411 6th Avenue SE, Suite 400
Cedar Rapids, IA 52402
www.foth.com

October 19, 2026

Brian Rath, P.E.
Land Quality Bureau, Iowa Department of Natural Resources
6200 Park Ave, Suite 200
Des Moines, IA 50321

Re: Phase 5B Stage1 Construction Drawings

Dear Brian

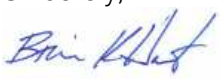
Attached is the construction drawings, specifications and quality assurance plan for the Phase 5B Stage 1 Cell. The plan is consistent with the operating permit and the DOPS with the following design changes.

- Added a geocomposites between the 60-mil HDPE liner and the 12-inch granular leachate drainage layer.
- Added a leachate collection pipe along the south edge of the base liner.
- Squared the south edge of the soil to be more perpendicular east and west base liner for potential future expansion. The change in volume is insignificant to design capacity.

The Phase 5B Cell will be built in two stages to allow for intermediate stormwater management. The updated Final Cover along with the Phase 5B Stage 2 configuration will be submitted with the Site 2 permit renewal application later this year.

Please call me if you have any questions or need additional information. I can be reached at 1-319-297-2063 or at brian.harthun@foth.com.

Sincerely,



Foth Infrastructure & Environment, LLC
Brian Harthun, P.E.
Senior Project Manager

Project Manual

2026 Site 2 Phase 5B – Stage 1 Construction



Cedar Rapids Linn County Solid Waste Agency
Linn County, Iowa

August 2026

Project I.D.: 26C004.00

Solving our clients' toughest science and engineering challenges

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SECTION 00 11 13

NOTICE OF PUBLIC HEARING AND LETTING

NOTICE OF PUBLIC HEARING ON PROPOSED PLANS, SPECIFICATIONS AND FORM OF CONTRACT FOR CONSTRUCTION OF THE CEDAR RAPIDS LINN COUNTY SOLID WASTE AGENCY'S 2026 SITE 2 PHASE 5B – STAGE 1 CONSTRUCTION PROJECT AND THE TAKING OF BIDS FOR SUCH CONSTRUCTION

Notice is hereby given that proposed plans, specifications, form of contract, and Foth Infrastructure & Environment, LLC's (Engineer) estimated total cost for construction of the 2026 Site 2 Phase 5B – Stage 1 Construction Project, as hereinafter described, are now on file with the Cedar Rapids Linn County Solid Waste Agency (Agency), at 1954 County Home Road, Marion, Linn County, Iowa.

A hearing will be conducted on the proposed plans, specifications, form of contract, and Engineer's estimated total cost at a meeting of the Agency to be held at the Agency, Site 2 Sanitary Landfill, 1954 County Home Road, Marion, Iowa 52302 at 1:30 P.M. local time on Tuesday, September 15, 2026, at which time and place any person may appear and file objections to the proposed plans, specifications, form of contract, or estimated total cost for said public improvements.

Sealed bids for the 2026 Site 2 Phase 5B – Stage 1 Construction Project will be received by the Cedar Rapids Linn County Solid Waste Agency at the Site 2 Sanitary Landfill, 1954 County Home Road, Marion, Iowa, until 12:00 p.m. local time on October 9, 2026. Bids will be publicly opened and read immediately following the bid deadline. An optional Pre-Bid meeting will be held at 10:00 A.M. on Wednesday, September 30, 2026, at the Cedar Rapids Linn County Solid Waste Agency Landfill Office, Site #2 Landfill, 1954 County Home Road, Marion, Iowa 52302. The contract is anticipated to be considered for award by the Agency Board on October 20, 2026.

The general nature of said improvements and the location are described as follows:

> 2026 Site 2 Phase 5B – Stage 1 Construction - Construct municipal solid waste Cell 5B at the Cedar Rapids Linn County Solid Waste Agency Site 2 Landfill. The Work generally includes approximately 335,209 cubic yards of common excavation, approximately 39,400 cubic yards of compacted clay liner, approximately 326,976 square feet of 60-mil HDPE geomembrane, approximately 267,923 square feet of geocomposite, groundwater and leachate drainage layers and collection piping, a stormwater retention basin, lift station, force main, and culverts, cell access road construction, erosion-control improvements, seeding, restoration, and other components required to complete Cell 5B in accordance with the Project Manual and accompanying Drawings.

All Work is to be in accordance with the plans, specifications, and Contract Documents prepared by Engineer on file with the Executive Director of the Agency, which are by this reference made a part of this notice as though fully set out and incorporated herein. By virtue of statutory authority, a preference will be given to products and provisions grown and coal produced within the State of Iowa.

All proposals shall be made on proposal forms furnished by Engineer and must be enclosed in a sealed envelope plainly identified and addressed to Cedar Rapids Linn County Solid Waste Agency, 1954 County Home Road, Marion, Iowa 52302.

Each Bidder shall accompany its proposal with Bid security as defined in Iowa Code section 26.8, as security that the successful Bidder will enter into a contract for the Work bid upon and will furnish, after award of the Contract, the required corporate surety bonds. The Bid security shall be in the amount of five percent (5%) of the total amount of the Bid and shall be in the form of a cashier's check or certified check drawn on a state-chartered or federally chartered bank, a certified share draft drawn on a state-chartered or federally chartered credit union, or a Bidder's bond with corporate surety satisfactory to the Agency. The proposal shall contain no condition except as provided in the Contract Documents.

If awarded the Contract, the Bidder will enter into the Agreement at the prices bid and furnish the required performance and payment bonds and evidence of insurance. The cashier's check, certified check, or certified share draft may be cashed, or the Bidder's bond forfeited, and the proceeds retained as penalty if the Bidder fails to execute the Agreement or furnish acceptable performance and payment bonds or evidence of insurance within thirty (30) days after acceptance of its proposal by resolution of the Agency. No Bidder may withdraw a proposal within sixty (60) days after the date set for opening Bids.

The successful Bidder will be required to furnish corporate surety performance and payment bonds, each in an amount equal to one hundred percent (100%) of the Contract Price. Said bonds shall be issued by a responsible surety acceptable to the Agency and shall guarantee faithful performance of and payment under the Contract, including the correction or maintenance obligations stated in the Contract Documents.

The Agency reserves the right to reject any or all proposals, to re-advertise for new proposals, and to waive informalities to the extent permitted by law and in the best interests of the Agency. Payment of the cost of said Project will be made from such fund or funds as may be lawfully used for said purpose.

Work under the proposed Contract shall be commenced no later than ten (10) days after the Notice to Proceed is issued and shall be substantially completed by 08/27/2027 and finally completed by 09/27/2027, subject to extensions of time granted in accordance with the Contract Documents. Additional milestone requirements, if any, shall be as stated in the Agreement.

Plans and specifications have been prepared by Engineer. The plans and specifications and the proceedings of the Agency referring to and defining said construction and proposed improvements are hereby made a part of this notice, and the proposed Contract shall be executed in compliance therewith. Said plans, specifications, and proposed Contract Documents are on file with the Executive Director of the Cedar Rapids Linn County Solid Waste Agency and with Engineer, Foth Infrastructure & Environment, LLC at their office located at 411 6th Ave SE, Suite 400, Cedar Rapids, Iowa 52401, telephone (319)365-9565 for examination of the plans and specifications by bidders at the Engineer’s office.

Plans and Specifications may be obtained from Foth Infrastructure & Environment, LLC at their office located at 411 6th Ave SE, Suite 400, Cedar Rapids, Iowa 52401, telephone (319)365-9565. A refundable deposit of $100.00 will be required for each set of plans and specifications, which will be refunded to the bidder upon return of the plans and specifications in good condition to the Engineer within 30 days of the date of award of the contract. For an additional non-refundable fee of $25.00, an electronic copy of the drawings in AutoCAD® format will also be provided. Deposit checks shall be made out to Foth Infrastructure and Environment.

The Engineer's opinion of probable construction cost for the Project is $4,848,154.72.

Published upon order of the Cedar Rapids Linn County Solid Waste Agency.

END OF SECTION

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.

ARTICLE 2 – COPIES OF BIDDING DOCUMENTS

2.01 Complete sets of the Bidding Documents may be obtained from the Issuing Office in the number and format stated in the advertisement or invitation to bid.

2.02 Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

2.03 Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license for any other use.

ARTICLE 3 – QUALIFICATIONS OF BIDDERS

3.01 To demonstrate Bidder's qualifications to perform the Work, after submitting its Bid and within five days of Owner's request, Bidder shall submit (a) written evidence establishing its qualifications such as financial data, previous experience, and present commitments, and (b) the following additional information:

A. Evidence of Bidder's authority to do business in the state where the Project is located.

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

C. Subcontractor and Supplier qualification information; coordinate with provisions of Article 12 of these Instructions, "Subcontractors, Suppliers, and Others."

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 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.

ARTICLE 4 – SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT THE SITE

4.01 *Site and Other Areas*

A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the

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Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.

4.02 *Existing Site Conditions*

A. Subsurface and Physical Conditions; Hazardous Environmental Conditions

1. The Supplementary Conditions identify:

a. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site.

b. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).

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

d. Technical Data contained in such reports and drawings.

2. Owner will make copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

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

B. Underground Facilities: Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or adjacent to the Site are set forth in the Contract Documents and are based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner, or others.

C. Adequacy of Data: Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions, and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated subsurface or physical conditions appear in Paragraphs 5.03, 5.04, and 5.05 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work, appear in Paragraph 5.06 of the General Conditions.

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4.03 *Site Visit and Testing by Bidders*

A. Bidder shall conduct the required Site visit during normal working hours and shall not disturb any ongoing operations at the Site.

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

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

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

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

4.04 *Owner's Safety Program*

A. An Owner safety program applies to Site visits and Work performed at the Site. The Owner's "Contractor Safety Briefing - Landfill/RRB" and "Vendor Agreement - Release of Liability" are included in Section 00 73 19. Bidder shall review these requirements before submitting its Bid and shall ensure that its employees, representatives, and other persons entering the Site on Bidder's behalf comply with the requirements. Owner may deny Site access to persons who have not completed the required safety briefing and liability waiver as directed by Owner.

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

ARTICLE 5 – BIDDER'S REPRESENTATIONS

5.01 It is the responsibility of each Bidder before submitting a Bid to:

A. examine and carefully study the Bidding Documents, and any data and reference items identified in the Bidding Documents;

B. visit the Site, conduct a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfy itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;

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C. become familiar with and satisfy itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work;

D. carefully study all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings;

E. consider the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs;

F. agree, based on the information and observations referred to in the preceding paragraph, that at the time of submitting its Bid no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents;

G. become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;

H. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder;

I. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work; and

J. agree that the submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 6 – PRE-BID CONFERENCE

6.01 Pre-bid conference will be held at 10:00 A.M., local time on Wednesday, 09/30/2026 at the Cedar Rapids Linn County Solid Waste Agency Landfill Office, Site #2 Landfill 1954 County Home Road, Marion, Iowa 52302. Representatives of Owner and Engineer will be present to discuss the Project. Engineer will transmit to all prospective Bidders of record such Addenda as Engineer considers necessary in response to questions arising at

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the conference. Oral statements may not be relied upon and will not be binding or legally effective.

ARTICLE 7 – INTERPRETATIONS AND ADDENDA

7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted in writing to the Owner. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by Engineer as having received the Bidding Documents. Questions received less than ten days prior to the date for opening of Bids may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect. However, if there is a desire to discuss any aspects of the Bidding Documents, then contact **Chris Oelkers,** at the office of the Engineer, at **(319) 365-9565.**

7.02 Addenda may be issued to clarify, correct, or change the Bidding Documents as deemed advisable by Owner or Engineer.

ARTICLE 8 – BID SECURITY

8.01 A bid shall be accompanied by Bid security made payable to Owner in an amount of 5 percent of Bidder's maximum Bid price and in the form of a certified check or bank money order or a Bid bond (on the form attached, Section 00 43 13) issued by a surety meeting the requirements of Paragraphs 5.01 and 5.02 of the General Conditions. Submittal of a Bid Bond on a form other than the Bid Bond form included in the Bidding Documents may be cause for rejection of Bid.

8.02 The Bid security of the Successful Bidder will be retained until such Bidder has executed the Contract Documents, furnished the required contract security and met the other conditions of the Notice of Award, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 30 days after the Notice of Award, Owner may annul the Notice of Award and the Bid security of that Bidder will be forfeited. The Bid security of other Bidders whom Owner believes to have a reasonable chance of receiving the award may be retained by Owner until seven days after the Effective Date of the Agreement, whereupon Bid security furnished by such Bidders will be returned.

8.03 Bid security of other Bidders whom Owner believes do not have a reasonable chance of receiving the award will be returned within seven days after the Bid opening.

ARTICLE 9 – CONTRACT TIMES

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

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ARTICLE 10 – LIQUIDATED DAMAGES

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

ARTICLE 11 – SUBSTITUTE AND "OR-EQUAL" ITEMS

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

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

ARTICLE 12 – SUBCONTRACTORS, SUPPLIERS, AND OTHERS

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

12.02 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers, individuals, or entities. Declining to make requested substitutions will not constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to revocation of such acceptance after the Effective Date of the Agreement as provided in Paragraph 7.06 of the General Conditions.

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12.03 Contractor shall not be required to employ any Subcontractor, Supplier, individual, or entity against whom Contractor has reasonable objection.

12.04 The dollar amount of the total fee paid to Subcontractors shall not exceed fifty (50) percent of the total contract amount.

ARTICLE 13 – PREPARATION OF BID

13.01 The Bid Form is included with the Bidding Documents.

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

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

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

13.03 A Bid by a partnership shall 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 partnership's address for receiving notices shall be shown.

13.04 A Bid by a limited liability company shall be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the firm's address for receiving notices shall be shown.

13.05 A Bid by an individual shall show the Bidder's name and address for receiving notices.

13.06 A Bid by a joint venture shall be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The joint venture's address for receiving notices shall be shown.

13.07 All names shall be printed in ink below the signatures.

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

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

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

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ARTICLE 14 – BASIS OF BID

14.01 *Lump Sum*

A. Bidders shall submit a Bid with a base price total which is the total of the unit costs in Schedule A. The Bidder shall include a separate price for each unit price adjustment described in the Bidding Documents as provided for in the Bid From. The price for each unit price adjustment will be the amount added or deleted from the base Proposal if the total actual amount of work exceeds or is less than 20% of the proposal quantities.

14.02 *Unit Price*

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

B. The "Bid Price" (sometimes referred to as the extended price) for each unit price Bid item will be the product of the "Estimated Quantity" (which Owner or its representative has set forth in the Bid Form) for the item and the corresponding "Bid Unit Price" offered by the Bidder. The total of all unit price Bid items will be the sum of these "Bid Prices"; such total will be used by Owner for Bid comparison purposes. The final quantities and Contract Price will be determined in accordance with Paragraph 13.03 of the General Conditions.

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

14.03 *Allowances*

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

ARTICLE 15 – SUBMITTAL OF BID

15.01 With each copy of the Bidding Documents, a Bidder is furnished two unbound copies of the Bid Form, and, if required, the Bid Bond Form. The unbound copy of the Bid Form is to be completed and submitted with the Bid security (Section 00 43 13) and the following documents:

A. Section 00 42 00 – Proposal Forms

B. Section 00 43 36 – Tabulation of Subcontractors

C. Section 00 45 13 – Bidder Qualification Form

D. Section 00 61 13 – Performance and Payment Bond

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15.02 A Bid shall be submitted no later than the date and time prescribed and at the place indicated in the Advertisement or Invitation to bid and shall be enclosed in a plainly marked package with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid shall be addressed to the Owner's address: Cedar Rapids Linn County Solid Waste Agency 1954 County Home Road, Marion, Iowa 52302. A bid shipped via other carrier shall be addressed to the Owner's physical address. All bids shall be submitted in duplicate according to the Notice of Public Hearing. Only one Bid Security is required to be submitted with the duplicate bids.

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

ARTICLE 16 – MODIFICATION AND WITHDRAWAL OF BID

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

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

ARTICLE 17 – OPENING OF BIDS

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

ARTICLE 18 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE

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

ARTICLE 19 – EVALUATION OF BIDS AND AWARD OF CONTRACT

19.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner further reserves the right to reject the Bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to not be responsible. Owner may also reject the Bid of any Bidder if Owner

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believes that it would not be in the best interest of the Project to make an award to that Bidder. Owner also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate contract terms with the Successful Bidder.

19.02 More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.

19.03 In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.

19.04 In evaluating Bidders, Owner will consider the qualifications of Bidders and may consider the qualifications and experience of Subcontractors, Suppliers, and other individuals or entities proposed for those portions of the Work for which the identity of Subcontractors, Suppliers, and other individuals or entities must be submitted as provided in the Supplementary Conditions.

19.05 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work in accordance with the Contract Documents.

19.06 Bidder agrees to waive any claim it has or may have against the Owner, the Engineer, and the respective employees arising out of or in connection with the administration, evaluation or recommendation of any Bid.

19.07 If the Contract is to be awarded, Owner will award the Contract to the Bidder whose Bid is in the best interests of the Project.

ARTICLE 20 – BONDS AND INSURANCE

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

ARTICLE 21 – SIGNING OF AGREEMENT

21.01 When Owner issues a Notice of Award to the Successful Bidder, it shall be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder shall execute and deliver the required number of counterparts of the Agreement (and any bonds and insurance documentation required to be delivered by the Contract Documents) to Owner. Within ten days thereafter, Owner shall deliver one fully executed counterpart of the Agreement to Successful Bidder with a complete set of the Drawings with appropriate identification.

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ARTICLE 22 – SALES AND USE TAXES

22.01 The Owner's Sales Tax Exemption Certificate will be provided to the Contractor for purchases of all materials used on this project.

END OF SECTION

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SECTION 00 41 13

BID FORM

2026 SITE 2 - MSW CELL 5B CONSTRUCTION

CEDAR RAPIDS LINN COUNTY SOLID WASTE AGENCY

ARTICLE 1 – BID RECIPIENT

1.01 This Bid is submitted to:

Cedar Rapids Linn County Solid Waste Agency
1954 County Home Road
Marion, Iowa 52302

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

ARTICLE 2 – BIDDER'S ACKNOWLEDGEMENTS

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

ARTICLE 3 – BIDDER'S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, other related data identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged:

Addendum No.	Addendum Date
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

B. Bidder has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or

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subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.

E. Bidder has considered the information known to Bidder; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents; and (3) Bidder's safety precautions and programs.

F. Based on the information and observations referred to in Paragraph 3.01.E above, Bidder does not consider that further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.

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

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

I. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by Engineer is acceptable to Bidder.

J. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.

K. Bidder will submit written evidence of its authority to do business in the state where the project is located before the award of the Contract.

L. Bidder agrees to waive any claim it has or may have against the Owner, the Engineer, and the respective employees, arising out of or in connection with the administration, evaluation or recommendation of the bid.

ARTICLE 4 – BIDDER'S CERTIFICATION

4.01 Bidder certifies that:

A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.

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B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.

C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and

D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:
   1. "Corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process.
   2. "Fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition.
   3. "Collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and
   4. "Coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

ARTICLE 5 – BASIS OF BID

5.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

As stated in the attached Bid Schedule. Award of the contract will be based on the total bid price.

Bidder acknowledges that estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all unit price Bid items will be based on actual quantities, determined as provided in the Contract Documents.

TOTAL BID PRICE $_____
Words **Dollars and cents**

ARTICLE 6 – TIME OF COMPLETION

6.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.

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

ARTICLE 7 – ATTACHMENTS TO THIS BID

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

A. 00 42 00 Proposal Form – including a hard copy of the Proposal Table if using the electronic.

B. List of Proposed Subcontractors;

C. List of Proposed Suppliers;

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D. Required Bid security in the form of a bid bond, certified check, or bank money order; and

E. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such license within the time for acceptance of Bids.

F. Section 00 45 13 Statement of Bidder's Qualifications.

ARTICLE 8 – DEFINED TERMS

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

ARTICLE 9 – BID SUBMITTAL

9.01 This Bid is submitted by:

If Bidder is:

An Individual

Name (typed or printed):_____

By:_____
(Individual's signature)

Doing Business As:_____

A Partnership

Partnership Name:_____

By:_____
(Signature of General Partner – attach evidence of authority to sign)

Name (typed or printed):_____

A Corporation

Corporation Name:_____(SEAL)

State of Incorporation:_____

Type (General Business, Professional, Service, Limited Liability):_____
_____

By:_____
(Signature – attach evidence of authority to sign)

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Name (typed or printed):_____

Title:_____
(CORPORATE SEAL)

Attest:_____

Date of Qualification to Do Business in _____
(State Where Project is Located)
is _____/_____/_____.

A Joint Venture

Name of Joint Venture:_____

First Joint Venturer Name:_____(SEAL)

By:_____
(Signature of First Joint Venture Partner – attach evidence of authority to sign)

Name (typed or printed):_____

Title_____

Second Joint Venturer Name:_____ (SEAL)

By:_____
(Signature of Second Joint Venture Partner – attach evidence of authority to sign)

Name (typed or printed):_____

Title_____

(Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation that is a party to the joint venture should be in the manner indicated above.)

Bidder's Business Address:_____

_____

Phone No._____ Fax No.:_____

E-mail:_____

SUBMITTED on _____, 20_____.

State Contractor License No. _____ *[If applicable]*

END OF SECTION

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SECTION 00 42 00

PROPOSAL FORMS

2026 SITE 2 PHASE 5B – STAGE 1 CONSTRUCTION

CEDAR RAPIDS LINN COUNTY SOLID WASTE AGENCY

Proposer Name: _____ Date: _____

PRE-PROPOSAL MEETINGS:

Contact Chris Oelkers (Engineer) to Discuss Plans and Specifications

chris.oelkers@foth.com

Landfill Office
1954 COUNTY HOME ROAD
Marion, IA 52302

PROPOSALS DUE by:

12:00 pm, October 9, 2026

Landfill Office
1954 COUNTY HOME ROAD
Marion, IA 52302

To the Auditor:

The undersigned has examined the Contract Documents, including the Instructions to Proposers, Example Agreement, Standard General and Supplementary Conditions, Technical Specifications, and Contract Drawings and is familiar with the site and location of the project, the nature of the work and local conditions affecting the cost of the work and hereby proposes to furnish all labor, materials and equipment required for the complete construction of site work described in strict accordance with all requirements of the Contract Documents and as follows:

ADDENDA RECEIVED

#	TITLE:	DATE:
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____

NO	SPEC	BID ITEM	UNIT	QUANTITY	UNIT PRICE	TOTAL
1	SUDAS 11020	MOBILIZATION	LS	1	$	$
2	CQA MANUAL	SOURCE TESTING	LS	1	$	$
3	SUDAS 10010	SALVAGE AND REMOVALS	LS	1	$	$
4	SUDAS 2010	COMMON EXCAVATION	CY	335208.7	$	$
5	SUDAS 2010	HAUL AND PLACE - STOCKPILE	CY	248306.9	$	$
5A	SUDAS 2010	HAUL AND PLACE - MSW 5A DAILY COVER	CY	15000	$	$
6	SUDAS 2010	HAUL AND PLACE - STORMWATER TERRACE	CY	6227	$	$
7	SUDAS 2010	HAUL AND PLACE - SUBGRADE	CY	2171.2	$	$
8	TECH SPEC 31 35 26	HAUL AND PLACE - CLAY LINER	CY	39400	$	$
9	SUDAS 2010	HAUL AND PLACE - STORMWATER DETENTION BASIN	CY	27003.1	$	$
10	SUDAS 2010	HAUL AND PLACE - ANCHOR TRENCH	CY	396.74	$	$
11	TECH SPEC 31 35 27	60-MIL HDPE LINER - SMOOTH	SF	326976	$	$
12	TECH SPEC 33 46 23	GEOCOMPOSITE	SF	326976	$	$
13	TECH SPEC 31 32 19	10-OZ SEPARATION GEOTEXTILE	SF	2400	$	$
14	TECH SPEC 31 35 27	GROUNDWATER DRAINAGE LAYER	CY	8450	$	$
15	TECH SPEC 31 35 28	COARSE GROUNDWATER DRAINAGE MATERIAL	CY	7	$	$
16	TECH SPEC 31 35 27	LEACHATE DRAINAGE LAYER	CY	9520	$	$
17	TECH SPEC 31 35 28	COARSE LEACHATE DRAINAGE MATERIAL	CY	39.25926	$	$
18	SUDAS 4010	8-IN PERF HDPE DR-11 GROUNDWATER COLLECTION PIPE	LF	1100	$	$
19	SUDAS 4010	8-IN PERF HDPE DR-11 LEACHATE COLLECTION PIPE	LF	1188	$	$
20	SUDAS 4010	8-IN SOLID HDPE DR-11 SIDESLOPE RISER PIPE	LF	256	$	$
21	SUDAS 4010	8-IN PERF HDPE DR-11 SIDESLOPE RISER PIPE	LF	30	$	$
22	SUDAS 4010	8-IN HDPE DR 11 GROUNDWATER BYPASS	LS	1	$	$
23	SUDAS 4010	6-IN HDPE DR 11 LEACHATE BYPASS	LS	1	$	$
23A	SUDAS 4010	8-IN HDPE DR 11 GROUNDWATER BYPASS PIPE	LF	280	$	$
23B	SUDAS 4010	8-IN HDPE DR 11 LEACHATE BYPASS DISCHARGE PIPE	LF	350	$	$
23C	SUDAS 4010	8-IN SOLID HDPE DR 11 LEACHATE CLEANOUT PIPE	LF	545	$	$
24	SUDAS 4010	6-IN FUEL TANK DRAIN PIPE	LF	230	$	$

25	TECH SPEC 33 35 43 & SUDAS 6010	4-FT DIA STORMWATER LIFT STATION	LS	1	$	$
26	SUDAS 4020	24" CLASS V RCP	LF	180	$	$
27	SUDAS 4020	24" FES WITH TRASH GUARD	EA	4	$	$
28	SUDAS 4020	REMOVE AND RE-INSTALL CULVERT	LF	85	$	$
29	SUDAS 9040	RIPRAP / MACADAM STORMWATER DAM	EA	2	$	$
30	SUDAS 4020 & 9040	STORMWATER COLLECTION PIPE	EA	1	$	$
31	SUDAS 4020 & 9040	STORMWATER BYPASS	EA	1	$	$
34A	IDOT 4196.01-5a	BIAXIAL POLYMER GRID	SF	106269	$	$
32	IDOT 2210 & TECH SPEC 32 15 00	6-IN MACADAM - CELL ACCESS ROAD	SY	11808	$	$
33	IDOT 4120 & TECH SPEC 32 15 00	6-IN CLASS A ROAD STONE - CELL ACCESS ROAD	SY	11808	$	$
34	SUDAS 9040	6-IN DRAINAGE SAND	TN	2044	$	$
35	SUDAS 9040	CLASS A RIPRAP	TN	3924	$	$
36	SUDAS 9040	SALVAGED RIPRAP DAM	EA	6	$	$
37	SUDAS 9040	8-FT WIDE RECP TYPE 2.B EROSION MAT	LF	4545	$	$
38	TECH SPEC 32 92 19 & SUDAS 9040	SEED, FERTILIZER AND FLEX TERRA	AC	6.1	$	$
39	TECH SPEC 32 92 19 & SUDAS 9040	SEED, FERTILIZER AND MULCH	AC	7.2	$	$
40	SUDAS 9040	SILT FENCE - INSTALL	LF	1250	$	$
41	SUDAS 9040	SILT FENCE - CLEAN	LF	1250	$	$
42	SUDAS 9040	SILT FENCE - REMOVAL	LF	1250	$	$
43	DETAIL C-14 - 2	TEMPORARY LINER EDGE MARKERS	EA	4	$	$
				CONTRACT TOTAL		$

Electronic Proposal table is available upon request. Print and submit along with the filled out and signed Proposal Form as noted in the Bid Form.

The Proposer understands that all quantities are to the best knowledge of the OWNER and the ENGINEER and may change based on field conditions.

OWNER acknowledges current fuel market conditions are volatile and may change over the course of the project. The Project contract includes accommodations for fluccuations in fuel prices in Section 00 73 00 as SC-13.01.B.6. Proposer agrees to provide recorded quantities for work identified in the referenced section on a weekly basis for fuel price adjustments during project duration.

PROPOSER'S SIGNATURE: _____

PROPOSER
PRINT NAME: _____

CONSTRUCTION SCHEDULE

Prepare a construction schedule showing Work activity dates taking into account the Milestones and Contract Times listed below. CONTRACTOR must arrange Schedule to accommodate facility permit requirements for ENGINEER observation during construction. Preferred dates are those as listed in the *example* agreement, **ARTICLE 3 - CONTRACT TIME**. Proposer may propose alternate schedule dates.

	MILESTONE	START	END
1.	**Mobilization and Site Preparation**	_____	_____
2.	**Subgrade Preparation**	_____	_____
3.	**Groundwater Drainage Layer Placement**	_____	_____
4.	**Clay Liner Placement**	_____	_____
5.	**HDPE Liner Placement**	_____	_____
6.	**Leachate Drainage Layer Placement**	_____	_____
7.	**Restoration w/seeding**		
	(*SUDAS 9010 Spring Window - March 1 – May 31)*		
	*(SUDAS 9010 Fall Window - August 10 – September 30***)**_____		_____
8.	**Substantial Completion** (turf establishment & permanent stormwater controls)		
		_____	_____
9.	**Completion** (all submittals, punch list complete)		
		_____	_____

HOURLY OR UNIT COST RATES

Attach or list hourly or unit cost rates for equipment and labor to perform other related work which may be added to this contract or separately invoiced.

HEALTH AND SAFETY RECORD

Provide the information requested below for the CONTRACTOR and all major SUBCONTRACTORs on the List of SUBCONTRACTORs. If more room is needed, duplicate this page, and indicate in attachments.

	CONTRACTOR	Subcontractor	Subcontractor	Subcontractor
Name:				
2022 Worker's Compensation Modification Rate				
2023 Worker's Compensation Modification Rate				
2024 Worker's Compensation Modification Rate				
2025 Worker's Compensation Modification Rate				
2022 Lost Work Day Frequency Rate				
2023 Lost Work Day Frequency Rate				
2024 Lost Work Day Frequency Rate				
2025 Lost Work Day Frequency Rate				
2022 OSHA Recordable Frequency Rate				
2023 OSHA Recordable Frequency Rate				
2024 OSHA Recordable Frequency Rate				
2025 OSHA Recordable Frequency Rate				
Do you have a written safety program? (Y/N)				
Do you have New Employee Orientation Program? (Y/N)				
Does the New Employee Orientation Program provide instructions on the following? (Y/N)				
Company Safety Policy				
Company Safety Rules				
Safety Meeting Attendance				
Company Safety Records				
Hazard Recognition				
Hazard Reporting				
Injury Reporting				
Personal Protective Equipment				
Respiratory Protection				
Fire Protection				
Static Electricity Control				
Housekeeping				
Toxic Substance				
Electrical Safety				
Safety Belts and Lifelines				
First Aid				
Driving Safety				
Hearing Protection				
Hazard Communication				
Do you have training program for newly hired or promoted first-line supervisors? (Y/N)				

LIST OF REQUESTED ATTACHMENTS — ATTACHED

1. (00 42 00) Hourly or Unit Cost Rates _____ # of Pages
2. (01 35 29) Additional HEALTH AND SAFETY RECORDs _____ # of Pages

It is understood by the undersigned that the right is reserved by the OWNER to reject any or all proposals and to waive irregularities and formalities in order to serve the best interests of the OWNER.

If this proposal is accepted, the undersigned agrees to promptly furnish a performance bond and a material, labor and payment bond in the full amount of the Contract Price such that aggregate liability shall be two (2) times the Contract Price, to execute an Agreement within ten (10) days of the Contract Award. The undersigned further agrees that if awarded a contract for construction, the work will be commenced promptly and will be completed in the time frame outlined in the agreement.

It is understood that if accepted by the OWNER, this Proposal Form becomes a part of the Contract Documents upon the signing of the negotiated Agreement, and failing to comply with any part of this proposal will be taken as failure of the Proposer to comply with the Contract Documents and will be just cause for rejection of the work.

Respectfully submitted,

PROPOSER is a ☐ Corporation ☐ Partnership ☐ Individual

FIRM: _____

BY: _____

Signature Type or Print Name and Date

ADDRESS: _____

_____

TELEPHONE: _____

SECTION 00 43 33

SUBSTITUTE AND “OR EQUALS” SCHEDULE

Within five (5) days of the proposal opening and before the Notice of Award, where possible, Proposers shall identify one or more proposed "or equals" and/or substitutes meeting the requirements of Paragraph 6.05 of Section 00 70 00, General Conditions of the Contract, for the following items identifying the comparative cost with the specified "named" item. The purpose of this schedule is to identify any proposed substitutes and "or equals" for these specific items. Proposed substitute/"or equal" proposals shall be submitted to Proposer prior to propose date for consideration.

If Engineer and Owner believe consideration of the proposed items will result in the betterment of the project, then the apparent low Proposer shall submit sufficient information for evaluation; in accordance with Paragraph 6.05 of the General Conditions.

Specification Section	Named Equipment	Proposed Substitute/ "Or Equal"	Proposal Price Deduct
			$
			$
			$
			$
			$
			$
			$

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SECTION 00 43 36

TABULATION OF SUBCONTRACTORS AND SUPPLIERS

The subcontractors shown below will be utilized for noted portions of the project work.
For the Classification of Work shown without a subcontractor name, the Bidder shall insert the name of the subcontractor to be used for that portion of the work.

Changes shall not be made subsequent to the bid unless the change(s) is/are approved by the Owner.

The Bidder shall insert the value of each Classification of Work shown.

Subcontractor	Classification of Work	Estimated Dollar Amount

Supplier	Material/Equipment	Estimated Dollar Amount

END OF SECTION

SECTION 00 45 13

STATEMENT OF BIDDER'S QUALIFICATIONS

The contents of this statement shall be confidential and may not be disclosed except upon the written order of the person furnishing the statement, for necessary use by the public body in qualifying the person, or in cases of actions against, or by, the person or municipality.

All Contractors intending to submit a bid for the listed Project shall submit a full and complete written statement on this form sworn to before an officer authorized by law to administer oaths. No bid will be received from any person who has not submitted the statement in the manner and place stated in the Advertisement for Bids.

The Owner will evaluate the statement and find the maker of the statement either qualified or unqualified. If not satisfied with the sufficiency of any answers contained in the statement, the bid may be rejected or disregarded.

Project Information

Project Name and Description:_____

Project Identification Number:_____

Owners Name:_____

Address:_____

Submitted To

_____

_____

_____

Contractor Information

Name of Organization:_____

Name of Individual:_____

Title:_____

Contractor's Address:_____

_____

Telephone Number:_ Fax Number:_____

If contractor is a Corporation:

Date and State of Organization:_____

List of Executive Officers, Names and Titles:_____
_____

If contractor is a Partnership:

Date and State of Organization:_____

Names of Current and General Partners:_____
_____

If contractor is a Joint Venture:

Date and State of Organization:_____

Name and Address and Form of Organization of Joint Venture Partners:_____
_____

If contractor is a Sole Proprietorship:

Date and State of Organization:_____

Name and Address of Owner or Owners:_____
_____
_____

Is organization a member of a controlled group of corporations as defined in I.R.C. Sec. 1563?
Yes_____

If yes, show names and addresses of affiliated companies:_____
_____

If contractor is a Limited Liability Company (LLC):

Date and State of Organization:_____
Name and Address of all Members and any Managing Members:_____
_____
_____

Experience, Performance and Capabilities

1. On Attachment A or an equivalent attachment provide details of related construction experience of the principal individuals of your organization directly involved in construction activities. Include name, position, date started with your organization, experience in your organization, and previous experience.

2. On Attachment B or an equivalent attachment provide details of projects currently under construction by your organization. (If joint venture, list participants' projects separately.) Include name, location, description of project, owner, design engineer, contract price, percent completed, date of scheduled completion, reference/contact including address and phone numbers.

3. On Attachment C or an equivalent attachment list major related construction projects completed by your organization in the past five years. Include name, location, description of project, owner, design engineer, contract price, percent completed, date of scheduled completion, reference/contact including address and phone numbers.

Provide name of surety company, agent's name, address, and phone number:_____
_____
_____

4. Has your organization ever defaulted on a contract? Yes____ No____ If yes, provide details on an attachment.

5. Has the organization ever failed to complete any work awarded to you? Yes____No____ If yes, provide details on an attachment

6. Has any corporate officer, partner, joint venture participant or proprietor ever failed to complete a construction contract awarded to him or her in their own name or when acting as a principal of another organization? Yes_____ No_____ If yes, provide details on an attachment.

7. In the last five years, has your organization ever failed to substantially complete a project in a timely manner? Yes_____ No_____ If yes, provide details on an attachment.

8. State the general types of work performed by your company with your own work force.

_____
_____
_____
_____
_____

9. Describe your organizations permanent safety program, and provide name of individual responsible for safety procedures on this project.

_____
_____
_____

10. Provide the following information with respect to an accredited Financial Institution familiar with your organization.

Name of Institution:_____
Address:_____
_____
Account Manager:_____
Telephone Number:_____

11. Indicate approximate total bonding capacity. _____$500,000 - $2,000,000, _____$2,000,000 - $5,000,000, _____ $5,000,000 - $10,000,000

I hereby certify that the information submitted herewith, including any attachments is true to the best of my knowledge and belief.

Dated at _____ this ____ day of _, 20_____.

Name of Organization:_____

By:_____ Title:_____

Subscribed and Sworn before me this _____ day of _____, 20_____

Notary Public:_____

My Commission Expires:_____

Seal

Attachment A - Related Construction Experience of the Principal Individuals

Name	Position	Date Started with Organization	Experience in Your Organization	Prior Positions and Experience

Attachment B - Projects Currently Under Construction

Name, Location and Description of Project	Owner's Name, Contact Person, Address and Phone Number	Design Engineer's Name, Contact Person, Address and Phone Number	Contract Price	Percent Complete and Date of Scheduled Completion

Attachment C - Related Major Construction Projects Completed in Past 5 Years

Name, Location and Description of Project	Owner's Name, Contact Person, Address and Phone Number	Design Engineer's Name, Contact Person, Address and Phone Number	Contract Price	Date Completed

SECTION 00 51 00

NOTICE OF AWARD

Date:

Project: MSW Cell 5B Construction	
Owner: Cedar Rapids Linn County Solid Waste Agency	Owner's Contract No.: DNA
Contract:	Engineer's Project No.:
Bidder:	
Bidder's Address:	

You are notified that your Bid dated XX/XX/XXXX for the above Contract has been considered.

You are the Successful Bidder and are awarded a Contract for Phase 5B Cell Construction at the Cedar Rapids Linn County Solid Waste Agency Site # 2 Landfill

The Contract Price of your Contract is _____, Dollars ($____)

_____ copies of the proposed Contract Documents (except Drawings) accompany this Notice of Award.

You must comply with the following conditions precedent within (15) days of the date you receive this Notice of Award.

1. Deliver to the Owner three fully executed counterparts of the Contract Documents.
2. Deliver with the executed Contract Documents the Contract security (Bonds) as specified in the Instructions to Bidders (Article 20), General Conditions (Paragraph 5.01), and Supplementary Conditions (Paragraph SC 5.01).
3. Deliver with the executed Contract Documents the Certificate of Insurance.
4. Other conditions precedent: None

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

Within ten days after you comply with the above conditions, Owner will return to you one fully executed counterpart of the Contract Documents.

Owner: Cedar Rapids Linn County Solid Waste Agency

By *(signature)*:

Name *(printed)*:

Title:

Copy: Engineer

SECTION 00 52 00

AGREEMENT

2026 SITE 2 - MSW CELL 5B CONSTRUCTION

THIS AGREEMENT is dated as of the _____ day of _____ in the year 2026 by and between Cedar Rapids Linn County Solid Waste Agency (hereinafter called OWNER) and _____ (hereinafter called CONTRACTOR).

OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1 – WORK

CONTRACTOR shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows: furnishing all labor, equipment, material and supplies necessary to complete the project as shown on the Contract Drawings for MSW Cell 5B at Cedar Rapids Linn County Solid Waste Agency Landfill accordance with the Contract Documents.

ARTICLE 2 – ENGINEER`

The Work has been designed by **Foth Infrastructure & Environment, LLC,** at 411 6th Ave SE, Suite 400, Cedar Rapids, IA 52401**,** who is hereinafter called ENGINEER and who is to act as OWNER's representative, assume all duties and responsibilities and have the rights and authority assigned to ENGINEER in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents. The Engineer's Project contact is Chris Oelkers, chris.oelkers@foth.com, office telephone (319) 365-9565.

ARTICLE 3 – CONTRACT TIME

3.1 The following work according to contract times shall be completed as agreed:

3.1.1 **Milestone date (TBD with Contractor):** restoration with seeding is complete and approved by ENGINEER and regulatory staff.

3.1.2 **August 27, 2027:** Substantial completion, which includes all Work, including seeding & permanent stormwater protection according to permits.

3.1.3 **September 27, 2027**: Final completion which includes all Work, turf establishment, submittals, clean up, and facility repairs.

3.2 Liquidated Damages. OWNER and CONTRACTOR recognize that time is of the essence of this Agreement and that OWNER may suffer financial loss if the Work is not completed within the times specified in Paragraph 3.1 above, plus any extensions thereof allowed in accordance with Article 4 of the General Conditions. They also recognize the delays, expense and difficulties involved in proving in a legal or arbitration preceding the actual loss suffered by OWNER if the Work is not completed on time.

3.3 Accordingly, instead of requiring any such proof, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as penalty) CONTRACTOR shall pay OWNER **one thousand dollars ($1000.00) per day** for each day that expires after the time specified in Paragraph 3.1.1 to complete restoration with seeding until the Work is complete.

3.4 Accordingly, instead of requiring any such proof, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as penalty) CONTRACTOR shall pay OWNER **according to the scheduled amount below** for each day that expires after the time specified in Paragraph 3.1.2 for Substantial Completion, until the Work is substantially complete. These liquidated damages apply in addition to other such damages as outlined in 3.3.

Table 1: Schedule of Liquidated Damages

Contract Amount ($)	Liquidated Damage Charge per Calendar Day ($)
0 – 25,000	300
25,000.01 – 100,000	400
100,000.01 – 500,000	900
500,000.01 – 1,000,000	1,200
1,000,000.01 – 2,000,000	1,500
2,000,000.01 – 5,000,000	2,500

ARTICLE 4 – CONTRACT PRICE

OWNER shall pay CONTRACTOR for completion of the Work in accordance with the Contract Documents in current funds as set forth in the CONTRACTOR's Proposal attached as Exhibit A.

ARTICLE 5 – PAYMENT PROCEDURES

CONTRACTOR shall submit Applications for Payment on the form provided for in SECTION 01 29 01 APPLICATION FOR PAYMENT of the GENERAL REQUIREMENTS division of these documents in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by ENGINEER as provided in the General and Supplemental Conditions.

5.1 Progress Payments. OWNER shall make progress payments on account of the Contract Price on the basis of CONTRACTOR's Application for Payment, on the basis of recommendations by ENGINEER and on the basis of other information available to OWNER. All progress payments will be on the basis of the progress of the Work measured by the schedule of values for lump sum work established in the General Conditions and in the case of unit price work based on the number of units completed.

5.2 Progress payments will be made in an amount equal to 95% of Work Completed, but in each case, less the aggregate of payments previously made and less such amounts as

ENGINEER shall determine, or OWNER may withhold, in accordance with the General and Supplemental Conditions.

5.3 Final Payment. Upon final completion and acceptance of the Work in accordance with the General and Supplemental Conditions, and after OWNER receives the final payment documentation required by the contract documents and applicable Iowa law. CONTRACTOR shall send three (3) original copies of the Certificate of Final Acceptance form signed by a Corporate Officer to OWNER. OWNER shall then execute final pay request, provide executed copies to ENGINEER and CONTRACTOR, and OWNER shall pay the remainder of the Contract Price within 60 days.

ARTICLE 6 – INTEREST

All moneys not paid when due as provided in Article 15 of the General Conditions will bear interest in accordance with the contract documents and applicable Iowa law.

ARTICLE 7 – CONTRACTOR'S REPRESENTATIONS

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

7.1 CONTRACTOR has familiarized itself with the nature and extent of the Contract Documents, Work, site, locality, and all conditions and laws and regulations that in any manner may affect cost, schedule, progress, and performance of furnishing of the Work, including significant regulatory approvals described in the Contract Documents for Solid Waste Disposal at permitted facilities.

7.2 CONTRACTOR has studied carefully all reports of explorations and tests of subsurface conditions and drawings of physical conditions which are identified in the Supplementary Conditions per Paragraph 5.03 of the General Conditions. CONTRACTOR understands that soil sample results reported from OWNER proposed borrow areas are representative of samples collected from reported locations only, that subsurface site conditions are unknown at other locations, and that they may obtain required soil material from others, with no additional compensation.

7.3 CONTRACTOR has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests, reports and studies (in addition to or to supplement those referred to in Paragraph 7.2 above) which pertain to the subsurface or physical conditions at or contiguous to the site or otherwise may affect the cost, progress, performance or furnishing of the Work as CONTRACTOR considers necessary for the performance or furnishing of the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of Paragraph 5.03 of the General Conditions; and no additional examinations, investigations, explorations, tests, reports, studies or similar information or data are or will be required by CONTRACTOR for such purposes.

7.4 CONTRACTOR has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing underground facilities and utilities at or contiguous to the site and assumes responsibility for the accurate location of said underground facilities and utilities. No additional examinations, investigations, explorations, tests, reports, studies or similar information or data in respect of said

underground facilities are or will be required by CONTRACTOR in order to perform and furnish the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of Paragraph 6.04 of the General Conditions.

7.5 CONTRACTOR has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.

7.6 CONTRACTOR has given ENGINEER written notice of all conflicts, errors or discrepancies that CONTRACTOR has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to CONTRACTOR.

ARTICLE 8 – CONTRACT DOCUMENTS

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

8.01 Contract Documents For MSW CELL 5B CONSTRUCTION at Cedar Rapids Linn County Solid Waste Agency

8.02 Instructions to Proposers

8.03 Agreement

8.04 Standard General Conditions of the Construction Contract Supplementary Conditions

8.05 Proposal Form

8.06 Responsible Contractor Verifications

8.07 Addenda

8.08 Contract Drawings

8.09 Technical Specifications

8.11 Notice to Proceed

8.12 Notice of Award

8.13 Bonds

8.14 Field Order Forms

8.15 Approved Subcontract Proposals w/Engineering Designs

8.16 Certificate of Geomembrane Subgrade Acceptance Form

8.17 Daily Construction Report Form

8.18 List of Addenda

8.19 Application for Payment

8.20 Certificate of Final Acceptance

8.21 Certificate of Insurance

8.22 Change Orders

8.23 All Written Amendments and other documents amending, modifying, or supplementing the Contract Documents pursuant to Paragraphs 11.01 of the General Conditions which may be delivered or issued after the Effective Date of the Agreement and are not attached hereto.

There are no Contract Documents other than those listed above in this Article 8. The Contract Documents may only be amended, modified or supplemented as provided in Paragraphs 11.01 of the General Conditions.

ARTICLE 9 – MISCELLANEOUS

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

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

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

IN WITNESS WHEREOF, OWNER and CONTRACTOR have signed this Agreement in triplicate. One counterpart each has been delivered to OWNER, CONTRACTOR, and ENGINEER. All portions of the Contract Documents have been signed or identified by OWNER and CONTRACTOR.

This Agreement will be effective on the date last signed below.

OWNER	CEDAR RAPIDS LINN COUNTY SOLID WASTE AGENCY	CONTRACTOR	
SIGNED BY		SIGNED BY	
NAME		NAME	
TITLE		TITLE	(Seal)
DATE		DATE	
ATTEST		ATTEST	
NAME		NAME	
TITLE		TITLE	

ADDRESS FOR GIVING NOTICES

OWNER	**CONTRACTOR**
	License No. (If CONTRACTOR is a corporation, attach evidence of authority to sign.)

