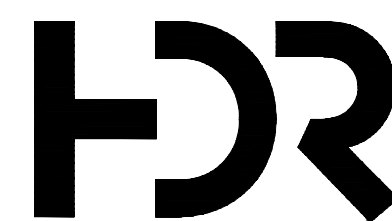
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SCALE AS SHOWN

SHEET
00C08

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- NOTES:
- ENSURE MIN 2' OVERLAP AT ALL GEOTEXTILE SEAMS WITH UPSLOPE GEOTEXTILE LAPPED ABOVE DOWNSLOPE GEOTEXTILE.
 - AT LETDOWN OUTFALL TO SEDIMENT POND, SMOOTHLY TRANSITION LETDOWN FLOWLINE FROM 24" BELOW GRADE TO MEET GRADES SHOWN ON 01C03. MAINTAIN 24" THICK REVETMENT STONE MIN. 6' BEYOND OUTFALL GRADE TRANSITION.



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**SOUTH CENTRAL IOWA SOLID WASTE AGENCY
LEACHATE POND AND
LOADOUT CONSTRUCTION**



STORMWATER DETAILS

FILENAME | 00C09.dwg
SCALE | AS SHOWN

SHEET
00C09

D
C
B
A

C:\pwworking\cunm01\1817751200C09.dwg Plot: 10/9/2020 4:13:20 PM L.CUNNINGHAM