APPROVED AS TO FORM AND EXECUTION THIS _____ DAY OF _____, 2026,

SECTION 00 55 00

NOTICE TO PROCEED

Dated:

Owner: Cedar Rapids Linn County Solid Waste Agency	Owner's Contract No.:
Project: MSW Cell 5B Construction	Engineer's Project No.:
Contractor:	
Contractor's Address:	

You are hereby authorized to proceed with the following bid items:

Until further notice, you are limited to the aforementioned bid items. No additional obligations under the Contract Documents are to be performed until you are notified in writing by the Owner.

In accordance with Article 4 of the Agreement, the date of Substantial Completion is August 27, 2027, and the date of readiness for final payment is October 01, 2027.

Before you may start any Work at the Site, Paragraph 2.01.B of the General Conditions provides that you must deliver to the Owner (with copies to Engineer and other identified additional insureds) certificates of insurance which Contractor is required to purchase and maintain in accordance with the Contract Documents.

Contractor	Owner's Authorized Representative
Given by:	Given by:
Authorized Signature	Authorized Signature
Title	Title
Date	Date

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SECTION 00 61 13.13

PERFORMANCE BOND

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

CONTRACTOR (*Name and Address*):

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

OWNER (*Name and Address*):
Cedar Rapids Linn County Solid Waste Agency
1954 County Home Road
Marion, IA 52302

CONTRACT
Effective Date of Agreement:
Amount:
Description (*Name and Location*):

BOND
Bond Number:
Date (*Not earlier than Effective Date of Agreement*):
Amount:
Modifications to this Bond Form:

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

CONTRACTOR AS PRINCIPAL	**SURETY**
_____ (Seal)	_____ (Seal)
Contractor's Name and Corporate Seal	Surety's Name and Corporate Seal
By: _____	By: _____
Signature	Signature (Attach Power of Attorney)
_____	_____
Print Name	Print Name
_____	_____
Title	Title
Attest: _____	Attest: _____
Signature	Signature
_____	_____
Title	Title

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

EJCDC C-610 Performance Bond
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Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner for the performance of the Contract, which is incorporated herein by reference.

1. If Contractor performs the Contract, Surety and Contractor have no obligation under this Bond, except to participate in conferences as provided in Paragraph 2.1.

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

2.1 Owner has notified Contractor and Surety, at the addresses described in Paragraph 9 below, that Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with Contractor and Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. If Owner, Contractor, and Surety agree, Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive Owner's right, if any, subsequently to declare a Contractor Default; and

2.2 Owner has declared a Contractor Default and formally terminated Contractor's right to complete the Contract. Such Contractor Default shall not be declared earlier than 20 days after Contractor and Surety have received notice as provided in Paragraph 2.1; and

2.3 Owner has agreed to pay the Balance of the Contract Price to:

1. Surety in accordance with the terms of the Contract; or
2. Another contractor selected pursuant to Paragraph 3.3 to perform the Contract.

3. When Owner has satisfied the conditions of Paragraph 2, Surety shall promptly, and at Surety's expense, take one of the following actions:

3.1 Arrange for Contractor, with consent of Owner, to perform and complete the Contract; or

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

3.3 Obtain bids or negotiated proposals from qualified contractors acceptable to Owner for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by Owner and contractor selected with Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Contract, and pay to Owner the amount of damages as described in Paragraph 5 in excess of the Balance of the Contract Price incurred by Owner resulting from Contractor Default; or

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

1. After investigation, determine the amount for which it may be liable to Owner and, as soon as practicable after the amount is determined, tender payment therefor to Owner; or
2. Deny liability in whole or in part and notify Owner citing reasons therefor.

4. If Surety does not proceed as provided in Paragraph 3 with reasonable promptness, Surety shall be deemed to be in default on this Bond 15 days after receipt of an additional written notice from Owner to Surety demanding that Surety perform its obligations under this Bond, and Owner shall be entitled to enforce any remedy available to Owner. If Surety proceeds as provided in Paragraph 3.4, and Owner refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice Owner shall be entitled to enforce any remedy available to Owner.

5. After Owner has terminated Contractor's right to complete the Contract, and if Surety elects to act under Paragraph 3.1, 3.2, or 3.3 above, then the responsibilities of Surety to Owner shall not be greater than those of Contractor under the Contract, and the responsibilities of Owner to Surety shall not be greater than those of Owner under the Contract. To the limit of the amount of this Bond, but subject to commitment by Owner of the Balance of the Contract Price to mitigation of costs and damages on the Contract, Surety is obligated without duplication for:

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5.1 The responsibilities of Contractor for correction of defective Work and completion of the Contract;

5.2 Additional legal, design professional, and delay costs resulting from Contractor's Default, and resulting from the actions of or failure to act of Surety under Paragraph 3; and

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

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

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

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

9. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the address shown on the signature page.

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

11. Definitions.

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

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

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

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

FOR INFORMATION ONLY – (*Name, Address and Telephone*) Surety Agency or Broker: Owner's Representative: Foth Infrastructure & Environment

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SECTION 00 61 13.16

PAYMENT BOND

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

CONTRACTOR (*Name and Address*):

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

OWNER (*Name and Address*):
Cedar Rapids Linn County Solid Waste Agency
1954 County Home Road
Marion, IA 52302

CONTRACT
Effective Date of Agreement:
Amount:
Description *(Name and Location)*:

BOND
Bond Number:
Date (*Not earlier than Effective Date of Agreement*):
Amount:
Modifications to this Bond Form:

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

CONTRACTOR AS PRINCIPAL	**SURETY**
_____ (Seal)	_____ (Seal)
Contractor's Name and Corporate Seal	Surety's Name and Corporate Seal
By: _____	By: _____
Signature	Signature (Attach Power of Attorney)
_____	_____
Print Name	Print Name
_____	_____
Title	Title
Attest: _____	Attest: _____
Signature	Signature
_____	_____
Title	Title

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

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

2. With respect to Owner, this obligation shall be null and void if Contractor:

2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants, and

2.2 Defends, indemnifies, and holds harmless Owner from all claims, demands, liens, or suits alleging non-payment by Contractor by any person or entity who furnished labor, materials, or equipment for use in the performance of the Contract, provided Owner has promptly notified Contractor and Surety (at the addresses described in Paragraph 12) of any claims, demands, liens, or suits and tendered defense of such claims, demands, liens, or suits to Contractor and Surety, and provided there is no Owner Default.

3. With respect to Claimants, this obligation shall be null and void if Contractor promptly makes payment, directly or indirectly, for all sums due.

4. Surety shall have no obligation to Claimants under this Bond until:

4.1 Claimants who are employed by or have a direct contract with Contractor have given notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.

4.2 Claimants who do not have a direct contract with Contractor:

1. Have furnished written notice to Contractor and sent a copy, or notice thereof, to Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials or equipment were furnished or supplied, or for whom the labor was done or performed; and
2. Have either received a rejection in whole or in part from Contractor, or not received within 30 days of furnishing the above notice any communication from Contractor by which Contractor had indicated the claim will be paid directly or indirectly; and
3. Not having been paid within the above 30 days, have sent a written notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to Contractor.

5. If a notice by a Claimant required by Paragraph 4 is provided by Owner to Contractor or to Surety, that is sufficient compliance.

6. Reserved.

7. Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by Surety.

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

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

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

11. No suit or action shall be commenced by a

Claimant under this Bond other than in a court of competent jurisdiction in the location in which the Work or part of the Work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Paragraph 4.1 or Paragraph 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

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

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

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

15. Definitions

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

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

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

FOR INFORMATION ONLY – (*Name, Address, and Telephone*) Surety Agency or Broker: Owner's Representative: Foth Infrastructure & Environment

SECTION 00 62 02

CERTIFICATE OF GEOMEMBRANE SUBGRADE ACCEPTANCE FORM

2026 SITE 2 - MSW CELL 5B CONSTRUCTION

CEDAR RAPIDS LINN COUNTY SOLID WASTE AGENCY

DESCRIPTION OF AREA TO BE CERTIFIED:

INSTALLER NAME: _____

PROJECT: _____

AREA ACCEPTED: _____

The undersigned, _____ (print name), certifies that they are a representative of _____ (Installer), duly authorized to execute this certificate, that they visually inspected the subgrade surface described above on _____ (Date) and found the surface to be acceptable for installation of the geomembrane.

This certification is based on observations of the surface of the subgrade only. No subsurface inspections or tests have been performed and _____ (Installer) makes no representations or warranties regarding conditions which may exist below the surface of the subgrade.

INSTALLER			
DATE:		ADDRESS:	
SIGNATURE:			
PRINTED NAME:			
TITLE:			

CERTIFICATE RECEIVED BY	
CONTRACTOR	*ENGINEER*
DATE:	DATE:
COMPANY:	COMPANY:
SIGNATURE:	SIGNATURE:
NAME:	NAME:
TITLE:	TITLE:

Contractor's Application for Payment

Owner:		**Owner's Project No.:**	
Engineer:		**Engineer's Project No.:**	
Contractor:		**Contractor's Project No.:**	
Project:			
Contract:			
Application No.:		**Application Date:**	
Application Period:	**From**	**to**	

1. Original Contract Price			$ -
2. Net change by Change Orders			$ -
3. Current Contract Price (Line 1 + Line 2)			$ -
4. Total Work completed and materials stored to date (Sum of Column G Lump Sum Total and Column J Unit Price Total)			$ -
5. Retainage			
a. _____	X $ -	Work Completed	$ -
b. _____	X $ -	Stored Materials	$ -
c. Total Retainage (Line 5.a + Line 5.b)			$ -
6. Amount eligible to date (Line 4 - Line 5.c)			$ -
7. Less previous payments (Line 6 from prior application)			
8. Amount due this application			$ -
9. Balance to finish, including retainage (Line 3 - Line 4)			$ -

Contractor's Certification

The undersigned Contractor certifies, to the best of its knowledge, the following:
(1) All previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with the Work covered by prior Applications for Payment;
(2) Title to all Work, materials and equipment incorporated in said Work, or otherwise listed in or covered by this Application for Payment, will pass to Owner at time of payment free and clear of all liens, security interests, and encumbrances (except such as are covered by a bond acceptable to Owner indemnifying Owner against any such liens, security interest, or encumbrances); and
(3) All the Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

Contractor: _____

Signature: _____ **Date:** _____

Recommended by Engineer		**Approved by Owner**	
By:		**By:**	
Title:		**Title:**	
Date:		**Date:**	
Approved by Funding Agency			
By:		**By:**	
Title:		**Title:**	
Date:		**Date:**	

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Progress Estimate - Lump Sum Work **Contractor's Application for Payment**

Owner:		**Owner's Project No.:**	
Engineer:		**Engineer's Project No.:**	
Contractor:		**Contractor's Project No.:**	
Project:			
Contract:			

Application No.: **Application Period:** **From** **to** **Application Date:**

A	B	C	D	E	F	G	H	I
			Work Completed					
Item No.	Description	Scheduled Value ($)	(D + E) From Previous Application ($)	This Period ($)	Materials Currently Stored (not in D or E) ($)	Work Completed and Materials Stored to Date (D + E + F) ($)	% of Scheduled Value (G / C) (%)	Balance to Finish (C - G) ($)
Original Contract								
			-			-		-
						-		-
						-		-
						-		-
						-		-
						-		-
						-		-
						-		-
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						-		-
						-		-
						-		-
						-		-
						-		-
						-		-
						-		-
	Original Contract Totals	$ -	$ -	$ -	$ -	$ -		$ -

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Progress Estimate - Unit Price Work

Contractor's Application for Payment

Owner: _____ **Owner's Project No.:** _____
Engineer: _____ **Engineer's Project No.:** _____
Contractor: _____ **Contractor's Project No.:** _____
Project: _____
Contract: _____

Application No.: _____ **Application Period:** From _____ to _____ **Application Date:** _____

A	B	C	D	E	F	G	H	I	J	K	L
		Contract Information				Work Completed					
Bid Item No.	Description	Item Quantity	Units	Unit Price ($)	Value of Bid Item (C X E) ($)	Estimated Quantity Incorporated in the Work	Value of Work Completed to Date (E X G) ($)	Materials Currently Stored (not in G) ($)	Work Completed and Materials Stored to Date (H + I) ($)	% of Value of Item (J / F) (%)	Balance to Finish (F - J) ($)
Change Orders											
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
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					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
				Change Order Totals	$ -		$ -	$ -	$ -		$ -
Original Contract and Change Orders											
				Project Totals	$ -		$ -	$ -	$ -		$ -

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Stored Materials Summary

Contractor's Application for Payment

Owner:
Engineer:
Contractor:
Project:
Contract:

Owner's Project No.:
Engineer's Project No.:
Contractor's Project No.:

Application No.: Application Period: From to Application Date:

A	B	C	D	E	F	G	H	I	J	K	L	M
						Materials Stored			Incorporated in Work			
Item No. (Lump Sum Tab) or Bid Item No. (Unit Price Tab)	Supplier Invoice No.	Submittal No. (with Specification Section No.)	Description of Materials or Equipment Stored	Storage Location	Application No. When Materials Placed in Storage	Previous Amount Stored ($)	Amount Stored this Period ($)	Amount Stored to Date (G+H) ($)	Amount Previously Incorporated in the Work ($)	Amount Incorporated in the Work this Period ($)	Total Amount Incorporated in the Work (J+K) ($)	Materials Remaining in Storage (I-L) ($)
								-			-	-
								-			-	-
								-			-	-
								-			-	-
								-			-	-
								-			-	-
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								-			-	-
								-			-	-
								-			-	-
								-			-	-
								-			-	-
					Totals	$ -	$ -	$ -	$ -	$ -	$ -	$ -

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SECTION 00 63 60

WORK CHANGE DIRECTIVE

NO.: _____

Owner: CEDAR RAPIDS LINN COUNTY SOLID WASTE AGENCY
Engineer: FOTH INFRASTRUCTURE & ENGINEERING, LLC.
Contractor:
Project:
Contract Name:
Date Issued:

Owner's Project No.: DNA
Engineer's Project No.:
Contractor's Project No.:
Effective Date of Work Change Directive:

Contractor is directed to proceed promptly with the following change(s):

Description:

[Description of the change to the Work]

Attachments:

[List documents related to the change to the Work]

Purpose for the Work Change Directive:

[Describe the purpose for the change to the Work]

Directive to proceed promptly with the Work described herein, prior to agreeing to change in Contract Price and Contract Time, is issued due to:

Notes to User—Check one or both of the following

☐ Non-agreement on pricing of proposed change. ☐ Necessity to proceed for schedule or other reasons.

Estimated Change in Contract Price and Contract Times (non-binding, preliminary):

Contract Price: $_____ **[increase] [decrease] [not yet estimated]**.

Contract Time: _____ days **[increase] [decrease] [not yet estimated]**.

Basis of estimated change in Contract Price:

☐ Lump Sum ☐ Unit Price ☐ Cost of the Work ☐ Other

	Recommended by Engineer	**Authorized by Owner**
By:	_____	_____
Title:	_____	_____
Date:	_____	_____

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SECTION 00 63 61

FIELD ORDER

FIELD ORDER NO.: [Number of Field Order]

Owner:	Cedar Rapids Linn County Solid Waste Agency	Owner's Project No.:	DNA
Engineer:	Foth Infrastructure & Environment, LLC	Engineer's Project No.:	26C004
Contractor:		Contractor's Project No.:	
Project:			
Contract Name:			
Date Issued:		Effective Date of Field Order:	

Contractor is hereby directed to promptly perform the Work described in this Field Order, issued in accordance with Paragraph 11.04 of the General Conditions, for minor changes in the Work without changes in Contract Price or Contract Times. If Contractor considers that a change in Contract Price or Contract Times is required, submit a Change Proposal before proceeding with this Work.

Reference:

Specification Section(s):

Drawing(s) / Details (s):

Description:

[Description of the change to the Work]

Attachments:

[List documents supporting change]

Issued by Engineer

By: _____

Title: _____

Date: _____

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SECTION 00 63 62

CHANGE ORDER

NO.:_____

Owner:	Cedar Rapids Linn County Solid Waste Agency	Owner's Project No.:	DNA
Engineer:	Foth Infrastructure & Environment, LLC	Engineer's Project No.:	26C004
Contractor:		Contractor's Project No.:	
Project:			
Contract Name:			
Date Issued:		Effective Date of Change Order:	

The Contract is modified as follows upon execution of this Change Order:

Description:

[Description of the change]

Attachments:

[List documents related to the change]

Change in Contract Price	**Change in Contract Times [State Contract Times as either a specific date or a number of days]**
Original Contract Price: $	Original Contract Times: **Substantial Completion:** Ready for final payment:
[Increase] [Decrease] from previously approved Change Orders No. 1 to No. **[Number of previous Change Order]**: $	**[Increase] [Decrease]** from previously approved Change Orders No.1 to No. **[Number of previous Change Order]**: Substantial Completion: Ready for final payment:
Contract Price prior to this Change Order: $	Contract Times prior to this Change Order: Substantial Completion: Ready for final payment:
[Increase] [Decrease] this Change Order: $	**[Increase] [Decrease]** this Change Order: Substantial Completion: Ready for final payment:
Contract Price incorporating this Change Order: $	Contract Times with all approved Change Orders: Substantial Completion: Ready for final payment:

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	Recommended by Engineer (if required)	Accepted by Contractor
By:		
Title:		
Date:		
	Authorized by Owner	**Approved by Funding Agency (if applicable)**
By:		
Title:		
Date:		

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SECTION 00 65 16

CERTIFICATE OF SUBSTANTIAL COMPLETION

Project: 2026 Site 2 - MSW Cell 5B Construction	
Owner: Cedar Rapids Linn County Solid Waste Agency	Owner's Contract No.: DNA
Contractor:	Engineer's Project No.: 26C004

This [tentative] [definitive] Certificate of Substantial Completion applies to:

☐ All Work under the Contract Documents: ☐ The following specified portions of the Work:

_____

_____

_____
Date of Substantial Completion

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the Project or portion thereof designated above is hereby declared and is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below.

A [tentative] [definitive] list of items to be completed or corrected is attached hereto. This list may not be all-inclusive, and the failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance, and warranties shall be as provided in the Contract Documents except as amended as follows:

☐ Amended Responsibilities ☐ Not Amended

Owner's Amended Responsibilities:

_____

_____

_____

Contractor's Amended Responsibilities:

_____

_____

_____

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The following documents are attached to and made part of this Certificate:

This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract Documents.

Executed by Engineer	Date
Accepted by Contractor	Date
Accepted by Owner	Date

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SECTION 00 70 00

GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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SECTION 00 70 00

GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Proposal 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 Proposals which clarify, correct, or change the Proposal Requirements or the proposed Contract Documents.
2. *Agreement*—The written instrument, executed by Owner and Contractor, which 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*—For the purpose of this document, Bid is synonymous with proposal.
5. *Proposer*—An individual or entity that submits a Proposal to Owner.
6. *Proposal Documents*—The Proposal Requirements, the proposed Contract Documents, and all Addenda.
7. *Proposal Requirements*—The Advertisement or invitation to propose, Instructions to Proposers, Proposal security, if any, the Proposal Form, and the Proposal 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.

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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. The word Plans and Sheets used in the Contract Documents shall mean Drawings as so defined.
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, which 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. Engineer shall be Foth Infrastructure & Environment, LLC.
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.

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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 Proposer of Owner's acceptance of the Proposal.
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. Owner shall be Cedar Rapids Linn County Solid Waste Agency
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. *Proposal* – The offer of a bidder submitted on the Bid Form setting forth the prices for the work to be performed.
34. *Resident Project Representative* – The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative (RPR) includes any assistants or field staff of Resident Project Representative.
35. *Samples* – Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
36. *Schedule of Submittals* – A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals.
37. *Schedule of Values* – A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.
38. *Shop Drawings* – All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.
39. *Site* – Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands or areas furnished by Owner which are designated for the use of Contractor.
40. *Specifications* – The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.

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41. *Subcontractor* – An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.
42. *Submittal* – A written or graphic document, prepared by or for Contractor, which the Contract Documents require Contractor to submit to Engineer, or that is indicated as a Submittal in the Schedule of Submittals accepted by Engineer. Submittals may include Shop Drawings and Samples; schedules; product data; Owner-delegated designs; sustainable design information; information on special procedures; testing plans; results of tests and evaluations, source quality-control testing and inspections, and field or Site quality-control testing and inspections; warranties and certifications; Suppliers' instructions and reports; records of delivery of spare parts and tools; operations and maintenance data; Project photographic documentation; record documents; and other such documents required by the Contract Documents. Submittals, whether or not approved or accepted by Engineer, are not Contract Documents. Change Proposals, Change Orders, Claims, notices, Applications for Payment, and requests for interpretation or clarification are not Submittals.
43. *Substantial Completion* – The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion of such Work.
44. *Successful Proposer* – The Proposer to which the Owner makes an award of contract.
45. *Supplementary Conditions* – The part of the Contract that amends or supplements these General Conditions.
46. *Supplier* – A manufacturer, fabricator, supplier, distributor, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
47. *Technical Data*
    a. Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (1) existing subsurface conditions at or adjacent to the Site, or existing physical conditions at or adjacent to the Site including existing surface or subsurface structures (except Underground Facilities) or (2) Hazardous Environmental Conditions at the Site.
    b. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then Technical Data is defined, with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06, as the data contained in boring logs, recorded measurements of subsurface water levels, assessments of the condition of subsurface facilities, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical, environmental, or other Site or facilities conditions report prepared for the Project and made available to Contractor.
    c. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data, and instead Underground Facilities are shown or indicated on the Drawings.
48. *Underground Facilities* – All active or not-in-service underground lines, pipelines, conduits, ducts, encasements, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems at the Site, including but not limited to those facilities or systems that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude oil products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, or traffic or other control systems. An abandoned facility or system is not an Underground Facility.

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49. *Unit Price Work* – Work to be paid for on the basis of unit prices.
50. *Work* – The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.
51. *Work Change Directive* – A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 *Terminology*

A. The words and terms discussed in Paragraphs 1.02.B, C, D, and E are not defined terms that require initial capital letters, but, when used in the Proposal 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.

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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. When Contractor delivers the executed counterparts of the Agreement to Owner, the Contractor shall also deliver to Owner required certificate of insurance.

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 an electronic copy of the Contract (including one fully signed counterpart of the Agreement) in portable document format (PDF). Owner will furnish two (2) hard (paper) copies of the Plans and Specifications. Additional copies of the Plans and Specifications will be furnished, upon written request by the Contractor, 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:

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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.

Accordingly, instead of requiring any such proof, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as penalty) CONTRACTOR shall pay OWNER **according to the scheduled amount below** for each day that expires after the time specified in Paragraph 3.1.2 for Substantial Completion, until the Work is substantially complete.

Table 1: Schedule of Liquidated Damages

Contract Amount ($)	Liquidated Damage Charge per Calendar Day ($)
0 – 25,000	300
25,000.01 – 100,000	400
100,000.01 – 500,000	900
500,000.01 – 1,000,000	1,200
1,000,000.01 – 2,000,000	1,500
2,000,000.01 – 5,000,000	2,500

Accordingly, instead of requiring any such proof, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as penalty) CONTRACTOR shall pay OWNER **one thousand dollars ($1000.00) per day** for each day that expires after the time specified in Paragraph 3.1.1 to complete restoration with seeding until the Work is complete.

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.

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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 therefore.
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

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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 Proposals (or on the Effective Date of the Contract if there were no Proposals), except as may be otherwise specifically stated in the Contract Documents. Standard Specifications to include Iowa Department of Transportation Standard Specifications for Construction and SUDAS Specifications
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

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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

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Contract. In no event will the Contract Times commence to run later than the 60th day after the day of Proposal opening or the 30th day after the Effective Date of the Contract, whichever date is earlier.

B. The Contract Times, including dates for substantial completion and final completion, are stated in the agreement.

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.

C. If, in the opinion of the Engineer, the Contractor falls behind the project schedule, the Contractor shall take such steps as may be necessary to improve progress. The Engineer may require the Work to be accelerated to regain the schedule, such as increase the number of shifts or overtime operations, days of work, amount of construction personnel or equipment, or any combination of these measures. Contractor shall submit to the Engineer for review and approval the proposed measures and such supplementary schedule as deemed necessary to demonstrate the manner in which the schedule or the agreed rate of progress will be regained, all without additional cost to the Owner.

Failure of the Contractor to comply will be grounds for determination by the Engineer that the Contractor is not prosecuting the Work with such diligence as will ensure completion within the time specified. Upon such determination, the Engineer may recommend that the Owner terminate the Contractor's right to proceed with the Work, or any separable part thereof, in accordance with determination for default or with other provisions provided in the Contract Documents.

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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

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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,

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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;

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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

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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 Proposal 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 Proposal 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 is 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

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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.

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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

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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.

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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 Proposal 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

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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. The Contractor shall purchase and maintain insurance covering the Owner's contingent liability for claims which may arise from operations under the Contract. The policy shall name the Owner and Engineer as an additional insured.

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.

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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;

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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*: The Contractor shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). The form of policy for this coverage shall be Completed Value. If the Owner is damaged by the failure of the Contractor to maintain such insurance, then the Contractor shall bear all reasonable costs properly attributable thereto. 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 Owner requests in writing that other special insurance be included in the property insurance policies provided under this Paragraph 6.04, Contractor shall, if possible, include such insurance, and the cost thereof will be charged to Owner by appropriate Change Order. Prior to commencement of the Work at the Site, Contractor shall in writing advise Owner whether or not such other insurance has been procured by Contractor.

F. Owner shall not be responsible for purchasing and maintaining any property insurance to protect the interests of the Contractor, subcontractors, or others in the Work.

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G. Contractor shall also obtain insurance which shall be written on a Builders Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework and Work in transit and shall insure against at least the following perils: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulation, water damage, and such other perils as may be required by Owner. Such insurance shall include the interest of Owner, Contractor, Subcontractors, Engineer, Engineer's consultants or any other person or entity having an insurable interest.

H. The limits of liability for the insurance required under Article 6 Bonds and Insurance of the General Conditions shall provide coverage for not less than the following amounts or greater if required by Laws and Regulations:

(1)	State	Statutory
(2)	Applicable Federal	Statutory
(3)	Employer's Liability	$1,500,000

Comprehensive General Liability:

(1)	Bodily Injury (including completed operations and products liability):	
	$1,500,000	Each Occurrence
	$2,000,000	Aggregate
	Property Damage:	
	$1,500,000	Each Occurrence
	$2,000,000	Aggregate
(2)	Property Damage Liability Insurance shall provide Explosion, Collapse, and Underground coverages where applicable.	
(3)	Personal Injury, with employment exclusion deleted:	
	$1,000,000	Each Occurrence

Comprehensive Automobile Liability:

Bodily Injury:	
$500,000	Each Person
$1,500,000	Each Occurrence
Property Damage:	
$1,500,000	Each Occurrence

Umbrella Excess Liability:

$2,000,000 over primary insurance

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$10,000 retention for self-insured hazards each occurrence

The Owner, Engineer, and Engineer's consultants shall be named as additional insured parties under the coverages required as specified in the Contractor's Liability Insurance paragraph in Article 6 Bonds and Insurance.

The Contractor shall submit with the signed Agreement between Owner and Contractor the completed Certificate of Insurance - Worker's Compensation and Liability only form.

The Contractual Liability required by the Contractual Liability Insurance paragraph of Article 6 Bonds and Insurance of the General Conditions shall provide coverage for not less than the following amounts:

(1) Bodily Injury:

$1,500,000 Each Occurrence

(2) Property Damage:

$1,500,000 Each Occurrence

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

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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.

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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. Proposer shall identify and submit with the Proposal a list of Subcontractors the Proposer proposes to contract with, the class of work to be performed by each and the estimated contract amount of each on the form provided with the Proposal Documents.

D. No provision of any instructions, warranties, or guarantees will be effective to assign to Engineer, or any of the Engineer's Consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty to authority to undertake responsibility contrary to the provisions of Paragraph 10.07.

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

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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.

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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.

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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 Proposal 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 Proposing 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.

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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.

O. The names of all subcontractors with more than 10% of the proposal price for contract proposals in excess of $250,000 shall be listed as part of the proposal or within one hour of the proposal submittal time as provided in the Submittal Forms. Failure to comply with this requirement may be cause for rejection of the proposal as nonresponsive.

P. Contractor shall perform with its own organization not less than one-third of Contract Price and shall not sublet to one Subcontractor more than one-half of Contract Price without previous written consent of Owner. After the Effective Date of the Agreement and prior to beginning of operations of a subcontract, Contractor may, if approved by Owner through a Change Order, employ a different subcontractor than was identified by the Contractor in the Proposal Documents. In this event, Contract Price shall be reduced by an amount equal to the reduction, if any, in the cost to Contractor as a result of the change of Subcontractor.

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.

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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 Proposal (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.

B. If Owner is tax exempt, Owner will furnish Contractor with a tax-exempt certificate for Contractor's use in determining applicable taxes. Contractor shall pay all export and import duties, taxes, or assessments levied against material or equipment involved in international shipment.

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 Proposal (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. The Contractor shall proceed diligently with the performance of this contract, pending final resolution of any request for relief, claim, appeal, or action arising under this Contract, and comply with any decision of the Owner.

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

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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).

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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.

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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

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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. The Contractor shall allow the Engineer seven (7) working days for shop and working drawing review.
   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.

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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. This 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.

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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,

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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 Proposal 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.

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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 to the 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.

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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

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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.

C. The Resident Project Representative (RPR) will be Engineer's agent at the Site, will act as directed by and under the supervision of Engineer, and will confer with Engineer regarding RPR's actions. RPR's dealings in matters pertaining to the Work in general shall be with Engineer and Contractor keeping Owner advised, as necessary. RPR's dealings with Subcontractors shall be through or with the full knowledge and approval of Contractor. The RPR shall:

1. Schedules: Review the progress schedule, schedule of Shop Drawing and Sample submittals, and schedule of values prepared by Contractor and consult with Engineer concerning acceptability.

2. Conferences and Meetings: Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences and other project-related meetings, and prepare and circulate copies of minutes thereof.

3. Liaison:

a. Serve as Engineer's liaison with Contractor, working principally through Contractor's authorized representative, assist in providing information regarding the 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 proper execution of the Work.

4. Interpretation of Contract Documents: Report to Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.

5. Shop Drawings and Samples:

a. Record date of receipt of Samples and approved Shop Drawings.

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b. Receive Samples which are furnished at the Site by Contractor and notify Engineer of availability of Samples for examination.

6. Modifications: Consider and evaluate Contractor's suggestions for modifications in Drawings or Specifications and report such suggestions, together with RPR's recommendations, to Engineer. Transmit to Contractor in writing decisions as issued by Engineer.

7. Review of Work and Rejection of Defective Work:

a. Conduct on-Site observations of Contractor's work in progress to assist Engineer in determining if the Work is in general proceeding in accordance with the Contract Documents.

b. Report to Engineer whenever RPR believes that any part of Contractor's work in progress will not produce a completed Project that conforms generally to the Contract Documents or will imperil the integrity of the design concept of the completed Project as a functioning whole as indicated in the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise Engineer of that part of work in progress that RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.

8. Inspections, Tests, and System Startups:

a. Verify that tests, equipment, and systems start-ups and operating and maintenance training are conducted in the presence of appropriate Owner's personnel, and that Contractor maintains adequate records thereof.

b. Observe, record, and report to Engineer appropriate details relative to the test procedures and systems start-ups.

9. Records:

a. Record names, addresses, fax numbers, e-mail addresses, web site locations, and telephone numbers of all Contractors, Subcontractors, and major Suppliers of materials and equipment.

b. Maintain records for use in preparing Project documentation.

10. Reports:

a. Furnish to Engineer periodic reports as required of progress of the Work and of Contractor's compliance with the progress schedule and schedule of Shop Drawing and Sample submittals.

b. Draft and recommend to Engineer, proposed Change Orders, Work Change Directives, and Field Orders. Obtain backup material from Contractor.

c. Immediately notify Engineer of the occurrence of any Site accidents, emergencies, acts of God endangering the Work, damage to property by fire or other causes, or the discovery of any Hazardous Environmental Condition.

11. Payment Requests: Review Applications for Payment with Contractor for compliance with the established procedure for their submission and forward with recommendations to Engineer, noting particularly the relationship of the payment requested to the schedule of values, Work completed, and materials and equipment delivered at the Site but not incorporated in the Work.

12. Certificates, Operation and Maintenance Manuals: During the course of the Work, verify that materials and equipment certificates, operation and maintenance manuals and other data required by the Specifications to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have these documents delivered to Engineer for review and forwarding to Owner prior to payment for that part of the Work.

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13. Completion:

a. Participate in a Substantial Completion inspection, assist in the determination of Substantial Completion and the preparation of lists of items to be completed or corrected.

b. Participate in a final inspection in the company of Engineer, Owner, and Contractor and prepare a final list of items to be completed and deficiencies to be remedied.

c. Observe whether all items on the final list have been completed or corrected and make recommendations to Engineer concerning acceptance and issuance of the Notice of Acceptability of the Work.

D. The RPR shall not:

1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items).

2. Exceed limitations of Engineer's authority as set forth in the Contract Documents.

3. Undertake any of the responsibilities of Contractor, Subcontractors, Suppliers, or Contractor's superintendent.

4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences, or procedures of Contractor's work unless such advice or directions are specifically required by the Contract Documents.

5. Advise on, issue directions regarding, or assume control over 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. Accept Shop Drawing or Sample submittals from anyone other than Contractor.

8. Authorize Owner to occupy the Project in whole or in part.

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.

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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;

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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

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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;

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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. Change Orders shall be prepared on the form included in the General Requirements.
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

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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

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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.

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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 proposals from subcontractors acceptable to Owner and Contractor and shall deliver such proposals to Owner, which will then determine, with the advice of Engineer, which proposals, 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,

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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.

6. The unit price of an item of Unit Price Work shall be subject to reevaluation and adjustment under the following conditions:

a. If the Proposal price of a particular item of Unit Price Work amounts to 25 percent or more of the Contract Price and the variation in the quantity of that particular item of Unit Price Work performed by Contractor differs by more than 25 percent from the estimated quantity of such item indicated in the Agreement; and

b. If there is no corresponding adjustment with respect to any other item of Work; and

c. If Contractor believes that Contractor has incurred additional expense as a result thereof or if Owner believes that the quantity variation entitles Owner to an adjustment in the unit price, either Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Article 10 if the parties are unable to agree as to the effect of any such variations in the quantity of Unit Price Work performed.

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

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

D. *Contractor's Fee*

1. When the Work as a whole is performed on the basis of cost-plus-a-fee, then:
   a. Contractor's fee for the Work set forth in the Contract Documents as of the Effective Date of the Contract will be determined as set forth in the Agreement.
   b. for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work, Contractor's fee will be determined as follows:
      1) When the fee for the Work as a whole is a percentage of the Cost of the Work, the fee will automatically adjust as the Cost of the Work changes.
      2) When the fee for the Work as a whole is a fixed fee, the fee for any additions or deletions will be determined in accordance with Paragraph 11.07.C.2.
2. When the Work as a whole is performed on the basis of a stipulated sum, or any other basis other than cost-plus-a-fee, then Contractor's fee for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work will be determined in accordance with Paragraph 11.07.C.2.

E. *Documentation and Audit*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor and pertinent Subcontractors will establish and maintain records of the costs in accordance with generally accepted accounting practices. Subject to prior written notice, Owner will be afforded reasonable access, during normal business hours, to all Contractor's accounts, records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda, and similar data relating to the Cost of the Work and Contractor's fee. Contractor shall preserve all such documents for a period of three years after the final payment by Owner. Pertinent Subcontractors will afford such access to Owner, and preserve such documents, to the same extent required of Contractor.

13.02 *Allowances*

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

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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 Proposals 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.

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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 has 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 ensure that the Work is not defective.

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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

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(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.

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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. Also, each Application for Payment shall include partial waivers of Lien rights from Suppliers and Subcontractors for which Work was included in previous payments to the Contractor.
4. The Owner shall retain five (5) percent of the amount of each payment until final completion and acceptance of all work covered by the Contract Documents. When the Work is substantially complete (operational and beneficial occupancy), the retained amount may be reduced below five (5) percent to only that amount necessary to assure completion. On completion and acceptance of a part of the Work on which the price is stated separately in the Contract Documents, payment may be made in full, including retained percentages, less authorized deductions.

   Retainage will be withheld and released in accordance with the Agreement, other contract documents, and applicable Iowa law.

   Administrative and legal cost incurred by the Owner in the handling of bonds and securities shall be considered accrued cost and shall be paid by the Contractor by reducing the final payment due under the contract.

   Failure to pay any amount due and payable under the terms of the contract within 60 days of Owner approval of a monthly estimate or 90 days after the final estimate of the amount earned shall obligate the Owner to pay to the Contractor simple interest on the past due amount at an annual rate equal to the monthly index of long term United States bond yields for the month prior to the month in which this obligation is incurred plus an additional one percent per annum. Interest shall not be imposed with respect to any amount which a county may legally withhold as a result of breach of contract or other contractual claim."

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

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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 and/or if liability for liquid damages has been incurred by contractor.
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.

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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.

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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

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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 been 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

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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.

4. Before final payment is made for the work on this project, the Contractor must make a satisfactory showing of all affidavits, releases, tax clearance, and other documentation required by the contract document and applicable Iowa law.

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

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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.

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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.

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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.

C. Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall:

1. Cease operations as directed by the Owner in the notice;

2. Take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

3. Except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing Subcontracts and purchase orders and enter into no further Subcontracts and purchase orders.

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.

16.05 *Environmental Litigation*

A. If the performance of all or any part of the Work is suspended, delayed, or interrupted due to an order of a court of competent jurisdiction as a result of environmental litigation, as defined below, the Owner, at the request of the Contractor, shall determine whether the order is due in any part to the acts or omissions of the Contractor or a Subcontractor at any tier not required by the terms of this Contract. If it is determined that the order is not due in any part to acts or omissions of the Contractor or a Subcontractor at any tier other than as required by the terms

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of this Contract, such suspension, delay, or interruption shall be considered as if ordered by the Owner in the administration of this Contract under the terms of Article 16 except that it will not be possible for the Owner to fix the date for resumption of the Work.

B. The term "environmental litigation," as used herein, means a lawsuit alleging that the Work will have an adverse effect on the environment or that the Owner has not duly considered, either substantively or procedurally, the effect of the Work on the environment.

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.

17.02 *Mediation*

A. Owner and Contractor agree that they shall submit any and all unsettled Claims or counterclaims, disputes, or other matters in question between them arising out of or relating to the Contract Documents or the breach thereof to mediation (prior to either of them initiating against the other a demand for arbitration pursuant to paragraph S.C. 17.03, unless delay in initiating arbitration would irrevocably prejudice one of the parties. The 30-day time limit within which to file a demand for arbitration as provided in paragraphs S.C. 17.03.B and 17.03.C shall be suspended with respect to a dispute submitted to mediation within that time limit and shall remain suspended until 10 days after the termination of the mediation.) The mediator of any dispute submitted to mediation under this agreement shall not serve as arbitrator of such dispute unless otherwise agreed.

17.03 *Arbitration*

A. All Claims or counterclaims, disputes, or other matters in question between Owner and Contractor arising out of or relating to the Contract Documents or the breach thereof (except for Claims which have been waived by the making or acceptance of final payment as provided by paragraph 15.07) not resolved under the provisions of paragraph S.C. 17.02 will be decided by binding arbitration, subject to the limitations of this paragraph S.C. 17.03. This agreement to arbitrate and any other agreement to consent to arbitrate entered into will be specifically enforceable under the prevailing law of any court having jurisdiction.

B. No demand for arbitration of any Claim or counterclaim, dispute, or other matter that is required to be referred to Engineer initially for decision in accordance with paragraph 10.07

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will be made until the earlier of: (i) the date on which Engineer has rendered a written decision, or (ii) the 31st day after the parties have presented their final evidence to Engineer if a written decision has not been rendered by Engineer before that date. No demand for arbitration of any such Claim or counterclaim, dispute, or other matter will be made later than 30 days after the date on which Engineer has rendered a written decision in respect thereof in accordance with paragraph 12.01; and the failure to demand arbitration within said 30 day period will result in Engineer's decision being final and binding upon Owner and Contractor. If Engineer renders a decision after arbitration proceedings have been initiated, such decision may be entered as evidence but will not supersede the arbitration proceedings, except where the decision is acceptable to the parties concerned.

C. Notice of the demand for arbitration will be filed in writing with the other party to the Contract and with the selected arbitrator, and a copy will be sent to Engineer for information. The demand for arbitration will be made within the 30 day period specified in paragraph S.C. 17.03.B, and in all other cases within a reasonable time after the Claim or counterclaim, dispute, or other matter in question has arisen, and in no event shall any such demand be made after the date when institution of legal or equitable proceedings based on such Claim or other dispute or matter in question would be barred by the applicable statute of limitations.

D. Except as provided in paragraph S.C. 17.03.E, no arbitration s rising out of or relating to the Contract Documents shall include by consolidation, joinder, or in any other manner any other individual or entity (including employees 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 is necessary if complete relief is to be afforded among those who are already parties to the arbitration; and
   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; and
   3. the written consent of the other individual or entity sought to be included and of Owner and Contractor has been obtained for such inclusion, which consent shall make specific reference to this paragraph; but no such consent shall constitute consent to arbitration of any dispute not specifically described in such consent or to arbitration with any party not specifically identified in such consent.

E. Notwithstanding paragraph S.C. 17.03.D, if a Claim or counterclaim, dispute, or other matters in question between Owner and Contractor involves the Work of a Subcontractor, either Owner or Contractor may join such Subcontractor as a party to the arbitration between Owner and Contractor hereunder. Contractor shall include in all subcontracts required by paragraph 7.07K a specific provision whereby the Subcontractor consents to being joined in arbitration between Owner and Contractor involving the Work of such Subcontractor. Nothing in this paragraph S.C. 17.03.E nor in the provisions of such subcontract consenting to joinder shall create any claim, right, or cause of action in favor of Subcontractor and against Owner, Engineer, or Engineer's Consultants that does not otherwise exist.

F. The award rendered by the arbitrators 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.

G. Owner and Contractor agree that the venue for any arbitration proceeding shall be in Linn County, Iowa and the proceeding shall be governed by Iowa law.

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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.

B. Contractor shall pay Subcontractors and Suppliers in accordance with the contract documents and applicable Iowa law.

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

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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.

18.11 *Covenant Against Contingent Fees*

A. The Contractor shall warrant that no person or selling agency has been employed or retained to solicit or secure the contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee. For breach or violation of this warranty, the Owner shall have the right to annul the contract without liability or in its discretion to deduct from the contract price or consideration, or otherwise recover, the full amount of such commission, percentage, brokerage, or contingent fee.

18.12 *Non-Discrimination Towards Handicapped Persons*

A. Before final payment is made for work on this project the Contractor shall submit a letter to the Owner stating that the Contractor's firm maintains a policy of non-discrimination toward persons with handicaps.

END OF SECTION

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SECTION 00 73 00

SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract, EJCDC C-700 (2018 Edition). All provisions which are not so amended or supplemented remain in full force and effect.

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

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

SC-1.01.A.18: Add the following language at the end of paragraph 1.01.A.18:

> The word Plans and Sheets used in the Contract Documents shall mean Drawings as so defined.

SC-1.01.A.22: Add the following language at the end of paragraph 1.01.A.18:

> Engineer shall be Foth Infrastructure & Environment, LLC.

SC-1.01.A.30: Add the following language at the end of paragraph 1.01.A.18:

> Owner shall be Cedar Rapids Linn County Solid Waste Agency

SC-2.01.B: Add the following language at the end of paragraph 2.01.B:

> When Contractor delivers the executed counterparts of the Agreement to Owner, the Contractor shall also deliver to Owner required certificate of insurance.

SC-2.02.A: Delete the paragraph in its entirety and replace the following new paragraph:

> Owner shall furnish to Contractor an electronic copy of the Contract (including one fully signed counterpart of the Agreement) in portable document format (PDF). Owner will furnish two (2) hard (paper) copies of the Plans and Specifications. Additional copies of the Plans and Specifications will be furnished, upon written request by the Contractor, at the cost of reproduction.

SC-3.02: Add the following to the end of Paragraph 3.02.A.1:

> Standard Specifications to include A. Iowa Department of Transportation (IDOT) and (Statewide Urban Design and Specifications [SUDAS]), 2026 Editions

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SC-4.01 A: Amend this Article to include the following definition of the Contract Time:

Restoration with seeding is complete and approved by ENGINEER and regulatory staff:

SUDAS 9010 – 08/10/2027 through 09/30/2027

The contract Substantial Completion shall be as follows:

August 27, 2027

The Final Completion and payment shall be as follows:

September 27, 2027

SC-4.04: Add the following to the end of Paragraph 4.04.B:

C. If, in the opinion of the Engineer, the Contractor falls behind the project schedule, the Contractor shall take such steps as may be necessary to improve progress. The Engineer may require the Work to be accelerated to regain the schedule, such as increase the number of shifts or overtime operations, days of work, amount of construction personnel or equipment, or any combination of these measures. Contractor shall submit to the Engineer for review and approval the proposed measures and such supplementary schedule as deemed necessary to demonstrate the manner in which the schedule or the agreed rate of progress will be regained, all without additional cost to the Owner.

Failure of the Contractor to comply will be grounds for determination by the Engineer that the Contractor is not prosecuting the Work with such diligence as will ensure completion within the time specified. Upon such determination, the Engineer may recommend that the Owner terminate the Contractor's right to proceed with the Work, or any separable part thereof, in accordance with determination for default or with other provisions provided in the Contract Documents.

SC-6.02: Delete Paragraph G in its entirety and insert the following:

G. The Contractor shall purchase and maintain insurance covering the Owner's contingent liability for claims which may arise from operations under the Contract. The policy shall name the Owner and Engineer as an additional insured.

SC-6.04: Add the following new paragraphs immediately after Paragraph 6.04E:

F. Contractor shall also obtain insurance which shall be written on a Builders Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework and Work in transit and shall insure against at least the following perils: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulation, water damage, and such other perils as may be required by Owner. Such insurance shall include the interest of Owner, Contractor, Subcontractors, Engineer, Engineer's consultants or any other person or entity having an insurable interest.

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G. The limits of liability for the insurance required under Article 6 Bonds and Insurance of the General Conditions shall provide coverage for not less than the following amounts or greater if required by Laws and Regulations:

(1)	State	Statutory
(2)	Applicable Federal	Statutory
(3)	Employer's Liability	$1,500,000

Comprehensive General Liability:

(1) Bodily Injury (including completed operations and products liability):

$1,500,000	Each Occurrence
$2,000,000	Aggregate

Property Damage:

$1,500,000	Each Occurrence
$2,000,000	Aggregate

(2) Property Damage Liability Insurance shall provide Explosion, Collapse, and Underground coverages where applicable.

(3) Personal Injury, with employment exclusion deleted:

$1,000,000	Each Occurrence

Comprehensive Automobile Liability:

Bodily Injury:

$500,000	Each Person
$1,500,000	Each Occurrence

Property Damage:

$1,500,000	Each Occurrence

Umbrella Excess Liability:

$2,000,000 over primary insurance
$10,000 retention for self-insured hazards each occurrence

The Owner, Engineer, and Engineer's consultants shall be named as additional insured parties under the coverages required as specified in the Contractor's Liability Insurance paragraph in Article 6 Bonds and Insurance.

The Contractor shall submit with the signed Agreement between Owner and Contractor the completed Certificate of Insurance - Worker's Compensation and Liability only form.

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The Contractual Liability required by the Contractual Liability Insurance paragraph of Article 6 Bonds and Insurance of the General Conditions shall provide coverage for not less than the following amounts:

(1) Bodily Injury:
$1,500,000 Each Occurrence

(2) Property Damage:
$1,500,000 Each Occurrence

SC-6.04: Delete the first sentence in Paragraph 6.04B and insert the following:

The Contractor shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). The form of policy for this coverage shall be Completed Value. If the Owner is damaged by the failure of the Contractor to maintain such insurance, then the Contractor shall bear all reasonable costs properly attributable thereto.

SC-6.04: Delete Paragraph 6.04E in its entirety and replace it with the following:

If Owner requests in writing that other special insurance be included in the property insurance policies provided under this Paragraph 6.04, Contractor shall, if possible, include such insurance, and the cost thereof will be charged to Owner by appropriate Change Order. Prior to commencement of the Work at the Site, Contractor shall in writing advise Owner whether or not such other insurance has been procured by Contractor.

SC-6.04: Add after paragraph E:

F. Owner shall not be responsible for purchasing and maintaining any property insurance to protect the interests of the Contractor, subcontractors, or others in the Work.

SC-7.04: Add after paragraph C:

D. No provision of any instructions, warranties, or guarantees will be effective to assign to Engineer, or any of the Engineer's Consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty to authority to undertake responsibility contrary to the provisions of Paragraph 10.07.

SC-7.07C: Add the following to the end of Paragraph 7.07C:

Proposer shall identify and submit with the Proposal a list of Subcontractors the Proposer proposes to contract with, the class of work to be performed by each and the estimated contract amount of each on the form provided with the Proposal Documents.

SC-7.07: Add the following new paragraphs immediately after Paragraph 7.07M:

O. The names of all subcontractors with more than 10% of the proposal price for contract proposals in excess of $250,000 shall be listed as part of the proposal or

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within one hour of the proposal submittal time as provided in the Submittal Forms. Failure to comply with this requirement may be cause for rejection of the proposal as nonresponsive.

P. Contractor shall perform with its own organization not less than one-third of Contract Price and shall not sublet to one Subcontractor more than one-half of Contract Price without previous written consent of Owner. After the Effective Date of the Agreement and prior to beginning of operations of a subcontract, Contractor may, if approved by Owner through a Change Order, employ a different subcontractor than was identified by the Contractor in the Proposal Documents. In this event, Contract Price shall be reduced by an amount equal to the reduction, if any, in the cost to Contractor as a result of the change of Subcontractor.

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

B. If Owner is tax exempt, Owner will furnish Contractor with a tax-exempt certificate for Contractor's use in determining applicable taxes. Contractor shall pay all export and import duties, taxes, or assessments levied against material or equipment involved in international shipment.

SC-7.16: Add the following sentence at the end of paragraph 7.16E.b:

The Contractor shall allow the Engineer seven (7) working days for shop and working drawing review.

SC-10.03: Add the following new paragraphs immediately after Paragraph 10.03.B:

B. The Resident Project Representative (RPR) will be Engineer's agent at the Site, will act as directed by and under the supervision of Engineer, and will confer with Engineer regarding RPR's actions. RPR's dealings in matters pertaining to the Work in general shall be with Engineer and Contractor keeping Owner advised, as necessary. RPR's dealings with Subcontractors shall be through or with the full knowledge and approval of Contractor. The RPR shall:

1. Schedules: Review the progress schedule, schedule of Shop Drawing and Sample submittals, and schedule of values prepared by Contractor and consult with Engineer concerning acceptability.
2. Conferences and Meetings: Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences and other project-related meetings, and prepare and circulate copies of minutes thereof.
3. Liaison:
   a. Serve as Engineer's liaison with Contractor, working principally through Contractor's authorized representative, and assist in providing information regarding the 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 proper execution of the Work.

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4. Interpretation of Contract Documents: Report to Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.
5. Shop Drawings and Samples:
   a. Record date of receipt of Samples and approved Shop Drawings.
   b. Receive Samples which are furnished at the Site by Contractor and notify Engineer of availability of Samples for examination.
6. Modifications: Consider and evaluate Contractor's suggestions for modifications in Drawings or Specifications and report such suggestions, together with RPR's recommendations, to Engineer. Transmit to Contractor in writing decisions as issued by Engineer.
7. Review of Work and Rejection of Defective Work:
   a. Conduct on-site observations of Contractor's work in progress to assist Engineer in determining if the Work is in general proceeding in accordance with the Contract Documents.
   b. Report to Engineer whenever RPR believes that any part of Contractor's work in progress will not produce a completed Project that conforms generally to the Contract Documents or will imperil the integrity of the design concept of the completed Project as a functioning whole as indicated in the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise Engineer of that part of work in progress that RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.
8. Inspections, Tests, and System Startups:
   a. Verify that tests, equipment, and systems start-ups and operating and maintenance training are conducted in the presence of appropriate Owner's personnel, and that Contractor maintains adequate records thereof.
   b. Observe, record, and report to Engineer appropriate details relative to the test procedures and systems start-ups.
9. Records:
   a. Record names, addresses, fax numbers, e-mail addresses, web site locations, and telephone numbers of all Contractors, Subcontractors, and major Suppliers of materials and equipment.
   b. Maintain records for use in preparing Project documentation.
10. Reports:
    a. Furnish to Engineer periodic reports as required of progress of the Work and of Contractor's compliance with the progress schedule and schedule of Shop Drawing and Sample submittals.
    b. Draft and recommend to Engineer, proposed Change Orders, Work Change Directives, and Field Orders. Obtain backup material from Contractor.
    c. Immediately notify Engineer of the occurrence of any Site accidents, emergencies, acts of God endangering the Work, damage to property by fire or other causes, or the discovery of any Hazardous Environmental Condition.
11. Payment Requests: Review Applications for Payment with Contractor for compliance with the established procedure for their submission and forward with

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recommendations to Engineer, noting particularly the relationship of the payment requested to the schedule of values, Work completed, and materials and equipment delivered at the Site but not incorporated in the Work.

12. Certificates, Operation and Maintenance Manuals: During the course of the Work, verify that materials and equipment certificates, operation and maintenance manuals and other data required by the Specifications to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have these documents delivered to Engineer for review and forwarding to Owner prior to payment for that part of the Work.
13. Completion:
    a. Participate in a Substantial Completion inspection, assist in the determination of Substantial Completion and the preparation of lists of items to be completed or corrected.
    b. Participate in a final inspection in the company of Engineer, Owner, and Contractor and prepare a final list of items to be completed and deficiencies to be remedied.
    c. Observe whether all items on the final list have been completed or corrected and make recommendations to Engineer concerning acceptance and issuance of the Notice of Acceptability of the Work.

C. The RPR shall not:

1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items).
2. Exceed limitations of Engineer's authority as set forth in the Contract Documents.
3. Undertake any of the responsibilities of Contractor, Subcontractors, Suppliers, or Contractor's superintendent.
4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences, or procedures of Contractor's work unless such advice or directions are specifically required by the Contract Documents.
5. Advise on, issue directions regarding, or assume control over 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. Accept Shop Drawing or Sample submittals from anyone other than Contractor.
8. Authorize Owner to occupy the Project in whole or in part.

SC-7.11: Add the following at the end of paragraph 7.11C:

The Contractor shall proceed diligently with the performance of this contract, pending final resolution of any request for relief, claim, appeal, or action arising under this Contract, and comply with any decision of the Owner.

SC-11.09: Add the following at the end of paragraph 11.09B.1:

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Change Orders shall be prepared on the form included in the General Requirements.

SC-13.01: Add the following paragraph to the end of 13.01.B.5:

6. The unit price of an item of Unit Price Work shall be subject to reevaluation and adjustment under the following conditions:
   a. If the Proposal price of a particular item of Unit Price Work amounts to 25 percent or more of the Contract Price and the variation in the quantity of that particular item of Unit Price Work performed by Contractor differs by more than 25 percent from the estimated quantity of such item indicated in the Agreement; and
   b. If there is no corresponding adjustment with respect to any other item of Work; and
   c. If Contractor believes that Contractor has incurred additional expense as a result thereof or if Owner believes that the quantity variation entitles Owner to an adjustment in the unit price, either Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Article 10 if the parties are unable to agree as to the effect of any such variations in the quantity of Unit Price Work performed.

SC-15.01B: Add the following sentence at the end of the paragraph 15.01 B.3:

Also, each Application for Payment shall include partial waivers of Lien rights from Suppliers and Subcontractors for which Work was included in previous payments to the Contractor.

SC-15.01B: Delete Paragraph 15.01 B.4in its entirety and insert the following:

4. The Owner shall retain five (5) percent of the amount of each payment until final completion and acceptance of all work covered by the Contract Documents. When the Work is substantially complete (operational and beneficial occupancy), the retained amount may be reduced below five (5) percent to only that amount necessary to assure completion. On completion and acceptance of a part of the Work on which the price is stated separately in the Contract Documents, payment may be made in full, including retained percentages, and less authorized deductions.

   Iowa Statutes provide for alternative forms of retainage. Any alternative form of retainage in the form of bonds and security deposits with Owner to be held in lieu of cash retainage will be acceptable only upon the execution of an assignment of such security to the Owner.

   Administrative and legal cost incurred by the Owner in the handling of bonds and securities shall be considered accrued cost and shall be paid by the Contractor by reducing the final payment due under the contract.

   Failure to pay any amount due and payable under the terms of the contract within 60 days of Owner approval of a monthly estimate or 90 days after the final

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estimate of the amount earned shall obligate the Owner to pay to the Contractor simple interest on the past due amount at an annual rate equal to the monthly index of long term United States bond yields for the month prior to the month in which this obligation is incurred plus an additional one percent per annum. Interest shall not be imposed with respect to any amount which a county may legally withhold as a result of breach of contract or other contractual claim."

SC-15.01: Add the following paragraph immediately after Paragraph 15.01C.5:

and/or if liability for liquid damages has been incurred by contractor.

SC-16.03: Add the following paragraph immediately following paragraph 16.03.B:

C. Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall:

1. Cease operations as directed by the Owner in the notice;
2. Take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
3. Except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing Subcontracts and purchase orders and enter into no further Subcontracts and purchase orders.

SC-16.04: Add the following paragraph immediately following paragraph 16.04.B:

SC-16.05 *Environmental Litigation*

A. If the performance of all or any part of the Work is suspended, delayed, or interrupted due to an order of a court of competent jurisdiction as a result of environmental litigation, as defined below, the Owner, at the request of the Contractor, shall determine whether the order is due in any part to the acts or omissions of the Contractor or a Subcontractor at any tier not required by the terms of this Contract. If it is determined that the order is not due in any part to acts or omissions of the Contractor or a Subcontractor at any tier other than as required by the terms of this Contract, such suspension, delay, or interruption shall be considered as if ordered by the Owner in the administration of this Contract under the terms of Article 16 except that it will not be possible for the Owner to fix the date for resumption of the Work.

B. The term “environmental litigation,” as used herein, means a lawsuit alleging that the Work will have an adverse effect on the environment or that the Owner has not duly considered, either substantively or procedurally, the effect of the Work on the environment.

SC-17.01: Add the following new paragraph immediately after Paragraph 17.01:

SC-17.02 *Mediation*

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A. Owner and Contractor agree that they shall submit any and all unsettled Claims or counterclaims, disputes, or other matters in question between them arising out of or relating to the Contract Documents or the breach thereof to mediation (prior to either of them initiating against the other a demand for arbitration pursuant to paragraph S.C. 17.03, unless delay in initiating arbitration would irrevocably prejudice one of the parties. The 30-day time limit within which to file a demand for arbitration as provided in paragraphs S.C. 17.03.B and 17.03.C shall be suspended with respect to a dispute submitted to mediation within that time limit and shall remain suspended until 10 days after the termination of the mediation.) The mediator of any dispute submitted to mediation under this agreement shall not serve as arbitrator of such dispute unless otherwise agreed.

SC-17.03 *Arbitration*

A. All Claims or counterclaims, disputes, or other matters in question between Owner and Contractor arising out of or relating to the Contract Documents or the breach thereof (except for Claims which have been waived by the making or acceptance of final payment as provided by paragraph 15.07) not resolved under the provisions of paragraph S.C. 17.02 will be decided by binding arbitration, subject to the limitations of this paragraph S.C. 17.03. This agreement to arbitrate and any other agreement to consent to arbitrate entered into will be specifically enforceable under the prevailing law of any court having jurisdiction.

B. No demand for arbitration of any Claim or counterclaim, dispute, or other matter that is required to be referred to Engineer initially for decision in accordance with paragraph 10.07 will be made until the earlier of: (i) the date on which Engineer has rendered a written decision, or (ii) the 31st day after the parties have presented their final evidence to Engineer if a written decision has not been rendered by Engineer before that date. No demand for arbitration of any such Claim or counterclaim, dispute, or other matter will be made later than 30 days after the date on which Engineer has rendered a written decision in respect thereof in accordance with paragraph 12.01; and the failure to demand arbitration within said 30-day period will result in Engineer's decision being final and binding upon Owner and Contractor. If Engineer renders a decision after arbitration proceedings have been initiated, such decision may be entered as evidence but will not supersede the arbitration proceedings, except where the decision is acceptable to the parties concerned.

C. Notice of the demand for arbitration will be filed in writing with the other party to the Contract and with the selected arbitrator, and a copy will be sent to Engineer for information. The demand for arbitration will be made within the 30 day period specified in paragraph S.C. 17.03.B, and in all other cases within a reasonable time after the Claim or counterclaim, dispute, or other matter in question has arisen, and in no event shall any such demand be made after the date when institution of legal or equitable proceedings based on such Claim or other dispute or matter in question would be barred by the applicable statute of limitations.

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D. Except as provided in paragraph S.C. 17.03.E, no arbitration s rising out of or relating to the Contract Documents shall include by consolidation, joinder, or in any other manner any other individual or entity (including employees 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 is necessary if complete relief is to be afforded among those who are already parties to the arbitration; and

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; and

3. the written consent of the other individual or entity sought to be included and of Owner and Contractor has been obtained for such inclusion, which consent shall make specific reference to this paragraph; but no such consent shall constitute consent to arbitration of any dispute not specifically described in such consent or to arbitration with any party not specifically identified in such consent.

E. Notwithstanding paragraph S.C. 17.03.D, if a Claim or counterclaim, dispute, or other matters in question between Owner and Contractor involves the Work of a Subcontractor, either Owner or Contractor may join such Subcontractor as a party to the arbitration between Owner and Contractor hereunder. Contractor shall include in all subcontracts required by paragraph 7.07K a specific provision whereby the Subcontractor consents to being joined in arbitration between Owner and Contractor involving the Work of such Subcontractor. Nothing in this paragraph S.C. 17.03.E nor in the provisions of such subcontract consenting to joinder shall create any claim, right, or cause of action in favor of Subcontractor and against Owner, Engineer, or Engineer's Consultants that does not otherwise exist.

F. The award rendered by the arbitrators will be final, judgement may be entered upon it in any court having jurisdiction thereof, and it will not be subject to modification or appeal.

G. Owner and Contractor agree that the venue for any arbitration proceeding shall be in Iowa and shall be governed by Iowa law.

SC-18.07.B After Paragraph 18.07.A add the following:

B. Contractor shall make progress and final payments to Subcontractors and Suppliers within the time required by Iowa Code section 573.12. Contractor shall pay interest on amounts not timely paid when required by applicable Iowa law.

SC-18.10: Add the following new paragraphs immediately after Paragraph 18.10:

SC-18.11 *Covenant Against Contingent Fees*

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A. The Contractor shall warrant that no person or selling agency has been employed or retained to solicit or secure the contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee. For breach or violation of this warranty, the Owner shall have the right to annul the contract without liability or in its discretion to deduct from the contract price or consideration, or otherwise recover, the full amount of such commission, percentage, brokerage, or contingent fee.

SC-18.12 *Non-Discrimination Towards Handicapped Persons*

Before final payment is made for work on this project the Contractor shall submit a letter to the Owner stating that the Contractor's firm maintains a policy of non-discrimination toward persons with handicaps.

END OF SECTION

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SECTION 00 73 19

CONTRACTOR LIABILITY WAIVER AND SAFETY BRIEFING

PART 1 - GENERAL

1.1 OWNER SAFETY REQUIREMENTS

A. The attached Cedar Rapids Linn County Solid Waste Agency “Contractor Safety Briefing - Landfill/RRB” and “Vendor Agreement - Release of Liability” are incorporated into the Contract Documents.

B. Contractor shall distribute the safety briefing to its employees, Subcontractors, Suppliers, vendors, and other persons entering Agency property in connection with the Work.

C. Before Site access, Contractor shall ensure that each person or entity required by Owner completes the safety briefing and executes the Owner’s liability waiver.

D. Contractor shall submit executed forms to Owner before the applicable person or entity enters the Site. Contractor shall submit additional forms before newly assigned personnel enter the Site.

E. Owner may deny or revoke Site access for failure to comply with the Owner’s safety requirements.

F. These requirements supplement Contractor’s Site-Specific Health and Safety Plan and do not transfer responsibility for construction safety to Owner or Engineer.

G. Include all costs associated with these requirements in the Contract Price. No additional payment or extension of Contract Time will be allowed for compliance.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

ATTACHMENTS:

Contractor Safety Briefing - Landfill/RRB
Vendor Agreement - Release of Liability

END OF SECTION

Cedar Rapids Linn County Solid Waste Agency
Contractor Safety Briefing — Landfill/RRB

Personal Safety

⇒ **There is NO SMOKING on agency property.** Vendors, contractors or temporary laborers failing to adhere to this rule may be banned from the site.

⇒ **Personal protective equipment (PPE):** We require **all vendors, contractors, temps, and Agency staff** to wear the following personal protective equipment:

- Gloves, when contacting waste or chemicals, including oil and fuel
- Hi-vis gear (vest, coat, or shirt)
- Steel toed boots
- Safety glasses

⇒ **Bloodborne Pathogens:** Working with or around waste means that there is always the potential for exposure to bloodborne pathogens and infectious agents such as hepatitis. To control this risk, we recommend that you get a Hep B vaccine series. Contact our EHS Manager for more information. In the event of contact with sharps or other potentially pathogenic waste, notify the site supervisor or a member of management immediately.

⇒ **Injury or Medical Emergency:** In the event that a vendor or contractor suffers an injury, please contact the site supervisor or a member of management immediately. In the event of a medical emergency or injury involving a customer or coworker, call 911. There are first aid kits in the office; shop, and break room. Landline phones are in the office/scale house. Emergency call lists are posted in the office/scale house and both break rooms.

⇒ **Respiratory protection and Dust**: Onsite roads can be dusty. Nuisance dust masks for voluntary use are available in the shop. These masks are for nuisance dusts only and are NOT intended to be used as respirators. If you have questions about the Agency's respiratory protection program, please contact our EHS manager.

Site Safety

⇒ **Scavenging or Salvaging Waste or Recyclables are STRICTLY PROHIBITED**

⇒ **Confined Spaces: Due to the potential for hazardous atmospheres resulting from landfill gases contractors and vendors are strictly prohibited from entering onsite confined spaces without consulting the Agency EHS Manger.** Confined spaces include all sumps, manholes, storm sewers, culverts, tanks, and the pit areas underneath the scales. Trenches and lagoons are also considered confined spaces. Confined space entries will be permitted contingent upon the following: Entries must be pre-approved and conducted by properly equipped, trained and authorized persons; pertinent training records must be submitted; confined space permit must be completed; the internal atmosphere of the confined space must be tested for oxygen content, flammable gases and vapors prior to entry; continuous monitoring of the atmosphere is required for the duration of the entry and additional requirements may apply depending on the space.

⇒ **Hot loads, and facility or landfill fires:** A "hot load" is a smoldering or burning load of waste that can cause a landfill fire. Agency staff uses both stockpiled soil and the water truck to suppress fires. The water truck is always kept full and must be accessible in the event of an onsite fire. Call 911 if the fire cannot be extinguished with on-site resources. If there is a fire involving the gas system, or fuel storage areas, evacuate immediately and call 911. **Any person who observes or suspects a fire should notify Agency staff immediately.**

⇒ **Landfill infrastructure (Gas and Leachate):** Agency landfills utilize leachate and landfill gas collection systems. These systems are required by our permit and regulated by state and federal law.

- Landfill gas (including methane and hydrogen sulfide) is highly flammable, thus ***there is no smoking on Agency property.*** If you observe an employee or vendor smoking onsite, please tell them to extinguish their cigarette immediately. All contractors are expected to help enforce our no smoking policy to their employees and subs.
- Leachate may not be released to storm water or released offsite. All leachate must be directed to the collection system and disposal through the sanitary sewer.
- In the event that you observe strong landfill gas odors or leachate seeps or ponding of impacted liquid anywhere onsite,

Vehicle Safety

⇒ **Seatbelts are mandatory** when operating vehicles or equipment on Agency property. Only Agency employees are authorized to operate the Agency vehicles or equipment.

⇒ **We have a posted speed limit of 15 MPH throughout the site.** Vendors or contractors failing to adhere to the speed limit may be banned from the site.

⇒ **Follow established traffic patterns**: Do not drive into the site against traffic. Stay to the right of the scale house.

⇒ **Safety Around Vehicles**: Please exercise situational awareness when onsite, particularly around all vehicles and equipment. Look both ways before crossing roadways or drive-through areas and seek to make eye contact with vehicle drivers and equipment operators before crossing their path. The site access roads can be very busy – cross with caution! Never walk behind, crawl, walk under, or stand behind vehicles or machines. Use extreme caution when backing up.

⇒ **Lock out/tag out**: NEVER start, operate or attempt to repair equipment that has been tagged out. Always check around and underneath vehicles before starting or moving. Exercise extreme caution around or near equipment or vehicles that have the potential to unexpectedly energize, close, roll, drop, pinch, or otherwise release hazardous energy due to work activities, damage, service, or maintenance activities.

Site Communication

⇒ **Radio and Cell Phone Communication:** When working onsite, either at the landfill, sawtooth, on grounds or in the RRB, operational staff and laborers must have a working radio on. We ask that contractors and vendors inform staff of their presence in work areas, and NOT use cell phones when operating vehicles on Agency property.

⇒ **Safety Data Sheets (SDS)** for chemicals and fuels used onsite are in 3-ring binders available in the breakroom and in the shop. All chemicals brought onto Agency property by vendors must be accompanied by a Safety Data Sheet and must be available to Agency staff upon request.

⇒ **Spills and Releases:** In the event of a spill of chemical or fuel on Agency property, or a release of leachate or gas resulting from site work, vendors and contractors are required to notify a member of management immediately.

⇒ **Safety Program:** We hold monthly safety meetings where staff are given an opportunity to discuss near-misses and incidents. If at any time you have a question or concern about site safety, about operation of equipment, or are unsure about performing any task, management has an open-door policy. You can talk to anyone of us.

Agency Contact Information

Mitzi Brunsvold

Environmental Heath & Safety Manager

(319) 377-5290, ext:105

mbrunsvold@solidwasteagency.org

Solid Waste Agency
Cedar Rapids Linn County

VENDOR Agreement - Release of Liability

I hereby release from liability and agree to indemnify and hold harmless the Cedar Rapids Linn County Solid Waste Agency (Agency), and any of its employees representing or related to the Agency, for any liability in connection with my use of Agency property or facilities.

The Agency has provided my company with site safety rules and I have read and understand them.

This release is for any and all liability, for personal injuries and property losses or damage occasioned by, or in connection with, the use of Agency facilities or equipment.

Company Name _____

Signature _____

Print Name _____

Date _____

1954 County Home Road Marion, Iowa 52302 Phone (319) 377-5290 Fax (319) 377-5480 www.solidwasteagency.org

SECTION 00 91 00

PRECONTRACT REVISIONS

LIST OF PRECONTRACT REVISIONS ATTACHED

REVISION #	TITLE	DATE

ATTACHED REVISIONS

SECTION 00 94 00

RECORD MODIFICATIONS

LIST OF MODIFICATIONS ATTACHED

REVISION #	TITLE	DATE

SECTION 01 10 00

SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes
1. References
2. Specification Formats and Conventions
3. Work Covered by the Contract Documents
4. Working Hours
5. Work Sequence
6. Use of Premises
7. Work By Others
8. Future Work
9. Owner-Furnished Products
10. Partial Owner Occupancy
11. Project Utility Sources

1.2 REFERENCES

A. Definitions
1. Basic Contract definitions and terminology are included in the General Conditions of the Contract.
2. The term "approved," when used to convey Engineer's action on Contractor's submittals, applications, and requests, is limited to Engineer's duties and responsibilities as stated in the General Conditions of the Contract.
3. The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.

B. Industry Standards
1. Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
2. Comply with standards in effect as of date of the Contract Documents, unless otherwise indicated.
3. If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement.
4. The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements.
5. Each section of the specifications generally includes a list of reference standards normally referred to in that respective section. The purpose of this list is to furnish the Contractor with a list of standards normally used for outlining the quality control desired

on the project. The lists are not intended to be complete or all inclusive, but only a general reference of standards that are regularly referred to.

6. Each entity engaged in construction on the Project shall be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents. Where copies of standards are needed to perform a required construction activity, obtain copies directly from the publication source and make them available on request.

1.3 SPECIFICATION FORMATS AND CONVENTIONS

A. The Specifications are organized into Divisions and Sections using the 50-division format and CSI's "MasterFormat" numbering system.

B. The Specifications use section numbers and titles to help cross-reference in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of sections in the Contract Documents.

1.4 WORK COVERED BY THE CONTRACT DOCUMENTS

A. Project Identification
1. Project Location: Cedar Rapids Linn County Solid Waste Agency Site # 2 Landfill, Marion, Iowa
2. Owner: Cedar Rapids Linn County Solid Waste Agency
3. Work will be performed under the following prime contracts:
   a. Contract: “2026 Site 2 – MSW Cell 5B Construction”

B. The Work includes:
1. Mobilize equipment.
2. Install stormwater best management practices to minimize erosion and siltation prior to disturbing any area.
3. Provide and install stormwater control measures on any soil stockpile.
4. Excavate overburden soil to appropriate base grades.
5. Provide and install a groundwater underdrain layer.
6. Install and compact clay liner.
7. Provide and install geomembrane.
8. Provide and install geocomposite drainage layer.
9. Provide and install drainage layer material.
10. Provide and install leachate control system piping.
11. Relocate stormwater and groundwater manholes and stormwater pump.
12. Provide and install gravel and geosynthetic for haul road.
13. Complete/repair any surface water control features, including permanent erosion control measures.
14. Seed all disturbed areas.
15. Repair any damaged area including resurfacing of roads as needed.
16. Provide dust control and maintenance of Echo Hill Road from Highway 13 to the landfill’s south entrance.
17. Conduct project close-out and clean-up.

1.5 WORKING HOURS

A. Owner's normal operating hours are 7:00 a.m. to 4:00 p.m., Monday through Friday, and 8:00 a.m. to 12:00 p.m. on Saturday. Contractor's operations may be conducted from 7:00 a.m. to 6:00 p.m., Monday through Saturday. Contractor shall maintain Site and entrance security whenever Contractor performs Work outside Owner's normal operating hours. Contractor shall request approval from Owner in writing at least 72 hours before proposed Sunday work, overtime work, or work outside these hours.

B. Owner's Representative will generally be available from 7:00 a.m. to 4:00 p.m., Monday through Friday. Testing, surveying, and Work requiring observation by Owner's Representative shall be scheduled during these hours unless otherwise coordinated in advance. Contractor shall be responsible for additional Owner, Engineer, or testing laboratory costs resulting from Contractor's work outside these hours.

1.6 WORK SEQUENCE

A. The sequence of work shall be the Contractors responsibility. The Contractor shall submit a proposed sequence to the Engineer within 15 days after issuance of the notice to proceed.

B. The Contractor shall coordinate with the Engineer prior to the equipment being relocated. The Engineer shall be notified two weeks prior to equipment relocation.

C. Contractor shall at all-time maintain control of the groundwater and stormwater pumps. Relocation of the pumps must be completed in a manner which does not allow stormwater and groundwater to be uncontrolled.

D. Contractor's work shall not impede landfill operation at any time.

1.7 USE OF PREMISES

A. Contractor's use of the premises shall be limited to the area identified at "Construction Limits" in the Contract Drawings for construction operations, including use of the Project Site, as allowed by law, ordinances, permits, easement agreements and the Contract Documents.

B. Contractor's use of premises is limited only by Owner's right to perform work or to retain other contractors on portions of the Project.

C. The Project Site is limited to property boundaries, rights-of-way, easements and other areas designated in the Contract Documents.

D. Provide protection and safekeeping of material and products stored on or off the premises.

E. Move any stored material or products which interfere with operations of Owner or other Contractors.

1.8 WORK BY OTHERS

A. Owner will perform certain construction operations which will be conducted at the Project site simultaneously with work under this contract. The construction operations performed by the Owner includes the following:

1. Installation of power poles and electrical lines to the location of the groundwater and stormwater pumps and controls.
2. Landfill disposal operations.

B. Cooperate fully with separate contractors and/or the Owner so work by others may be carried out smoothly, without interfering with or delaying work under this Contract.

1.9 OWNER-FURNISHED PRODUCTS

A. Owner will furnish the following to be installed by the Contractor:
1. Clay soils located as shown on drawing
2. On-site soils located as shown on drawing

B. The Contractor is responsible for excavating, hauling, and placing Owner-furnished items at the Project site.

1.10 PARTIAL OWNER OCCUPANCY.

A. Contractor provides:
1. Access for Owner's personnel.
2. Prior to occupancy, execute Certificate of Substantial Completion for designated areas.

1.11 PROJECT UTILITY SOURCES.

A. Iowa One Call. The contractor is required to contact Iowa One Call for utility locations according to Iowa requirements.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 14 00

WORK RESTRICTIONS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. CONTRACTOR Use of Premises

B. Protection and Repair of Existing Facilities and Utilities

C. Unfavorable Construction Conditions

D. Survey Markers

E. Petroleum or Hazardous Material Release

1.2 RELATED SECTIONS

A. 01 10 00 SUMMARY OF WORK AND SCHEDULE

B. 01 50 00 TEMPORARY FACILITIES AND CONTROLS

1.3 CONTRACTOR USE OF PREMISES

A. Definition of Site
1. The Site is defined as the area within the property boundary shown on the Drawings.
2. CONTRACTOR shall limit operations as much as practicable, including material and equipment storage, to within those boundaries. CONTRACTOR must perform all operations so that OWNER's use of OWNER's facilities is not restricted. At all times, CONTRACTOR shall conduct CONTRACTOR's operations so as to maintain the roads along the Work such that CONTRACTOR's operations do not impair OWNER's use of OWNER's facilities.
3. CONTRACTOR shall access the Site only through the back gate from Echo Hill Road unless otherwise directed by OWNER. Contractor shall control access through this entrance and maintain the entrance and gate in a secure condition throughout the Project. Contractor shall close and secure the gate when the entrance is unattended and shall not permit access by unauthorized persons.

B. Hours of Operation
1. CONTRACTOR's operations shall be limited to the hours of 7:00 a.m. to 6:00 p.m. (Central Standard Time), Monday through Saturday, unless prior arrangements are made with OWNER.

1.4 PROTECTION AND REPAIR OF EXISTING FACILITIES AND UTILITIES

A. CONTRACTOR shall perform operations carefully and in such a manner as to protect existing facilities and utilities. Obstructions not shown on the Drawings may exist and shall be exposed by CONTRACTOR without damage. CONTRACTOR shall be responsible for damage to existing facilities and utilities resulting from CONTRACTOR's operations, and shall repair or replace damaged items, including existing underground membrane liner or cover, to OWNER's satisfaction.

B. Groundwater monitoring wells shall be protected during construction.

1.5 UNFAVORABLE CONSTRUCTION CONDITIONS

A. When unfavorable weather, soil, drainage, or other unsuitable construction conditions exist, CONTRACTOR shall confine operations to work which will not be adversely affected by such conditions. No portion of the Work shall be constructed under conditions which would adversely affect the quality of the Work, unless special means or precautions are taken to perform the Work in a proper and satisfactory manner.

1.6 SURVEY MARKERS

A. CONTRACTOR shall conduct operations so as to preserve bench marks, survey reference points, and stakes existing for the construction. CONTRACTOR will be charged the expense of repairing or replacing survey markers and shall be responsible for mistakes or lost time that result due to damage or destruction of survey markers due to CONTRACTOR's operations.

1.7 PETROLEUM OR HAZARDOUS MATERIAL RELEASE

A. Contractor shall immediately stop the release, protect persons and property, and notify Owner, Engineer, and applicable regulatory authorities of any petroleum or hazardous-material release caused by Contractor or its Subcontractors. Contractor shall contain, clean up, transport, and dispose of affected material in accordance with applicable Laws and Regulations and to the satisfaction of Owner. All associated costs shall be borne by Contractor. Initial containment and response shall begin immediately, and required corrective actions shall be completed within the time required by the applicable regulatory authorities.

1.8 SITE SPECIFIC

A. CONTRACTOR shall not interfere with Owner's continuing landfill operations, facility access, waste-hauling traffic, or emergency access.

B. CONTRACTOR shall protect groundwater monitoring wells, gas monitoring wells, piezometers, survey monuments, utility markers, and other monitoring facilities during construction. Contractor shall immediately notify Owner and Engineer of any damage.

PART 2 - NOT USED

PART 3 - NOT USED

END OF SECTION

SECTION 01 22 01

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:
1. Measurement and payment for project items on Unit Price Bid Schedule (Section 00 42 00).

B. Unit Prices include:
1. Defined work for each Unit Price Item which will provide a functionally complete Project when combined with all Unit Price Items. If there are specific work items which the Contractor believes are not identified in any Unit Price Item, but are required to provide a functionally complete Project, then the identified specific work items shall be included in the appropriate Unit Price Item.
2. The method of measurement for payment.
3. The price per unit for payment.

C. Lump Sum Prices include:
1. All work items which will result in a functionally complete project in accordance with the specifications and drawings.

D. Earth Work Quantities
1. Bid quantities based on volume with no shrinkage factor applied.

E. Geosynthetics Quantities
1. The HDPE liner, geocomposite, and leachate collection trench geotextiles shall be measured inside the waste boundary. All material placed outside the waste boundary (within anchor trench and beyond) is incidental to the bid price.

1.2 GENERAL WORK ITEMS

A. Include with the appropriate Bid Item the following work items which are common to the Bid Items for this Section.
1. Maintenance, protection, replacement and/or repair of damaged facilities outside the area identified for payment in a separate Unit Price Item.
2. Site access requirements including temporary soil material as required for access.
3. Dust control including watering of grades.
4. Traffic control.
5. Right-of-way requirements.
6. Regulatory requirements.
7. Construction staking and other survey work not provided by Owner’s representative.
8. Location of existing anchor trench, utilities and piping.

9. Protection of existing underground piping and utilities.
10. Quality assurance and quality control (QA/QC) testing and inspections not provided by the Owner's representative.
11. All safety-related costs.
12. Attendance at weekly progress meeting.
13. Shop drawings and other submittals.
14. Removal of litter from construction area.

1.2 BID ITEMS:

A. Mobilization/Demobilization (Bid Item 1)
1. This item includes mobilization and demobilization of equipment, materials, personnel, field office, temporary facilities, and any Contractor provided temporary utilities.
2. Measurement for payment shall be made as described in SUDAS 11,020
3. The unit of measurement for payment is lump sum.

B. Source Testing (Bid Item 2)
1. The unit price for Source Testing is based on the testing performed by the contractor listed in the Pre-Construction Table of the CQA Manual 7.1.1.
2. Payment will be made once the results for all tests are delivered to the Engineer.
3. The unit of measurement for payment is lump sum.

C. Salvage and Removals (Bid Item 3)
1. The unit price for this bid item includes all work described on DWG C-07 according to SUDAS 10,010.
2. Measurement for payment will not be made.
3. The unit of measurement for payment is lump sum.

D. Common Excavation (Bid Item 4) SUDAS CLASS 5B
1. The unit price for this bid item includes excavation of Cell 5B in accordance with the Drawings, Specification and SUDAS 2010.
2. Measurement for payment will be based on field survey of the project area, as surveyed by the pre-construction topographic survey by Owner and the Contractor's licensed surveyor.
3. The unit of measurement for payment is cubic yards.

E. Haul and Place – Clay Material (Bid Items 5-10)
1. The unit price for this bid item includes hauling and placement of clay material in accordance with Drawings, Specification, CQA Manual, and SUDAS 2010.
2. Measurement for payment will be based on field survey of the Cell 5B project area, as surveyed by the pre-construction topographic survey by Owner and the Contractor's licensed surveyor.
3. The unit of measurement for payment is cubic yards.

F. 60-MIL HDPE Liner - Smooth (Bid Item 11)
1. The unit price for HDPE Liner shall include furnishing and installing HDPE Liner as required in Specification 31 35 27 and the following:

a. Conduct required quality control/quality assurance testing.
b. Complete tie-ins to existing Cell 5A HDPE liner.
c. Make repairs to the existing HDPE liner at the tie-ins to Cell 5A.

2. Measurement for payment will be based on bid quantity, which is determined by the Cell 5B waste limits.
   a. No payment will be made for material placed beyond these limits.
3. The unit of measurement for payment is square feet.

G. Geocomposite (Bid Item 12)
1. The unit price for Geocomposite Drainage Net shall include furnish and install Geocomposite Drainage Net as required in Specification 33 46 23.
2. Measurement for payment will be based on bid quantity, which is determined by the Cell 5B waste limits.
3. The unit of measurement for payment is square feet

H. 10-OZ Geotextile (Bid Item 13)
1. The unit price for Geotextile shall include furnishing and installing Geotextile as required in Specification 31 22 19.
2. Measurement for payment will be based on bid quantity.
3. The unit of measurement for payment is square feet

I. Drainage Layer – Groundwater and Leachate (Bid Items 14-17)
1. The unit price for this bid item includes loading, hauling and placement of underdrain drainage material within the groundwater and leachate drainage layers and the coarse aggregate trenches as described in the Drawings, Specification, and SUDAS 2010.
2. Measurement for payment will be based on the bid quantity.
3. The unit of measurement for payment is cubic yards.

J. Perforated Piping (Bid Items 18, 19 and 21)
1. The unit price for Groundwater and Leachate Collection Perforated Piping as described in the drawings, specification and SUDAS 4010.
2. Measurement for payment will be based on the bid quantity.
3. The unit of measurement for payment is lineal feet.

K. Solid Piping (Bid Item 20, 22-24 and 26-27)
1. The unit price for Solid Piping as described in the drawings, specification and SUDAS 4010.
2. Measurement for payment will be based on the bid quantity.
3. The unit of measurement for payment is lineal feet.

L. 4-ft Dia Stormwater Lift Station (Bid Item 25)
1. The unit price for this bid item includes all the materials, equipment, electrical service work and control panel work necessary to complete the Stormwater Lift Station as described on DWG C-16, Specifications and SUDAS 6010.
2. Measurement for payment will be based on the bid quantity.
3. The unit of measurement for payment is cubic yards.

M. Stormwater Piping (Bid Items 28-30)
1. The unit price for Storm Water Piping is as described in the drawings, specifications and SUDAS 4020.
2. Measurement for payment will be based on the bid quantity.
3. The unit of measurement for payment is lineal feet and each.

N. Stormwater Detention Basin Dams, Piping, Erosion Control and Letdowns (Bid Items 31-33 and 36-38)
1. The unit price for Stormwater Detention Basin Dams, Piping, Erosion Control and Letdowns is as described in the Drawings, Specification and SUDAS 9040.
2. Measurement for payment will be based on the bid quantity.
3. The unit of measurement for payment is tons and each.

O. Cell Access Road (Bid Items 34 and 35)
1. The unit price for the Cell Access Road is as described in the Drawings, Specification 32 15 00 and IDOT 2210 and 4120.
2. Measurement for payment will be based on the bid quantity.
3. The unit of measurement for payment is square yards.

P. Erosion Control (Bid Items 39-44)
1. The unit price for Erosion Control is as shown in the Drawings, Speciation 32 92 19 and SUDAS 9040.
2. Measurement for payment will be based on the bid quantity.
3. The unit of measurement for payment is lineal feet and acres.

Q. Temporary Liner Edge Markers (Bid Item 45)
1. The unit price for Temporary Liner Edge Markers furnishing and installing the markers at the described locations according to Detail C-14, 2.
2. Measurement for payment will be based on the bid quantity.
3. The unit of measurement for payment is each.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 26 00

CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Proposal Requests

B. Claims

C. Change Orders

D. Field Orders

1.2 MEASUREMENT AND PAYMENT

A. Measurement and Payment for this Section is detailed in 01 29 00 Payment Procedures.

1.3 RELATED SECTIONS

A. 01 26 01 CONTRACT CHANGE FORM INSTRUCTIONS

B. 00 63 61 FIELD ORDER FORM

C. 00 63 62 CHANGE ORDER FORM

D. 00 72 00 GENERAL CONDITIONS

E. 01 33 00 SUBMITTALS

1.4 PROPOSAL REQUESTS

A. OWNER or ENGINEER may, in anticipation of ordering an addition, deletion, or revision to the Work, request CONTRACTOR to prepare a detailed proposal of cost and times to perform contemplated change.

B. Proposal request will include reference number for tracking purposes and detailed description of and reason for proposed change, and such additional information as appropriate and as may be required for CONTRACTOR to accurately estimate cost and time impact on Project.

C. Proposal request is for information only; CONTRACTOR is neither authorized to execute proposed change nor to stop Work in progress as result of such request.

D. CONTRACTOR’S written proposal shall be transmitted to ENGINEER promptly, but not later than 14 days after CONTRACTOR’S receipt of OWNER’S written request.

Proposal shall remain firm for a maximum period of 45 days after receipt by ENGINEER.

E. OWNER'S request for proposal or CONTRACTOR'S failure to submit such proposal within the required time period will not justify a Claim for an adjustment in Contract Price or Contract Times (or Milestones.)

1.5 CLAIMS

A. Refer to Section 00 72 00 GENERAL CONDITIONS, Article 12 –Claims.

1.6 CHANGE ORDERS

A. Refer to the Section 01 26 01 CONTRACT CHANGE FORM INSTRUCTIONS and 00 72 00 GENERAL CONDITIONS and Article 11 – Changes to the Contract

PART 2 - PRODUCTS

2.1 FIELD ORDER FORM

A. See 00 63 61 FIELD ORDER FORM

2.2 CHANGE ORDER FORM

A. See 00 63 62 CHANGE ORDER FORM

PART 3 - EXECUTION (Not Used)

END OF SECTION

SPECIFICATION 01 26 01

CONTRACT CHANGE FORM INSTRUCTIONS

PART 1 - GENERAL INFORMATION

1.1 CHANGE ORDER FORM

A. The Change Order Form was developed to provide a uniform format for handling contract changes that affect Contract Price and/or Contract Time (schedule). Changes that have been initiated by a Work Directive Change must be incorporated into a subsequent Change Order if they affect Price or Time (schedule).

B. Changes that affect Contract Price or Contract Time (schedule) should be promptly addressed by a Change Order. The practice of accumulating change order items to reduce the administrative burden may lead to unnecessary disputes.

C. For supplemental instructions and minor changes not involving a change in the Contract Price or Contract Time (schedule), a Field Order may be used.

D. Completing The Change Order Form:
   1. ENGINEER initiates the form, including a description of the changes involved with attachments that clarify change. If a change only applies to price, or to time (schedule), cross out the part of the tabulation that does not apply.
   2. ENGINEER sends three signed copies of Change Order Form to CONTRACTOR for Contractor Approved By signature and Date.
   3. CONTRACTOR should send 3 signed copies of the form to the OWNER for Owner Approved By signature and Date.
   4. Finally, OWNER should distribute one executed copy of the Change Order Form signed and dated by ENGINEER, CONTRACTOR, and OWNER to ENGINEER and CONTRACTOR. The third signed copy should be kept by OWNER for its files.

1.2 FIELD ORDER FORM

A. Field Order Form is completed by on-site Project Representative or ENGINEER based on discussions with CONTRACTOR, ENGINEER or OWNER.

B. Field Orders will only be issued for work agreed upon by the OWNER, ENGINEER, and CONTRACTOR as no-cost changes, no-schedule changes to the Contract.

C. ENGINEER will issue Field Orders, with e-mailed electronic copy followed by hard copy to Contractor if requested.

D. Effective date of the Field Order shall be the date of signature by ENGINEER, unless otherwise indicated thereon.

E. CONTRACTOR shall acknowledge receipt by signing and returning one copy to ENGINEER.

PART 2 - PRODUCTS (Not used)

PART 3 - EXECTUION (Not used)

END OF SECTION

SECTION 01 29 00

PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Application for Payment

B. Determining Payment

C. Owner's Right to Change Quantitites

D. Measurement of Quantities

E. Survey

1.2 RELATED SECTIONS

A. 01 22 00 UNIT PRICE MEASUREMENT & PAYMENT

B. 01 26 00 CONTRACT MODIFICATION PROCEDURES

1.3 FORMAT AND CONTENT

A. Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each specification section.

B. Include the following project identification on the Schedule of Values:
1. Project name and location: Phase 5B Cell Construction at the Cedar Rapids Linn County Solid Waste Agency Site # 2 Landfill
2. Name of Engineer: Foth Infrastructure & Environment, LLC
c/o Chris Oelkers (Chris.Oelkers@foth.com)
3. Engineer's project number:
4. Contractor's name and address:
5. Date of submittal:

C. Arrange the Schedule of Values per specification section with the following subdivisions, description of work and dollar values for each:
1. Subcontractor work.
2. Manufacturer or fabricator.
3. Supplier.
4. Contractor work.

D. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports.

E. Round amounts to nearest whole dollar; total shall equal the Contract Sum.

F. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.

G. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

H. Provide a separate line item in the Schedule of Values for each allowance. Show line item value of unit cost allowances as a product of the unit cost multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.

I. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

J. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense at Contractor's option.

1.4 APPLICATION FOR PAYMENT

A. The CONTRACTOR will submit no more than one Application for Payment per month or at the completion of the work.

B. The CONTRACTOR will submit one copy of each Application for Payment to the OWNER and one copy to the ENGINEER.

C. The CONTRACTOR will use the APPLICATION FOR PAYMENT presented in 01 29 01 APPLICATION FOR PAYMENT to list items and quantities in each Application for Payment.

D. The Application for Payment will include documentation for all measurements requested by ENGINEER.

1.5 DETERMINING PAYMENT

A. Payments will be made according to the quantities submitted by the CONTRACTOR and approved by OWNER at the prices stated on the Proposal Form.

B. The CONTRACTOR will measure all quantities as described herein for each pay item. The quantities will be verified by the ENGINEER and OWNER prior to approval for payment.

C. The CONTRACTOR will provide all personnel, equipment, and documentation necessary for measurement of quantities.

D. Estimated quantities shown on the Proposal Form are for Proposal preparation and contract solicitation purposes only. Payment will be determined by actual quantities

and measurements as submitted by the CONTRACTOR and approved by the OWNER.

E. The CONTRACTOR will only be paid for the actual quantities completed multiplied by the Unit Price provided by the CONTRACTOR on the Proposal Form.

F. PAYMENT WILL NOT BE MADE FOR THE FOLLOWING:
1. Any material delivered to the site, but not used.
2. Products wasted or disposed of in a manner inconsistent with the Contract Documents.
3. Additional work undertaken to correct problems or mistakes or clean up spills caused by the CONTRACTOR's work. Any spill of materials caused by the CONTRACTOR will be managed entirely at the CONTRACTOR's expense.
4. Any work or material that is not described in the Contract Documents or not pre-approved by the OWNER.
5. Additional work undertaken at the discretion of the CONTRACTOR that is not described in these Contract Documents.

1.6 OWNERS RIGHT TO CHANGE QUANTITIES

A. OWNER reserves the right to instruct the CONTRACTOR to not conduct Work related to individual pay items included on the Proposal Form.

B. OWNER reserves the right to increase or decrease by Change Order or other method specified in the Contract Documents, without limit, any of the quantities of construction, for which a unit price is specified, without any changes in the unit prices proposed by CONTRACTOR.

1.7 PROGRESS PAYMENT SCHEDULE

A. Contractor shall submit a complete Application for Payment to Owner and Engineer no later than the first calendar day of each month.

B. Unless otherwise agreed, the payment period shall end on the final day of the preceding month.

C. Contractor shall provide all measurements, testing documentation, lien waivers, and other required supporting information with the Application for Payment. An incomplete Application may be carried forward to the following payment cycle.

D. Owner and Engineer intend to finalize the reviewed Application for Payment by the first Thursday following the first Tuesday of each month.

E. The finalized Application for Payment will be presented to the Agency Board at its regular meeting on the third Tuesday of the month. Payment is subject to Board approval and the payment provisions of the Contract Documents.

1.8 FREQUENCY

A. Contractor shall submit no more than one Application for Payment each month.Requests for progress payments shall be at least 10 days before the date established for each progress payment, but not more often than once a month.

1.9 Use forms provided by Engineer for applications for payment. Sample copy of the Application for Payment and Continuation Sheet is included in section "Contractor's Application for Payment".

1.10 Application Preparation Procedures

A. When requested by the Contractor, the Engineer will determine the actual quantities and classifications of Unit Price Work performed.
1. Preliminary determinations will be reviewed with the Contractor before completing Application for Payment.
2. Engineer will complete the Application for Payment based on Engineer's decision on actual quantities and classifications.
3. Engineer will submit three (3) original copies of Application for Payment to Contractor for certification of all three (3) original copies.
4. Contractor shall submit signed Application for payment to Owner for approval within time frame agreed to at the Preconstruction Conference.

B. For a lump sum price contract, the Contractor shall prepare a preliminary determination for payment based on the approved Schedule of Values and review with Engineer before completing Application for Payment.
1. Submit all three (3) original signed copies of Application for Payment to Engineer with signed certification within time frame agreed to at the Preconstruction Conference.
2. Engineer will submit all three (3) original copies of the Application for Payment with recommendation to Owner.

C. If payment is requested for materials and equipment not incorporated in the Work, then the following shall be submitted with the Application for Payment:
1. Evidence that materials and equipment are suitably stored at the site or at another location agreed to in writing.
2. A bill of sale, invoice, or other documentation warranting that the materials and equipment are free and clear of all liens.
3. Evidence that the materials and equipment are covered by property insurance.

D. If payment is requested for work completed under Allowances, then the follow the procedures noted under 3.b. of this section.

E. Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor.

1.11 With each Application for Payment, submit waivers of liens from subcontractors and suppliers for the construction period covered by the previous application.

A. Submit partial waivers on each item for amount requested before deduction for retainage on each item.

B. When an application shows completion for an item, submit final or full waivers.

C. Owner reserves the right to designate which entities involved in the Work shall submit waivers.

D. Submit final Application for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application.

E. Submit waivers of lien on forms executed in a manner acceptable to Owner.

1.12 The following administrative actions and submittals shall precede or coincide with submittal of first Application for Payment:

A. List of subcontractors.

B. Schedule of Values.

C. Contractor's construction schedule.

D. Copies of building and other permits.

E. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.

1.13 Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted including, but not limited, to the following:

A. Evidence of completion of Project closeout requirements.

B. Insurance certificates for products and completed operations where required and proof that taxes, fees and similar obligations were paid.

C. Updated final statement, accounting for final changes to the Contract Sum.

D. Consent of Surety to Final Payment.

E. Final lien waivers as evidence that claims have been settled.

F. Contractor, subcontractors and suppliers notarized State of Iowa Department of Revenue Form 35-002 documenting Sales or Use Taxes paid on all materials incorporated into this project.

G. Final liquidated damages settlement statement.

PART 2 - MEASUREMENT OF QUANTITIES

2.1 DEFINITIONS

A. Planimetric measurement: shall be defined by distances and areas measured on two-dimensional (2D) layouts without considering vertical or elevation (3D) dimensions to

provide ENGINEER and CONTRACTOR direct estimating, measurement, payment and documentation on the provided Contract Drawings to estimate and document work for payment.

B. 3D measurement: shall be defined as distance and areas measured with vertical or elevation information included using geodetic global positioning system (GPS) survey, tape measure of actual maximum length, measuring wheel along surfaces and distances, or other device that directly measure pay items as described and calculable by field personnel, or computer-aided drafting and design (CADD), depending on the device used to collect the data.

2.2 MEASUREMENT BY VOLUME/WEIGHT

A. [CY(P)]: This unit indicates "Plan" quantities will be used to measure cubic yards of material placed for payment. Plan quantities will be calculated by multiplying the plan thickness/cross-sectional dimension of a material shown on the Contract Drawings by the 2D planimetric horizontal area or vertical length as measured in the field unless otherwise specified.
   1. No "fluff factors" will be used to calculate CY(P) volumes for payment.

B. [CY]: This unit indicates cubic yards of material borrowed from existing stockpiles, or stockpiled, or borrow areas, or excavated for grading, or placed as embankment, will be used to calculate quantities for payment. The stockpile, borrow area, or area designated for excavation or embankment will be surveyed by OWNER before material is removed, after stripping topsoil if present, and again immediately after use is complete. Cross sectional surveys used to calculate quantities shall be completed on a minimum 50-foot grid and breaks in grade.
   1. Where CY(P) volumes are present in a survey comparison of surfaces, they shall be subtracted from the total estimate for payment elsewhere.
   2. No "fluff factors", or truck load counts, or pre-compaction surveys, will be used to calculate volumes for payment.

C. [CY(LT)]: This unit indicates actual Truck Load tickets will be used to measure material placed for payment. The quantities will be based upon the actual volume of material used to complete the work as shown on the Contract Drawings. The load tickets shall be easily readable, tabulated and provided by the CONTRACTOR. Each Load Ticket shall clearly indicate the project name, CONTRACTOR, Date, and Volume in Cubic Yards. Load tickets not clearly providing requested information will be rejected. The ENGINEER reserves the right to discuss load ticket volumes and/or information regarding the material from the supplier.

D. [T]: This unit indicates actual Tonnage from Truck Load tickets, or Scalehouse measurement by OWNER, will be used to measure material for payment. The quantities will be based upon the actual tonnage of material to complete the work as shown on the Contract Drawings. The load tickets shall be easily readable, tabulated and provided by the CONTRACTOR. Each Load Ticket shall clearly indicate the project name, CONTRACTOR, Date, and Weight. Load tickets not clearly providing requested information will be rejected. The ENGINEER reserves the right to weigh Trucks at OWNER's scalehouse to verify +/- 1% calibration with delivered loads.

2.3 MEASUREMENT BY AREA

A. [ACRE]: This unit indicates payment for Work shall be made based on acres of area measured. The "area measured" for each item is defined in 01 22 00 UNIT PRICE MEASUREMENT & PAYMENT. Measurements will be made using standard survey or commercial Global Positioning System methods rounded to the nearest 0.01 acre for payment using the 2D planimetric area unless otherwise specified.

B. [SF]: This unit indicates payment for Work shall be made based on square feet of area measured. The "area measured" for each pay item is defined in in 01 22 00 UNIT PRICE MEASUREMENT & PAYMENT. Measurements will be made using standard survey methods, or tape measure, or commercial GPS to measure distances between staked corners. Areas will be calculated to the nearest whole square foot for payment using the 2D planimetric area unless otherwise specified.

2.4 MEASUREMENT BY LENGTH

A. [LF]: This unit indicates payment for Work shall be made based on linear feet measured. Linear feet measured for payment shall be the longest dimension of the work performed or material placed. Measurement shall be made in the field using a tape measure or professional grade survey with recorded results to determine quantity for payment rounded to the nearest whole foot using the 2D planimetric distance unless otherwise specified.

B. [VF]: This unit indicates payment for Work shall be made based on vertical feet measured. Vertical feet measured for payment shall be the longest dimension of the work performed or material placed perpendicular to a level line at the point of measurement. Measurement shall be made in the field using a tape measure to determine quantity for payment rounded to the nearest 0.1 of a foot.

2.5 MEASUREMENT BY INDIVIDUAL PAY ITEMS

A. [LS]: This unit indicates payment shall be on a lump sum basis. Lump sum measurements shall be one unit for the item listed on the Proposal Form and include all work defined in the Contract Documents for that item. Progress payment for LS Work may be measured according to schedules defined in 01 22 00 00 UNIT PRICE MEASUREMENT & PAYMENT for individual pay items.

B. [EA]: This unit indicates payment shall be made based on each item completed as defined in these Specifications for that item. Payment for items measured as each shall include all labor and materials required to complete the item according to the Contract Documents.

C. [HR]: This unit indicates payment shall be made based on the number of hours required to complete the item as defined in these Specifications. Measurements will be rounded to the nearest half-hour.

PART 3 - EXECUTION

3.1 SURVEY

A. Contractor may conduct its own survey(s) for payment at its own expense according to 01 22 00 UNIT PRICE MEASUREMENT & PAYMENT.

B. CONTRACTOR must give OWNER a minimum of three days' notice to complete surveys before using material from on-site borrow areas and before completing additional work in such an area so OWNER may complete contract survey.

END OF SECTION

SECTION 01 29 01

APPLICATION FOR PAYMENT

MUNICIPAL SOLID WASTE CELL 5B AT
CEDAR RAPIDS/LINN COUNTY SOLID WASTE AGENCY
COUNTY PROJECT: DNA

[INSERT AFTER APPROVED ENGINEERS ESTIMATE]

SECTION 01 31 00

PROJECT MANAGEMENT

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Project Management Personnel

B. Meetings

C. Reporting

1.2 MEASUREMENT AND PAYMENT

A. Measurement and Payment for this Section is to be included as part of MOBILIZATION, PROJECT MANAGEMENT AND SUBMITTALS.

B. No additional compensation will be made to meet requirements of this section, even if not specifically defined as part of the Work elsewhere in this Proposal.

1.3 RELATED SECTIONS

A. 01 11 00 SUMMARY OF WORK AND SCHEDULE

B. 01 14 00 WORK RESTRICTIONS

C. 01 42 00 MOBILIZATION

D. 01 33 00 SUBMITTALS

E. 01 35 43 HEALTH, SAFETY, AND EMERGENCY RESPONSE

1.4 PROJECT MANAGEMENT PERSONNEL

A. Construction Superintendent (Foreman): The CONTRACTOR will designate an experienced Construction Superintendent, approved by the OWNER, to act as its representative on-site during construction activities. The Construction Superintendent will be directly responsible for supervising the day-to-day progress of the work, documenting the work, meeting with ENGINEER and representatives of the OWNER, completing project reporting, and ensuring that all work is completed in accordance with the Contract Documents and all applicable laws and regulations. The Construction Superintendent, or an alternate employee of CONTRACTOR approved by the OWNER, will be on the site as needed to coordinate all construction activities, and provide signed daily, or weekly, progress reports required for payment.

B. Resident Project Representative: The ENGINEER will designate a Resident Project Representative to be on the site at all times to document the work, ensure that the work

is performed in accordance with the Contract Documents, verify measurements for payment, and work with the CONTRACTOR to resolve construction issues. Resident Project Representative may execute Field Orders with ENGINEER's verbal authorization.

C. Site Health and Safety Officer: The CONTRACTOR will designate a Site Health and Safety Officer to ensure that all work at the site is performed in accordance with the provisions of Section 01 35 29, and all applicable state and federal laws and regulations. The Site Health and Safety Officer, or an alternate approved by the OWNER, will always be on the site during the work. The Site Health and Safety Officer will be familiar with the requirements of 29 CFR 1904, 1910, and 1926. One person may assume the roles of Construction Superintendent and Site Health and Safety Officer.

1.5 MEETINGS

A. Pre-Construction Meeting will be held at or near the site prior to beginning the work to discuss the Contract Documents, review the Site-Specific Health and Safety Plan, and resolve any remaining design, construction, or schedule issues. At a minimum, this meeting will be attended by the CONTRACTOR's Construction Superintendent, Site Health and Safety Officer, OWNER, and ENGINEER.

B. Weekly Health and Safety Meeting will be conducted during active construction periods to discuss site activities and potential hazards. The Construction Superintendent, all CONTRACTOR personnel on-site, Landfill Operations Manager or OWNER representative, and Engineer's on-site Representative will attend. Topics of discussion should be identified by anyone present at the beginning of the meeting as it relates to the work, and to address remedies that may apply.
   1. Daily Meetings: The Resident Project Representative and Construction Superintendent will communicate daily to address work in progress on that day, estimate actual quantities of pay items, and to resolve construction and/or schedule issues.

C. Weekly Progress Meeting
   1. A Weekly Progress Meeting shall be attended by CONTRACTOR, OWNER, and ENGINEER, or representatives thereof, to assess progress of the Work. The meetings shall be held regularly each week throughout the duration of the project, unless otherwise specified by the OWNER. At each progress meeting, the CONTRACTOR shall describe the following:
      a. Work performed that week.
      b. Labor and equipment used that week.
      c. Descriptions of problems or delays encountered that week and how such problems or delays were resolved.
      d. Descriptions of upcoming activities and current schedule.
      e. Review of pending submittals

D. Contract Schedule & Payment Meetings
   1. A Substantial Completion meeting shall be conducted on-site prior to request for payment of related Work. It shall be attended by CONTRACTOR, OWNER, and

ENGINEER to verify that the Work is substantially complete and define the schedule for work that needs to be done for completion.

2. A Final Payment meeting shall be conducted on-site prior to request for final payment. It shall be attended by CONTRACTOR, OWNER, and ENGINEER to verify that the Work is complete, and CONTRACTOR shall provide a signed Certificate of Final Acceptance Form with Final Pay Request.

E. The Construction Superintendent and other CONTRACTOR personnel will be available at reasonable times to meet to discuss the progress of work and to resolve issues as required.

F. The Resident Project Representative will call meetings, as determined necessary by the ENGINEER, to ensure that the CONTRACTOR is performing the work according to the appropriate laws and regulations and these Contract Documents.

1.6 REPORTING

A. Daily Construction Report Form
1. Construction Superintendent will complete a Daily Construction Report Form by the end of each work day and submit a copy to the Resident Project Representative for review and verification. A Daily Construction Report Form that may be used for this purpose is provided in 01 32 00 DAILY CONSTRUCTION REPORT FORM.
2. The Report shall include any measurement of quantities for pay items to be submitted for pay requests.
3. Report shall include any CONTRACTOR testing of materials and products.

B. Construction Certification Report
1. Within 30 days of substantial completion of work, the CONTRACTOR will submit a Construction Certification Report to the OWNER and ENGINEER.
2. The report will indicate the extent to which the work was completed according to the Contract Documents.
3. It will include any contractor submittals and engineering certifications required by the Proposal. See Section 01 33 00 SUBMITTALS for additional information.

PART 2 - (Not used)

PART 3 - (Not used)

SECTION 01 31 19

PROJECT MEETINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for project meetings including, but not limited to, the following:
   1. Preconstruction conferences.
   2. Progress meetings
   3. Preinstallation conferences.

1.2 PRECONSTRUCTION CONFERENCE

A. Engineer will schedule a preconstruction conference within 20 days after the Contract Times start to run and before Work at the site is started.

B. Authorized representatives of the Owner; Engineer; the Contractor and its superintendent; major subcontractors; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with the Project and authorized to make binding decisions of matters relating to the Work.

C. The purpose of the Preconstruction Conference is to:
   1. Establish a working understanding among the parties as to the Work.
   2. Discuss the following preliminary schedules prepared by the Contractor.
      a. Progress schedule.
      b. Shop drawing and sample submittals.
      c. Schedule of values for all Work.
   3. Processing Applications for Payment.
   4. Maintaining required records.
   5. Other Project requirements.

1.3 PROGRESS MEETINGS

A. Progress meetings at the Project site will be scheduled by the Engineer at regular intervals.

B. In addition to representatives of the Owner, the Engineer and the Contractor, each subcontractor, supplier, or other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with the Project and authorized to make binding decisions on matters relating to the Work.

C. Items of significance will be reviewed that could affect progress.
   1. Review progress since the last meeting. Determine where each activity is in relation to the Contractor’s construction schedule, whether on time or ahead or

behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether scheduled revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

2. Review the present and future needs of each entity present, including the following:
   a. Interface requirements.
   b. Time.
   c. Sequences.
   d. Status of submittals.
   e. Deliveries.
   f. Off-site fabrication problems.
   g. Access.
   h. Site utilization.
   i. Temporary facilities and services.
   j. Hours of work.
   k. Hazards and risks.
   l. Housekeeping.
   m. Quality and work standards.
   n. Change orders.
   o. Documentation of information for payment requests.

D. Revise the construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue the revised schedule within five (5) days after each meeting.

1.4 PREINSTALLATION CONFERENCES

A. Conduct a preinstallation conference at the Project site prior to construction activity that requires coordination with other construction. This project would entail a preinstallation conference prior to the installation of the geomembrane cover. Depending on Contractor schedule, this may be combined with the Preconstruction Conference.

B. The installer and representatives of manufacturers and fabricators involved in or affected by the installation, and its coordination or integration with other materials and installations that have preceded or will follow shall attend the meeting. Advise the Engineer of scheduled meeting dates.

1. Review the progress of other construction activities and preparations for the particular activity under consideration at each preinstallation conference, including requirements for the following:
   a. Contract Documents.
   b. Options.
   c. Related Change Orders.
   d. Purchases.
   e. Deliveries.
   f. Shop drawings, product data, and quality control samples.
   g. Review of mockups.
   h. Possible conflicts.

i. Compatibility problems.
j. Time schedules.
k. Weather limitations.
l. Manufacturer's recommendations.
m. Warranty requirements.
n. Compatibility of materials.
o. Acceptability of substrates.
p. Temporary facilities.
q. Space and access limitations.
r. Governing regulations.
s. Inspecting and testing requirements.
t. Required performance results.
u. Recording requirements.
v. Protection.

2. Record significant discussions and agreements and disagreements of each conference and the approved schedule. Promptly distribute the record of the meeting to everyone concerned including the Owner and the Engineer.
3. Do not proceed with the installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of Work and reconvene the conference at the earliest feasible date.

PART 2 - PRODUCTS (Not used)

PART 3 - EXECUTION (Not used)

END OF SECTION

SECTION 01 33 00

SUBMITTALS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Submittals

B. Construction Progress Schedules

C. Geomembrane Submittals

D. Off-Site Material Testing Submittals

E. Pipe Construction Submittals

F. Signage Construction Submittals

G. Project specific SWPPP Submittal

H. Stormwater and Erosion Control Product Submittals

I. Signage Product Submittals

J. Swing Gate Fence Submittals

K. Construction Survey Data Submittals

L. Site Access Keys

M. Contractor’s Responsibilities

N. Engineer’s Action on Submittals

O. Submittal Instructions

1.2 MEASUREMENT AND PAYMENT

A. Measurement and Payment for this Section is included in MOBILIZATION, PROJECT MANAGEMENT AND SUBMITTALS, or other line items required to perform the Work.

B. Partial payment for this Work may be made as defined in 01 22 00 UNIT PRICE MEASUREMENT AND PAYMENT.

C. No additional compensation will be made to meet requirements of this section, even if not specifically defined as part of the Work elsewhere in this Proposal.

D. Approval for individual pay items require approved submittals as listed below.

1.3 RELATED SECTIONS

A. 01 31 00 PROJECT MANAGEMENT

B. 01 77 00 CLOSEOUT PROCEDURES

1.4 SUBMITTALS

A. Proof of Insurance with OWNER and ENGINEER additionally insured

B. Construction Progress Schedules & Daily Reporting

C. Clay Borrow Area Excavation & Restoration Plan – NOT USED

D. Geomembrane Submittals

E. Off-Site Soil Material Testing Results

F. Pipe Installation Survey Record

G. Construction Survey Data
1. Clay Liner Subgrade
2. Top of Groundwater Drainage Layer
3. Geomembrane Subgrade
4. Lines and Grades of stormwater controls
5. Drain Tile
6. Top of Final Cover
7. Final Conditions, including road and location of installed infrastructure (signs, road, fencing gate)

H. CONTRACTOR Construction Certification Report (01 31 00 PROJECT MANAGEMENT)

I. Contractor's Certification of Final Acceptance Form

PART 2 - PRODUCTS

A. CONTRACTOR shall provide submittals specified in this Proposal

B. Although the list below is prepared from the proposed Work, it is non-exhaustive of required submittals listed elsewhere in the Contract Documents.

2.2 CONSTRUCTION PROGRESS SCHEDULES

A. Prepare and submit Construction Progress Schedule in accordance with General Conditions.

B. Schedule Revisions:
1. Every 2 weeks to reflect changes in progress of Work.
2. Indicate progress of each activity at date of submittal.
3. Show changes occurring since previous submittal of schedule.
4. Major changes in scope (i.e., Change Order).
5. Activities modified since previous submittal.
6. Revised projections of progress and completion.
7. Other identifiable changes (i.e., Field Orders).

2.3 Provide DAILY narrative report:

A. Use 01 32 00 DAILY CONSTRUCTION REPORT FORM and:
1. Identify problem areas, anticipated delays, and impacts on schedule.
2. Detail any corrective action recommended and its effect.
3. Detail effect of changes on schedule of other CONTRACTORs if any.

2.4 GEOMEMBRANE SUBMITTALS

A. The following submittal shall be provided to and approved by ENGINEER prior to delivery of geomembrane to the Site or mobilization of the geomembrane installer's crew or equipment:
1. CONTRACTOR shall supply information from the resin manufacturer regarding the resin type, properties as specified in the Specifications, and production dates of the resin used for this project. The resin type identification shall include the cell classification of the resin in accordance with the requirements of the latest Geosynthetic Research Institute (GRI) specification GM13 or GM 17.
2. CONTRACTOR shall submit from the geomembrane sheet manufacturer test methods and results defining physical characteristics of the geomembrane to be used for this project. Test results representative of each roll of geomembrane furnished for this project shall be submitted, and test results shall be reported with corresponding roll identification numbers.
3. CONTRACTOR shall supply a statement of the geomembrane manufacturer's quality control procedures, indication of any resin admixtures, frequency of sampling, methods of material transportation and storage, and acceptance criteria for roll goods delivered to the Site.
4. CONTRACTOR shall provide submittals describing the geomembrane sheet manufacturer's details of any factory seaming process proposed. Test results which may not be available prior to construction (i.e., environmental stress crack) shall be presented as preliminary prior to construction with final test results submitted within 75 days of the Notice to Proceed.

B. CONTRACTOR shall submit from the geomembrane installer each of the following:
1. A proposed panel and seam layout diagram specifying the type and location of all field and factory seams. The layout diagram shall be to scale and used as a construction plan and shall include all necessary dimensions and details. The layout diagram shall be compatible with the seam layout requirements specified in the specifications.
2. An installation schedule.

3. A list of all personnel performing field supervision, seaming supervision, and quality control, along with experience records and resumes.
4. A list of equipment types proposed to be used in panel layout, membrane seaming, and destructive and nondestructive testing.
5. Quality control certificates indicating resin type, properties as specified in these Specifications, and production dates shall be provided with each shipment of extrudate rods delivered to the Site.

C. The Certificate of Geomembrane Subgrade Acceptance Form in SECTION 00 62 02 CERTIFICATE OF GEOMEMBRANE ACCEPTANCE in accordance with these Specifications.

D. Following installation of geomembrane, CONTRACTOR shall submit the following:
1. Panel layout Record Drawing, indicating all panel numbers, seam locations, patch locations, and destructive test locations. The diagram shall be to scale.
2. Daily pre-weld testing forms, destructive testing forms, daily progress reports.
3. Independent Test Lab Destructive Test Results
4. A 5-year material and 1-year workmanship warranty.

2.5 OFF-SITE SOIL MATERIAL TESTING SUBMITTALS

A. The CONTRACTOR shall bear all costs of retesting as a result of failed tests completed and shall be performed by the same independent firm used by OWNER or ENGINEER, unless otherwise directed or approved by ENGINEER.

B. Clay Liner: Source Testing as outlined in the CQA Manual

C. Granular Drainage Material: Source Testing as outlined in the CQA Manual

2.6 PIPE CONSTRUCTION SUBMITTALS

A. CONTRACTOR shall submit furnished pipe construction material information to ENGINEER, before delivery to site including manufacturer’s name, pipe class, dimensions, and specifications.

B. CONTRACTOR shall submit survey information required to ENGINEER before backfilling any pipe which includes Plan Sheet (landfill) site coordinates and invert elevations at flow-lines of aprons, manholes, and pipe at 100-foot intervals, starts, ends and bends.

2.7 CONSTRUCTION SURVEY DATA SUBMITTALS

A. CONTRACTOR shall submit the following, as applicable, survey data in Plan Sheet (landfill) Coordinates with accompanying dates to ENGINEER in a format usable by major Computer Aided Drafting & Design (CADD) programs under the direction of an Iowa Registered Land Surveyor.

B. As-built Information for all installed markers and posts including feature information, horizontal and vertical locations.

C. Project area features such as:
   1. Existing tie-ins
   2. Future tie-ins
   3. Marker posts (eg, landfill gas trenches)
   4. Liner trench edge
   5. Leachate Pipe Construction Information including feature information, horizontal and vertical invert locations, including, but not limited to, the following features:
      a. Lysimeter pipes
      b. Cleanout and vacuum pipes
      c. Perforated collection pipes
      d. Pump access pipe
      e. Transfer pipes
      f. Gas vent route, riser pipe, termination and stub locations
   6. Ditchlines at 25-foot intervals and at any invert elevations for stormwater pipes, convergence points and tie-in lines at lowest point of ditches and berms
   7. Drain Pipe Construction information, horizontal and vertical invert locations, including, but not limited to, the following features:
      a. Perforated ADS N-12 Pipe
      b. RCP CL V
      c. HDPE DR11 & DR17 Pipe
      d. Signed marker posts
      e. Inverts at pipe intersections
      f. 50-foot intervals and change in grades
   8. As-built Information for Manholes, Vaults, and control panels including horizontal and vertical locations

2.8 SITE ACCESS KEYS

A. CONTRACTOR shall return any site access keys provided by OWNER to OWNER.

PART 3 - EXECUTION

3.1 CONTRACTOR'S RESPONSIBILITIES

A. Review data prior to submittal.

B. Determine and verify the following:
   1. Field measurements
   2. Field construction criteria
   3. Catalog numbers and similar data
   4. Conformance with Specifications

C. Coordinate each submittal with requirements of Work and Contract Documents.

D. Notify OWNER and ENGINEER in writing, at time of submittal, of deviations in submittals from requirements of Contract Documents.

E. Begin no Work requiring submittals until return of submittals with ENGINEER approval.

F. Designate in Construction Progress Schedule, dates for submittal and receipt of reviewed layout diagrams and related submittals described in this Section.

G. Submittals received but not requested in Specifications or change orders will be returned without review.

Submittals shall contain:

1. Date of submittal and dates of previous submittals
2. Project title and number
3. Contract identification
4. Names of:
   a. CONTRACTOR
   b. Supplier
5. Identification of product, with identification numbers, and Drawing and Specification section numbers
6. Field dimensions, clearly identified
7. Name of manufacturer
8. Applicable standards, such as ASTM when required
9. Identification of deviations from Contract Documents
10. Identification of revisions on resubmittals
11. 8-in. by 3-in. blank space for CONTRACTOR and ENGINEER stamps
12. CONTRACTOR's stamp, signed, certifying review of submittal, verification of products, field measurements, field construction criteria, and coordination of information within submittal with requirements of Work and Contract Documents.

Resubmittal Requirements:

1. Comply with submittal requirements.
2. Make corrections or changes in submittals required by ENGINEER.
3. Identify on transmittal form submittal is resubmission.
4. Layout diagrams and soil material data:
5. Revise initial drawings or data and resubmit as specified for initial submittal.
6. Indicate any changes made other than those requested by ENGINEER.
7. ENGINEER's responsibility for variation or revisions from previously reviewed submittal is established in Article 7.16.D of the General Conditions.

3.2 ENGINEER’S ACTION ON SUBMITTALS

A. ENGINEER's Action:

B. General:

1. Except for CONTRACTOR's submittals for record, where action and return on submittals is required or requested, ENGINEER will review each submittal, mark with appropriate action, and return. Where submittal must be held for coordination, ENGINEER will so advise CONTRACTOR without delay.

2. ENGINEER will stamp each submittal with action stamp appropriately marked with submittal action.

C. Notification of Insufficient Information:
1. If information submitted is not sufficient to complete review of submittal, ENGINEER will send transmittal to CONTRACTOR notifying CONTRACTOR that additional information is required.
2. Submittal will not be returned. Submittal will be placed in an on "hold" status until CONTRACTOR provides additional information.
a. Action Stamp:

D. Marking: Approved.
1. Final Unrestricted Release: Where submittals are marked "Approved," Work covered by submittal may proceed provided it complies with Contract Documents. Acceptance of Work depends on that compliance.

E. Marking: Approved With Noted Exceptions.
1. Final-But-Restricted Release: When submittals are marked as "Approved With Noted Exceptions," Work covered by submittal may proceed provided it complies with ENGINEER's notations or corrections on submittal and with Contract Documents. Acceptance of Work depends on that compliance. Resubmittal not required.

F. Marking: Not Approved.
1. Submittal Not Accepted. When submittals are marked as "Not Approved," do not proceed with Work covered by submittal.
2. Prepare new submittal for different material supplier or different product line.

G. Marking: Revise and Resubmit.
1. Returned for Resubmittal: When submittals are marked as "Revise and Resubmit," do not proceed with Work covered by submittal. Do not permit Work covered by submittals to be used at the Site or elsewhere where Work is in progress.
2. Revise submittal or prepare new submittal in accordance with ENGINEER's notations. Resubmit without delay. Repeat if required to obtain different action marking.
3. SUBMITTAL INSTRUCTIONS
a. Required submittals should be sent to addresses for giving Notices in the Agreement. ENGINEER copies may be given to Resident Project Representative on-site.
b. Submittals shall be emailed to ENGINEER as requested by ENGINEER and should be confirmed received after allowing ENGINEER initial response indicating that they have been received.
c. If hard copies are required or provided in the field, they shall be given to ENGINEER's project representative.
d. If having submitted documents awaiting approval and having not received formal response within five work days, CONTRACTOR shall contact ENGINEER directly to ensure timely response incase submittal was no received due to unforeseen circumstances.

END OF SECTION

SECTION 01 35 53.13

SAFETY AND ENVIRONMENTAL PROCEDURES FOR HAZARDOUS MATERIAL SITES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes
   1. Site safety and health plan
   2. Personal injury and property damage prevention
   3. Personnel organization, qualifications, and responsibilities

1.2 REFERENCES

A. Code of Federal Regulations (CFR)
   1. 29 CFR 1910 Occupational Safety and Health Standards
   2. 29 CFR 1926 Safety and Health Regulations for Construction

1.3 SUBMITTALS

A. Submit Site Safety and Health Plan, not for approval, but as evidence of compliance with State and Federal requirements.

1.4 PROJECT CONDITIONS

A. Existing Conditions
   1. Site is an active landfill receiving waste

1.5 SITE SAFETY AND HEALTH PLAN

A. Develop and implement a site safety and health plan meeting the requirements of 29 CFR 1910.120, 29 CFR 1926, and other applicable federal, state, and local regulations.

B. Prepare the plan specifically for the site and the anticipated activities based on available information on site conditions and hazards.

C. The plan shall be considered a living document, updated as conditions change during Project execution.

D. On-site work shall not begin until the plan has been prepared and implemented.

E. Include the following in the implementation portion of the plan:
   1. Monitoring for flammable atmospheres in the work area including excavations.
   2. Monitoring of atmosphere for toxic vapors.
   3. Monitoring for other hazards commonly associated with construction activities.

1.6 PERSONAL INJURY AND PROPERTY DAMAGE PREVENTION

A. Provide necessary protection to prevent damage, injury, or loss to:
   1. Persons on the Site or who may be affected by the Work;
   2. Materials and equipment to be incorporated in the Work;
   3. Other property at or adjacent to the Site, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and underground facilities not designated for removal, relocation, or replacement.

B. Comply with all applicable laws, ordinances, rules, and regulations affecting the safety of persons or property providing any necessary safeguards for such safety and protection.

C. Notify the owners of any properties or utilities that are affected by the Work.

D. The duties and responsibilities of the Contractor for the safety and environmental protection of the workers and the site shall continue until final payment is made by the Owner to the Contractor.

1.7 PERSONNEL ORGANIZATION, QUALIFICATIONS AND RESPONSIBILITIES

A. Designate the Safety Representative per the General Conditions, a Site Safety and Health Officer and at least one alternate.

B. The Site Safety and Health Officer shall:
   1. Implement and enforce the site health and safety plan.
   2. Provide hazard communication information.
   3. Be responsible for any safety environmental monitoring.
   4. Have the authority to stop work activities if unacceptable health or safety conditions exist.
   5. Coordinate and recommend corrective actions for identified health and safety deficiencies and oversee the corrective actions.

C. Training
   1. As a minimum, personnel performing duties with potential for exposure to on-site contaminants shall meet and maintain the following 29 CFR 1910.120 and 29 CFR 1926 training requirements:
      a. Forty hours of off-site health and safety training for hazardous waste.
      b. Three days actual field experience under the direct supervision of a trained, experienced supervisor.
      c. Eight hours refresher training annually.
   2. The Site Safety and Health Officer shall have an additional 8 hours management and supervisor training in accordance with 29 CFR 1910.120 and 29 CFR 1926.
   3. Submit evidence of training for personnel working near and in waste (exposing geomembrane tie-in) to Engineer prior to work beginning.

PART 2 - PRODUCTS (Not used)

PART 3 - EXECUTION (Not used)

END OF SECTION

SECTION 01 41 00

REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes
1. Underground Utilities.
2. Storm Water.
3. Property Monuments and Existing Structures.
4. Facility Permitted by IDNR.
5. Health and Safety.

1.2 UNDERGROUND UTILITIES

A. Under the provisions of Iowa Code, Chapter 480.4, all contractors, subcontractors, and any firm or individual intending to do work on this contract shall contact all utility firms in the affected area of construction a minimum of forty-eight (48) hours prior to beginning construction so that affected utilities will be located and marked. Contact Iowa One Call, 1-800-292-8989.

B. Iowa One Call may not locate utilities privately owned or operated by Owner. At least 48 hours before excavation, Contractor shall notify Owner and request identification of known private utilities within the proposed work area. Owner will identify or mark known approximate utility locations based on available information. Contractor shall not rely solely on such markings and shall verify utility locations by appropriate non-destructive methods before excavation. Contractor remains responsible for protecting existing utilities and repairing damage caused by its operations.

1.3 STORM WATER

A. Contractor shall obtain required permits from all regulatory governmental agencies governing storm water.

B. The governing agency in Iowa is:

Iowa Department of Natural Resources (IDNR)
Henry A. Wallace Building
502 E. Ninth Street
Des Moines, IA 50309-0034

C. The Cedar Rapids Linn County Solid Waste Agency Site # 2 Landfill is required to maintain an NPDES General Permit No. 1 “Stormwater Discharge Associated with Industrial Activity.” The Contractor will take necessary measures to prevent the movement of soils into adjacent waterways by establishing and maintaining adequate erosion control measures.

D. The Contractor shall comply with the stormwater requirements of the landfill’s general permit.

1.4 PROPERTY MONUMENTS AND EXISTING STRUCTURES

A. Protect iron pipe monuments or existing structures (e.g. LFG wells, monitoring wells, underground force mains) from movement.

B. The cost of replacement of any monuments or existing structures that are moved or destroyed during construction shall be the Contractor's responsibility.

C. Perpetuation of destroyed or moved monuments or existing structures shall be performed in accordance with state statutes by a registered land surveyor.

1.5 FACILITY PERMITTED BY THE IDNR

A. The Cedar Rapids Linn County Solid Waste Agency Site # 2 Landfill is permitted to operate under Iowa DNR permit number 57-SDP-01-72P. The Contractor shall not violate any conditions of the permit. A copy of the permit is available by contacting the Engineer.

1.6 HEALTH AND SAFETY

A. A site-specific Health and Safety Plan for the Contractor is required to be submitted to the Owner and Engineer prior to the start of construction.

B. The contractor is to comply with the requirements of the Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response (HAZWOPER) Standard and 29 CFR 1926.1101 Asbestos. The contractor, subcontractor, and their employees who will be working on or near the waste or are potentially exposed to landfill gas are required to have the OSHA 40-hour Health and Safety training and required to be submitted to the Owner and Engineer prior to start of construction. The Contractor must include copies of updated certificated of OSHA training for each employee working at the site required to have such training based on OSHA rules.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 43 33.13

CERTIFICATE OF ACCEPTANCE OF SOIL SUBGRADE SURFACE BY INSTALLER

INSTALLER	PROJECT
Name: _____	_____
Address: _____	_____
_____	_____
_____	_____

Authorized Representative: _____ Owner: _____
The undersigned, _____ certifies that he/she is a representative of _____, duly authorized to execute this certificate, that he/she visually inspected the subgrade surface, described as _____, and found the surface to be acceptable for installation of the geomembrane.
Estimated Area Accepted: _____ square feet.

This document only applies to the acceptability of surface conditions for installation of geosynthetic products. The installer does not accept responsibility for compaction, elevation or moisture content, nor for the surface maintenance during deployment. Structural integrity of the subgrade and maintenance of these conditions are the responsibility of the Contractor.

Date: _____ Signature: _____
Name: _____
Title: _____
Company: Foth Infrastructure & Environment, LLC

Certificate Received by Inspector:

Date: _____ Signature: _____
Name: _____
Title: _____

END OF SECTION

SECTION 01 45 00

QUALITY CONTROL

PART 1 - GENERAL

1.1 REFERENCES

A. ASTM International (ASTM):

1.	ASTM C88	Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate – NOT USED
2.	ASTM C535	Standard Test Method for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine– NOT USED
3.	ASTM D7928	Standard Test Method for Particle-Size Distribution (Gradation) of Fine-Grained Soils Using the Sedimentation (Hydrometer) Analysis– NOT USED
4.	ASTM D6913	Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis
5.	ASTM D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 feet pound force per cubic foot [ft-lbf/ft^3]) (600 kilonewton-meters per cubic meters [kN-m/m^3])
6.	ASTM D2216	Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock
7.	ASTM D2434	Standard Test Method for Permeability of Granular Soils (Constant Head)
8.	ASTM D2435	Standard Test Methods for One-Dimensional Consolidation Properties of Soils Using Incremental Loading
9.	ASTM D2487	Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System)
10.	ASTM D2488	Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)
11.	ASTM D4318	Standard Test Methods for Liquid, Limit, Plastic Limit, and Plasticity Index of Soils– NOT USED
12.	ASTM D5084	Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter
13.	ASTM D6938	Standard Test Method for In-place Density and Water Content of Soil and Soil Aggregate by Nuclear Methods (Shallow Depth)

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for quality-control services.

B. Quality-control services include inspections, tests, and related actions, including reports performed by Owner's Representative, by independent agencies, and by

governing authorities. They do not include contract enforcement activities performed by Engineer.

C. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with Contract Document requirements. Testing of imported materials not provided by the Owner (e.g., sand, gravel, etc.) prior to delivery shall be the responsibility of the Contractor.

D. Requirements of this Section relate to customized fabrication and installation procedures, not production of standard products.
   1. Specific quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
   2. Specified inspections, tests, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with Contract Document requirements.
   3. Requirements for Contractor to provide quality-control services required by Engineer. Owner, or authorities having jurisdiction, are not limited to provisions of this section.

E. Vertical Tolerances
   1. Material thickness for the sand drainage layer and stone fingers shall have 0.1-foot thickness tolerance above the specified thickness (required thickness is 1.0 foot), and zero thickness tolerance below the specified thickness.

F. Laboratory Testing and Material Specification – See the CQA Manual.

1.3 RESPONSIBILITIES

A. Contractor Responsibilities
Unless otherwise indicated as the responsibility of another identified entity, Contractor shall provide inspections, tests, and other quality-control and qualification testing services specified here and elsewhere in the Contract Documents. Costs for these services are the responsibility of the Contractor and shall be included in the Contract Sum. Contractor shall provide Engineer with source and QAQC testing data. Contractor shall provide access to Owner's representative to construction area for the observation of sample collection and testing performed by the Contractor. Contractor shall assist in any sampling procedures that may require heavy equipment.

B. Owner's Representative's Responsibilities
Unless otherwise indicated as the responsibility of another identified entity, Owner's representative shall provide inspections, review testing results, and other quality-control and verification testing services specified here and elsewhere in the Contract Documents.

C. Retesting
The Contractor is responsible for retesting fees required due to failed permeability

testing where results of inspections, tests, or other quality-control services prove unsatisfactory and indicate noncompliance with Contract Document requirements, regardless of whether the original test was Contractor's responsibility.

1. The cost of retesting construction, revised or replaced by the Contractor, is the Contractor's responsibility where required tests performed on original construction indicated noncompliance with Contract Document requirements.

D. Associated Services

Cooperate with agencies performing required inspections, tests, and similar services, and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include, but are not limited to, the following:

1. Provide access to the Work.
2. Furnish incidental labor and facilities necessary to facilitate inspections and tests.
3. Take adequate quantities of representative samples of materials that require testing or assist the agency in taking samples.
4. Provide facilities for storage and curing of test samples.
5. Provide the agency with a preliminary design mix proposed for use for materials mixes that require control by the testing agency.
6. Provide security and protection of samples and test equipment at the Project Site.

E. Duties of the Testing Agency

The independent agency engaged to perform inspections, sampling, and testing of materials and construction specified in individual Sections shall cooperate with the Engineer and the Contractor in performance of the agency's duties. The testing agency shall provide qualified personnel to perform required inspections and tests.

1. The agency shall notify the Engineer and the Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. The agency is not authorized to release, revoke, alter, or enlarge requirements of the Contract Documents or approve or accept any portion of the Work.
3. The agency shall not perform any duties of the Contractor.

F. Coordination

Coordinate the sequence of activities to accommodate required services with a minimum of delay. Coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.

1. The Engineer is responsible for scheduling times for inspections, tests, taking samples, and similar activities.
2. The Engineer may collect samples to be included as part of required testing frequency, or direct Contractor to sample from a specific location.

1.4 QUALITY ASSURANCE

A. Qualifications for Service Agencies

Engage inspection and testing service agencies, including independent testing laboratories, that are prequalified as complying with the American Council of Independent Laboratories' "Recommended Requirements for Independent Laboratory Qualification" and that specialize in the types of inspections and tests to be performed.

1. Each independent inspection and testing agency engaged on the Project shall be authorized by authorities having jurisdiction to operate in the state where the Project is located.

PART 2 - PRODUCTS (Not used)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

A. Upon completion of inspection, testing, sample taking and similar services, repair damaged construction and restore substrates and finishes.

B. Protect construction exposed by or for quality-control service activities and protect repaired construction.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing, or similar services.

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes
   1. Temporary utilities including:
      a. Temporary electric power.
      b. Temporary sanitary facilities, including drinking water.

   2. Support facilities including:
      a. Dewatering facilities.
      b. Project identification and other temporary signs.
      c. Waste disposal services.
      d. Other construction aids and miscellaneous services and facilities.

   3. Protection including:
      a. Barricades, warning signs, and lights.
      b. Environmental protection.

B. Provide temporary facilities and controls required for construction activities except, if any, for facilities and controls indicated as provided by the Owner.

1.2 UTILITY USE CHARGES

A. Include cost or use charges for temporary facilities in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, the following:
   1. Owner’s construction forces.
   2. Occupants of Project.
   3. Engineer.
   4. Testing agencies.

B. Pay sewer service use charges for sewer usage (portable toilet), by all parties engaged in construction, at Project site.

C. Pay water service use charges, whether metered or otherwise, for water used by all entities engaged in construction activities at the Project Site.

D. Pay electric power service use charges, whether metered or otherwise, for electricity used by all entities engaged in construction activities at Project Site.

1.3 QUALITY ASSURANCE

A. Comply with industry standards and with applicable laws and regulations of authorities having jurisdiction, including but not limited to the following:

1. Health and safety regulations.
2. Utility company regulations.
3. Police, fire department and rescue squad rules.
4. Environmental protection regulations.
5. National Fire Protection Association (NFPA) 241 "Standards for Safeguarding Construction, Alterations and Demolition Operations."
6. American National Standards Institute (ANSI)-A10 Series standards for "Safety Requirements for Construction and Demolition."
7. National Electrical Contractors Association (NECA) Electrical Design Library "Temporary Electrical Facilities," NFPA 70, and NEMA, NECA and UL Solutions, Inc. (UL) standards and regulations for temporary electric service.

B. Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.4 PROJECT CONDITIONS

A. The following conditions apply to use of temporary services and facilities by all parties engaged in the Work:
1. Keep temporary services and facilities clean and neat.
2. Relocate temporary services and facilities as required by progress of the Work.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Provide undamaged materials in serviceable conditions and suitable for use intended.

2.2 EQUIPMENT

A. Provide undamaged equipment in serviceable conditions and suitable for use intended.

B. Provide temporary self-contained toilet units of temporary single-occupant toilet units of the chemical, aerated recirculation, or combustion type for use by all construction personnel. Units shall be properly vented and fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material. Toilets shall be a maximum of 100 yards away from the active construction.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

C. Temporary Electric Power Service
1. Provide weatherproof grounded electric power service and distribution system of sufficient size, capacity, and power characteristics for construction needs.
2. Include meters, transformers, overload-protected disconnects, automatic ground-fault interrupters and main distribution switch gear.

D. Temporary Lighting
1. Install and operate temporary lighting that will fulfill security and protection requirements without operating the entire system.
2. Provide lighting that provides adequate illumination for construction operations and traffic conditions.

E. Heating Facilities
1. Provide vented self-contained heaters with individual space thermostatic control.
2. Do not use gasoline-burning space heaters, open flame, or salamander-type heating units.

F. Temporary Sanitary Facilities
1. Provide toilets, wash facilities, and drinking water fixtures in compliance with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities.
2. Provide toilet tissue, paper towels, paper cups, and similar disposable materials as appropriate, for each facility, and provide covered waste containers for used materials.
3. Install separate self-contained toilet units for male and female personnel shielded to ensure privacy.
4. Install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up for a healthy and sanitary condition.
   a. Dispose of drainage properly.
   b. Supply cleaning compounds appropriate for each condition.
   c. Include safety showers, eyewash fountains, and similar facilities for the convenience, safety, and sanitation of personnel.
5. Provide drinking water fountains or containerized tap-dispenser bottled-drinking water units, complete with paper cup supplies. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45 to 55°F (7 to 13°C).

G. Stormwater Controls
1. Provide earthen embankments and similar barriers in and around excavations and subgrade construction, sufficient to prevent flooding by runoff of stormwater from heavy rains.
2. Provide erosion control facilities required to prevent eroded soil from leaving the Site.
3. Comply with all construction storm water permit requirements.

3.2 TEMPORARY SUPPORT FACILITIES

A. Locate field offices, storage sheds, sanitary facilities, and other temporary construction and support facilities for easy access.

B. Provide incombustible construction for offices, shops, and sheds located within the construction area or within 30 feet (9 meters) of building lines. Comply with NFPA 241.

C. Furniture
1. Minimally provide desks, chairs, file cabinets, plan table, plan rack, and bookcase.
2. Provide water cooler and a private toilet room with a water closet, lavatory, and medicine cabinet.
3. Furnish meeting room with conference table, tack board, and not less than 12 chairs.

D. Collection and Disposal of Waste
1. Collect waste from construction areas and elsewhere daily. Enforce requirements strictly and dispose of material lawfully.
2. Comply with NFPA 241 for removal of combustible waste material and debris.
3. Do not hold waste materials for more than seven days during periods when the ambient temperature remains continuously less than 80°F (27°C), or more than three days when the temperature exceeds or is expected to rise above 80°F (27°C).
4. Handle and properly containerize hazardous, dangerous, or unsanitary waste materials separately from other waste.

3.3 TEMPORARY PROTECTION FACILITIES

A. Barricades, Warning Signs, and Lights
1. Comply with standards and code requirements for erecting structurally adequate barricades.
2. Paint with appropriate colors, graphics, and warning signs to inform personnel and the public of the hazard involved.
3. Where appropriate and needed, provide lighting, including flashing red or amber lights.
4. Maintain existing fence and gates to prevent unauthorized entry onto construction and landfill site. Ensure gate is closed and locked at end of each work day.

B. Environmental Protection
1. Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways, and subsoil might be contaminated or polluted or that other undesirable effects might result.
2. Avoid using tools and equipment that produce harmful noise.
3. Restrict use of noise-making tools and equipment to hours that will minimize complaints from persons near the site.

3.4 OPERATION, TERMINATION, AND REMOVAL

A. Maintenance

1. Maintain facilities in good operating condition until removal.
2. Maintain markers for underground lines.
3. Protect underground lines from damage during excavation operations.

B. Termination and Removal

1. Unless the Owner requests that a temporary facility be maintained longer, each temporary facility shall be removed when the need for its service has ended and can be replaced by authorized use of a permanent facility.
2. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility.
3. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
4. Materials and facilities that constitute temporary facilities are the property of the Contractor, except the Government reserves the right to take possession of project identification signs.
5. Prior to project completion, replace clean and restore permanent facilities used during the construction period including, but not limited to, the following:
   a. Replace significantly worn parts and parts subject to unusual operating conditions.
   b. Replace lamps burned out or noticeably dimmed by hours of use.

END OF SECTION

SECTION 01 57 13

TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes:
1. Hydraulic soil stabilizers
2. Silt fence
3. Erosion stabilization mat
4. Temporary ditch checks
5. Sand bags
6. Fiber logs
7. Temporary vegetal cover

1.2 REFERENCES

A. Iowa DOT, Standard Specifications for Highway and Bridge Construction, most recent series.

B. Iowa Department of Natural Resources (IDNR), Storm Water Discharge Associated with Industrial Activity for Construction activities, most recent series.

C. IDNR, Storm Water Management for Construction Activities, most recent series.

D. American Society for Testing and Materials (ASTM):
1. ASTM D1388 Standard Test Method for Stiffness of Fabrics
2. ASTM D2487 Standard Test Method for Classification of Soils for Engineering Purposes
3. ASTM D3776 Standard Test Method for Mass Per Unit Area (Weight) of Woven Fabric
4. ASTM D4355 Standard Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)
5. ASTM D4491 Standard Test Method for Water Permeability of Geotextiles by Permittivity
6. ASTM D4632 Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
7. ASTM D4751 Standard Test Method for Determining Apparent Opening Size of a Geotextile
8. ASTM D5035 Standard Test Method for Breaking Strength and Elongation of Textile Fabric (Strip Method)
9. ASTM D5338 Standard Test Method for Determining Aerobic Biodegradation of Plastic Materials Under Controlled Composting Conditions

1.3 SYSTEM DESCRIPTION

A. Design Requirements
1. Select and design method of erosion and sediment control in accordance with local erosion control ordinances. Follow the State Construction Site Best Management Practices.

B. Provide erosion control shown on the Drawings, as a minimum.

C. Provide additional erosion and sediment control to prevent erosion which may be caused due to selected construction methods.

D. All stromwater controls for disturbed areas shall be installed prior to earth moving activities and maintained throughout the project.

1.4 SUBMITTALS

A. Manufacturer's certification for manmade products.

1.5 DESCRIPTION

A. Work in this section consists of construction and maintenance of temporary erosion and sediment control measures to be performed prior to and during construction.

B. Contractor shall be responsible for selecting method of erosion and sediment control.

PART 2 - PRODUCTS

2.1 IOWA DOT

A. Erosion Control Materials, Section 4169, Iowa DOT Standard Specification for Highway and Bridge Construction

2.2 EROSION BALES

A. Erosion Bales
1. Tightly compacted bales of grain straw or hay.
2. Use straw, if required to function for more than 15 days.

B. Support Post
1. Wood or steel construction, minimum length 4 feet.
2. Wood Posts: 2" x 2" or equivalent steel posts.

2.3 SILT FENCE

A. Geotextile Fabric
1. Fabric shall be either woven or non-woven polyester, polypropylene, stabilized nylon, polyethylene or polyvinylidene chloride.
2. Fabric shall have the minimum strength values in the weakest principal direction.
3. Non-woven fabric may be needle punched, heat bonded, resin bonded or combination thereof.
4. Fabric shall meet the following requirements:

a. Grab Tensile Strength	ASTM D4632	101 lbs. (450 N)
b. Apparent Opening Size	ASTM D4751	0.3 mm
c. UV Resistance Strength Retained	ASTM D4355	70 at 500 Hours (%)
d. Permittivity (per second)	ASTM D4491	0.14

B. Support Posts
1. Wood or steel construction minimum length 4 feet.
2. Wood posts - 2" x 2" or equivalent steel posts.

2.4 EROSION STABILIZATION MAT

A. General
1. Netting, if used, shall not exceed 15% of the total blanket weight.
2. Bond the netting to the parent material to prevent separation for the life of the project (minimum two months).

B. Types
1. Type A:
   a. Used for slopes 2.5:1 or flatter (not to be used in channels).
   b. Minimum shear stress required is 1.0 lbs/ft2 (50 pa).
   c. Not to be used in channels.
2. Type B:
   a. Used for slopes 2:1 or flatter or in channels when design shear stress is less than the minimum shear stress of the mat used
   b. Minimum shear stress required is 1.5 lbs/ft2 (70 pa).
   c. Channel mat roll width shall be 6 feet (1.8m) or greater.
3. Type Urban (Urban Areas and Lawn Areas Where Mowing Will Occur):
   a. Use only 100% organic biodegradable netted products including parent material, stitching and netting.
   b. Minimum thickness shall be ⅜ inch (9mm) as measured in-place.
   c. Mats placed on slopes greater than 4:1 and up to 2.5:1 shall be double netted.
   d. Netting and installation shall not pose a safety risk to pedestrians walking on or crossing the mat.

C. Anchoring Devices
1. Anchoring and components for temporary erosion mats shall be completely biodegradable as determined by ASTM D5338.
2. Materials shall be environmentally safe for soil and groundwater.
3. Do not use petroleum based plastics or composites.
4. Do not use materials which may present a hazard from splintering or spearing.
5. Design anchors to hold a minimum of two months and be substantially degraded within four months during the summer (warm soil conditions).

D. Jute fabric shall meet the following general requirements:
1. Uniform, open weave of single jute yarn.
2. Twisted construction having an average twist of not less than one and one-half turns per inch.
3. Furnished in rolled strips 48 inches wide with a minimum of 78 wrapped ends.
4. Fabric shall have a minimum of 41 weft yarns per linear yard of length.
5. Weight of fabric shall be a minimum of 92 lbs. per 100 square yards.
6. Non-toxic to vegetation.
7. Smolder resistant.

E. Wood fiber blanket shall meet the following general requirements:
1. Uniform web of interlocking wood excelsior fibers.
2. Uniform thickness.
3. Weight - 78 pounds per 80 square yards.

4. Have net backing on one side as follows:
   a. Mesh size not exceeding 1½ inches by 3 inches.
   b. Woven of twisted paper, cotton cord or biodegradable plastic.
5. Non-toxic to vegetation.
6. Material Properties
   a. Porosity Calculated 85-90%.
   b. Stiffness ASTM D1388 2,000 mg-cm (maximum).
   c. Weight ASTM D3776 18 oz/s.y.
   d. Tensile Strength ASTM D5035 (2 inch strip).
      i. Length Direction 15 lb.
      ii. Width Direction 5 lb.
   e. Elongation ASTM D5035 (2 inch strip).
      i. Length Direction 150%
      ii. Width Direction 100%
7. Use flexible mat of polyvinylchloride monofilaments bonded together into a three-dimensional web designed exclusively to serve as an erosion control and revegetation mat.

F. Staples
1. Staples for anchoring erosion mat shall meet the following minimum requirements:
   a. U-shaped.
   b. No. 11 gage or larger diameter steel wire.
   c. Width of one to two inches.
   d. Length:
      i. Not less than six (6) inches for firm soil.
      ii. Not less than twelve (12) inches for soft or loose soils.
      iii. Not less than eight (8) inches where erosion mat is placed over sod.
2. Pins shall have a 3/16 inch shank diameter with attached 1½ inch washer.
3. Staples shall have a ¾ inch shank diameter with a 1" minimum top width.

2.5 TEMPORARY DITCH CHECKS (TDC)

A. Make TDC of materials that are either biodegradable, that can be removed during long term erosion control construction activities, or that will not conflict with long term erosion and sediment control structures if left in-place.

B. Submit a list of TDC materials to the Engineer for review.

2.6 SAND BAGS

A. Sand Bags
1. Minimum unfilled size of 16 by 26 inches.
2. Completely filled with a granular soil (P200 <50%).

2.7 FIBER LOG

A. Erosion Bales
1. Tightly compacted bales of grain straw or hay.
2. Use straw, if required to function for more than 15 days.

B. Support Post
1. Wood or steel construction, minimum length 4 feet.
2. Wood posts - 2" x 2" or equivalent steel posts.

2.8 TEMPORARY VEGETAL COVER

A. Temporary Seed Mixture Components

Species	Min. % Purity	Min. % Germ.	Lbs. per Acre
Oats	98	90	80
Rye	98	85	100

B. Use rye grass when permanent seeding is to follow within one (1) year.

C. Hydroseeding – Submit seed mix, application methods and emulsion specification to Engineer for approval prior to application.

PART 3 - EXECUTION

3.1 GENERAL

A. Keep disturbed areas to a minimum.

B. Provide sediment control on unbroken slopes greater than 75 feet in length or 3:1 or steeper.

C. Sediment control practices must be in place on all down gradient perimeters prior to any up gradient land disturbing activities.

D. Stabilize and protect disturbed areas with temporary seed and mulch within seven (7) days of active disturbance of the soil surface.

E. Place excavated trench material on the high side of the trench where appropriate.

F. Discharge trench water to filter barrier prior to release into a drainage way.

G. Install gravel mats at site vehicle entrance and site exit locations to prevent tracking of soil.

H. Collect tracked soil and clean from paved roads near the construction site the same day it occurs.

I. Sediment control measures shall be in place at the end of each working day.

J. Locate soil stockpiles no closer than 25 feet of a roadway, wetland, or drainage control channel and control by covering the pile with tarpaulins, temporary seed and mulch or other suitable means, if the pile is exposed for 14 days or more.

K. Protect storm inlets including inlets in paved roadways with suitable approved barriers.

L. When it is necessary to cross waterways, provide crossing structures for machinery.

M. Repair, replace, and maintain erosion and sedimentation structures until vegetation is re-established or permanent structures are installed.

N. Remove temporary erosion control structures and accumulated sediment and/or debris when vegetation is established.

3.3 EROSION AND SEDIMENTATION CONTROL DEVICES

A. Erosion Bales
1. Place where shown on the Drawings at a minimum.
2. Place bales or bags end to end across surface water flow path.
3. Place bales or bags at right angles to the direction of water flow.
4. Embed and securely anchor bales with wood or steel stakes or posts.
5. Excavate shallow sump on the upstream side of bales or bags.
6. Place bales so that the bindings are oriented around the sides rather than on top and bottom.
7. Wedge gaps between bales with straw to prevent water from flowing between bales.
8. Entrench straw bales fence or sand bags at least 4 inches into the ground. Slope up the upslope side of fence to the bales at least 4 inches.
9. Place bales or bags prior to disturbing upslope areas.
10. Drive support posts a minimum of 12 inches into the subgrade and extend to the top of the bales or bags.
11. Remove from the site after final stabilization.

B. Erosion Bags
1. Place type (sand or rock filled) where shown on the Drawings at a minimum.
2. Place bags end to end across surface water flow path.
3. Place bags at right angles to the direction of water flow.
4. Excavate shallow sump on the upstream side of bags.
5. Entrench bags at least 4 inches into the ground.
6. Place bags prior to disturbing upslope areas.
7. Drive support posts a minimum of 12 inches into the subgrade and extend to the top of the bags.
8. Remove from the site after final stabilization.

C. Silt Fences
1. Place geotextile (silt) fence prior to disturbing upslope areas.
2. Excavate trench approximately 4 inches by 4 inches along perimeter of area to be fenced.
3. Secure and continuously anchor bottom of geotextile (silt) fence with excavated material in trench bottom.
4. Install support post on downstream side of the geotextile to a depth adequate to stabilize geotextile fence (12" minimum depth).
5. Secure geotextile to posts.
a. Staples: ½" deep.
b. Staple to up slope side of post.
6. Backfill over geotextile in trench and compact.
7. Maximum spacing of the posts shall not exceed 10 linear feet.
8. Silt fence required all cluster bed areas downstream of area.
9. All silt fence must be removed prior to project completion.

D. Erosion Mats
1. Installation:

a. See plan details for anchor trench (at ends, checks and edges) installation procedures.
   i. Anchor trenches shall be 12" deep.
   ii. Compact anchor trench backfill.
   iii. Place staples in end and check trenches spaced at 12 inches.
b. Follow manufacturer's specifications and instructions for placement unless project documents are more stringent.
c. Roll width overlaps shall be 12" at edges. Pin or staple every 3 feet along overlap length.
d. Roll end overlaps may be spliced by overlapping (in the direction of water flow) two feet with the upstream portion of the mat on top of the downstream portion. This overlap shall receive at least three pins or staples with a maximum spacing of 12 inches.
e. Pins or staples shall be 18" in length minimum driven flush with the mat.
f. Place mat flat conforming to contours in soil surface. Do not stretch mat.
g. Place mat from toe of slope toward top of slope.
h. Mat can be placed from downstream toward upstream or from upstream toward downstream.

2. Site Preparation (See also Section "Landscaping - Turf Establishment"):
   a. Place seed and fertilizer prior to placing permanent erosion geomat.
   b. Seed and fertilizer may be placed after permanent erosion mat installation with Engineer's approval.
   c. Ground surface shall be smooth and compact.
   d. Remove all rocks, dirt clods, stumps, roots, grass clumps, trash and other obstructions from lying in direct contact with the soil surface and the erosion mat.

E. Soil Stabilizers – Hydroseeding
1. Installation:
   a. Install soil stabilizers using conventional hydraulic seeding equipment.
   b. Follow manufacturer’s recommendations for application rates.
   c. Application of PAM, in its pure form, shall not exceed 200 lbs/acre (225 kg/ha).
   d. Do not use asphalt based products as soil stabilizers.
   e. Do not place soil stabilizers in channels.

F. Temporary Ditch Checks
1. Installation:
   a. TDC shall be capable of maintaining location and form during and after rainfall events.
   b. TDC shall be placed at locations shown on the Drawings.
   c. Place TDC generally perpendicular to the flow line of the ditch and extend far enough so the ground level on the ends of the TDC are a minimum 18 inches higher than the flow line.

3.3 MAINTENANCE

A. Inspect silt fences and filter barriers immediately after each rainfall and at least daily during prolonged rainfall.
1. Make any required repairs immediately.
2. Maintain temporary erosion and sedimentation control structures until permanent soil erosion controls are completed and/or vegetation is established.
   a. Repair damaged structures.
   b. Replace lost structures.

c. Remove sediment from deposition areas adjacent to erosion control structures without damaging structures on a regular basis.
d. Refill eroded areas as required for grade stabilization.

B. If the fabric on a silt fence or filter barrier decomposes or becomes ineffective prior to the end of the expected usable life and the barrier still be necessary, replace the fabric promptly.

C. Remove sediment deposits after each major storm event and when deposits reach approximately one-half the height of the barrier.

D. Remove any sediment deposits remaining in place after the silt fence or filter barrier is no longer required and dress to conform with the existing grade, prepared and seeded.

E. Repair/restore any washed out areas.

F. Maintenance period to be entire project period including the one-year warranty.

G. Owner may direct Contractor to remove the temporary erosion control measures any time during the one-year correction period.

H. Construct permanent erosion control measures immediately after earthwork is completed.

I. Maintenance of erosion control methods shall be conducted throughout the contract period and during any times when the Contractor has temporarily demobilized (e.g., winter).

END OF SECTION

SECTION 01 71 23

FIELD ENGINEERING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes
1. Engineering Surveys Provided by the Owner's Surveyor.
2. Engineering Surveys Provided by the Contractor.
3. On-Site Inspection Services.
4. Profile and Topography Shown on the Drawings.
5. Record Measurements and Markers.

1.2 SUBMITTALS

A. Provide record measurements of facilities as installed or constructed including, but not limited to;
1. Record measurements to base of underdrain
2. Record measurements to top of underdrain
3. Record measurement of top of clay liner.
4. Record measurement of top of drainage layer.

PART 2 - PRODUCTS

2.1 LAND SURVEYOR

A. The Owner shall provide a Land Surveyor or Professional Engineer licensed in the State of Iowa to perform all measurements for determination of payment quantities and construction record drawing information.

B. The Contractor shall coordinate survey needs at the Pre-Construction conference.

PART 3 - EXECUTION

3.1 PREPARATION

A. Prior to any dirt movement or excavation, verify and sign Certification of Existing Topography based on information provided by the Engineer. Any discrepancies identified by the Contractor shall be investigated by the Engineer.

B. Investigate and verify the existence and location of site improvements, utilities, and other existing facilities.

C. Before construction, verify the location of invert elevations at points of connection of sanitary sewer, storm sewer, water piping and underground electrical services.

D. Furnish information to the Engineer and the appropriate utility regarding conflicts that are necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction.

E. Provide the Owner's representative two working days advance notification when ready for engineering surveys for construction to be provided by the Owner's representative.

3.2 ENGINEERING SURVEYS TO BE PROVIDED BY THE OWNER

A. General
1. Locate established construction reference stakes, benchmarks and control points. Cost of replacement will be paid by the Contractor.
2. Provide additional construction staking as necessary to complete construction based on the construction reference stakes provided by the Owner's Surveyor and the Drawings.
3. Before beginning with necessary construction staking, verify the information shown on the Drawings, in relation to the established construction reference stakes, bench marks, control points and property corners. Notify the Engineer of any discrepancies.
4. Remove construction reference stakes when directed by the Engineer.
5. Provide existing utility locates.

B. Soil Surveys
1. The Owner's Surveyor will provide a pre-construction topographic map to the Contractor. Prior to any excavation, the Contractor will acknowledge in writing the validity of the existing topography map.
2. Provide liner subbbase stakeout.
3. Record elevations at the proposed base of underdrain layer. When the proposed base of underdrain layer is reached, the area is to be surveyed. Record elevations at the top of the underdrain. When the underdrain is complete the area will be surveyed. This survey along will be used along with scale tickets to determine underdrain material installed.
4. Record elevations at the proposed top of compacted clay liner. When the proposed top of compacted clay liner is reached, the area is to be surveyed. This survey will be used to determine cubic yards installed and will be the basis for payment for clay layer material installed.
5. Record elevations of top of drainage layer. Provide survey data to determine the top of the drainage layer. This survey will be used to certify the drainage layer thickness. This survey, along with a survey of the proposed top of the compacted clay cover will be used to determine the cubic yards installed and will be the basis for payment for the drainage layer material installed.

C. Landfill Clay Liner
1. Provide top of clay liner grade stakes
2. Provide any intermediate construction reference points as required to verify installation at the line ad grade established and locate appurtenant structures.
3. Check the grade with the construction reference points at a minimum of 50 foot for liner base grades.
4. Provide additional construction reference points necessary to establish location and grade in accordance with the Drawings.

D. Provide additional construction reference points necessary to establish location and grade in accordance with the Drawings.
Clay Cover, Drainage Layer
1. Provide construction reference points set for clay liner and drainage layer at critical changes in horizontal and vertical alignment (breaklines) and on a maximum of a 50-foot grid.
2. Provide 25-foot off-set points at limits of liner construction on a maximum of a 50-foot grid.

3. Survey grid for payment and documentation of thickness should be at 50 foot grid.

E. As-built Surveys
1. Underdrain base layer
2. Underdrain top layer
3. Clay liner.
4. Drainage layer..

3.3 RECORD MEASUREMENTS AND MARKERS

A. Contractor will provide record survey information of the as-constructed facilities showing the horizontal and vertical locations of leachate collection line and leachate collection header.

B. Leachate Collection Line
At a minimum, provide a record survey at 25 foot intervals recording the horizontal and vertical location of the following:
1. Shoulders of trench
2. Bottom of trench
3. Leachate collection pipe
4. Cleanouts and Manhole

C. Leachate Collection Header
At a minimum, provide a record survey recording the horizontal and vertical location of the following:
a. Underground covered work that deviates from the Drawings.
b. Valves and pipeline fittings.
c. Changes in direction.
d. "Y" or "T" branches.

END OF SECTION

SECTION 01 77 00

CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
   1. Substantial Completion.
   2. Final Completion.
   3. Inspection Procedures.
   4. Project Record Documents.
   5. Operation and Maintenance Manuals.
   6. Warranties.
   7. Instruction of Owner's Personnel.
   8. Final Cleaning.

1.2 SUBSTANTIAL COMPLETION

A. Before notification that the Work is substantially complete, provide the following:
   1. Demonstrate to the Engineer that systems and system components operate as intended.
   2. Advise Owner of pending insurance changeover requirements.
   3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
   4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
   5. Prepare and submit Project Record Documents, operation and maintenance manuals, construction photographs, damage or settlement surveys, property surveys, and similar final record information.
   6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
   7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
   8. Complete startup testing of systems.
   9. Submit test/adjust/balance records.
   10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
   11. Advise Owner of changeover in heat and other utilities.
   12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
   13. Complete final cleaning requirements, including touchup painting.
   14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Submit written notification to Owner and Engineer that the entire Work is ready for its intended use and the entire Work is substantially complete.
   1. If the items in paragraph A. above are complete, then within 14 days Owner, Contractor and Engineer will make an inspection of the Work to determine status of completion.
   2. If Engineer considers the Work substantially complete, then Engineer will prepare and deliver to the Owner a tentative Certificate of Substantial Completion fixing the date of Substantial Completion with an attached tentative list of items to be completed or corrected before final payment.
   3. Engineer will issue a definitive Certificate of Substantial Completion with list of items to be completed or corrected or notify Contractor that the Work is not substantially complete within 21 days after submittal to Owner.
   4. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
   5. Results of completed inspection will form the basis of requirements for Final Completion.

1.3 FINAL COMPLETION

A. Before requesting final inspection for determining final completion, complete the following:
   1. Items identified as requiring correction or completion.
   2. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
   3. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
   4. Verify all survey data has been submitted and verified by the Engineer.

B. Submit a written notice that the entire Work is complete. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements.
   1. Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.4 PROJECT RECORD DOCUMENTS

A. Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record documents for Engineer's reference during normal working hours.

B. Maintain and submit one set of blue- or black-line white prints of Contract Drawings and Shop Drawings.
   1. Mark record drawings to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, Subcontractor, or similar entity, to prepare the marked-up record drawings.
      a. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.

b. Accurately record information in an understandable drawing technique.
c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
d. Mark contract drawings or shop drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where shop drawings are marked, show cross-reference on contract drawings.

2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
3. Mark important additional information that was either shown schematically or omitted from original Drawings.
4. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.

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

1.5 OPERATION AND MAINTENANCE MANUALS

A. Assemble and deliver one (1) complete hard copy set of operation and maintenance data indicating the operation and maintenance of each system, subsystem, and piece of equipment not part of a system and one (1) electronic pdf copy. Include operation and maintenance data required in individual specification sections and as follows:

1. Operation Data:
   a. Emergency instructions and procedures.
   b. System, subsystem, and equipment descriptions, including operating standards.
   c. Operating procedures, including startup, shutdown, seasonal, and weekend operations.
   d. Description of controls and sequence of operations.
   e. Piping diagrams.

2. Maintenance Data:
   a. Manufacturer's information, including list of spare parts.
   b. Name, address, and telephone number of Installer or supplier.
   c. Maintenance procedures.
   d. Maintenance and service schedules for preventive and routine maintenance.'
   e. Maintenance record forms.
   f. Sources of spare parts and maintenance materials.
   g. Copies of maintenance service agreements.
   h. Copies of warranties and bonds.

B. Organize operation and maintenance manuals into suitable sets of manageable size. Bind and index data in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, with pocket inside the covers to receive

folded oversized sheets. Identify each binder on front and spine with the printed title "OPERATION AND MAINTENANCE MANUAL," Project name, and subject matter of contents.

1.6 WARRANTIES

A. Submit written warranties for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Submit properly executed warranties of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
   1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8½- by 11-inch/115- by 280-mm paper.
   2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
   3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS (Not used)

PART 3 - EXECUTION

3.1 DEMONSTRATION AND TRAINING

A. Instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
   1. Provide instructors experienced in operation and maintenance procedures.
   2. Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at the start of each season.
   3. Schedule training with Owner through Engineer with at least seven days advance notice.
   4. Coordinate instructors, including providing notification of dates, times, length of instruction, and course content.

B. Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification

Sections. For each training module, develop a learning objective and teaching outline. Include instruction for the following:

1. System design and operational philosophy.
2. Review of documentation.
3. Operations.
4. Adjustments.
5. Troubleshooting.
6. Maintenance.
7. Repair.

3.2 FINAL CLEANING

A. Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
   a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
   b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
   c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
   d. Remove tools, construction equipment, machinery, and surplus material from Project site.
   e. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
   f. Do not paint over “UL” and similar labels, including mechanical and electrical nameplates.
   g. Leave Project clean and ready for occupancy.

C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner’s property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

D. Verify all permanent erosion control measures have been installed and are functional as intended.

E. Verify temporary erosion controls have been removed as directed by the Engineer.

END OF SECTION

SECTION 31 05 10

SOILS AND AGGREGATES FOR EARTHWORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes
1. Engineered soils and aggregates materials
2. Iowa Department of Transportation (IDOT) classifications

1.2 REFERENCES

A. ASTM International (ASTM)
1. ASTM C33 – Standard Specification for Concrete Aggregates.
2. ASTM D75 – Standard Test Method for Sampling Aggregates.
3. ASTM C88 – Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
4. ASTM C131 – Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
5. ASTM C535 – Standard Test Method for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
6. ASTM C602 – Standard Specification for Agricultural Liming Materials.
7. ASTM D422 – Standard Test Method for Particle Size Analysis of Soils.
8. ASTM D448 – Standard Specification for Standard Sizes of Coarse Aggregate for Highway Construction.
9. ASTM D1140 – Standard Test Method for Amount of Material in Soils Finer than the No. 200 (75 micrometers [μm]) Sieve.
10. ASTM D1241 – Standard Specification for Materials for Soil-Aggregate Subbase, Base, and Surface Courses.
11. ASTM D2216 – Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil Aggregate Mixtures.
12. ASTM D2434 – Standard Test Method for Permeability of Granular Soils
13. ASTM D2487 – Standard Test Method for Classification of Soils for Engineering Purposes.
14. ASTM D4318 – Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity of Soils.
15. ASTM D6913-17 Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis
16. ASTM D7928-17 – Standard Test Method for Particle-Size Distribution (Gradation) of Fine-Grained Soils Using the Sedimentation (Hydrometer) Analysis

B. Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, (IDOT Standard Specification)

1.3 SUBMITTALS

A. Provide test reports showing the results of required material testing.

B. Soils analysis including recommendations for fertilizer type and application.

C. Daily delivery tickets for each load of material delivered to the site.

1.4 QUALITY ASSURANCE

A. An independent testing laboratory to provide testing services required by this section.

PART 2 - PRODUCTS

2.1 ON-SITE SOILS

A. Clay Soil
1. See Section 31 35 26 Clay Liner Construction.

B. Topsoil
1. Topsoil shall be defined as the upper soil horizon consisting of mineral layers of maximum humus (organic) accumulation.
2. Topsoil shall:
   a. Have adequate mineral content to support the growth of the vegetation intended to be established.
   b. Have one of the following Soil Conservation Service (SCS) soil textures: loam, sandy loam, silt loam, silty clay loam, or clay loam.
   c. Be free from herbicides which would be detrimental for the intended use.
   d. Have adequate fertility for quick establishment of vegetation
   e. Shall be neither excessively acid nor excessively alkaline.
   f. Shall be free from deleterious substances.

C. General Fill
1. Shall be any soil material excavated on the project site or obtained from borrow areas.
2. Soil materials unsuitable and, therefore, not approved for this classification are:
   a. Soils with high organic contents such as topsoil, peat, muck, organic silts, and clays, marls, etc.
   b. Manmade or rubble filled soils containing such materials as: foundry sand, fly ash cinders, asphalt, and concrete rubble, etc.
   c. Silty soils such as: rock flour, loess, etc.
   d. Soils with gravel larger than 2-inch.
   e. Silty clay or clays with a high plasticity (CH soils as defined in ASTM D2487).
   f. All soil contaminated with hazardous waste materials as defined by the United States Environmental Protection Agency (USEPA).

D. Structural Fill
1. Same as General Fill except shall be suitable for compacting under roadways, landfill, as stormwater pond berms to 95% Standard Proctor.

2.2 IOWA DEPARTMENT OF TRANSPORTATION CLASSIFICATION

A. Aggregate for Surface or Base Course
1. Aggregate for surface or base course shall be in conformance with IDOT Standard Specification, Section 4120. All testing and quality control required by IDOT Standard Specification shall be completed and submitted to the Engineer.
2. Gradation shall be specified on the Drawings and conform to the gradations in the Aggregate Gradation Table in the IDOT Standard Specification (Article 4109). Surface aggregate shall be Gradation 11 and base course shall be gradation 13.

B. Revetment Stone, Erosion and Gabion Stone
1. Revetment stone shall be in accordance with IDOT Standard Specification, Section 4130
2. Gradation
a. Class A revetment stone shall be in accordance with IDOT Standard Specification Section 4130.02 A.1.
b. Class B revetment stone shall be in accordance with IDOT Standard Specification Section 4130.02 A.2.
c. Class C revetment stone shall be in accordance with IDOT Standard Specification Section 4130.02 A.3.
d. Class D and E revetment stone shall be in accordance with IDOT Standard Specification Section 4130.02 A.4.
e. Erosion stone gradation shall be in accordance with IDOT Standard Specification Section 4130.04
f. Gabion stone shall be in accordance with IDOT Standard Specification Section 4130.07

2.3 SOURCE QUALITY CONTROL

A. For IDOT materials complete all tests as required by IDOT Standard Specifications and submit to Engineer.

B. In addition to the above, furnish a soil analysis of topsoil:
1. Analyze for the following:
a. pH
b. Phosphorus
c. Potassium
d. Soluble Salts
e. Calcium
f. Magnesium

C. Perform one acceptable test for each type of material at each source. More frequent testing may be required per the construction quality assurance document. Contractor shall perform the maximum amount of testing where specified.

PART 3 - EXECUTION

3.1 APPLICATION

A. Use the soil classification as specified or stated on Drawings.

B. Place material in accordance with the Drawings and appropriate specification sections for the type of work being performed.

C. If material is not specified on Drawings, submit appropriate recommended material gradation to Engineer.

END OF SECTION

SECTION 31 10 00

SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:
1. Clearing, grubbing, and disposal.
2. Stripping and stockpiling topsoil.
3. Regulatory: Clearing to be completed prior to March 31.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Topsoil
1. Topsoil is defined as the upper soil horizon consisting of mineral layers of maximum humus (organic) accumulation.

PART 3 - EXECUTION

3.1 PROTECTION

A. Protect bench marks, survey ties, and existing structures from damage or displacement.

B. Prevent obstruction of traffic and protect all remaining trees, shrubs, and other vegetation from injury.

C. Conduct tree clearing prior to March 31 in accordance with the landfill permit to protect the habitat of the endangered Indiana bat.

3.2 CLEARING, GRUBBING, AND DISPOSAL

A. General
Clear and grub the area of construction as identified on the drawings.

B. Clearing
Cut all brush, shrubs, stumps and trees to within 4 inches of the existing ground surface.

C. Grubbing
1. Remove all stumps, roots, logs, and timber.
2. Grubbing shall be carried to a minimum depth of 12 inches.

D. Disposal
   1. Contractor is responsible for the following:
      a. Disposal of all material removed under clearing and grubbing.
      b. Furnishing of a disposal site.
      c. Obtain and conform to all necessary, federal, state, and local permits for burning and/or burial of material.
      d. Conform to all requirements for disposal of diseased trees.
      e. If permits are not required, Contractor shall comply with the following requirements:
         1) Cover disposal material in a manner that shall minimize future cover settlement.
         2) Maintain a minimum of 2 feet of soil cover.
      f. Bury non-burnable materials in the area designated, if shown on the drawings.
         1) Bury sufficient depth to maintain a minimum of 2 feet of soil cover.
         2) Replace soil and compact in accordance with section "Earthwork."
         3) Replace topsoil, seed, fertilize and mulch in accordance with the applicable section.

E. Clearing operations shall be completed in a manner so as to prevent obstruction of traffic and to protect all remaining trees, shrubs, and other vegetation from injury.

3.3 STRIPPING AND STOCKPILING TOPSOIL

A. Stripping
   1. Remove all topsoil beneath:
      a. Landfill cells.
      b. Roadways.
      c. Stormwater basins.
   2. Remove topsoil to a depth of 6 inches in:
      a. Areas disturbed by utility construction.
      b. Areas requiring cuts or significant fills (significant fills are fills which cannot be obtained by the addition of topsoil only).

B. Stockpiling
   1. Contractor shall stockpile topsoil obtained in the stripping operation for replacement. Coordinate stockpile location with Owner if the stockpile is permanent or as shown in the drawings.
      a. For areas where topsoil is to be replaced after underground utility construction.
      b. For areas involving site grading where topsoil is to be replaced in order to sustain vegetative growth.
   2. In areas where topsoil will not be required as specified above, Contractor shall remove and dispose of excess material as defined in other sections.

END OF SECTION

SECTION 31 22 00

GRADING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes
   1. Excavation.
   2. Test rolling.
   3. Filling and compacting.
   4. Backfilling around structures.
   5. Disposal of surplus materials.
   6. Finish grading.
   7. Material Testing.

B. Section Excludes
   1. All clay material placed within the landfill cell boundary. See Spec Section 31 35 26.13

1.2 REFERENCES

A. ASTM International (ASTM)
   1. D1557 – Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-pound (lb) (4.54 kilogram [kg]) Rammer and 18-inch (in.) (457 millimeter [mm]) Drop.
   2. D2216 – Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures.
   3. D6938-07 – Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Soil used for backfilling shall be classified as General Fill or Structural Fill per the appropriate specification and placed as indicated in the Drawings. Where not indicated, Structural Fill shall be used.

2.2 GRADING EQUIPMENT

A. Grading equipment used for final grading shall be equipped with global positioning system (GPS) equipment to control the grade. Design information will be provided by the Owner suitable for input into most GPS equipment.

PART 3 - EXECUTION

3.1 EXCAVATION

A. Excavation to Correct Grade
   1. Excavate site as follows:
      a. To elevation shown on the plans.
      b. To such additional width as necessary for erections and removal of forms, shoring or sheeting, and finishing of walls.
   2. Excavation of unsuitable materials.
      a. Excavate unsuitable soil materials under a proposed structure.
      b. Extend excavation laterally a minimum of 5 feet beyond the building limits plus 1 foot for each foot of cut below the foundation.
      c. Notify the Owner's project representative prior to proceeding with the removal of unsuitable material.

B. Excavation Precautions
   1. Excavation Slope Stability:
      a. Maintain excavation slope to ensure a stable excavation and prevent caving.
      b. Provide and erect all timber work, shoring, sheeting, bracing, etc. necessary to prevent caving and displacement of adjacent property.
         1) Shoring shall be placed so as not to interfere with building work.
         2) Shoring shall be independent of footings.
   2. Underpinning Existing Structures:
      a. Underpin as necessary to protect existing structures and foundations.
      b. Furnish all material, labor, and equipment necessary to complete underpinning operations.
   3. Dewatering of Excavations:
      a. Provide and maintain all equipment necessary to keep excavated areas free of all groundwater, surface water, or precipitation.
      b. Soil which becomes soft, yielding, or loses support due to inadequate dewatering efforts shall be dealt with as follows:
         1) Excavate disturbed soil materials for their entire depth.
         2) Replace excavated materials with an approved fill material.
      c. **Unless otherwise noted in the contract documents or listed as its own Bid Item, all dewatering equipment and labor is incidental to the project**.
   4. Protect Excavation from Freezing:
      a. Take precautions necessary to prevent frost from entering subgrade soils.
      b. If subgrade becomes frozen, remove snow, ice, and frozen soil prior to placement of additional fill or finish surfacings.

3.2 TEST ROLLING

A. Test roll finished cut or fill subgrades by rolling with a pneumatic tire roller or a heavyweight loader rubber tire vehicle.
   1. Method and equipment used shall be suitable for intended use.
   2. Take necessary precautions to protect existing structures from damage during test rolling.

3. Test roll an area equal to the area of the proposed construction plus a minimum of 3 feet on each side.

B. Treat areas showing yielding or rutting under test rolling as follows:
1. Replace and/or recompact as necessary to stabilize the area.
2. Retest soil areas replaced or recompacted.

3.3 FILLING AND COMPACTING

A. Layer thickness for fill soil shall be as follows:
1. Layer thickness shall be dependent on the soil classification type, weight, and soil contact pressure of compaction equipment being used.
2. Layer thickness shall not exceed 12 inches.

B. Compaction
1. Compaction method for fill soils shall be appropriate for soil material being compacted and provide sufficient soil contact pressure to thoroughly compact entire lift thickness.

C. Proper soil moisture contents for compaction shall be maintained in all soils.
1. Optimum moisture content as determined by standard (ASTM D698) Proctor shall be used to determine acceptance moisture contents for soil compaction.
2. Water content for Structural Fill shall be +/- 2% of optimum moisture.

D. Compaction requirements for Structural Fill unless specified elsewhere shall be 95% Standard Proctor.

E. Soil classes not requiring compaction by the above schedule will be proof rolled when requested by the Owner's Representative.

F. Density testing will be performed by the Engineer.

G. Recompact any areas not meeting density requirements.

3.4 BACKFILLING AROUND STRUCTURES

A. Do not backfill any foundation, wall, or structure prior to inspection by the Engineer.

3.5 DISPOSAL OF SURPLUS MATERIALS

A. Haul and dispose of all surplus materials.

B. Surplus materials shall be hauled and placed in the appropriate stockpile locations at the direction of the Owner.

3.6 FINISH GRADING

A. Grade, trim, and shape subgrade to required grade and section.

1. Adjust slopes by grading so that transition is smooth and gradual.
2. The crests of cut banks shall be rounded and shaped.
3. Refill, regrade and compact washouts and ruts.
4. Remove all stones 4 inches or larger from grading limits.

B. Vertical Grading Tolerances
1. Areas within the limits of the clay liner – 0.0 feet to -0.2 feet.
2. Areas outside the limits of the clay liner – +0.2 feet to -0.2 feet.

END OF SECTION

SECTION 31 23 33

TRENCHING, BACKFILLING, AND COMPACTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes
1. Dewatering.
2. Disposal of surplus material.
3. Sheeting and bracing.
4. Supporting of existing structures.
5. Trenching, backfilling and compacting.
6. Materials testing.

B. This section applies to below ground pressure and gravity pipelines.

1.2 REFERENCES

A. ASTM International (ASTM):
1. ASTM D698 – Standard Testing Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft –lbs/ft^3) (2700 kN -m/m^3)
2. ASTM D6938 – Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

1.3 QUALITY ASSURANCE

A. Owner will conduct material testing on Owner-provided materials.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Conform to Section 31 05 10, Soils and Aggregates for Earthwork.

B. General Fill and Structural Fill
1. Unless otherwise specified, use native excavated material as backfill material.

C. Drainage Material for Underdrain and Leachate Systems
1. Conform to 31 35 27 Drainage Layer Material and 31 35 28 Leachate Collection System.

D. Iowa Department of Transportation (IDOT) Classification
1. Conform to Section 31 05 10, Soils and Aggregates for Earthwork

PART 3 - EXECUTION

3.1 DEWATERING

A. Provide and maintain necessary means and methods to dewater excavations as required, including equipment, power, and permits, until completion of trench backfill.

B. Dispose of water as directed by the Owner.

C. Prevent runoff and dewatering system discharge from entering excavation.

D. Unless otherwise noted in the contract documents or listed as its own Bid Item, all dewatering equipment and labor is incidental to the project.

3.2 TRENCH EXCAVATION

A. Excavate trench to sufficient width and depth to permit proper utility construction at line and grade shown on the drawings.

B. Employ methods other than blasting to excavate bedrock, if encountered, from the trench. Notify Engineer if bedrock is encountered.

C. The bottom of the excavation shall conform to the pipe embedment details with a minimum width of the pipe per the Drawings.

D. Do not open more than 200 feet of trench at any one time.

E. Place excavated material in a location that will minimize inconvenience to public travel, adjacent property owners and other contractors.

F. Dispose excess material along with other excavated native material.

G. Sheeting and Bracing
   1. Sheet and brace trenches and excavations as required by applicable federal and state codes, by the Contract Documents, and as necessary to protect life and property.
      a. When close sheeting is required, prevent soil from entering the trench either below or through such sheeting.
   2. Removal of Sheeting and Bracing:
      a. Remove sheeting and bracing as the excavation is backfilled in such a manner to avoid disturbance of adjacent structures and to insure adequate protection of the completed pipe section.
      b. If the sheeting and bracing cannot be removed without damage to the pipe or adjacent areas, leave in place.

H. Portable Trench Shoe Shield (Shoe)
   1. A shield may be used with the following restrictions.
      a. Construct as required by State or Federal authority.
      b. Do not exceed trench limits.
      c. Do not disturb or alter pipe and bedding.

I. Rock Removal
   1. Remove and dispose of rock larger than 3 inches. Coordinate stockpile location with the Owner.

3.3 TRENCH BACKFILLING AND COMPACTION

A. Provide pipe foundation material below the bedding per Drawings.

B. Notify Engineer of poor soils below the pipe foundation and/or the pipe bedding.

C. Provide pipe embedment as required for the type of pipe installed per the appropriate Section.

D. Backfill the trench with excavated material in layers not exceeding 18 inches unless Structural Fill is specified.

E. Backfill Compaction
   1. Compact trenches using mechanical compaction methods.
   2. Compact backfill in layers not exceeding 18 inches to the following densities:

Material Type	Density Requirement
Native Material	Equal to adjacent undisturbed material
Structural Fill	Minimum of 95% of the Standard Proctor Density

F. Provide Structural Fill per Drawings.

G. Backfill trench at the end of each work day. Do not leave trench open overnight or weekends.

3.4 FIELD QUALITY CONTROL

1. Engineer will perform a minimum of one moisture/density test in accordance with ASTM D6938 (Nuclear Method) per 100 linear feet of trench.

2. Contractor shall recompact any defective backfill to meet the project requirements.

END OF SECTION

SECTION 31 25 00

EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes
1. Erosion bags.
2. Inlet protection
3. Silt fence.
4. Revetment stone.
5. Temporary vegetal cover.
6. Temporary erosion mats.
7. Wattles and sediment logs.
8. Hydraulic soil stabilizer.
9. Filter socks.

1.2 REFERENCES

A. Iowa Department of Transportation (IDOT) (Statewide Urban Design and Specifications [SUDAS] Section 9040)
1. Standard Specifications for Highway and Bridge Construction.
2. Erosion and Sediment Control Field Guide, 2026

B. ASTM International (ASTM)
1. ASTM D1388 – Standard Test Method for Stiffness of Fabrics
2. ASTM D2487 – Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System)
3. ASTM D3776 – Standard Test Method for Mass Per Unit Area (Weight) of Fabric
4. ASTM D4355 – Standard Test Method for Deterioration of Geotextiles from Exposure to Light, Water and Heat in a Xenon Arc Type Apparatus
5. ASTM D4491 – Standard Test Method for Water Permeability of Geotextiles by Permittivity
6. ASTM D4632 – Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
7. ASTM D4751 – Standard Test Method for Determining Apparent Opening Size of a Geotextile
8. ASTM D4833 – Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products
9. ASTM D5035 – Standard Test Method for Breaking Force and Elongation of Textile Fabrics (Strip Method)
10. ASTM D5199 – Standard Test Method for Measuring the Nominal Thickness of Geosynthetics
11. ASTM D5261 – Standard Test Method for Measuring Mass Per Unit Area of Geotextiles

12. ASTM D5338 – Standard Test Method for Determining Aerobic Biodegradation of Plastic Materials Under Controlled Composting Conditions
13. ASTM D6525 – Standard Test Method for Measuring Nominal Thickness of Permanent Rolled Erosion Control Products

C. Iowa Department of Natural Resources (IDNR)
1. Iowa Stormwater Management Manual (2009)
2. Iowa Construction Site Erosion Control Manual (2006)

1.3 SYSTEM DESCRIPTION

A. Design Requirements
1. Select and design method for erosion and sediment control in accordance with local erosion control ordinances. Follow the guidelines in the Iowa Stormwater Management Manual.

B. Provide erosion control shown on the Drawings, as a minimum.

C. Provide additional erosion and sediment control to prevent erosion, which may be caused due to selected construction methods.

1.4 SUBMITTALS

A. Manufacturer's certification for manmade products.

PART 2 - PRODUCTS

2.1 EROSION BAGS

A. Sand Bags
1. Minimum unfilled size of 16 by 26 inches.
2. Completely filled with a granular soil (IDOT Gradation 32).

B. Rock Filled Filter Bags
1. Minimum unfilled size of 18 x 30 inches.
2. Construct bag of high-density polyethylene.
3. Seal bag with a high-density polyethylene draw string knitted directly into the bag opening in a rolled seam using minimum of 480 denier polyester sewing yarn.
4. Fill bag with well graded coarse aggregate (IDOT Gradation 21):

2.2 INLET PROTECTION

A. Provide proposed inlet protection as shown on drawings.

B. Use IDOT-approved materials. Revetment stone class E, or as directed by Engineer.

2.3 SILT FENCE

A. Silt fence shall conform to IDOT Standard Specifications for Highway and Bridge Construction, Series 2015. Table 4196.01-1.

2.4 REVETMENT STONE

A. Revetment Stone is normally used for permanent erosion control. However, should this method of erosion control be selected, or for construction of temporary ditch checks, provide as follows:
   1. Provide minimum thickness of 1.0 feet (300 millimeters [mm]) measured perpendicular to the base.
   2. Provide IDOT Class E revetment stone as a minimum.
   3. If severe erosion is anticipated, submit design to the Engineer.

2.5 TEMPORARY VEGETAL COVER

A. Temporary Seed Mixture Components shall be according to the most current IDOT Standard Specifications for Highway and Bridge Construction.
   1. Use Type 5 mix for rural temporary erosion.
   2. Use Type 4 mix for urban temporary erosion.
   3. Use Wetland mix for areas delineated on Drawings.
   4. Use native grass and flowers (wild flowers) in areas shown on Drawings.

B. Use conventional seeding methods
   1. Fertilize.
   2. Seed bed preparation.
   3. Seed application.
   4. Mulching.

2.6 TEMPORARY EROSION MATS

A. General
   1. Use IDOT IM 4169.10 for suppliers.
   2. Netting shall be applied to both sides.

B. Types
   1. Wood excelsior mat and coconut fiber mat
      a. Used for slopes 4:1 or flatter.
      b. Comply with IDOT Standard Specification, 4169.10 B.1 and B.2
      c. Not to be used in channels.
   2. Slope protection
      a. Used for slopes or in channels.
      b. Comply with IDOT Standard Specification 4169, C.1 and C.2.
   3. Netting
      a. Comply with IDOT Standard Specification 4169.10 D.

C. Anchoring Devices
1. Anchoring and components for temporary erosion mats shall be stapled or pinned using wire staples, according to IDOT Standard Specification 4169.10 A.
2. Materials shall be environmentally safe for soil and groundwater.
3. Do not use petroleum-based plastics or composites.
4. Do not use materials that may present a hazard from splintering or spearing.

2.7 WATTLES AND SEDIMENT LOGS

A. Wattles and sediment logs consist of straw or wood excelsior enclosed in a polyester or plastic netting. Diameter shown on the plans (6-inch minimum).

B. Submit product manufacturer data to Engineer for approval prior to use.

C. Follow IDOT Standard Specification 4169.12 B.

2.8 HYDRAULIC SOIL STABILIZERS

A. Sticking Agent
1. Shall conform to IDOT Standard Specification, 4169.05.

B. Mulch
1. Shall conform to IDOT Standard Specification 4169.07.
2. Use straw, hydraulic, bonded fiber matrix or mechanically bonded fiber matrix.
3. Use straw mulch as a minimum.

C. Submit to Engineer product specifications for selected hydraulic soil stabilizer prior to permitting use on project.

2.9 FILTER SOCKS

A. Conform to IDOT Standard Specification 4169.12 C.

B. Submit to the Engineer for approval.

2.10 GEOTEXTILE FABRICS

A. In accordance with IDOT Standard Specification 4196.

PART 3 - EXECUTION

3.1 GENERAL

A. Keep disturbed areas to a minimum.

B. Stabilize and protect disturbed areas with temporary seed and mulch within 14 days of active disturbance of the soil surface when no further construction is occurring.

C. Place excavated trench material on the high side of the trench where appropriate.

D. Discharge trench water to filter barrier prior to release into a drainage way.

E. Install gravel mats at site vehicle entrance and site exit locations to prevent tracking of soil.

F. Collect tracked soil and clean from paved roads near the construction site the same day it occurs.

G. Sediment control measures shall be in place at the end of each working day.

H. Locate soil stockpiles no closer than 25 feet of a roadway, wetland, or drainage control channel and control by covering the pile with tarpaulins, temporary seed and mulch or other suitable means, if the pile is exposed for 14 days or more.

I. Protect storm inlets including inlets in paved roadways with suitable approved barriers.

J. When it is necessary to cross waterways, provide crossing structures for machinery.

K. Repair, replace, and maintain erosion and sedimentation structures until vegetation is re-established or permanent structures are installed.

L. Remove temporary erosion control structures and accumulated sediment and/or debris when vegetation is established.

3.2 EARTH STRUCTURES

A. Utilize one or more of the following:
   1. Earth Structures
      a. Berms or embankments.
      b. Sedimentation basins and traps.
      c. Temporary diversion ditches.
      d. Temporary chutes and ditches.
      e. Grade control structures.
   2. Construct earthen structures using standard net weights and techniques including fine grading and compaction.

3.3 EROSION AND SEDIMENTATION CONTROL DEVICES

A. Erosion Bags
   1. Place type (sand or rock filled) where shown on the Drawings at a minimum.
   2. Place bags end to end across surface water flow path.
   3. Place bags at right angles to the direction of water flow.
   4. Excavate shallow sump on the upstream side of bags.
   5. Entrench bags at least 4 inches into the ground.

6. Place bags prior to disturbing upslope areas.
7. Drive support posts a minimum of 12 inches into the subgrade and extend to the top of the bags.
8. Remove from the site after final stabilization.

B. Inlet Protection
1. Provide inlet protection in accordance with the Iowa Construction Site Erosion Control Manual, Section 3.9.
2. Provide submittal to Engineer for selected inlet protection.

C. Silt Fences
1. Place geotextile (silt) fence prior to disturbing upslope areas.
2. Excavate trench approximately 4 inches by 4 inches along perimeter of area to be fenced.
3. Secure and continuously anchor bottom of geotextile (silt) fence with excavated material in trench bottom.
4. Install support post on downstream side of the geotextile to a depth adequate to stabilize geotextile fence (12-inch minimum depth).
5. Secure geotextile to posts.
   a. Staples: 0.5-inch deep.
   b. Staple to up slope side of post.
6. Backfill over geotextile in trench and compact.
7. Maximum spacing of the posts shall not exceed 10 linear feet.

D. Revetment stone
1. Place revetment stone by mechanical methods and as required in IDOT Standard Specification 2507.03 B
2. Place revetment stone upon appropriate geotextile fabric as required by IDOT Standard Specification 4196.01 B.3.

E. Temporary Vegetal Cover
1. Use conventional seeding methods unless otherwise directed by Engineer.
2. Comply with IDOT Standard Specifications 2601.03 C.

F. Temporary Erosion Mats
1. Installation:
   a. See plan details for anchor trench (at ends, checks and edges) installation procedures.
      1) Anchor trenches shall be 12 inches deep.
      2) Compact anchor trench backfill.
      3) Place staples in end and check trenches spaced at 12 inches.
   b. Follow manufacturer's specifications and instructions for placement unless project documents are more stringent.
   c. Roll width overlaps shall be 12 inches at edges. Pin or staple every 3 feet along overlap length.
   d. Roll end overlaps may be spliced by overlapping (in the direction of water flow) 2 feet with the upstream portion of the mat on top of the downstream

portion. This overlap shall receive at least three pins or staples with a maximum spacing of 12 inches.
e. Pins or staples shall be 18 inches in length minimum, driven flush with the mat.
f. Place mat flat conforming to contours in soil surface. Do not stretch mat.
g. Place mat from toe of slope toward top of slope.
h. Mat can be placed from downstream toward upstream or from upstream toward downstream.

2. Site Preparation.
a. Place seed and fertilizer prior to placing permanent erosion control blanket.
b. Seed and fertilizer may be placed after permanent erosion mat installation with Engineer's approval.
c. Ground surface shall be smooth and compact.
d. Remove all rocks, dirt clods, stumps, roots, grass clumps, trash and other obstructions from lying in direct contact with the soil surface and the erosion mat.

G. Wattles and Sediment Logs
1. Installation:
a. Place wattle or log on top of an erosion control blanket.
b. Place one every 1% of grade, evenly spaced at an interval of 50 feet.

H. Hydraulic Soil Stabilizers
1. Installation:
a. Install soil stabilizers using conventional hydraulic seeding equipment.
b. Follow manufacturer’s recommendations for application rates.
c. Do not use asphalt based products as soil stabilizers.
d. Do not place soil stabilizers in channels.

I. Filter Socks
1. Installation:
a. Filter socks shall be capable of maintaining location and form during and after rainfall events.
b. Filter socks shall be placed at locations shown on the Drawings.
c. Place filter socks generally perpendicular to the flow line of the ditch and extend far enough so the ground level on the ends of the filter socks are a minimum 18 inches higher than the flow line.

3.4 MAINTENANCE

A. Inspect silt fences and filter barriers immediately after each rainfall and at least daily during prolonged rainfall.
1. Make any required repairs immediately.
2. Maintain temporary erosion and sedimentation control structures until permanent soil erosion controls are completed and/or vegetation is established.
a. Repair damaged structures.
b. Replace lost structures.

c. Remove sediment from deposition areas adjacent to erosion control structures without damaging structures on a regular basis.
d. Refill eroded areas as required for grade stabilization.

B. If the fabric on a silt fence or filter barrier decomposes or becomes ineffective prior to the end of the expected usable life and the barrier is still necessary, replace the fabric promptly.

C. Remove sediment deposits after each major storm event and when deposits reach approximately half the height of the barrier.

D. Remove any sediment deposits remaining in place after the silt fence or filter barrier is no longer required and dress to conform to the existing grade, prepared and seeded.

E. Repair/restore any washed-out areas.

F. Maintenance period to be entire project period including the one-year warranty.

G. Owner may direct Contractor to remove the temporary erosion control measures any time during the one-year correction period.

H. Construct permanent erosion control measures immediately after earthwork is completed.

END OF SECTION

SECTION 31 32 19

GEOTEXTILES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Geotextile fabrics under riprap.
2. Geotextile fabrics for separation, cushioning, and subgrade reinforcement.

1.2 REFERENCES

A. ASTM International (ASTM):
1. ASTM D123 – Standard Terminology Relating to Textiles.
2. ASTM D4354 – Standard Practice for Sampling Geotextiles for Testing.
3. ASTM D4355 – Standard Test Method for Determination of Geotextiles from Exposure to Ultraviolet Light and Water (Xeron-Arc Type Apparatus).
4. ASTM D4491 – Standard Test Method for Water Permeability of Geotextiles by Permittivity.
5. ASTM D4533 – Standard Test Method for Trapezoid Tearing Strength of Geotextiles.
6. ASTM D4632 – Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
7. ASTM D4751 – Standard Test Method for Determining Apparent Opening Size of Geotextiles.
8. ASTM D4833 – Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes and Related Products.
9. ASTM D4873 – Standard Guide for Identification, Storage and Handling of Geosynthetic Rolls.
10. ASTM D4884 – Standard Test Method of Strength of Sewn or Thermally Bonded Seams of Geotextiles.

B. Geosynthetics Research Institute (GRI)
1. GT12(a) – Test Methods and Properties for Nonwoven Geotextiles Used as Protection (or cushioning) Materials – ASTM Version.
2. GT13 – Test Methods and Properties for Geotextiles Used as Separation between Subgrade Soils and Aggregate.

C. Iowa Department of Transportation Standard Specifications, most recent version.

1.3 SUBMITTALS

A. Provide, prior to delivery of the geotextile fabric, a manufacturer's Certificate of Compliance that the geotextile fabric meets the requirements of this Section.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver only geotextiles meeting the specifications of the Site.

B. All geotextiles shall be labeled, shipped, stored and handled in accordance with ASTM D4873.

C. Do not use hooks, tongs, or other sharp instruments for handling geotextile.

D. Store geotextile fabric in a dry location until installed.

PART 2 - PRODUCTS

2.1 GENERAL

A. Provide geotextile fabric consisting of either woven or non-woven polyester, polypropylene, stabilized nylon, polyethylene or polyvinylidene chloride.
   1. All fabric shall have the minimum strength values in the weakest principle direction.
   2. Non-woven fabric may be needle punched, heat-bonded, resin-bonded, or combinations thereof.

B. The geotextile fabric shall be insect, rodent, mildew, and rot resistant.

C. Clearly mark the geotextile fabric rolls showing the type of fabric.

D. If sewn seams are used, provide a field sewn seam sample produced from the geotextile fabric and thread and with the equipment to be used on the project, prior to its incorporation into the work.

2.2 MATERIALS

A. Geotextile Fabric – Used Under Riprap
   1. The fabric shall comply with the specifications in Iowa DOT Section 4196, Table 4196.01-3 Fabric for Use as Embankment Erosion Control.

B. Woven Geotextile Fabric Subgrade Reinforcement
   1. Woven geotextile fabric subgrade reinforcement shall be used beneath roadway subbase.

2. The fabric shall comply with the following minimum physical requirements:

Parameter	Method	Value[1]
Trapezoid Tear (lb)	ASTM D4533	120 lbs
Apparent Opening Size (sieve size)	ASTM D4751	30-70
Ultraviolet Degradation (% strength retained)	ASTM D4355	70
Grab Tensile Strength (lb)	ASTM D4632-86	315 min.
CBR Puncture Strength (lb)	ASTM D6241	900 min.
Elongation at Required Strength (%)	ASTM D4632-86	15% max.

Note:
[1] All numerical values represent minimum/maximum average roll values (i.e., the average of test results on any roll in a lot should meet or exceed the minimum values in the table).
CBR = California Bearing Ratio

C. Nonwoven Geotextile Fabrics – Used for Underdrain or Leachate Collection Systems
1. The geotextile fabric shall comply with the physical properties in Table 1.

Table 1 – Geotextile Properties

Property(1)	Test Method ASTM	Unit	NOT USED - 16 oz/yd^2	10 oz/yd^2
Mass per unit area	D5261	oz/yd^2	16	10
Grab tensile strength	D4632	lb	425	270
Grab tensile elongation	D4632	%	50	50
Trap. Tear strength	D4533	lb	150	100
Permittivity	D4491	sec^{-1}	0.57	0.94
Permeability	D4491	cm/sec	0.25	0.30
Puncture (pin) strength	D6241	lb	1200	725
UV resistance(2)	D4355	%	70	70

Notes:
(1)All values are MARV except UV resistance; it is a minimum value.
(2) Evaluation to be on 2.0-inch strip tensile specimens after 500 hours exposure.
MARV – minimum average roll value
oz/yd^2 – ounce per square yard
UV - ultraviolet

PART 3 - EXECUTION

3.1 SEAMS WITHIN UNDERDRAIN AND LEACHATE COLLECTION SYSTEMS

A. Sew the seams of the geotextile with thread having the same or greater physical properties as the material. Thread shall have similar or better resistance to chemical attack and UV degradation as the geotextile material.

B. Test seams in accordance with ASTM D4884.

C. Seams shall develop a tensile strength equal to or greater than 90% of the required grab tensile strength of the fabric, unless otherwise specified.

D. Seam shall be a prayer type. Provide a minimum of one test result from a trial seam performed at Site.

E. Repair any geomembrane damaged during installation of geotextile.

3.2 SEAMS FOR UNDER RIPRAP OR ROADS

A. Grade the area smooth and remove all stones, roots, sticks, or other foreign material which would interfere with the fabric being completely in contact with the soil.

B. Place the fabric loosely and parallel to the direction of water movement.
1. Provide pinning or stapling to hold the geotextile in place.
2. Join separate pieces of fabric by overlapping or sewing according to Table 2.

Table 2 – Maximum Spacing for Securing Pins

Slope	Spacing (feet)
Steeper than 3H to 1V	2
From 3H to 1V to 4H to 1V	3
Flatter than 4H to 1V	5

3. Place the fabric in the overlapped joints with a minimum overlap of 24 inches in the direction of flow.

C. After placement, do not expose the fabric longer than 48 hours prior to covering.

D. Cover damaged areas with a patch of fabric using a 3-foot overlap in all directions.

E. Place riprap from the base of the slope upward.

F. Do not allow freefall of riprap to prevent damage to the fabric.

3.3 PROTECTION

A. Protect the geotextile at all times during construction from contamination by surface runoff. Remove and replace any geotextile so contaminated with uncontaminated geotextile.

B. Replace any damaged geotextile.

C. Schedule the work so that the covering of the geotextile with a layer of the specified material is completed within 20 calendar days after placement of the geotextile.

D. Protect the geotextile from damage prior to and during the placement of riprap or other materials.
   1. Limit the height of drop to less than 300 millimeters (mm) (1 foot) or place a cushioning layer of sand or gravel on top of the geotextile before placing the material, or other methods deemed necessary.
   2. Take care to ensure that the utilized cushioning materials do not impede the flow of water.
   3. Before placement of riprap or other materials, demonstrate that the proposed placement technique will not cause damage to the geotextile.

END OF SECTION

SECTION 31 35 26

CLAY LINER CONSTRUCTION - LANDFILL

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work in this section specifies the construction of the sanitary landfill clay liner.

B. Contractor shall under this specification excavate, haul, place, and compact all clay soils used in construction of the landfill liner system.

1.2 PRODUCTS INSTALLED BUT NOT FURNISHED BY CONTRACTOR

A. Owner will furnish borrow site where Contractor can obtain clay liner material.

B. An on-site clay source has been identified. On-site clay source must be tested in accordance with this Section and Section 01 45 00, Quality Control. The Contractor is responsible for installing qualified clay that meets the minimum project requirements.

1.3 RELATED SECTIONS

A. Section 31 22 00, Grading

B. Section 31 05 10, Soils and Aggregates for Earthwork

1.4 REFERENCE STANDARDS

A. ASTM International (ASTM)
1. ASTM D698 – Test for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5-lb. (2.49-kg) Rammer and 12-in. (305-mm) Drop (Standard Proctor).
2. ASTM D1140 – Standard Test Method for Amount of Material in Soils Finer than the No. 200 (75 um) Sieve.
3. ASTM D1557 – Test for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, using 10-lb. (4.5-kg) Rammer and 18-in. (457-mm) Drop (Modified Proctor)
4. ASTM D1587 – Standard Practice for Thin-Walled Tube Sampling of Soils
5. ASTM D2216 – Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil Aggregate Mixtures
6. ASTM D2434 – Standard Test Method for Permeability of Granular Soils (Constant Head)
7. ASTM D2487 – Standard Classification of Soils for Engineering Purposes.
8. ASTM D2488 – Standard Practice for Description and Identification of Soils (visual-manual procedure)

9. ASTM D4318 – Liquid Limit, Plastic Limit, and Plasticity Index of Soils
10. ASTM D5084 – Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter
11. ASTM D6938 – Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
12. ASTM D7928 – Standard Test Method for Particle-Size Distribution (Gradation) of Fine-Grained Soils Using the Sedimentation (Hydrometer) Analysis

1.5 TESTING RESPONSIBILITY

A. The Contractor shall perform on-site moisture density testing of compacted clay liner in the presence of the Owner's representative.

B. The Contractor shall provide the following:
   1. Access for testing, inspection, and documentation.
   2. Machinery required to grade density testing locations.
   3. Replace and recompact clay material removed for testing purposes:
      a. Backfill Shelby tube holes in liner with powdered bentonite-voclay-premium gel or equal and hydrate.

1.6 TESTING REQUIREMENTS

A. Source Testing
   1. Standard Proctor: ASTM D698 (minimum 3 tests or 1/5,000 cubic yards [cy])
   2. Grain Size and Hydrometer Analysis: ASTM D7928 (minimum 3 tests or 1/5,000 cy)
   3. Atterberg Limits: ASTM D4318 (minimum 3 tests or 1/5,000 cy)
   4. Hydraulic Conductivity: ASTM D5084 (3 per compaction test)
   5. Soil Classification ASTM D2487 (minimum 3 tests or 1/5,000 cy)

B. Installation Testing
   1. Density testing will be performed on a 50-foot grid pattern for each 6- to 8-inch lift on a 50-foot horizontal offset and every 50 linear feet in liner anchor trenches in accordance with ASTM D6938. Density and moisture must meet the compaction requirements to achieve the necessary permeability specified in the geotechnical laboratory analysis (Compaction Curve) and are equal to or greater than 95% of the Standard Proctor (ASTM D698) maximum dry density and moisture content as determined by Owner's Representative.
   2. One Shelby tube sample per 12 inches of thickness per acre of liner placement shall be retrieved and analyzed for the following:
      a. Grain Size and Hydrometer Analysis: ASTM D422 – no less than 50% by weight passing the #200 sieve.
      b. Moisture Content: ASTM D2216 - +2-4%.
      c. Dry Density: ASTM D698 – must achieve 95% compaction.
      d. Atterberg Limits – ASTM D4318 - Liquid Limit (LL): 25% or greater; Plastic Index (PI): Average 12% or greater

e. Hydraulic Conductivity: ASTM D5084 – maximum of 1 x 10^{-7} centimeters per second (cm/sec).
f. In-place moisture density test (ASTM D6938) shall be collected at each Shelby tube sampling location. Density and moisture must meet the compaction requirements to achieve the necessary permeability specified in the geotechnical laboratory analysis and can be no less than 95% of the Standard Proctor (ASTM D698) maximum density and moisture content to be specified.
g. All test holes shall be filled with bentonite and hydrated by the Contractor.

3. Failing Samples
   a. If any sample fails to meet project requirements (i.e., maximum permeability of 1 x 10^{-7} cm/sec), a minimum of two adjacent previously untested samples shall be analyzed. Adjacent samples shall be taken 50 feet from the original sample location.
   b. If the additional samples fail, the liner shall be removed and replaced or scarified and recompacted, as directed by the Owner's representative, at the Contractor's expense.
   c. The cost for the additional sampling, testing, and engineering review shall be paid by the Contractor.

PART 2 - PRODUCTS

2.1 CLAY LINER MATERIAL

A. Source
   1. A source of clay liner material located on-site.
   2. The in-place soils have historically been suitable for liner material. The Contractor will perform source testing in accordance with this Section and Section 01 45 00, Quality Control, to verify compaction requirements. Contractor will excavate the material and re-compact.

B. An alternate clay borrow source will not be approved by the Owner or Engineer.

PART 3 - EXECUTION

3.1 CLAY EXCAVATING, LOADING AND HAULING

A. Strip and stockpile topsoil.

B. Contractor is responsible for excavating and loading clay at the borrow site.

C. Contractor is responsible for hauling only clay which meets the requirements for clay liner material to the project area.

3.2 SUBGRADE PREPARATION

A. Soil materials used for liner support material or for berm construction shall be placed and compacted to 90% Standard Proctor.

B. Subgrade shall be graded to the tolerance stated in Section 01 45 00, Quality Control. Subgrade shall be unyielding (no yielding greater than 2 inches). Proof roll subgrade prior to clay placement.

3.3 CLAY LINER PLACEMENT

A. General
1. Clay liner placement shall not proceed until liner subgrade, grading, testing, and documentation has been completed.
2. Place clay materials so that lift thickness after compaction is not greater than 6 inches.
3. The Contractor shall immediately proceed with the construction of the subsequent clay liner lift after the completion of quality control testing and construction documentation work (field testing and surveying) of the previous lift.
4. Each lift to be kneaded with the previously placed lift.
5. The top surface of the clay liner shall be made smooth by proof rolling after completing compaction of the final lift of clay.
6. Maximum clod size is 3 inches.

B. Landfill Base
1. Place clay in a continuous lift across the entire landfill bottom.
2. Clay liner for landfill base shall consist of 6-inch compacted lifts placed to a minimum thickness of 2 feet measured perpendicular to the liner surface. Tolerance of 0.0 to +0.1 feet.

C. Landfill Sidewall
1. Construct clay liner for landfill sidewall after completion of construction and testing of liner base.
2. Clay liner for landfill sidewall shall consist of 6-inch compacted lifts placed to a minimum thickness of 2 feet measured perpendicular to the liner surface. Tolerance of 0.0 to +0.1 feet

D. Moisture Content Adjustment
1. Provide all equipment necessary to adjust clay to the proper moisture content for compaction.
2. Clay liner shall not be placed at a moisture content less than +2% of optimum as determined by ASTM D698.
3. Excessively dry or wet clay material shall be replaced prior to placement of additional lifts.

E. Compaction
1. Provide a sheepsfoot roller for clay liner compaction except in confined areas.

2. Compact clay to meet the compaction requirements specified in the geotechnical laboratory analysis (Daniels Curve) to achieve the required permeability. At a minimum clay must be compacted to 95% of the Standard Proctor maximum density with a moisture content between 2% and 4% above optimum.
3. Upon completion of each 6-inch compacted lift, Contractor shall provide the following:
   a. Machinery required to blade clay liner at density test locations.
   b. Machinery required to obtain undisturbed samples (i.e., Shelby tubes).
   c. Access to clay liner for checking grades after the completion of each lift.

F. The maximum permeability of clay samples collected and tested under Paragraph 1.6 of this section shall be 1×10^{-7} cm/sec.

3.4 CONTRACTOR'S RESPONSIBILITY

A. Maintain the integrity of the clay liner until final payment and acceptance.
   1. Clay integrity shall include clay moisture content, density, and hydraulic conductivity.

3.5 RESPONSIBILITY FOR CLAY LINER NOT MEETING SPECIFICATION REQUIREMENTS

A. If the in-place clay liner fails to meet the requirements of this section, the Contractor shall be responsible as follows:
   1. Remove and replace or rework any portion of the clay liner not meeting the project specifications until project specifications are met.
   2. The Contractor shall not be compensated for removing, replacing, or reworking clay not meeting the specification requirements.

END OF SECTION

SECTION 31 35 27

DRAINAGE LAYER MATERIAL

PART 1 - GENERAL

SUMMARY

1.1 SUMMARY

A. Section Includes
1. Description.
2. Related sections.
3. References.
4. Quality assurance testing responsibility.
5. Selection of material for use as drainage layer.
6. Subgrade preparation.
7. Installation.

1.2 DESCRIPTION

A. Work in this section specifies the construction of the drainage layer over the geocomposite and the groundwater underdrain drainage layer.

1.3 RELATED SECTIONS

A. Section 01 45 00 Quality Control

B. Section 31 22 00 Grading

C. Section 31 35 27 HDPE Geomembrane

1.4 REFERENCES

A. American Society for Testing and Materials (ASTM)
1. ASTM D422 Particle Size Analysis of Soils
2. ASTM D2434 Permeability of Granular Soils (Constant Head)

1.5 GENERAL

A. Damage to the geomembrane liner during placement of the drainage layer material shall be immediately repaired by the Contractor at no cost to the Owner.

1.6 QUALITY ASSURANCE TESTING RESPONSIBILITY

A. The Contractor shall provide information on the source and location of off-site material to the Owner’s representative.

B. The Contractor shall provide access for testing, inspection, and documentation.

C. The Contractor shall provide an established testing laboratory, approved by the Owner, and pay for all source and in-place testing as described in Section 2.1.

D. Payment to Contractor shall not occur unless quality assurance testing results show complete conformance with the contract documents.

E. The Contractor's Surveyor shall provide required record thickness of the drainage layer on a 50-foot grid pattern.

PART 2 - PRODUCTS

2.1 DRAINAGE LAYER MATERIALS

A. Drainage layer materials shall meet the requirements as follows:
1. IDOT Gradation 3 non-calcareous material
2. Hydraulic conductivity shall be no less than 1×10^{-3} cm/sec (ASTM D2434).

B. The Contractor shall provide a source for drainage material. The Contractor shall submit source testing data at a rate of one sample per 2,000 cubic yards for verification the granular drainage material meeting the IDOT specification.

C. Drainage layer shall meet IDOT specifications for Grade 1 gradation. No limestone.

D. The Contractor is also required to submit permeability test results from in situ testing to the Engineer to verify the drainage material has a minimum hydraulic conductivity of 1×10^{-3} cm/sec. One test per acre is required.

2.2 GROUNDWATER UNDERDRAIN MATERIALS

A. Drainage layer materials shall meet the requirements as follows:
1. IDOT Gradation 3 Aggregate - SAND
2. Hydraulic conductivity shall be no less than 1×10^{-2} cm/sec (ASTM D2434).

B. The Contractor shall provide a source for drainage material. The Contractor shall submit source testing data at a rate of one sample per 2,000 cubic yards for verification the granular drainage material meeting the IDOT specification.

C. Drainage layer shall meet IDOT specifications for Grade 3 gradation. No limestone.

PART 3 - EXECUTION

3.1 SUBGRADE PREPARATION

A. The clay liner, geomembrane liner, and geocomposite shall be installed and approved per the Engineer (in accordance with Section 31 35 26 Clay Liner Construction, Section 31 35 27 HDPE Geomembrane and Section 33 46 23 Geosynthetic Drainage Layer) prior to placement of the drainage layer.

3.2 INSTALLATION OF DRAINAGE LAYER OVER GEOMEMBRANE/ GEOCOMPOSITE

A. Drainage layer installation shall not commence until 60-mil HDPE geomembrane installation has been approved, material testing and documentation have been completed and the geocomposite is installed.

B. The drainage layer shall be carefully placed over the geocomposite to avoid damage to the underlying liner materials. A minimum 1 ft of drainage material shall be maintained beneath vehicles with a ground pressure less than 5 psig, 2 ft for all other tracked vehicles and flotation tire equipped vehicles, and 3 ft for truck and all other wheeled hauling equipment.

C. Minimize compaction of the drainage layer material.

D. Place drainage material to the thickness indicated on the construction drawings.

E. Equipment used to deploy the drainage layer shall be equipped with low ground pressure tracks and shall have a gross weight less than 24,000 pounds and rated ground pressure of <5 psig.

F. No rubber tire vehicles shall be allowed on the drainage layer during or after placement.

G. Material placement on slopes shall proceed from the toe of slope (bottom) to the crest (top).

H. Material shall always be pushed ahead of the machinery.

I. Contractor shall provide monitors to observe the placement of the drainage layer to prevent the propagation of wrinkles in the geomembrane and geocomposite. Under no circumstance can wrinkles be folded over. Placement should be performed during conditions which keep wrinkling to a minimum.

J. Any damage to the 60-mil geomembrane during the placement of the granular drainage layer shall be repaired in accordance with Section 31 35 26.16 HDPE Geomembrane.

K. Contractor shall prevent contamination of the material and avoid excess handling, which causes the breakdown of the material.

3.3 TOLERANCE

A. Drainage layer material shall be graded to a vertical tolerance of 0.0 to +0.1 feet at each grid (documentation) location. The drainage layer thickness must be equal to or greater than 1.0 foot at all locations. Verification of thickness and tolerance shall be completed by the Owner's surveyor at a 50-foot grid pattern interval.

3.4 FIELD QUALITY CONTROL

A. Tests
1. A minimum of one sample for every 2,000 cubic yards of material installed will be tested for Grain Size (ASTM D422).
2. The thickness of the drainage layer will be verified by the Owner's surveyor on a grid pattern no greater than 50 feet by 50 feet.
3. Owner will perform and pay cost of as-installed tests.
4. Additional drainage layer material shall be placed by the Contractor in areas showing a deficiency of drainage material at no cost to the Owner.

3.5 PROTECTION

A. The integrity of the drainage layer shall be maintained by the Contractor at no cost to the Owner until substantial completion is accepted by the Owner.

END OF SECTION

SECTION 31 35 27.19

HDPE GEOMEMBRANE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Smooth High-Density Polyethylene (HDPE) flexible membrane.
2. Textured HDPE flexible membrane.
3. Subgrade preparation.
4. Membrane installation.
5. Quality assurance and control measures.

1.2 REFERENCES

A. ASTM International (ASTM)
1. ASTM D638 – Test Method for Tensile Properties of Plastics
2. ASTM D746 – Test Method for Brittleness Temperature of Plastics and Elastomers by Impact
3. ASTM D1004 – Test Method for Initial Tear Resistance of Plastic Film and Sheeting
4. ASTM D1238-95 – Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer
5. ASTM D1505 – Test Method for Density of Plastics by the Density-Gradient Technique
6. ASTM D1603 – Test Method for Carbon Black in Olefin Plastics
7. ASTM 4437 – Practice for Determining the Integrity of Field Seams Used in Joining Flexible Polymeric Sheet Geomembranes
8. ASTM D4833-96 – Test Method for Index Puncture Resistance of Geotextiles, Geomembranes and Related Products
9. ASTM D5199-95 – Test Method for Measuring Nominal Thickness of Geotextile and Geomembranes
10. ASTM D5321-92 – Test Methods for Determining the Coefficient of Soil and Geosynthetic or Geosynthetic set Geosynthetic Friction by the Direct Shear Method
11. ASTM D5397-95 – Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes using Notched Constant Tension Load Test
12. ASTM D5885-97 – Standard Test Method for Oxidative Induction Time of Polyolefin Geosynthetics by High-Pressure Differential Scanning Calorimetry
13. ASTM D5596-94 – Test Methods of Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics
14. ASTM D5994-96 – Test Method for Measuring the Core Thickness of Textured Geomembranes

B. Geosynthetic Research Institute (GRI):
   1. GRI GM12 – Asperity Measurement of Textured Geomembranes Using a Depth Gage
   2. GRI GM13 – Test Properties, Testing Frequency and Recommended Warranty for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes
   3. GRI GM19 – Seam Strength and Related Properties of Thermally Bonded Polyolefin Geomembranes

1.3 SUBMITTALS

A. Product Data Submittals
   1. Data which shows HDPE geomembrane material properties.
   2. Specifications for resin and polymer.

B. Shop Drawing Submittals
   1. Product data including specifications for resin and polymer.
   2. Panel layout diagram.
   3. Installation procedures.
   4. Liner anchor details.
   5. Liner penetration details.
   6. Liner repair procedures.

C. Quality Assurance/Quality Control (QA/QC) Submittals
   1. Test Reports, Certificates Submittals:
      a. Certification that liner material conforms to specifications.
      b. Field quality control test reports of required tests. Provide as soon as results become available.
      c. Manufacturing quality control data (see note on Table 1) provided for each roll of geomembrane.
      d. Membrane installer's written certification that the base subgrade is suitable and acceptable for installation of the liner material.
   2. Qualification Statements:
      a. Qualification information on manufacturer/fabricator.
      b. Qualification information on installer.

D. Samples
   1. Liner material.
   2. Welded seams, shop and field.

E. Closeout Submittals
   1. Written warranty by the manufacturer/fabricator and installer.
   2. As-built panel layout drawing in Autocad format within 10 calendar days of completion of installation.

1.4 QUALITY ASSURANCE

A. Qualifications

1. Installer Information:
   a. Corporate background.
   b. Capabilities including:
      1) Size.
      2) Equipment.
      3) Personnel.
      4) Anticipated daily production.
   c. List of 10 (minimum) completed facilities totaling a minimum of 2,000,000 square feet:
      1) Name, location, and purpose of facility.
      2) Date of installation.
      3) Name of Owner and project manager.
      4) Description and surface area of liner and name of liner manufacturer.
      5) Types of seams and seaming equipment used.
   d. Assigned to this project will be a master seamer who has experience seaming a minimum of 1,000,000 square feet of liner using the same type of equipment and material intended for this project.
   e. Qualifications of personnel performing seaming operations.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Transporter shall be aware of the consequences of damage to liner and familiar with manufacturer's handling requirements.

B. Prepare and package materials to prevent damage or deterioration such as excessive aging or puncturing during shipment.

C. Identify the material thickness, length, width, and manufacturer's mark on packaging.

D. Protect material such that it is dry upon arrival at the Site (i.e., free of water, snow, etc.).

E. Provide open packaging cores such that a 4-inch diameter metal rod can be inserted for deployment.

F. Store and protect liner material from vandalism, vehicular traffic, and damage from construction activities. Do not store more than two rolls high.

1.6 WARRANTY

A. Provide a written warranty by the manufacturer/fabricator and installer in the Owner's name guaranteeing the quality of the material and workmanship. (Five years for the material and one year for the installation.)

B. All damage to the liner, except those expressly due to operation of equipment, shall be covered by the warranty.

PART 2 - PRODUCTS

2.1 ACCEPTABLE HDPE MANUFACTURERS

A. Agru America

B. Poly-Flex, Inc.

C. Solmax

D. An Engineer-approved equal

2.2 HDPE FLEXIBLE MEMBRANE MATERIAL

A. Provide a high density polyethylene liner meeting the minimum requirements stated in the following Table 1:

Table 1 – HDPE Geomembrane Material Properties

Property	Test Method	Units	White 60-mil Smooth HDPE Required Value	White 60-mil Textured HDPE Required Value
A. Sheet Properties				
1. Thickness (min. avg.)	ASTM D5199/ASTM D5994	Mil	60	60
a. Lowest Ind. for 8 Out of 10 Values		Mil	60	60
b. Lowest Ind. for Any of 10 Values		Mil	60	60
3. Asperity Height (min. avg.)	ASTM D7466	Mil	Not Applicable	10
4. Tensile Properties (min. avg. in each direction)	ASTM D6693			
a. Yield Strength		lb/in.	126 min.	126 min.
b. Break Strength		lb/in.	228 min.	90 min.
c. Elongation at Yield		%	12 min.	12 min.
d. Elongation at Break		%	700 min.	100 min.
5. Tear Resistance	ASTM D1004	lb	42 min.	42 min.
6. Puncture Resistance	ASTM D4833	lb	108 min.	90 min.
7. Carbon Black Content	ASTM D1603	% Range	2 to 3%	2 to 3%
8. Carbon Black Dispersion	ASTM D5596	Rating		
8 out of 10			category 1 or 2	category1 or 2
All 10			category 1,2 or 3	category 1, 2 or 3
B. Resin Properties				
1. Melt Flow Index	ASTM D1238	g/10 min.	<1.0 max.	<1.0 max.
2. Resin Density	ASTM D1505	g/cm^3	0.932 min.	0.932 min.
C. Seam Properties[1]				
1. Peel Strength (fusion)	GRI GM19	lb/in.	91 min.	91 min.
2. Peel Strength (extrusion)	GRI GM19	lb/in.	78 min.	78 min.
3. Shear Strength	GRI GM19	lb/in.	120 min.	120 min.
D. Environmental Properties				
1. Stress Cracking	ASTM D5397	hrs.	300	300
2. U.V. Resistance, high pressure OIT (Min. Avg.)	ASTM D5885	% retained after 1600 hrs	50	50
E. Friction Resistance[2]				
1. Interface Between Geomembrane and Underlying Material	ASTM D5321		Not Required	22º min. (residual)
2. Interface Between Geomembrane and Overlying Material	ASTM D5321		Not Required	22º min. (residual)

Notes:
General note: Manufacturer shall provide MQC test results of materials in accordance with the frequencies listed in the GRI GM-13 specifications.
[1] Refer to GRI GM19 for seam "locus of break" requirements. Four out of five seams must meet strength values. The fifth seam can be 80% of the strength values.
[2] Tests to be done under saturated/wet conditions; a minimum of three samples shall be tested for each of the interfaces.

B. Provide HDPE liner meeting the minimum requirements stated in Table 1.
C. White liner.
D. General HDPE Material Requirements
   1. Contain no additive which will leach out or cause deterioration over time.
   2. Be free of holes, blisters, undispersed raw materials and any sign of contamination by foreign matter.

3. Provide labels on rolls identifying thickness, length, width and manufacturer's mark number.

2.3 WELDING PRODUCTS

A. Manufacture field welding material from the same materials used in the manufacture of the membrane.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that the clay liner has been tested and approved by the Engineer prior to subgrade preparation.

B. Inspect site and remove the following:
1. Angular rocks, roots, grass and vegetation.
2. Foreign materials and protrusions.

C. After surface preparation is completed, the liner installer shall inspect the site and provide a written certification that the base subgrade is suitable and acceptable for installation of the liner material.

3.2 SURFACE PREPARATION

A. Prior to liner installation, prepare surface by grading, recompacting and proof rolling.

B. Grade site such that there are no abrupt changes or breaks in grade.

C. Compact subgrade to provide a firm unyielding base for liner installation.

D. Roll subgrade surface smooth with a drum roller such that base is unyielding.

E. Remove from subgrade surface all loose earth, rocks, rubble and other foreign material.

F. Correct any defects in subgrade identified by the membrane installer.

3.3 MEMBRANE INSTALLATION

A. Climatic Conditions
1. Temperature: Install membrane during temperature range of 5 degrees Celsius (°C) to 40°C. 40 degrees Fahrenheit (°F) to 105°F
2. Wind: Do not attempt installation when wind velocity and/or dusty conditions interfere with membrane placement, alignment of seams, or cleanliness of seam area.

3. Precipitation: Do not attempt installation when precipitation interferes with having a dry seaming surface (i.e., rain, sleet, snow, or heavy dew).

B. Layout
1. Overlap a minimum of 3 inches for extrusion and 4 inches for fusion welding.
2. Prepare areas for welding in accordance with the manufacturer's/installer's requirements, including cleaning.
3. Place temporary anchoring such as sand bags on 2-foot centers on membrane immediately after layout.
4. Provide sufficient personnel to properly place the membrane and to operate the equipment so that the project proceeds in a workmanlike manner to completion.
5. All panels shall be placed perpendicular to slopes greater than 10%.
6. Longitudinal seams shall not be located within the leachate collection trenches.
7. In no cases will equipment travel be allowed over unprotected geotextile/geomembrane. If equipment is used to deploy geomembrane over clay surface, it shall not cause rutting (greater than 1 inch) in the clay surface.

C. Welding
1. Weld together by extrusion welding or by hot wedge (fusion) welding.
2. Welding equipment shall be capable of continuously monitoring and controlling the temperature in the zone of contact or on the extrusion welder.
3. Seams parallel to the toe of the slopes shall be located a minimum of 10 to 15 feet from the toe without prior engineers approval, but in no case less than 5 feet.
4. Mark any burnouts or defects found along seam while welding.
5. Sufficient number of hot shoe and extrusion welders shall be on-site at all times such that the progress of work is not hampered due to the lack of equipment or personnel.
6. Field welding shall result in a homogeneous bond which is durable, strong, and airtight.

D. Repair
1. Repair and patch all areas of membrane which show injury, scuffing, puncture, or distress.
2. Repair and patch all defective welds.
3. Complete repairing and patching in accordance with the manufacturer's recommendations.
4. All repairs are to be completed within 24 hours of initial discovery.

E. Anchoring
1. Excavation of anchor trench is the responsibility of the membrane installer.
2. Anchor in accordance with the anchoring details shown on the drawings.
   a. Excavate the trench only for such lengths as will be used for anchoring on any particular day.
   b. Use temporary anchor until the panels are welded and are ready for anchoring.
3. Backfill anchor trenches the same day the membrane welding has been tested and approved.
4. Backfill anchor trench with excavated soil and compact to 95% standard Proctor Maximum Dry Density (ASTM D698).

F. Membrane Penetrations
1. Attach membrane to objects penetrating the liner in accordance with the details shown on the drawings.
2. Provide fabricated boots for pipes where applicable. Install boots in accordance with manufacturer's recommendations.

3.4 FIELD QUALITY CONTROL

A. Owner’s Installation Observation
1. The Owner will provide an experienced and qualified QC observation team during the membrane installation to observe and record installation procedures and quality control procedures and results.
2. Provide information and assistance to the Owner’s QC observation team as required to observe and verify the following.
   a. Membrane packaging identification slips.
   b. Subgrade conditions prior to liner installation.
   c. Handling of membrane package or roll.
   d. Unrolling and deployment of each membrane panel.
   e. Temporary and permanent anchoring of membrane.
   f. Confirm that required overlap distances are met.
   g. Preparation and cleaning of membrane prior to seaming.
   h. Seaming products for membrane for proper products, equipment, and techniques and observation of trial seams.
   i. Visual observation of the membrane to ensure it is free from pores, pinholes, and other detrimental defects.
   j. Visual observation of fusion welds. Mark all breaks or holes for repairs.
   k. Observation of non-destructive tests on seams.
   l. Observation of sampling of destructive test samples.

B. General - Site Tests, Inspections
1. Provide membrane samples required for the required quality control testing.
2. Provide testing and measurement equipment.
3. Tests shall be performed in the presence of the QC observer.
   a. The QC observer will record the date and time, ambient temperature, location and seam number, pass or fail description, reason for taking sample and attached to each sample.

C. Trial Seams
1. Conduct trial seams at the beginning of each seaming period and a minimum of once every 4 hours for each seaming apparatus used.
2. Make trial seams at locations selected by Owner's representative near the area of the seaming and in contact with the subgrade.
3. Trial seam samples shall be 10 feet long for hot shoe welding and 3 feet long for extrusion welding with the seam centered lengthwise.
4. Cut five specimens 1 inch wide from each opposite end of the trial seam and test for shear and peel (both sides of seams) with a tensiometer.

5. If trial seam fails test, the seaming apparatus cannot be used until deficiencies are corrected and two consecutive successful tests are achieved.

D. Non-Destructive Seam Testing
1. Provide non-destructive seam testing over the full length of the seam.
2. Test single wedge fusion seams and extrusion seams with a vacuum testing box apparatus.
   a. Apparatus includes:
      1) Rigid housing with viewing window, soft rubber gasket attached to bottom, valve assembly, and vacuum gauge.
      2) Vacuum tank and pump with pressure controller and fittings.
   b. Provide vacuum test as follows:
      1) Trim excess sheet overlap.
      2) Clean window and gasket surface, and inspect gasket for damage if any.
      3) Energize the vacuum pump and reduce tank pressure to 5 pounds per square inch (psi).
      4) Wet seam test area with soapy solution.
      5) Press down box over wetted area.
      6) Close bleed valve and open vacuum valve to create a vacuum inside the box.
      7) Maintain the vacuum for a period of 15 seconds and examine seam through window for presence of soap bubbles.
      8) If no bubbles appear after 15 seconds, stop test and move to adjoining area overlapping each test area a minimum of 3 inches and repeat process.
      9) Repair all areas where soap bubbles appear and retest.
3. Test double fusion seams with a channel in between using air pressure testing equipment.
   a. Equipment includes:
      1) Air pump equipped with pressure gauge.
      2) Manometer with air feeding device.
   b. Proceed with air pressure testing as follows:
      1) Seal both ends of the seam to be tested.
      2) Attach air feed device to one end of the channel.
      3) Pressurize the test channel to 30 psi and maintain.
      4) Test for a period of 5 minutes. If there is a pressure loss which exceeds 4 psi or venting the channel at the other end does not release the pressure at the air feed device, subdivide the seam and retest to locate blocks, leaks, etc.
      5) Repair and retest until the full length of seam passes.

E. Destructive Seam Testing
1. Take destructive test samples at locations designated by the Owner's representative.
2. The locations will generally average one for every 500 feet of the total seaming length for the installation.
3. The following will be considered by the Owner's representative in selecting the sample locations.
   a. Areas identified as suspect during non-destructive testing/observation.

b. A minimum of two samples for each seamer.
c. A minimum of two samples for each seaming condition.
d. A minimum of two samples for each representative working condition (i.e., weather conditions).
e. Seams that may appear suspect to the observer.

4. Cut samples as seaming progresses and immediately repair holes resulting from sampling and vacuum test the seams.
5. At each sampling location, take two 1-inch test strips for field testing.
   a. Cut each strip 1 inch wide with the seam centered parallel to the width.
   b. The distance between these two strips shall be 48 inches.
6. Test the two 1-inch-wide strips in the field using a tensiometer for peel adhesion.
   a. The tensiometer shall be capable of maintaining a constant jaw separation rate of 2 inches per minute.
   b. If the test fails, repair the seam.
   c. Owner's representative will be the final judge regarding seam acceptability, based on the failure criteria.
7. For seams to be considered acceptable, four out of five strips per sample shall pass field for tensile properties and five out of five shall pass for peel separation.
8. One coupon shall be cut from the beginning or end of each seam greater than 100 feet and tested for peel and shear using the field tensiometer.

F. Procedure for Failed Destructive Tests
1. Repair failed seam by either isolating the length of the failed seam by cutting additional destructive test samples a minimum of 10 feet on both sides of failed destructive test or repair the entire seam.
2. Repair failed seam or portion with one of the following methods:
   a. Cut out failed seam or portion, reposition panel, and re-seam.
   b. Install a cap strip.
3. Test repaired seams by destructive test method if repair length exceeds 100 feet.
4. Repaired seams shall be bounded by passing destructive tests.

G. Defects and Repairs of Non-Seam Areas
1. Provide a visual inspection of the geomembrane and repair the following defects:
   a. Holes.
   b. Blisters.
   c. Liner with undispersed raw material.
   d. Contaminated liner material.
2. Keep liner clean for during inspection and repair.
3. Provide non-destructive testing of repairs.

H. Report of QC Testing and Inspection
1. Provide written quality control reports for all testing and observations made.
   a. Provide reports to the Owner at the end of each day.
   b. Provide copies of all field laboratory test results within 24 hours of completion of tests.

I. Manufacturer's/Installer's Field Services

1. The membrane installer shall provide a full-time superintendent experienced in the installation of HDPE membrane to both supervise and provide technical expertise at all times during installation.
2. The membrane installer shall certify in writing to the Owner or the Owner's representative, that the subgrade is suitable and acceptable for installation of the liner material.

J. "As-Built" Report

Provide an "as-built" drawing summarizing panel locations, destructive sample locations, and repair locations within 10 days of the completion of the installation. Drawing shall be to scale and provided in electronic format compatible with AutoCAD using the site coordinate system.

END OF SECTION

SECTION 31 35 28

LEACHATE COLLECTION SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes
This section outlines acceptable methods and materials for the installation of the leachate collection system.

1.2 SCOPE OF WORK

A. Work under this section shall include:
1. Installation of perforated and non-perforated HDPE leachate collection piping including cleanouts.
2. Backfilling of leachate collection pipes.
3. Installation of double encasement of transfer lines.
4. Provide special bedding and backfilling materials.
5. Pipeline testing and cleaning.

B. Related work specified elsewhere:
1. Earthwork
2. Clay Liner Construction
3. High Density Polyethylene Pipe
4. PVC Pipe
5. Landfill Piping - Auxiliary Materials
6. Soils and Aggregates
7. Testing of pipeline construction.
8. Trenching, backfilling and compacting.

1.3 QUALITY ASSURANCE TESTING RESPONSIBILITY

C. The Contractor shall contract with an established testing laboratory (approved by Owner) and pay for all testing as described in Section 3.5. Testing locations and identification numbers to be provided by the Owner.

D. The Contractor shall provide the following:
1. Access for testing, inspection, and documentation.
2. Shipping of all samples.
3. Test results.

PART 2 - PRODUCTS

2.1 LEACHATE COLLECTION PIPES (PERFORATED) WITHIN COMPOSITE LINED AREA

A. Pipe sizes and perforations as shown on the plans.

B. HDPE SDR 11 pipe in accordance with appropriate specification sections.

2.2 LEACHATE TRANSFER PIPES (NON-PERFORATED) OUTSIDE COMPOSITE LINER AREA

A. Pipe sizes as shown on the plans.
   1. HDPE pipe in accordance with section High Density Polyethylene Pipe and Fittings.

2.3 BEDDING MATERIAL

A. Leachate collection pipe bedding stone shall conform to the following:
   1. Shall be hard, strong, durable particles free from seams, cracks and other structural defects.
   2. Rounded to subangular.
   3. Washed and free from organic impurities and debris.
   4. Noncalcareous (limestone or dolomite will not be allowed).
   5. Gradation for bedding stone shall conform to the following:
      a. 6" pipe and sump bedding (3/4 – 1 ½ " non-calcareous stone)

Sieve Size	% Passing by Weight
1-1/2"	100
1"	20 – 55
¾"	0 – 15
⅜"	0 – 5
No. 4	<5
No. 200	<2

   6. Hydraulic conductivity (ASTM D2434) greater than or equal to 1 cm/sec.
   7. Pea Gravel
      a. Gradation for 3/8 " pea gravel shall conform to the following:

Sieve Size	% Passing by Weight
3/8"	85 – 95
No. 4	5 – 15
No. 8	0 – 2

B. Source Quality Control
   1. A minimum of one sample each of each type of bedding stone shall be collected at each source and analyzed by ASTM standard methods for grain size distribution to the No. 200 sieve at the expense of the Contractor.
   2. Test reports shall be provided to the Engineer/Architect one week prior to intended use. Reports must also include the source and location of the material samples.

2.4 LEACHATE HEAD MONITORING RISER

A. Pipe sizes as shown on the plans.

B. Slotted screen to be No. 10 slot (0.010 in.) with welded cap on end.

C. HDPE SDR 11 pipe in accordance.

PART 3 - EXECUTION

3.1 LEACHATE COLLECTION PIPES (PERFORATED)

A. Install geotextile as shown on the plans.
   1. Overlap geotextile according to the manufacturer's requirements.

B. Perforated pipe shall be laid with perforations down, oriented symmetrically about vertical centerline.

C. Bed and backfill pipe with bedding stone as shown on the plans and specified in 2.3 of this section.
   1. Compact stone by hand around the lower 180° arc of pipe.
   2. Lightly hand tamp remainder of stone.

D. Install filter layer stone above bedding stone as shown on the plans and specified in 2.3 of this section.

E. Engineer may collect samples of filter layer and bedding stone and analyze for grain size distribution to the No. 200 sieve at Owner’s expense.

3.2 DOUBLE ENCASEMENT OF PIPING

A. Double encased piping shall be of the materials, size and class shown on the drawings.

B. Annular space between carrier pipe and encasement pipe shall be sealed at location shown on the drawings as follows.
   1. By a modular, mechanical type unit consisting of interlocking, synthetic rubber links shaped to fill the annular space between the pipe and the wall opening such as Link Seal, or equal.

C. Center inner pipe within outer pipe with spaces centralized every 10 feet along pipe.

3.3 PIPELINE CLEANING

A. All leachate collection and transfer pipelines shall be cleaned after the pipelines are installed. Pipelines shall be jet cleaned in the direction from the pipes low point to high point. Contractor shall remove any debris from pipelines or manholes and dispose of all such material. Jetter truck shall provide a minimum pressure of 1800 psi at a minimum flow rate of 65 gpm. Contractor to submit a cleaning report to the Owner within 15 days of cleaning.

3.4 PRESSURE TESTING

A. Pressure test all piping in accordance with section Testing and Inspection of Pipelines and Appurtenances. Owner’s representative must be present during all testing.

3.5 LEACHATE HEAD MONITORING RISER

A. Install as shown on the plans.

B. Owner’s representative will document the leachate head monitoring riser including the following:

1. Elevation of pipe, subbase, liner and various backfill components.
2. Photographs of riser components.
3. Obtain soil samples for grain size analysis.
4. Documentation that the riser pipe passes leakage tests.
5. Documentation that the riser is free of obstructions allowing access to the screened interval by the sampling device.

3.6 FIELD QUALITY CONTROL

A. Tests – Pipe and Sump Bedding and Filter Layer
1. A minimum of one sample for every 1,000 lineal feet of trench installed will be tested for Grain Size (ASTM D422). A minimum of 3 tests must be performed.
2. A minimum of one sample for every sump installed will be tested for Grain Size (ASTM D422).
3. A minimum of one sample of each bedding or filter material shall be tested for hydraulic conductivity (ASTM D2434).
4. Contractor will perform and pay cost of as-installed tests.
5. Contractor shall pay for all retesting necessitated by failure of the as-installed bedding material to meet these specifications.

3.7 TOLERANCES

A. The elevation of the pipe shall not vary from the design elevation by more than +0.05 ft. at each 25 ft. (50 ft. if laser equipment is used) interval. Positive drainage must be maintained at all locations.

END OF SECTION

SECTION 32 15 00

AGGREGATE SURFACING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Aggregate.
2. Geotextile Fabric for Ground Stabilization – Biaxial Polymer Grid IDOT 4196.01-5a.

B. Material quality control testing shall be included in the bid price.

1.2 REFERENCES

A. Iowa Department of Transportation (IDOT)
1. Standard Specifications for Highway and Bridge Construction, including Supplemental Specifications and Recurring Special Provisions
2. Any American Association of State Highway and Transportation Officials (AASHTO) references indicated in the IDOT Standard Specifications.
3. Any ASTM International (ASTM) references indicated in the IDOT Standard Specifications.

1.3 SUBMITTALS

A. Submit the results of quality control testing (include location where test was done):
1. Material testing results required for the Surface Aggregate and Macadam Stone Base per the IDOT Standard Specifications Articles 4120 and 4122.

B. Submit daily one copy of weight tickets showing the net weight for each truckload of crushed aggregate base material delivered and placed.

1.4 QUALITY ASSURANCE

A. Obtain an independent testing laboratory approved by the Owner to provide quality control testing.

1.5 DELIVERY, STORAGE AND HANDLING

A. Stockpiling of Aggregates:
1. Store aggregates to prevent contamination by foreign matter or by aggregates of different sizes.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Surface Aggregate - Class A – Grade 11 quality or better as defined in IDOT Standard Specifications for Highway and Bridge Construction Article 4109.02, including Supplemental Specifications and Recurring Special Provisions.
   1. Test aggregate material per IDOT requirements to determine gradation and quality, including Articles 4120.

B. Macadam Stone Base - Gradation 13 quality or better as defined in IDOT Standard Specifications for Highway and Bridge Construction Article 4109.02, including Supplemental Specifications and Recurring Special Provisions.
   1. Test aggregate material per IDOT requirements to determine gradation and quality, including Articles 2210 and 4122.

PART 3 - EXECUTION

3.1 PREPARATION

A. Establish grades, lines, and levels in accordance with the grades shown on the Drawings. Compact the subgrade in accordance with the appropriate Section.

B. Fine grade the subgrade to meet subgrade elevations as shown on the Drawings.

3.2 GEOTEXTILE

A. Place Geotextile over prepared subgrade in accordance with IDOT.

3.3 MADACAM AND SURFACE AGGREGATE PLACEMENT

A. Place Macadam as available in lifts as needed to achieve a firm, unyielding surface.
B. Place Surface Aggregate over Macadam in lifts as needed to achieve a firm, unyielding surface.

3.4 FIELD QUALITY CONTROL

A. Proof roll under the observation of Engineer.

END OF SECTION

SECTION 32 92 19

SEEDING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes
   1. Seeding and planting:
      a. Soil Preparation.
      b. Seeding.
      c. Soil Amendments.

B. Related Specification Sections include but are not necessarily limited to:
   1. Division 01 – General Requirements.
   2. Section 31 23 00 - Earthwork.
   3. Section 31 25 00 - Soil Erosion and Sediment Control.

1.2 QUALITY ASSURANCE

A. Referenced Standards:
   1. Iowa Statewide Urban Design and Specifications – SUDAS Standard Specifications.
   2. Iowa DOT Standard Specifications.
   3. American Nursery and Landscape Association/American National Standards Institute (ANLA/ANSI):
      a. Z60.1, American Standard for Nursery Stock.
   4. AOAC International (AOAC).
   5. ASTM International (ASTM):
      a. D2028, Standard Specification for Cutback Asphalt (Rapid-Curing Type).
      b. D5276, Standard Test Method for Drop Test of Loaded Containers by Free Fall.
   6. United States Department of Agriculture (USDA):
      a. Federal Seed Act.

B. Quality Control:
   1. Fertilizer:
      a. If Engineer determines fertilizer requires sampling and testing to verify quality, testing will be done at Contractor's expense, in accordance with current methods of the AOAC.
      b. Upon completion of Project, a final check of total quantities of fertilizer used will be made against total area seeded.
      c. If minimum rates of application have not been met, Contractor will be required to distribute additional quantities to make up minimum application specified.

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. Equipment list and methods to be utilized for execution of seeding.
3. Installation Schedule:
   a. Show schedule of when areas are anticipated to be planted.
   b. Indicate planting schedules in relation to schedule for intermittent and final grading activities.
4. SUDAS Standard Specifications 2020, Section 9060.1.03 – Submittals.
   a. 9010.1.03.A.1 – Seed: Submit a laboratory analysis for all seeds, specifying the purity and germination. Provide a lot number on all submittals and labeling. Ensure lot number is the same on all records pertaining to a particular seed. Provide 48 HRS notice prior to mixing the seed and give the Engineer an opportunity to witness the seed mixing. Submit a mechanically printed seed tag from an Iowa Crop Improvement Association-approved seed conditioner or grower.
   b. 9010.1.03.A.2 – Fertilizer: Submit certification of the fertilizer analysis with scale weight and statement of guaranteed analysis. Submit from a certified fertilizer dealer, a mechanically printed commercial fertilizer label, or bill of lading. Comply with the inspection and acceptance requirements of Iowa DOT Materials I.M. 469.03.
   c. 9010.1.03.B – Submit written instructions recommending procedures for maintenance of seeded areas.
5. Application rate of fertilizer.
6. Copies of invoices for fertilizer used on Project showing grade furnished, along with certification of quality and warranty.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Seed and Fertilizer:
1. Per SUDAS Standard Specifications 2020, Section 9010.1.05 – Delivery, Storage, and Handling.
2. Furnish seed in sealed standard containers labeled with producer's name and seed analysis.
3. Remove from the site seed which has become wet, moldy, or otherwise damaged in transit.
4. Furnish fertilizer uniform in composition, free flowing and suitable for application with approved equipment, delivered to site in bags or other containers, each fully labeled and bearing the name, and warranty of the producer.

B. Plant Materials: Per SUDAS Standard Specifications 2020, Section 9030.1.05.

1.5 SEQUENCING AND SCHEDULING

A. Installation Schedule:
1. Show schedule of when perennial grasses are anticipated to be planted.
2. For seeding, follow requirements of SUDAS Standard Specifications

2020, Section 9010.1.06.

a. Coordinate the seeding schedule with all other work on the project. Notify the Engineer at least three calendar days prior to the start of seeding operations.
b. After all land-disturbing activities are complete and the seedbed has been approved by the Engineer, perform seeding operations.

3. Indicate planting schedules in relation to schedule for intermittent grading, finish grading, and soil amendments/topsoiling.
4. Indicate anticipated dates Owner will be required to review installation for initial acceptance and final acceptance.

B. Pre-installation Meeting:
1. Meet with Owner and other parties as necessary to discuss schedule and methods, unless otherwise indicated by Owner.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS AND SUPPLIERS

A. Submit request for substitutions in accordance with SUDAS Standard Specifications 2020, Section 9010.1.04 for seeding and Section 9030.1.04 for plant materials and in accordance with Specification Section 01 25 13.

2.2 MATERIALS

A. Topsoil:
1. Topsoil shall either consist of on-site stripped and stockpiled topsoil available for reuse within the construction limits or amended topsoil utilizing owner-provided compost. Coordinate location of topsoil and amended topsoil with Owner.

B. Seed Quality:
1. Fresh, clean, new-crop seed labeled in accordance with USDA Rules and Regulations under the Federal Seed Act in effect on date of bidding.
2. Provide seed of species, proportions, and minimum percentages of purity, germination and maximum percentage of weed seed as specified.
3. Approval of all seed for use shall be based on the accumulative total of PLS specified for each phase of work.

C. Perennial Grass Seeding:
1. Per Iowa DOT Standard Specifications, Article 2601.03, C, 3, b – Rural Seeding Mixture.
2. For all areas:

GRASSES	LBS PLS PER ACRE
Fescue, Tall (Fawn)	100
Ryegrass, Perennial (Linn)	75
Bluegrass, Kentucky	20

D. Existing Topsoil:
   1. Natural soil capable of sustaining rigorous plant growth, not in frozen or muddy condition.
   2. Free from subsoil, slag, clay, stones, lumps, live plants, roots, sticks, crabgrass, noxious weeds, and foreign matter.
   3. Maximize re-use of existing topsoil from excavation or disturbance areas, unless otherwise noted in the Drawings.

E. Mulch:
   1. Perennial grass seeded areas, top of slope, sideslope and ditch seeded areas:
      a. Clean, seed-free, threshed straw of oats, wheat, barley, rye, beans, peanuts, or other locally available mulch material which does not contain an excessive quantity of matured seeds of noxious weeds or other species that will grow or be detrimental to seeding or provide a menace to surrounding land.
      b. Do not use material which is fresh or excessively brittle, or which is decomposed and will smother or retard growth of grass.
         1) SUDAS Standard Specifications 2020, Section 9012.2.05.

F. Fertilizer:
   1. Commercial fertilizer meeting applicable requirements of State and Federal law.
   2. Cyanic compound or hydrated lime not permitted in mixed fertilizers.
   3. For Conventional seeding:
      a. Iowa DOT Standard Specifications, Article 2601, 01, C, 3, c.

PART 3 - EXECUTION

3.1 SOIL PREPARATION

A. General:
   1. Limit preparation to areas which will be planted soon after.
   2. Provide facilities to protect and safeguard all persons on or about premises.
   3. Protect existing trees designated to remain.
      a. Verify location and existence of all underground utilities.Take necessary precaution to protect existing utilities from damage due to construction activity.
      b. Repair all damages to utility items at sole expense.

B. Preparation for Seeding:
   1. Spread topsoil a minimum of 4 IN thick.
   2. Amended topsoil, utilizing owner provided compost, shall be used in lieu of topsoil in other disturbed areas that are to be vegetated as indicated within the Drawings.
      a. Compost to be loaded, hauled and dumped on areas to be vegetated.

b. Spread compost to a depth of approximately 2 IN evenly over all areas to be seeded using stockpiled compost, and incorporate into the ground surface by disking to a depth of 6 to 8 IN.

3. Loosen surface to minimum depth of 4 IN.
4. Remove stones over 1 IN in any dimension and sticks, roots, rubbish, and other extraneous matter.
5. Prior to applying fertilizer, loosen areas to be seeded with a double disc or other suitable device if the soil has become hard or compacted.
6. Correct any surface irregularities in order to prevent pocket or low areas which will allow water to stand.
7. Distribute fertilizer uniformly over areas to be seeded.
8. Incorporate fertilizer into soil to a depth of at least 2 IN by disking, harrowing, or other approved methods.
9. Restore areas to specified condition if eroded or otherwise disturbed after fine grading and before planting.

3.2 INSTALLATION

A. General:

1. Do not use seed which is wet, moldy or otherwise damaged.
2. Perform seeding work from March 1 to May 31 for spring planting, and August 10 to September 30 for fall planting, unless otherwise approved by Owner.
3. Employ satisfactory methods of sowing using mechanical power-driven drills or seeders, or mechanical hand seeders, or other approved equipment.
4. Distribute seed evenly over entire area at rate of application.
   a. Install to depth recommended by seed manufacturer.
5. Stop work when work extends beyond most favorable planting season for species designated, or when satisfactory results cannot be obtained because of drought, high winds, excessive moisture or other factors.

a. Resume work only when favorable conditions develop.

6. Lightly rake seed into soil followed by light rolling or cultipacking.
7. Immediately protect seeded areas against erosion by mulching.
8. Protect seeded slopes against erosion with erosion netting as specified in the Drawings or other methods approved by Engineer.
   a. Protect seeded areas against traffic or other use by erecting barricades and placing warning signs.
9. Immediately following spreading mulch, anchor mulch using a rolling coulter or a wheatland land packer having wheels with V-shaped edges to force mulch into soil surface, or other suitable equipment which will secure the mulch firmly.

3.3 MAINTENANCE AND REPLACEMENT

A. General:

1. Protection of new materials:
   a. Provide protection necessary to prevent damage to improvements.
      1) Repair and pay for all damaged items.

2. Replace unacceptable materials with materials and methods identical to the original Specifications unless otherwise approved by the Owner.

B. Warranty:

1. A warranty is required for this Project to guarantee completed seeding areas for a period of twelve months. This warranty will be at no additional cost to the Owner and shall be considered incidental to the seeding unit price.

END OF SECTION

SECTION 33 05 33

HDPE PIPE AND FITTINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes
1. High-density polyethylene (HDPE) pipe and fittings for all gravity and pressure pipe for conveyance of leachate and landfill gas.

1.2 REFERENCES

A. ASTM International (ASTM)
1. ASTM D638 Standard Test Method for Tensile Properties of Plastics
2. ASTM D1238 Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer
3. ASTM D1505 Standard Test Method for Density of Plastics by the Density-Gradient Technique
4. ASTM D1598 Standard Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure
5. ASTM D1599 Standard Test Method for Resistance to Short-Time Hydraulic Failure Pressure of Plastic Pipe, Tubing and Fittings
6. ASTM D2122 Standard Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings
7. ASTM D2290 Standard Test Method for Apparent Hoop Tensile Strength of Plastic or Reinforced Plastic Pipe by Split Disk Method
8. ASTM D2837 Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials
9. ASTM D3261 Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Pipe and Tubing
10. ASTM D3350 Standard Specification for Polyethylene Plastics Pipe and Fittings Materials

B. American Water Works Association (AWWA)
1. AWWA C901 Standard for Polyethylene (PE) Pressure Pipe and Tubing, ½ in.(13 mm) Through 3 in. (76 mm) for Water Service
2. AWWA C906 Standard for Polyethylene (PE) Pressure Pipe and Fittings, 4 in. (100 mm) Through 63 in. (1,575 mm), for Water Distribution and Transmission

C. National Sanitation Foundation (NSF)
1. NSF No. 14 Plastics Piping Components and Related Materials

1.3 SUBMITTALS

A. Product Data
1. Provide product data on pipe and fittings including dimensions and perforation patterns.

B. Quality Assurance/Control Submittals
1. Certification that the tests required by this specification section were performed and meet the stated minimum requirements.
2. Evidence from the pipe manufacturer that the personnel completing joints is qualified to perform the thermal butt fusion.
3. Manufacturer's instructions and procedures for joining the pipe and pipe fittings.

1.4 QUALITY ASSURANCE

A. Pipe shall be available to Owner's representative for inspection.

B. Material manufacturer, pipe diameters and pressure classes shall not be mixed.

C. Personnel completing the joints shall be certified by the pipe manufacturer as being qualified to perform the thermal butt fusion.

1.5 DELIVERY, STORAGE AND HANDLING

A. Upon delivery inspect pipe and fittings for damage, cracks, holes, or foreign inclusions.

B. Check date of production to verify the pipe will be installed within six (6) months of date of production.

C. Store pipe and accessories on flat level ground with no rocks or other objects under the pipe.

PART 2 - PRODUCT

2.1 MATERIALS

A. Pipe Sizes 4-inch and Larger
1. Pipe and fittings shall be high density polyethylene (HDPE) meeting AWWA C906 standards.
2. Materials used for the manufacture of the HDPE pipe and fittings shall be made from a PE 3408 resin compound meeting the minimum cell classification of PE 345434C in accordance with ASTM D3350 and the hydrostatic design basis of 1,600 psi determined in accordance with ASTM D2837.
3. Provide pipe with a dimension ratio (DR) of 11, pressure class 160 unless stated otherwise on the Drawings or in the Bid Schedule.
4. Pipe shall be installed within 6 months of the production date.

B. Fittings
   1. Fittings shall meet the requirements of AWWA C901 or AWWA C906 whichever applies.
   2. Fittings for pipe greater than 3 inches diameter shall be HDPE molded fittings and HDPE fabricated fittings of the same equivalent dimension ratio, pressure rating and outside diameter as the connecting pipe.
      a. The pipe manufacturer shall mold or fabricate and supply all HDPE molded fittings, fabricated fittings, accessories and adapters required to perform the Work. No Contractor fabricated fittings shall be used.
      b. Molded fittings shall be manufactured with thermal butt-fused joints meeting the requirements of ASTM D3261.
      c. Fabricated fittings shall be made by heat fusion joining specially machined shapes cut from pipe, polyethylene sheet stock, or molded fittings.

2.2 PIPE IDENTIFICATION

A. Mark the pipe and fittings with the appropriate standard AWWA C901 or AWWA C906 whichever is applicable to affirm the product was manufactured, inspected, sampled, and tested in accordance with the standard.

B. Pipe and fittings shall be marked with the following at intervals between markings of no greater than 5 feet:
   1. Nominal size and OD base of DIOD.
   2. Standard material code designation of PE 3408.
   3. Dimension ratio.
   4. Pressure class
   5. AWWA C901 or AWWA C906, whichever is applicable.
   6. Manufacturer’s production code to include day, month, year produced.

2.3 JOINTS

A. HDPE Pipe and Pipe Fittings Greater than 3 inches Diameter
   1. Pipe and pipe fittings shall be designed for joining by thermal butt fusion.
   2. Joining method shall be capable of conveying water at the pressure designated by the pressure class.
   3. Joints shall be pipe end to pipe end and pipe end to fitting.

B. Transition from HDPE to Ductile Iron Pipe or PVC Pipe
   1. Provide a molded flange connector adapter with a ductile iron back-up flange for making a flange to flange connection. If the connecting pipe is plain end then use an EBAA Iron Inc. Megaflange 2100 Restrained Flange Adaptor on the connecting pipe.
   2. For buried connections use a mechanical joint connection adaptor with a mechanical joint flange backup connecting to a mechanical joint pipe ductile iron pipe and when connecting to a plain end PVC pipe provide an EBAA Iron Inc. use the series 15PF00 for Restraint for C900 PVC Pipe.
      a. Provide extended T-bolts for the connection.

b. Provide stainless steel stiffener inserted in the pipe.

3. From the transition joint pipe restrains shall be provided at all joints within the following distances of the transition joint:
   a. 6" diameter pipe - 15 linear feet.
   b. 8" diameter pipe - 19 linear feet.
   c. 10" diameter pipe - 24 linear feet.
   d. 12" diameter pipe - 28 linear feet.
   e. 14" diameter pipe - 33 linear feet.
   f. 16" diameter pipe - 36 linear feet.

2.4 SOURCE QUALITY CONTROL

A. The following tests shall be performed on the production pipe:
   1. Measurement of pipe dimensions in accordance with ASTM D2122.
      a. Pipe dimensions shall be within the tolerances stated in AWWA C906 or AWWA C901 whichever is applicable.
      b. Wall thickness variability in any diametrical cross section of the pipe shall not exceed 12%.
      c. The outside diameter measured at the cut-end of the pipe length shall not be more than 1.5% smaller than the average outside diameter specified in AWWA C906 or AWWA C901, whichever is applicable, when measured at any point not closer than 12 inches to the squarely cut-end of the pipe length.
   2. Thermal stability of a pipe specimen from mid-wall area in accordance with the method described in ASTM D3350. The minimum induction temperature shall be 220ºC.
   3. Ring-tensile strength test of pipe specimens tested in accordance with ASTM D2290. Tensile strength shall be not less than 2,900 psi.
   4. Quick burst test of pipe specimens in accordance with ASTM D1599. The test pressure at failure shall not be less than that which results from the minimum hoop stress value of 2,900 psi.
   5. Elongation at break test of five pipe specimens cut equally spaced around the circumference of the pipe in the longitudinal direction tested in accordance with ASTM D638 using a cross-head separation of 2 inches per minute. The elongation at break for each test specimen shall not exceed 400%.
   6. Five-second pressure test of a section of pipe tested in accordance with ASTM D1598. The pipe shall not burst, crack, spit, or otherwise fail a test pressure four times the pipe pressure class applied for five seconds. This test is also required for fittings.
   7. Melt index of pipe specimens tested in accordance with ASTM D1238. The resultant index shall be less than 0.15.
   8. Density of pipe specimens tested in accordance with ASTM D2839. The result shall be minimum 0.955 grams per cubic centimeter.
   9. Bend-back test in accordance with AWWA C901 or AWWA C906 whichever is applicable. Any indication of cracking or crazing shall reject the pipe.

B. Test the PE compounds by an accredited testing agency in accordance with the applicable requirements of NSF No. 14 to demonstrate the materials are suitable for use with potable water.

PART 3 - EXECUTION

3.1 POLYETHYLENE PIPE INSTALLATION

A. In addition to the applicable sections for installing piping, conform to the following:
   1. Thermal butt fuse all joints as per ASTM D2657.
   2. Utilize certified personnel for jointing operation.

END OF SECTION

SECTION 33 35 43

SUBMERSIBLE PUMP LIFT STATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:
1. Precast concrete wet well.
2. Non-clog submersible centrifugal pumps.
3. Pump mounting and guide systems.
4. Piping, fittings and valves.
5. Electrical switchgear and electrical service.
6. System instrumentation and controls.
7. Control panels.
8. Magnetic flow meter.
9. Flow indicator/totalizer.
10. Installation and start-up.

B. Provide one (1) complete submersible pump lift station.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):

1.	ASTM A48	Standard Specification for Gray Iron Castings
2.	ASTM A615	Standard Specification for Deformed and Plain Billet - Steel Bars for Concrete Reinforcement
3.	ASTM C443	Standard Specification for Joints for Circular Concrete Server and Culvert Pipe, Using Rubber Gaskets
4.	ASTM C478	Standard Specification for Precast Reinforced Concrete Manhole Sections
5.	ASTM C913	Standard Specification for Precast Concrete Water and Wastewater Structures
6.	ASTM C923	Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures and Pipes
7.	ASTM C990	Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants
8.	ASTM D4101	Standard Specification for Propylene Plastic Injection and Extrusion Materials

B. Federal Specifications (FS):

1.	FS SS-C-153C	Cement, Bituminous, Plastic

C. American National Standards Institute (ANSI):
   1. ANSI A21.10 Ductile-Iron and Gray Iron Fittings, 3 inch through 48 inch for Water and Other Liquids

D. National Electric Code (NEC)

E. NEMA Electrical Standards

F. Underwriter's Laboratory

1.3 SUBMITTALS

A. Provide detailed shop drawings, product data, and other information as required to demonstrate compliance with this specification.

B. Submittals shall include, but not be limited to, the following:
   1. Complete assembly and installation drawings.
   2. Wet well openings shown and located.
   3. Manufacturers certification that precast concrete structures were manufactured in accordance with designated reference standards with test results and date of tests.
   4. Descriptive information on material and equipment.
   5. Assembled electrical and control equipment drawings for all components.
   6. Pump information including:
      a. Name of manufacturer.
      b. Type and model.
      c. Design rotative speed.
      d. Size of shaft.
      e. Weight of pump and motor assembly.
      f. Complete performance curves showing:
         1) Capacity
         2) Head
         3) Efficiency
         4) Brake Horsepower
      g. Materials of construction and cross-sectional drawing.
      h. Pump mounting and guide system.

C. Operation and maintenance manuals shall be provided with detailed and complete information on equipment start-up, operation, and maintenance. Provide manuals for all components part of the equipment specified herein.

D. Furnish completed maintenance data cards for each system component.

PART 2 - PRODUCTS

2.1 WET WELL STRUCTURES

A. Structures shall be precast reinforced concrete components either circular or rectangular as shown on the Drawings.

B. Precast concrete base sections, riser sections, and flat top shall meet the requirements of ASTM C478 for circular components and the requirements of ASTM C913 for rectangular components.

C. Base section shall include base riser section with integral monolithic bottom extending minimum of 6 inches beyond riser section.

D. Tops for structures shall be flat slab top designed to meet AASHTO H-20 loadings.

E. Joints between components.
   1. Joint design shall be in accordance with ASTM C990.
   2. Gasket shall be 1¼ inch thick butyl rubber material meeting requirements of AASHTO M-198 Type B flexible plastic gasket and ASTM C990 butyl rubber sealant.

F. Joint where pipe passes through structure walls
   1. A watertight joint shall be provided between the pipe and structure walls.
   2. The joints shall be designed to absorb vibration and settling of the pipe.
   3. Connector between precast concrete reinforced structures and gravity pipes:
      a. Resilient flexible connector shall meet ASTM C923
      b. The seal between the flexible connector and the structure shall be by casting the connector integrally with the structure wall.
      c. The seal between the connector and the pipe shall be by compression of the resilient material against the outside of the pipe.
      d. Factory-made structures shall use A-Lok, Z-Lok, or equal.

G. Access Hatches
   1. Door panel ¼" aluminum reinforced diamond plate. Design shall be sufficient to withstand minimum 300 lb/ft2 live load.
   2. Frame ¼" thick extruded aluminum with neoprene cushion and continuous concrete anchor.
   3. Door shall open to 90° and automatically lock with stainless steel hold open arm.
   4. Door shall close flush with the frame.
   5. Hinges and all hardware shall be stainless steel.
   6. Handle shall be non-corrosive with locking hasp for padlock.
   7. Recessed lock box for padlocking hatch.
   8. Hatch shall be compatible with wet well size.
   9. Acceptable manufacturers:
      a. Bilco
      b. Haliday
      c. Nystrom

H. Caution Sign
   1. A caution sign shall be installed on the wet well hatch.

2. The sign material shall be non-corrosive with yellow background and black lettering at least one inch size.
3. The minimum size shall be 10" x 14".
4. The sign shall read:

"Caution - Dangerous/Hazardous Gases
Level 2 Confined Space
Do not enter without proper equipment and supervision"

2.2 SURFACE COATINGS

A. Interior concrete surfaces of wet well and all piping which is not stainless steel or PVC - coal tar epoxy, two coats, each coat 8 mil minimum dry film thickness.

B. Pumps
Standard factory applied coating suitable for submerged conditions.

2.3 PUMPING EQUIPMENT

A. Furnish non-clog, submersible pump to fit conditions as shown on the drawings and herein specified. Each pump station shall be designed for the following operation conditions:

Requirements
1. No. of pumps: One (1)
2. Manufacturer
   a. Flygt
3. Model
   a. NP 645 SH 3~Adaptive 248
4. Horsepower: 11 hp
5. Voltage, phase: 460V/480V – 3 phase

B. General
1. The design shall be such that the pump unit will automatically and firmly connect to the discharge piping when lowered into place on its mating discharge connection, permanently installed in the wet well.
2. The pump shall be easily removable from surface level for inspection or service, requiring no bolts, nuts or other fastenings to be disconnected. For this purpose there shall be no need for personnel to enter the wet well at any time to service the pumping equipment.
3. Each pump shall be fitted with a stainless steel chain or cable of adequate strength and length to permit raising and lowering the pump for inspection or removal. Chain/cable shall be sized for total weight to be lifted with a minimum safety factor of 3.0.
4. The pump, with its appurtenances and cable, shall be capable of continuous submergence under water without loss of watertight integrity to a depth of 65 feet.

C. Pump Construction

1. General
   a. All major parts including motor, seal housing, sliding guide brackets, impeller and volute shall be grey cast iron in accordance with ASTM A48, Class 35B.
   b. All surfaces in contact with wastewater shall be protected by a coating resistant to wastewater.
   c. All exposed bolts, nuts and other fasteners shall be 300 series stainless steel.
   d. The pump discharge shall be fitted with standard ANSI A21.10, 125 pound flange.
2. Impeller:
   a. Construct with a long throughlet without acute turns.
   b. The impeller shall be dynamically balanced without deforming or weakening it. The impeller shall be a slip fit to the shaft.
   c. Volute case wear ring of 230 brass or stainless steel shall be provided which is easily field replaceable.
3. Shaft Seal System:
   a. Pump shall be provided with a mechanical rotating shaft seal system running in an oil reservoir having separate, constantly hydro-dynamically lubricated lapped seal faces. The (lower) seal unit between the pump and oil chamber shall contain one stationary and one positively driven rotating tungsten-carbide ring. The (upper) seal unit between the oil sump and motor housing shall contain one stationary tungsten-carbide ring and one positively driven rotating carbon ring. Each interface shall be held in contact by its own spring system supplemented by external liquid pressures.
   b. The seals shall require neither maintenance nor adjustment, but shall be easily inspected and replaceable.
   c. The shaft sealing system shall be capable of operating submerged to depths of, or pressures equivalent to 65 feet. No seal damage shall result from operating the pumping unit out of its liquid environment. The seal system shall not rely upon the pumped media for lubrication.
4. Guide Bracket and Discharge Connection:
   a. A sliding guide bracket shall be an integral part of the pump unit.
   b. The volute casing shall have a machined discharge flange to automatically and firmly connect with the cast iron discharge connection, which when bolted to the floor of the sump and discharge line, will receive the pump discharge connecting flange without the need of adjustment, fasteners, clamps or similar devices.
   c. Installation of pump unit to the discharge connection shall be the result of a simple linear motion the pump unit guided by no less than two guide bars.
   d. No other motion of the pump unit, such as tilting or rotating, shall be required. Sealing of the discharge interface by means of a diaphragm, o-ring or other devices will not be considered acceptable nor equal to a metal to metal contact of the pump discharge flange and mating discharge connection specified and required. No portion of the pump unit shall bear directly on the floor of the wet well. there shall be no more than one 90° bend allowed between the volute discharge flange and station piping.

5. Tolerances and Mating Surfaces:
   a. Tolerances of all parts shall be such that allow replacement of any part without additional machining required to insure sealing as described above. No secondary sealing compounds greases or other devices shall be used.
   b. All mating surfaces of major parts shall be machined and fitted with nitrile o-rings where watertight sealing is required. Machining and fittings shall be such that sealing is accomplished by automatic compression in 2 planes and o-ring contact made on four surfaces, without the requirement of specific torque limits to affect this. Rectangular cross sectioned gaskets requiring specific torque limits to achieve compression shall not be considered adequate or equal.
6. Cooling System: Each unit shall be provided with an adequately designed cooling system. Thermal radiators integral to the stator housing cast in one unit are acceptable. Where water jackets alone or in conjunction with radiators are used, separate circulation shall be provided. Cooling media channels and ports shall be non-clogging by virtue of their dimensions. Provision for external cooling and flushing shall be provided. Pump shall be capable of operating in a non-submerged condition without overheating.

D. Pump Guides
1. Each unit shall be furnished with complete guides for pump installation and removal. Guide system shall be of stainless steel material and include the following:
   a. Upper guide holder and level sensor cable holder.
   b. Intermediate guide brackets.
   c. Lower guide bar holders shall be integral with the discharge connection.
   d. Guide bars shall be stainless steel pipe.

2.4 MOTOR AND CABLE

A. Pump, motor and cable shall be explosion proof and shall be FM approved for Class 1, Division 1, Group D service.

B. The pump motor shall be housed in a watertight casing and shall have moisture resistant Class F 155°C insulation. The motor shall be NEMA Design B and designed for continuous duty.
1. Motors shall be wired to operate at voltage and phase shown in pump schedule at 60 hertz.

C. The cable entry water seal design shall be such that precludes specific torque requirements to insure a watertight and submersible seal. The cable entry junction box and motor shall be separated by a stator lead sealing gland or terminal board which shall insulate the motor interior from foreign materials gaining access through the pump top.

D. Pump motor cable installed shall be suitable for submersible pump applications and this shall be indicated by a code or legend permanently embossed on the cable. Cable sizing and configuration shall conform to NEC specifications rated SO, STO or better

for pump motors and shall be adequate size to allow motor voltage conversion without replacing the cable.

E. Furnish electrical cable(s) for power and signal of sufficient length to go to the electrical connection point at the local control panel. Cables suspended in the wet well shall be provided with heavy duty stainless steel cable grips, Kellems or equal.

F. Provide integral thermal sensors (one for each phase). Embed in stator to monitor stator temperature. Switches shall be wired in series and two leads shall be brought up with cable to the pump control panel.

G. Provide integral moisture sensor in oil chamber or stator housing to detect seal or casing leakage. Two leads shall be brought up with cable to the pump control panel.

H. Conductivity switch monitor shall be provided by pump supplier with pump. Conductivity switch monitor shall be installed in the control panel.

I. A suitable thrust bearing shall be incorporated in the motor to be capable of carrying the weight of all rotating parts and the hydraulic thrust of the pump. Bearings shall have a minimum B-10 life of 50,000 hours.

J. The cable shall have a factory installed rubber boot on the end to protect it during transit.

K. Horsepower load shall not exceed nameplate rating of motor for full pump curve from shutoff to maximum runout capacity.

2.5 VALVES

A. Ball Check Valve
   1. Nodular cast iron type GGG 40/ASTM 65-45-12/SSAE 4512 body.
   2. Metal core ball with vulcanized Nitril rubber covering

2.6 PIPE AND FITTINGS

A. Pipe and fittings shall be ductile in accordance with Section 02090.

B. Flexible couplings shall be installed in the pipe between separate Wet Well and Valve Vault. Acceptable manufacturers: Dresser, Smith Blair, and Rockwell.

2.7 ELECTRICAL AND CONTROL SYSTEMS

A. General
   1. All electric components and work, as indicated or implied by this specification, and as required to provide a complete, fully operational system, shall be furnished and installed under the scope of this specification.
   2. Pump supplier shall also supply the electrical and control system.

B. Electric Service and Distribution
   1. Relocate existing pump electric service line from the panel to new pump lift station location.

   2. Electric Service:
      a. Electric service shall be 3 phase, 4 wire, 480/277 volt for the pump.
      b. The pump supplier shall check with the Electrical contractor to verify all service information.

C. Conduit
   1. All exposed conduit shall be furnished in manufactured lengths and except as otherwise specified shall be full-weight, heavy wall, rigid steel conduit protected inside and out by a coating of metallic zinc and shall be U.L. labeled. Minimum conduit size shall be ¾" unless otherwise noted. Fittings used in conjunction with steel conduits shall be hot-dipped galvanized.
   2. All underground conduit shall be schedule 80 PVC.
   3. Conduits shall be of size required to accommodate the number of conductors in accordance with the tables given in the current edition of the State Electrical Code, National Electrical code, or as noted on the drawings whichever is larger.
   4. Crouse-Hinds type EYS, Appleton ESU, or equal horizontal position conduit sealing fittings shall be used for conduit systems installed in Class I hazardous locations.
   5. Crouse-Hinds type EYS, Appleton type EYS or equal vertical position conduit sealing fittings shall be used for conduit systems installed in Class I hazardous locations.

D. Junction boxes shall be cast iron, hot dipped, galvanized inside and outside with threaded conduit connections and watertight gasket covers NEMA 4X. Box size shall be as required by code for the number of conduits and conductors entering and leaving.

E. Lift Station Control Panel
   1. Utilize existing Cot

F. Level Control System
   1. A primary and a secondary level control system shall be provided. Primary control shall be by a wet well pressure transducer or capitance probe.

PART 3 - EXECUTION

3.1 Install the wet well, valve manhole and piping at alignment and grades shown on the drawings.

3.2 Piping, fittings and valves shall be installed per alignment shown on the drawings with proper support and restraint on all pipe, valves, joints and fittings.

3.3 The pump and pump guides shall be installed and anchored with stainless steel anchors per manufacturer's recommendations.

3.4 Each motor power cable and control cable shall be in a separate conduit with sealed junction boxes below the control panel. Each motor power cable and control cable shall be provided with a cable support grip, to support cables suspended in the wet well.

3.5 The control panel shall be installed on a concrete pad, free standing with a minimum of 18-inch legs.

3.6 All system components shall be installed in accordance with manufacturer's recommendations and in accordance with Project drawings and specifications.

3.7 SUPERVISION OF ERECTION, START-UP AND TRAINING SERVICES

A. Minimum start-up service by equipment supplier shall be 1 day (8 hours on-site) with 1 trip.

B. In addition to the above, the equipment supplier shall provide a minimum of 1 day (8 hours on-site) for operator training and final adjustment with 1 trip.

C. The time for the training and adjustment period shall be designated by the Owner, but in any event it shall be within one year guarantee period after final acceptance.

D. Qualifications of Start-up Personnel
1. Personnel shall be authorized by the manufacturer to start-up the equipment provided.
2. Personnel shall come to the site with the required tools and electrical instruments.
3. Personnel shall have full knowledge of electrical controls pertaining to the equipment and control panels furnished.
4. Failure to provide personnel with full qualifications shall be cause for service trip to be disqualified as part of requirements and may be cause for reimbursement for costs incurred by the Owner due to services required for start-up inspection.

3.8 PUMP TEST

A. The pump manufacturer shall perform the following inspections and tests on each pump before shipment from factory.
1. Impeller, motor rating, and electrical connections shall first be checked for compliance to the specifications.
2. A motor and cable insulation test for moisture content or insulation defects.
3. Prior to submergence, the pump shall be run dry to establish correct rotation and mechanical integrity.
4. The pump shall be run for 30 minutes submerged, a minimum of 6 feet underwater.
5. After operational test No. 4, the insulation test (No. 2) is to be performed again.

6. Test shall demonstrate ability of each pump to operate without vibration, noise or overheating, and to deliver its rated capacity and efficiency under the specified conditions.

B. A written report stating the foregoing have been done, shall be supplied with each pump at the time of shipment. Provide certified pump curve.

3.9 SITE TEST

A. Test in presence of the Engineer.

B. Pump shall be subjected to an operational test before acceptance as follows:
1. Preparation: The unit under test shall be properly installed in the wet well, firmly upon its discharge connection after determination (a) proper service voltage is being supplied, and (b) proper rotation of the impeller. No cooling by forced or circulated air shall be allowed.
2. Pump shall be demonstrated to operate without excessive noise, vibration, and without overheating at its rated condition.

C. All components and operation sequences of the lift station, as specified herein, shall be tested in the field to verify proper operation in accordance with this specification. Each operation and alarm condition shall be satisfactorily performed.

D. If tests demonstrate that any equipment supplied under this specification does not conform, in entirety, to the requirements of the specification, the equipment shall be rejected and replaced at no cost to the Owner.

END OF SECTION

SECTION 33 42 13

STORMWATER CULVERTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Reinforced precast concrete pipe.
   2. Corrugated metal pipe.

1.2 REFERENCES

A. Iowa Department of Transportation (IDOT)
   1. Standard Specifications for Highway and Bridge Construction, including Supplemental Specifications and Recurring Special Provisions
   2. Any American Association of State Highway and Transportation Officials (AASHTO) references indicated in the IDOT Standard Specifications.
   3. Any ASTM International (ASTM) references indicated in the IDOT Standard Specifications.

B. 2026 SUDAS Sections 4020 and 4030

1.3 SUBMITTALS

A. Reinforced concrete pipe- submit test results and manufacturer’s information as required by IDOT Standard Specification Article 4145. (Statewide Urban Design and Specifications [SUDAS] Section 4020)

B. Corrugated metal pipe – submit test results and manufacturer’s information as required by IDOT Standard Specification Article 4141. (SUDAS Section 4030)

1.4 QUALITY ASSURANCE

A. Pipe shall be available to Owner's Representative for inspection.
B. Perform testing as required by IDOT Standard Specifications 4141 and 4145.

1.5 DELIVERY, STORAGE AND HANDLING

A. Upon delivery ensure that the pipe is clearly marked with the following information:
   1. Pipe class or strength designation.
   2. Date of manufacture.
   3. Name or trademark of manufacturer.
   4. Plant identification.

B. Store material to protect from damage and do not stack in layers.

PART 2 - PRODUCTS

2.1 CONRETE PIPE

A. Conform to IDOT Standard Specification Article 4145. SUDAS 4020

2.2 CORRUGATED METAL PIPE

A. Conform to IDOT Standard Specification Article 4141. SUDAS 4030

PART 3 - EXECUTION

3.1 CONRETE PIPE

A. Conform to IDOT Standard Specification Article 2419. SUDAS 4020

3.2 CORRUGATED METAL PIPE

A. Conform to IDOT Standard Specification Article 2417. SUDAS 4030

3.3 FIELD QUALITY CONTROL

A. Inspect and reject pipe for the following defects:
   1. Improper marking.
   2. Fractures or cracks passing through wall, except for a single end crack that does not exceed depth of joint.
   3. Defects indicating non-compliance with proportioning, mixing and molding of the concrete.
   4. Surface defects indicating honeycombed or open texture.
   5. Ends are not normal to the wall and center line of the pipe.
   6. Damaged or cracked ends.
   7. Any continuous crack having a width of 0.01 inch or more and extending for a length of 12 inches or more.

END OF SECTION

SECTION 33 46 23

GEOSYNTHETIC DRAINAGE LAYER

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Geosynthetic drainage layer.

1.2 REFERENCES

A. ASTM International (ASTM)
1. ASTM D413 – Standard Test Method for Rubber Property – Adhesion to Flexible Substrate.
2. ASTM D1505 – Standard Test Method for Density of Plastics by the Density-Gradient Technique.
3. ASTM D4218 – Standard Test Method for Determination of Carbon Black Content in Polyethylene Compounds By the Muffle-Furnace Technique.
4. ASTM D4491 – Standard Test Method for Water Permeability of Geotextiles by Permittivity.
5. ASTM D4632 – Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
6. ASTM D4716 – Test Method for Determining the (In-place) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.
7. ASTM D4751 – Standard Test Method for Determining Apparent Opening Size of a Geotextile.
8. ASTM D5199 – Standard Test Method for Measuring Nominal Thickness of Geosynthetics.
9. ASTM D5261 – Standard Test Method for Measuring Mass per Unit Area of Geotextiles.
10. ASTM D5596 – Standard Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics.

1.3 SUBMITTALS

A. Submit manufacturer’s product data, describing the material type and the specified properties.

B. Submit shop drawings showing locations and construction methods and procedures for seams, penetrations, fasteners, and anchors.

C. Submit manufacturer’s installation recommendations and repair procedures.

D. Submit the results of manufacturer’s quality control (QC) testing for each roll of material.

1.4 DELIVERY, STORAGE AND HANDLING

A. Deliver the geocomposite material wrapped to protect the fabric from damage during shipping, handling, ultraviolet (UV) radiation, and abrasion.

B. Upon receipt of the geocomposite material at the site, inspect each roll to verify that it is properly wrapped, properly labeled, and undamaged.

C. Store the geocomposite in a dry, protected location until installed.

D. Do not stack rolls of material.

E. While unrolling the geocomposite for installation, inspect for damage or defects. Repair or replace any damaged material in accordance with the manufacturer's instructions.

PART 2 - PRODUCTS

2.1 GEOSYNTHETIC DRAINAGE LAYER

A. Geonet drainage core:
1. Manufacture drainage core of the geosynthetic drainage layer with polyethylene (PE) polymer geonet that is clean and free of any foreign contaminants.
2. Regrind material that consists of edge trimmings and other scraps may be used to manufacture the geonet; however, post-consumer recycled materials shall not be used.

B. Geotextile filtration layer:
1. Manufacture filtration layer of the geosynthetic drainage composite with nonwoven geotextile material.

C. Geocomposite:
1. Cover the geonet on top and bottom (double-sided) with the geotextile filtration layer.
2. Create geocomposite by heat bonding geotextile to the geonet.
3. Label each roll of the geotextile filtration layer with the manufacturer's name, product identification, lot number, roll number and roll dimensions.

D. Geosynthetic drainage layer properties:
1. The geocomposite and its components shall meet the property requirements stated in Table 1.
   a. Where applicable, Table 1 property values represent minimum average roll values (MARV) in the weakest principal direction.
   b. The value for AOS represents the maximum average roll value.

Table 1 – Geosynthetic Drainage Layer Properties

Property	Test Method	Test Value	Minimum Testing Frequency
GEONET			
Thickness, minimum average	ASTM D 5199	200 mil	15,000 lb
Thickness, lowest individual	ASTM D 5199	-10%	15,000 lb
Polymer Density, minimum	ASTM D 1505	0.940 g/cc	200,000 lb
Carbon Black Content	ASTM D 4218	2 to 3%	15,000 lb
Carbon Black Dispersion	ASTM D 5596	See note[1]	45,000 lb
GEOTEXTILE			
Mass/Unit Area, minimum	ASTM D 5261	8.0 oz/sq yards	20,000 sq. yards
Grab Strength, minimum	ASTM D 4632	220 lb	20,000 sq. yards
Permittivity, minimum	ASTM D 4491	1.0/sec	100,000 sq. yards
AOS (095), maximum	ASTM D 4751	80 sieve	100,000 sq. yards
GEOCOMPOSITE			
Transmissivity, minimum, including attached geotextiles[2]	ASTM D 4716	20 gal/min-foot	100,000 sq. yards
Geonet/Geotextile adhesion[3]	ASTM D 413	1.0 lb/inch	100,000 sq. yards

Notes:
[1] Carbon black dispersion for 10 different views: 8 of 10 in Category 1 or 2; and all 10 in Category 1, 2, or 3.
[2] Manufacturing quality control transmissivity tests shall be measured using water at 20 degrees Celsius (°C) with a gradient of 0.1 under a normal pressure of 10,000 pounds per square foot (psf). A minimum seating period of 15 minutes shall be used.
[3] Average of five equally spaced tests across the roll width.
Abbreviations:
% = percent
g/cc = grams per cubic centimeter
gal/min-foot = gallons per minute-foot
lb = pound
lb/inch = pounds per inch
sec = second
sq. yards = square yards

2.2 SOURCE QUALITY CONTROL

A. Provide quality control testing at the manufacturer's location using the test methods and frequencies stated in Table 1.

B. At a minimum, test each roll in accordance with Table 1.

PART 3 - EXECUTION

3.1 PREPARATION

A. Prior to placement of the geosynthetic drainage layer, clean the subgrade of all materials that could damage or interfere with the function of the drainage layer.

B. Lay out the work in accordance with the manufacturer's recommendations and shop Drawings.

3.2 INSTALLATION

A. Placement:
1. Do not damage the geosynthetic drainage layer during placement.
2. Roll the geosynthetic drainage layer in the direction of maximum slope, keeping the geosynthetic flat against the subgrade (geomembrane) to minimize wrinkles and folds.
3. Do not drag the drainage layer across textured geomembrane.
4. Place adequate ballast (e.g., sandbags) to prevent uplift by wind prior to covering.

B. Seams and overlaps:
1. Geonet side seams:
   a. Overlap geonet side seams by a minimum of 100 millimeters (mm) (4 inches).
   b. Space side seam fasteners a maximum of 1.5 meters (m) (5 feet) apart.
   c. In anchor trenches, space fasteners a maximum of 305 mm (1 foot) apart.
2. Geonet end seams:
   a. Overlap geonet end seams by a minimum of 305 mm (1 foot).
   b. Space end seam fasteners a maximum of 150 mm (6 inches) apart.
   c. Place overlaps in the direction of flow.
   d. Provide geonet-to-geonet contact at geocomposite end seam connections.
   e. Do not place end seams on side slopes steeper than 4 horizontal to 1 vertical (4H:1V) unless specifically approved by the Engineer.
   f. End seams shall not be within 10-LF of the radius ends of slope shoulders or elbows.
3. Geonet Fasteners
   a. Tie geonet rolls together with plastic fasteners.
   b. The fasteners shall be a contrasting color from the geonet and attached geotextiles.
   c. Do not use metallic fasteners.
4. Geotextile seams:
   a. Overlap the geotextile component of the geocomposite in the direction of flow.
   b. Cover the holes placed in geotextile to allow seaming of geonet rolls by placing geotextile cap strips.
   c. Cap strips shall be a minimum of 610 mm (2 feet) in width and thermally bonded to the geotextile component of the geocomposite.
5. Geocomposite edges:
   a. Place cap strips over any exposed edges of geocomposite.
   b. Cap strips shall be a minimum of 610 mm (2 feet) in width and thermally bonded to the geotextile component of the geocomposite.

C. Stacked geosynthetic drainage layers:
1. When geosynthetic drainage layers are to be stacked, stagger roll ends and edges so that joints do not lie above one another.

2. Place stacked layers in the same direction and in a manner that prevents interlocking.

D. Corners:
1. In the corners of side slopes, install an extra layer of drainage layer material from the top to the bottom of the slope.

E. Penetrations:
1. Attach a geotextile apron to penetrations so that soil is prevented from getting into the drainage layer.
2. Extend the apron of the attached geotextile out from the penetration a minimum of 610 mm (2 feet).
3. Thermally bond the apron geotextile to the geotextile component of the geocomposite.

3.3 REPAIRS

A. Geonet damage:
1. Make repairs by placing a patch of the geosynthetic drainage layer over the damaged area.
2. Extend the patch a minimum of 610 mm (2 feet) beyond the edge of the damage.
3. Use approved fasteners spaced every 150 mm (6 inches) around the patch to hold the patch in place.
4. If more than 25 percent of the roll width is damaged, obtain a determination from the Engineer as to whether it can be repaired or requires replacement.

B. Geotextile damage:
1. Repair damaged geotextile by placing a patch of geotextile over the damaged area with a minimum of 305 mm (12 inches) of overlap in all directions.
2. Thermally bond the geotextile patch in place.

3.4 PROTECTION AND BACKFILLING

A. Upon completion of installation, obtain acceptance from the Engineer prior to covering.

B. Cover the geosynthetic drainage layer with the specified materials within 14 days of acceptance.

END OF SECTION

Drawings

ISSUED FOR BID

2026 SITE 2 PHASE 5B - STAGE 1 CONSTRUCTION
CEDAR RAPIDS / LINN COUNTY SOLID WASTE AGENCY

MARION
LINN COUNTY, IOWA
AUGUST 2026

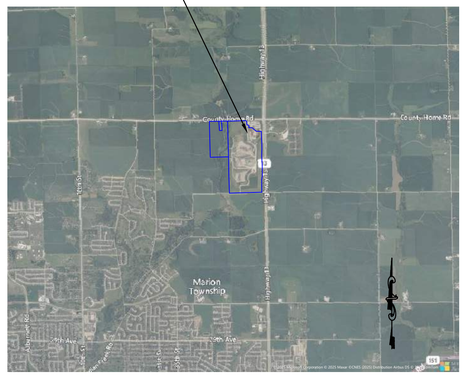
Prepared for:
Cedar Rapids / Linn Co. SWA

Solid Waste Agency
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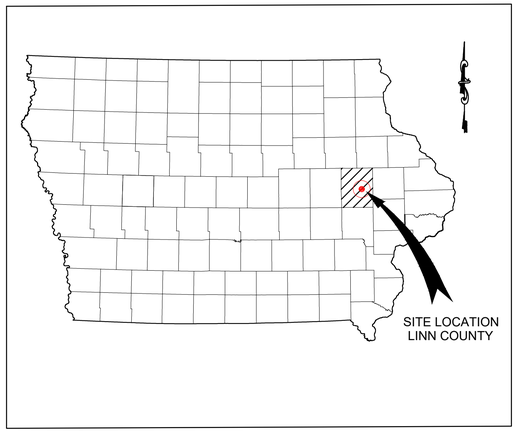
Prepared by:
Foth Infrastructure & Environment, LLC

Foth

CEDAR RAPIDS / LINN COUNTY
SOLID WASTE AGENCY



VICINITY MAP



LOCATION MAP

DRAWING INDEX

SHEET NUMBER	TITLE
G-01	COVER SHEET
G-02	LEGEND, ABBREVIATIONS, AND NOTES
G-03	QUANTITIES
C-04	SITE MAP
C-05	EXISTING CONDITIONS
C-06	BORROW AREA / RESTORATION
C-07	REMOVALS SHEET
C-08	TOP OF BASE GRADE
C-09	TOP OF CLAY
C-09A	STORMWATER RETENTION BASIN & LIFT STATION
C-10	TOP OF DRAINAGE
C-11	CROSS-SECTIONS
C-12	EROSION CONTROL PLAN
C-13	LINER DETAILS
C-14	LINER DETAILS
C-15	LEACHATE DETAILS
C-16	LIFT STATION DETAIL
C-17	STORMWATER DETAILS
C-18	STORMWATER DETAILS
C-19	EROSION CONTROL DETAILS
C-20	MISCELLANEOUS DETAILS
C-21	ELEVATION TABLE

LICENSED PROFESSIONAL ENGINEER
BRIAN K. HARTHUN 14049
IOWA

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.

AUG. 20, 2026
BRIAN K. HARTHUN, P.E. DATE
License Number: 14049
My license renewal date is DECEMBER 31, 2026
Pages or sheets covered by this seal:
ALL SHEETS ENCLOSED

SHEET TITLE:
TITLE SHEET

ISSUANCE:
ISSUED FOR BID

PROJECT NO: 26C004.00

SHEET NUMBER
G-01

Thursday, August 20, 2026 10:45:58 AM
DWG Filename: g-01 cover sheet.dwg Layout: layout1
DWG Folder Location: Clients\Cedar Rapids Linn Co SWA IA\0026C004.00\CAD\Drawings\L-3\

NOTES:

1. SITE LOCATION: W ½ OF SECTION 16, T84N, R6W, LINN COUNTY, IOWA
2. TOPOGRAPHY SURVEYED BY FOTH, SEPTEMBER 2025
3. COORDINATE SYSTEM IS: NAD83 IOWA NORTH STATE PLANE
4. UTILITY LOCATIONS ARE APPROXIMATE: CONTRACTOR SHALL FIELD LOCATE ALL UNDERGROUND AND ABOVE GROUND UTILITIES INCLUDING NOTIFICAITION OF IOWA ONE CALL (1-800-292-8989). COORDINATE ALL EXISTING UTILITIES WITH OWNER AND IOWA ONE CALL PRIOR TO CONSTRUCTION.
5. CONTRACTOR SHALL PROTECT ALL EXISTING INFRASTRUCTURE, TO INCLUDE BUT NOT LIMITED TO MONITORING WELLS, GAS COLLECTION WELLS, CULVERTS, PIPING SYSTEMS, ETC.
6. CONSULT WITH OWNER OR ENGINEER PRIOR TO ANY ACTIVITIES WHICH MAY INVOLVE MODIFICATIONS TO EXISTING LEACHATE MANAGEMENT PIPING SYSTEM
7. CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTION SITE SECURITY DURING THE WORK
8. CONTRACTOR SHALL FOLLOW ACTIVE LANDFILL TRAFFIC PATTERNS AND NOT INTERRUPT LANDFILL ACTIVITIES. COORDINATE WITH OWNER.
9. CONTRACTOR SHALL REPLACE ANY DISTURBED AREAS OUTSIDE OF CONSTRUCTION AREA TO EXISTING CONDITIONS WITHIN 14 DAYS OF CEASING CONSTRUCTION IN THE AREA, OR AS DETERMINED BY OWNER.

GENERAL SYMBOLS

EXISTING	PROPOSED	
730	750	CONTOURS (MAJOR)
		CONTOURS (MINOR)
×774.9	×774.9	SPOT ELEVATION
E	E	ELECTRIC
OHE	OHE	OVERHEAD UTILITY
UGE	UGE	UNDERGROUND UTILITY
FO		FIBER OPTIC LINE
FM	FM	FORCEMAIN
SSR	SSR	SIDESLOPE RISER PIPE
LL	LL	LEACHATE LINE
LT	LT	LEACHATE COLLECTION TRENCH
CO	CO	LEACHATE CLEANOUT
		FENCE
PROP		PROPERTY LINE
		DRAINAGE DITCH
		DRAINAGE TERRACE
		PHASE LIMITS
		WASTE LIMITS
		LINER LIMITS
		STORMWATER BASIN
	3:1	SLOPE RATIO
	4%	SLOPE PERCENTAGE
		CULVERT
		SILT FENCE
		FLEX TERRA
		MANHOLE
CP-1	CP-2	CONTROL POINT
BM-1	BM-2	BENCHMARK
GV-1	GV-2	GAS VALVE
GW-1	GW-2	VERTICAL GAS WELL
M-1	M-2	MONITORING WELL

CONVENTIONAL SYMBOLS

A / A	CROSS SECTION CALLOUT
N	NORTH ARROW
C-16 | 1	DETAIL CALLOUT

ABBREVIATIONS

APPROX	APPROXIMATE
BLDG	BUILDING
BM	BENCH MARK
CL	CENTERLINE
CO	CLEANOUT
CONC	CONCRETE
CONT	CONTINUED
CP	CONTROL POINT
CY	CUBIC YARD
DIA	DIAMETER
DI	DUCTILE IRON
E	EAST
ELEV	ELEVATION
EL.	ELEVATION
EQ	EQUIVALENT
EXIST	EXISTING
EX	EXISTING
FT	FOOT
GCL	GEOSYNTHETIC CLAY LINER
GW	GAS WELL
HDPE	HIGH DENSITY POLYETHYLENE
IDOT	IOWA DEPARTMENT OF TRANSPORTATION
IN	INCH
INV	INVERT
LEA	LEACHATE
LF	LINEAR FEET
LP	LIGHT POLE
MAX	MAXIMUM
MIL	MILLIMETER
MIN	MINIMUM
MISC	MISCELLANEOUS
MSW	MUNICIPAL SOLID WASTE
MW	MONITORING WELL
N	NORTH
NTS	NOT-TO-SCALE
OZ	OUNCE
PROP	PROPERTY
PVC	POLYVINYL CHLORIDE
PW	PRIVATE WELL
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RECP	ROLLED EROSION CONTROL PRODUCT
ROW	RIGHT-OF-WAY
SD	STORM DRAIN
SDR	STANDARD DIMENSION RATIO
SF	SQUARE FOOT
SMH	SEWER MANHOLE
SS	STORM SEWER
SSR	SIDE SLOPE RISER
ST	STREET
STA	STATION
SUDAS	STATEWIDE URBAN DESIGN AND SPECIFICATIONS
SW	STORMWATER
TEMP	TEMPORARY
TYP	TYPICAL
VAR	VARIES
W	WEST

NOTE:
NOT ALL ABBREVIATION AND SYMBOL ENTRIES SHOWN MAY BE UTILIZED IN THE PLAN SET

Foth

2026 SITE 2 PHASE 5B - STAGE 1 CONSTRUCTION

CEDAR RAPIDS/LINN COUNTY SOLID WASTE AGENCY MARION, IA

REVISIONS			
NO.	BY	DATE	DESCRIPTION

DATE OF PREPARATION

	BY	DATE
SURVEYED	FOTH	SEPT. 2025
DRAWN	TMH	AUGUST 2026
DESIGNED	TMH	AUGUST 2026
CHECKED	CGO	AUGUST 2026

SHEET TITLE:

LEGEND, ABBREVIATIONS, AND NOTES

(ISSUED FOR BID)

PROJECT NO: 26C004.00

SHEET NUMBER

G-02

Thursday, August 20, 2026 10:24:30 AM
DWG Filename: g-002 legend abbreviations notes.dwg Layout: g-02
DWG Folder Location: ACCDocs\Foth\CRLCSWA-Cell 5B Design & Const-\Project Files\CAD\Drawings

NO	SPEC	BID ITEM	UNIT	QUANTITY	INSTALLED
1	SUDAS 11020	MOBILIZATION	LS	1	
2	CQA MANUAL	SOURCE TESTING	LS	1	
3	SUDAS 10010	SALVAGE AND REMOVALS	LS	1	
4	SUDAS 2010	COMMON EXCAVATION	CY	335,209	
5	SUDAS 2010	HAUL AND PLACE - STOCKPILE	CY	248,307	
5A	SUDAS 2010	HAUL AND PLACE - MSW 5A DAILY COVER	CY	15,000	
6	SUDAS 2010	HAUL AND PLACE - STORMWATER TERRACE	CY	6,227	
7	SUDAS 2010	HAUL AND PLACE - SUBGRADE	CY	2,171	
8	TECH SPEC 31 35 26	HAUL AND PLACE - CLAY LINER	CY	39,400	
9	SUDAS 2010	HAUL AND PLACE - STORMWATER DETENTION BASIN	CY	27,003	
10	SUDAS 2010	HAUL AND PLACE - ANCHOR TRENCH	CY	397	
11	TECH SPEC 31 35 27	60-MIL HDPE LINER - SMOOTH	SF	326,976	
12	TECH SPEC 33 46 23	GEOCOMPOSITE	SF	326,976	
13	TECH SPEC 31 32 19	10-OZ SEPARATION GEOTEXTILE	SF	2,400	
14	TECH SPEC 31 35 27	GROUNDWATER DRAINAGE LAYER	CY	8,450	
15	TECH SPEC 31 35 28	COARSE GROUNDWATER DRAINAGE MATERIAL	CY	7	
16	TECH SPEC 31 35 27	LEACHATE DRAINAGE LAYER	CY	9,520	
17	TECH SPEC 31 35 28	COARSE LEACHATE DRAINAGE MATERIAL	CY	39	
18	SUDAS 4010	8-IN PERF HDPE DR-11 GROUNDWATER COLLECTION PIPE	LF	1,100	
19	SUDAS 4010	8-IN PERF HDPE DR-11 LEACHATE COLLECTION PIPE	LF	1,295	
20	SUDAS 4010	8-IN SOLID HDPE DR-11 SIDESLOPE RISER PIPE	LF	256	
21	SUDAS 4010	8-IN PERF HDPE DR-11 SIDESLOPE RISER PIPE	LF	30	
22	SUDAS 4010	8-IN HDPE DR 11 GROUNDWATER BYPASS	LS	1	
23	SUDAS 4010	6-IN HDPE DR 11 LEACHATE BYPASS	LS	1	
23A	SUDAS 4010	8-IN HDPE DR 11 GROUNDWATER BYPASS PIPE	LF	280	
23B	SUDAS 4010	8-IN HDPE DR 11 LEACHATE BYPASS DISCHARGE PIPE	LF	350	
23C	SUDAS 4010	8-IN SOLID HDPE DR 11 LEACHATE CLEANOUT PIPE	LF	425	
24	SUDAS 4010	6-IN FUEL TANK DRAIN PIPE	LF	230	
25	TECH SPEC 33 35 43 & SUDAS 6010	4-FT DIA STORMWATER LIFT STATION	LS	1	
26	SUDAS 4020	24" CLASS V RCP	LF	180	
27	SUDAS 4020	24" FES WITH TRASH GUARD	EA	4	
28	SUDAS 4020	REMOVE AND RE-INSTALL CULVERT	LF	85	
29	SUDAS 9040	RIPRAP / MACADAM STORMWATER DAM	EA	2	
30	SUDAS 4020 & 9040	STORMWATER COLLECTION PIPE	EA	1	
31	SUDAS 4020 & 9040	STORMWATER BYPASS	EA	1	
34A	IDOT 4196.01-5a	BIAXIAL POLYMER GRID	SF	106,269	
32	IDOT 2210 & TECH SPEC 32 15 00	6-IN MACADAM - CELL ACCESS ROAD	SY	11,808	
33	IDOT 4120 & TECH SPEC 32 15 00	6-IN CLASS A ROAD STONE - CELL ACCESS ROAD	SY	11,808	
34	SUDAS 9040	6-IN DRAINAGE SAND	TN	2,044	
35	SUDAS 9040	CLASS A RIPRAP	TN	3,924	
36	SUDAS 9040	SALVAGED RIPRAP DAM	EA	6	
37	SUDAS 9040	8-FT WIDE RECP TYPE 2.B EROSION MAT	LF	4,545	
38	TECH SPEC 32 92 19 & SUDAS 9040	SEED, FERTILIZER AND FLEX TERRA	AC	6	
39	TECH SPEC 32 92 19 & SUDAS 9040	SEED, FERTILIZER AND MULCH	AC	7	
40	SUDAS 9040	SILT FENCE - INSTALL	LF	1,250	
41	SUDAS 9040	SILT FENCE - CLEAN	LF	1,250	
42	SUDAS 9040	SILT FENCE - REMOVAL	LF	1,250	
43	DETAIL C-14 - 2	TEMPORARY LINER EDGE MARKERS	EA	4	

Foth

2026 SITE 2 PHASE 5B - STAGE 1 CONSTRUCTION

CEDAR RAPIDS/LINN COUNTY SOLID WASTE AGENCY MARION, IA

REVISIONS

NO.	DESCRIPTION	DATE	BY
1			
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6			

DATE OF PREPARATION

	BY	DATE
SURVEYED	FOTH	SEPT. 2025
DRAWN	TMH	AUGUST 2026
DESIGNED	TMH	AUGUST 2026
CHECKED	CGO	AUGUST 2026

SHEET TITLE:

QUANTITIES

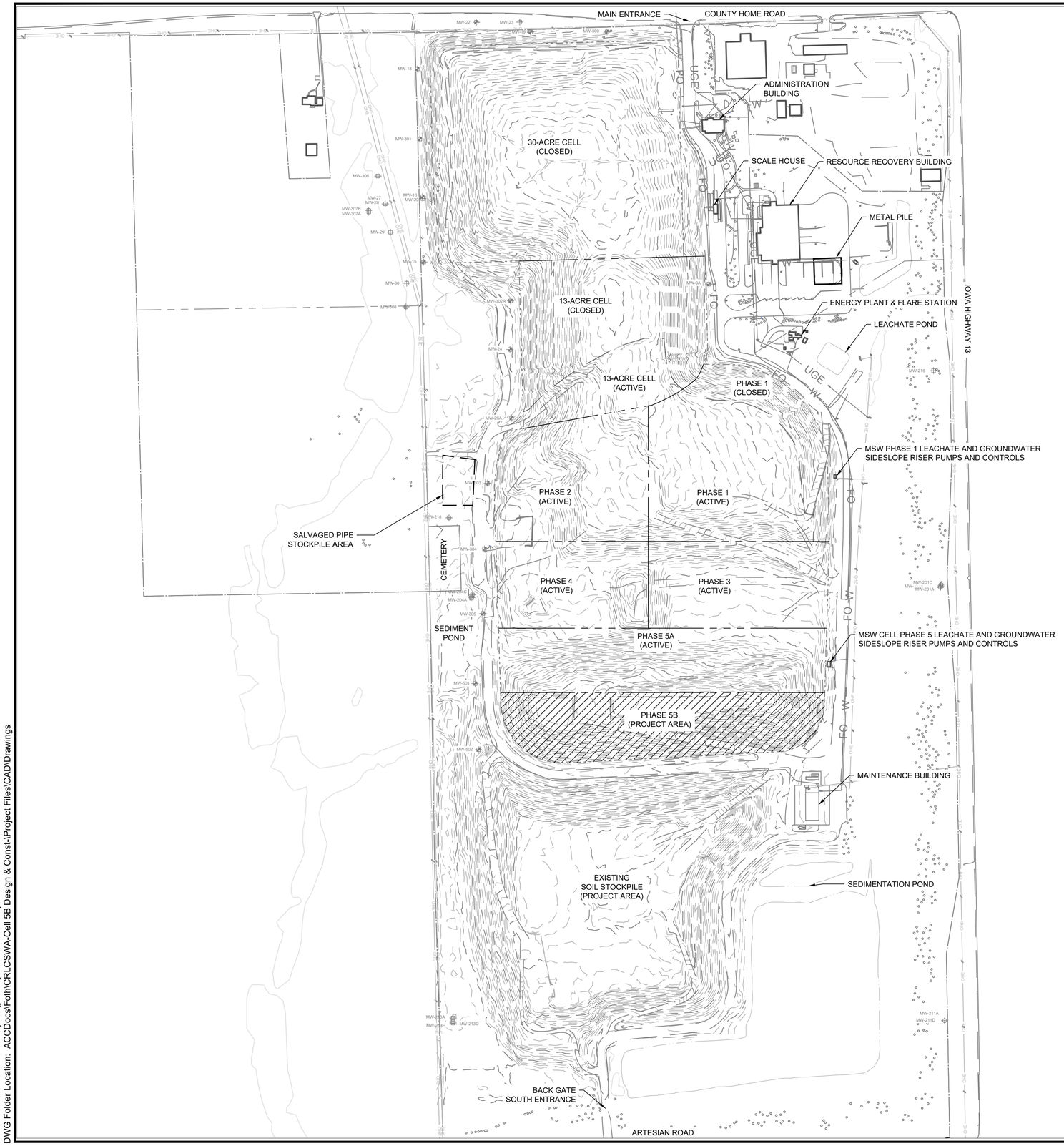
(ISSUED FOR BID)

PROJECT NO: 26C004.00

SHEET NUMBER

G-03

Thursday, August 20, 2026 11:14:12 AM
DWG Filename: g-002 legend abbreviations notes.dwg Layout: g-03
DWG Folder Location: ACCDocs\Foth\CRLCSWA-Cell 5B Design & Const-\Project Files\CAD\Drawings



Thursday, August 20, 2026 10:25:11 AM
DWG Filename: c-04 site map.dwg Layout: c-04 site map
DWG Folder Location: ACCDocs\Foth\CRLCSWA-Cell 5B Design & Const-I\Project Files\CAD\Drawings

Foth

2026 SITE 2 PHASE 5B - STAGE 1 CONSTRUCTION

CEDAR RAPIDS/LINN COUNTY SOLID WASTE AGENCY MARION, IA

REVISIONS			
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	BY	DATE
SURVEYED	FOTH	SEPT. 2025
DRAWN	TMH	AUGUST 2026
DESIGNED	TMH	AUGUST 2026
CHECKED	CGO	AUGUST 2026

SHEET TITLE:

SITE MAP

(ISSUED FOR BID)

PROJECT NO: 26C004.00

SHEET NUMBER

C-04

PROPERTY BOUNDARY

PHASE 3
(ACTIVE)

PHASE 4
(ACTIVE)

SEDIMENT
POND

PHASE 5A
(ACTIVE)

36" RCP = 777.92

36" RCP = 779.84

EXISTING STORM WATER
BASIN LIFT STATION

EXISTING STORM WATER BASIN

PHASE 5B
(PROPOSED)

EXISTING CULVERT

MSW CELL PHASE 5 LEACHATE AND
GROUNDWATER SIDESLOPE RISER
PUMPS AND CONTROLS

24" RCP (W) = 837.30
24" RCP (E) = 837.44

24" RCP (W) = 837.03
24" RCP (E) = 836.85

STORM PUMP CONTROL PANEL

INV EL = 836.12 24" RCP

EXISTING HANDHOLE

EXISTING STORM WATER
BASIN DISCHARGE

FUEL TANK
SECONDARY CONTAINMENT DISCHARGE PIPE
6-IN. PVC INV EL = 840.80

MANHOLE
RIM EL = 844.43

MAINTENANCE BUILDING

AREA INTAKE
RIM EL = 839.14

CHAIN LINK FENCE

EXISTING
SOIL STOCKPILE

SEDIMENTATION PONDS

FL EL = 819.77 12" PVC

N

NAD 83

GRAPHIC SCALE
0 50 100 200
(IN FEET)
1 INCH = 100FEET

Foth

2026 SITE 2 PHASE 5B - STAGE 1 CONSTRUCTION

**CEDAR RAPIDS/LINN COUNTY
SOLID WASTE AGENCY
MARION, IA**

REVISIONS			
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SURVEYED	FOTH	SEPT. 2025
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DESIGNED	TMH	AUGUST 2026
CHECKED	CGO	AUGUST 2026

SHEET TITLE:

EXISTING
CONDITIONS

(ISSUED FOR BID)

PROJECT NO: 26C004.00

SHEET NUMBER

C-05

Thursday, August 20, 2026 10:26:30 AM
DWG Filename: c-05 existing conditions.dwg Layout: ex conditions
DWG Folder Location: ACCDocs\Foth\CRLCSWA-Cell 5B Design & Const-\Project Files\CAD\Drawings

SEDIMENT POND

PHASE 5A
(ACTIVE)

PHASE 5B

SOIL STOCKPILE

EXISTING WASTE LIMITS

FL EL = 840.80 6" PVC
52-LF

N 3499758.93
E 5449579.45
EL 840.80

MANHOLE
RIM EL = 844.43

MAINTENANCE BUILDING

CHAIN LINK FENCE

INSTALL 230-LF OF 6" PIPE AND
CONNECT TO EXISTING AREA INTAKE

N 3499521.63
E 5449526.74
EL 840.57

EXISTING 24-IN CULVERTS

SEDIMENTATION POND

C-18 | 1 REPAIR EXISTING
LETDOWN STRUCTURE
REUSE EXISTING CLASS A MATERIAL

C-20 | 1 DRAINAGE TERRACES

-5.8%

-11.8%

N

NAD 83

GRAPHIC SCALE
0 50 100 200
(IN FEET)
1 INCH = 100FEET

Foth

2026 SITE 2 PHASE 5B - STAGE 1 CONSTRUCTION

CEDAR RAPIDS/LINN COUNTY SOLID WASTE AGENCY
MARION, IA

REVISIONS			
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DRAWN	TMH	AUGUST 2026
DESIGNED	TMH	AUGUST 2026
CHECKED	CGO	AUGUST 2026

SHEET TITLE:

BORROW AREA / RESTORATION

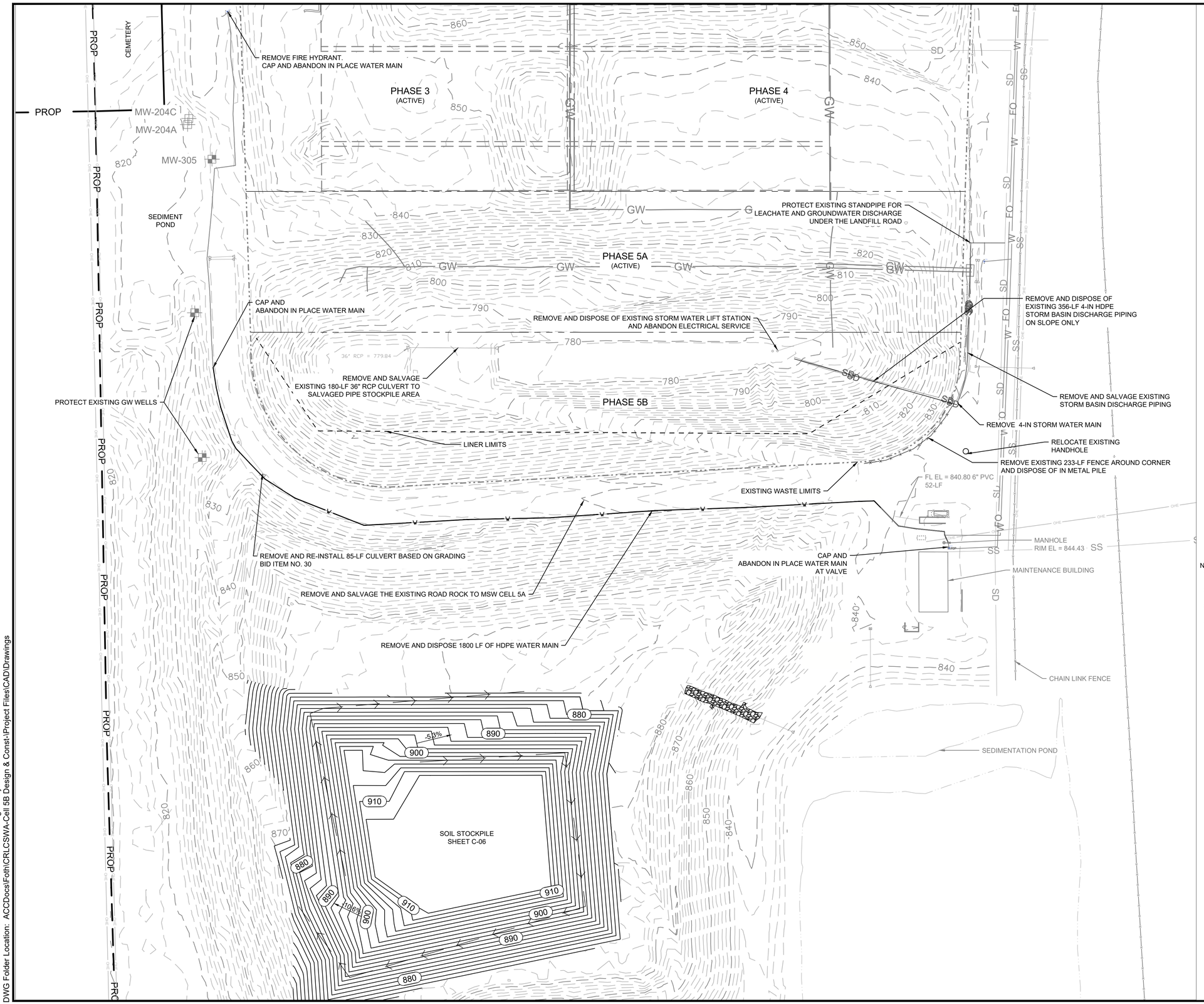
(ISSUED FOR BID)

PROJECT NO: 26C004.00

SHEET NUMBER

C-06

Thursday, August 20, 2026 10:28:35 AM
DWG Filename: c-06 borrow area and restoration.dwg Layout: borrow area and restoration - 06
DWG Folder Location: ACCDocs\Foth\CRLCSWA-Cell 5B Design & Const-\Project Files\CAD\Drawings



NOTES:

1. THE EXISTING PUMP EQUIPMENT WILL BE SALVAGED TO THE OWNER
2. COORDINATE ROAD ROCK STOCKPILE LOCATION WITH OWNER
3. CONTRACTOR RESPONSIBLE FOR PROTECTION OF GW WELLS
4. REMOVE AND RELOCATE EXISTING SERVICE LINE TO PROPOSED LIFT STATION

N

NAD 83

GRAPHIC SCALE
0 50 100 200
(IN FEET)
1 INCH = 100FEET

Foth

2026 SITE 2 PHASE 5B - STAGE 1 CONSTRUCTION

CEDAR RAPIDS/LINN COUNTY SOLID WASTE AGENCY MARION, IA

REVISIONS NO.	DESCRIPTION	DATE	BY

DATE OF PREPARATION

	BY	DATE
SURVEYED	FOTH	SEPT. 2025
DRAWN	TMH	AUGUST 2026
DESIGNED	TMH	AUGUST 2026
CHECKED	CGO	AUGUST 2026

SHEET TITLE:

REMOVALS SHEET

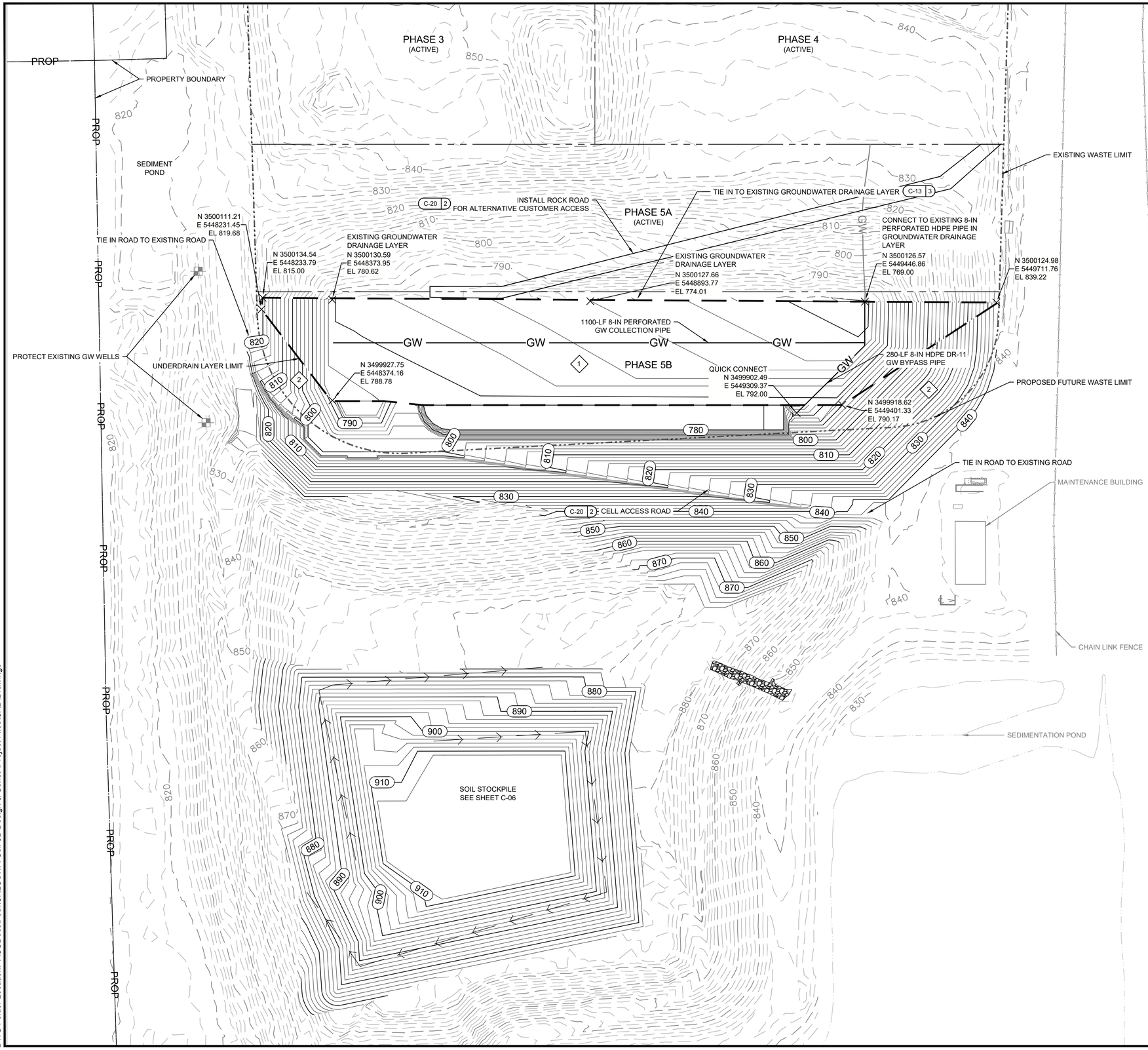
(ISSUED FOR BID)

PROJECT NO: 26C004.00

SHEET NUMBER

C-07

Thursday, August 20, 2026 10:28:17 AM
DWG Filename: c-06 borrow area and restoration.dwg Layout: 07 - removals
DWG Folder Location: ACCDocs\Foth\CRLCSWA-Cell 5B Design & Const-\Project Files\CAD\Drawings



PLAN NOTES:

1. CELL AREA INSIDE OF THE GROUND WATER DRAINAGE LAYER SHALL BE EXCAVATED 5-FT BELOW THE TOP OF CLAY SURFACE ELEVATION
2. CELL AREA OUTSIDE OF THE GROUND WATER DRAINAGE LAYER SHALL BE CUT TO SUBGRADE

N

NAD 83

GRAPHIC SCALE
0 50 100 200
(IN FEET)
1 INCH = 100FEET

Foth

2026 SITE 2 PHASE 5B - STAGE 1 CONSTRUCTION

CEDAR RAPIDS/LINN COUNTY SOLID WASTE AGENCY MARION, IA

REVISIONS			
NO.	BY	DATE	DESCRIPTION
1			
2			
3			
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6			

DATE OF PREPARATION

	BY	DATE
SURVEYED	FOTH	SEPT. 2025
DRAWN	TMH	AUGUST 2026
DESIGNED	TMH	AUGUST 2026
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SHEET TITLE:

TOP OF BASE GRADE

(ISSUED FOR BID)

PROJECT NO: 26C004.00

SHEET NUMBER

C-08

Thursday, August 20, 2026 11:15:34 AM
DWG Filename: c-08 base grade.dwg Layout: base grade
DWG Folder Location: ACCDocs\Foth\CRLCSWA-Cell 5B Design & Const-\Project Files\CAD\Drawings

PROP
PROPERTY BOUNDARY
PHASE 3
(ACTIVE)
PHASE 4
(ACTIVE)
EXISTING WASTE LIMIT
SEDIMENT
POND
C-20 | 2 ROCK ROAD FOR ALTERNATIVE CUSTOMER ACCESS
PHASE 5A
(ACTIVE)
N 3500133.83
E 5448233.03
EL 820.72
N 3500130.59
E 5448373.95
EL 785.62
N 3500128.46
E 5448920.13
EL 778.72
TIE IN TO EXISTING LINER C-13 | 3
C-11 | 2
N 3500126.43
E 5449454.75
EL 774.99
N 3500125.97
E 5449714.71
EL 839.95
TIE IN ROAD TO EXISTING ROAD
C-13 | 1 60-MIL HDPE LINER
CONSTRUCT BERM ON TOP OF LINER C-14 | 3
C-14 | 2 EDGE OF LINER MARKER (TYP.)
DRAINAGE TERRACE C-20 | 1
PROTECT EXISTING GW WELLS
PIPE END
N 3499901.23
E 5448419.50
EL 786.00
PIPE END
N 3499904.83
E 5448463.09
EL 786.00
PIPE END
N 3499904.99
E 5448563.60
EL 784.00
PHASE 5B
LINER LIMITS
STORM WATER BASIN
UGE
RELOCATE EXISTING
SERVICE LINE
RELOCATE EXISTING
HANDHOLE
MAINTENANCE BUILDING
RE-INSTALL 85-LF CULVERT
DRAIN TO NORTH
INSTALL 80-LF OF
24" CLASS V RCP WITH
FLARED END SECTION
AND TRASH GUARD
PIPE END
N 3499821.68
E 5448419.50
EL 798.00
INSTALL 100-LF OF
24" CLASS V RCP WITH
FLARED END SECTION
AND TRASH GUARD
PROPOSED FUTURE WASTE LIMIT
TIE IN ROAD TO EXISTING ROAD
C-20 | 1 DRAINAGE TERRACE
450-LF 6-IN HDPE DR-17 STORM WATER BYPASS PIPE
C-20 | 2 CELL ACCESS ROAD
CONNECT TO EXISTING AREA INTAKE
450-LF 4-IN HDPE DR-17 STORM WATER BYPASS PIPE
CHAIN LINK FENCE
SEDIMENTATION POND
SOIL
STOCKPILE

N
NAD 83

GRAPHIC SCALE
0 50 100 200
(IN FEET)
1 INCH = 100FEET

Foth

2026 SITE 2 PHASE 5B - STAGE 1 CONSTRUCTION

CEDAR RAPIDS/LINN COUNTY SOLID WASTE AGENCY MARION, IA

REVISIONS NO.	DESCRIPTION	DATE	BY

DATE OF PREPARATION

	BY	DATE
SURVEYED	FOTH	SEPT. 2025
DRAWN	TMH	AUGUST 2026
DESIGNED	TMH	AUGUST 2026
CHECKED	CGO	AUGUST 2026

SHEET TITLE:

TOP OF CLAY

(ISSUED FOR BID)

PROJECT NO: 26C004.00

SHEET NUMBER
C-09

Thursday, August 20, 2026 10:31:29 AM
DWG Filename: c-09 top of clay and liner.dwg Layout: top of liner - 09
DWG Folder Location: ACCDocs\Foth\CRLCSWA-Cell 5B Design & Const-\Project Files\CAD\Drawings

PHASE 5A
(ACTIVE)

PHASE 5B

C-20 2 ROCK ROAD FOR ALTERNATIVE CUSTOMER ACCESS

CONNECT TO EXISTING
LEACHATE PIPE

N 3500128.46
E 5448920.13
EL 778.72

N 3500126.43
E 5449454.75
EL 774.99

N 3500125.97
E 5449714.71
EL 839.95

CONNECT TO EXISTING FORCE MAIN

INSTALL 65-LF OF
24-IN. DIAMETER PERFORATED ADS N-12 PIPE
BID ITEM NO. 32

24-IN X 30-IN ADS N-12 CROSS

PIPE END
N 3499904.99
E 5448563.60
EL 784.00

MSW CELL 5B WASTE LIMIT

C-18 1 RIP RAP FLUME

STORM WATER BASIN

STORMWATER BYPASS
BID ITEM NO. 33
C-17 3

RELOCATE EXISTING
SERVICE LINE

DRAINAGE TERRACE C-20 1

4-FT DIA. LIFT STATION C-16 1

STORMWATER COLLECTION PIPE
BID ITEM NO. 32
C-17 3

PROPOSED FUTURE WASTE LIMIT

C-17 3 RIPRAP / MACADAM STORMWATER DAM
BID ITEM NO. 31

C-20 1 DRAINAGE TERRACE

450-LF 6-IN HDPE DR-17 STORM WATER BYPASS PIPE
SEE SHEET C-09

LEA
UGE
SD
OHE
W
FOP

840 830 820 810 800 790 780 860 870

N

NAD 83

GRAPHIC SCALE
0 25 50 100
(IN FEET)
1 INCH = 50 FEET

Thursday, August 20, 2026 10:32:09 AM
DWG Filename: c-09 top of clay and liner.dwg Layout: stormwater d basin 09a
DWG Folder Location: ACCDocs\Foth\CRLCSWA-Cell 5B Design & Const-1\Project Files\CAD\Drawings

Foth

CEDAR RAPIDS/LINN COUNTY
SOLID WASTE AGENCY
MARION, IA

2026 SITE 2 PHASE 5B - STAGE 1 CONSTRUCTION

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DRAWN	TMH	AUGUST 2026
DESIGNED	TMH	AUGUST 2026
CHECKED	CGO	AUGUST 2026

SHEET TITLE:

STORMWATER RETENTION BASIN & LIFT STATION

(ISSUED FOR BID)

PROJECT NO: 26C004.00

SHEET NUMBER
C-09A

PHASE 3
(ACTIVE)

PHASE 4
(ACTIVE)

PHASE 5A
(ACTIVE)

PHASE 5B

PROP

PROPERTY BOUNDARY

SEDIMENT
POND

TIE IN ROAD TO EXISTING ROAD

PROTECT EXISTING GW WELLS

LEACHATE DRAINAGE LAYER LIMIT

C-20 2 ROCK ROAD FOR ALTERNATIVE CUSTOMER ACCESS

C-13 3 TIE IN TO EXISTING LEACHATE DRAINAGE LAYER

N 3500130.59
E 5448373.95
EL 785.62

N 3500127.66
E 5448893.77
EL 779.01

1065-LF 8-IN HDPE DR-11
LEACHATE COLLECTION PIPE

145-LF 8-IN SOLID DR-11 HDPE
LEACHATE CLEANOUT PIPE

CONNECT TO EXISTING
LEACHATE DISCHARGE LINE
N 3500144.93
E 5449441.61
EL 781.53

N 3500126.43
E 5449454.75
EL 774.99

EXISTING WASTE LIMIT

350-LF 8-IN SOLID DR-11 HDPE
LEACHATE DISCHARGE LINE
MINIMUM 2-FT INTO EXISTING WASTE
TO TOP OF PIPE

230-LF 8-IN HDPE DR-11
LEACHATE COLLECTION PIPE C-15 3

280-LF 8-IN SOLID DR-11 HDPE
LEACHATE CLEANOUT PIPE

256-LF 8-IN HDPE DR-11 SOLID SIDESLOPE RISER C-15 2

30-LF 8-IN HDPE DR-11 PERFORATED PIPE C-15 2

END PIPE
N 3499926.68
E 5449386.84
EL 792.00

PROPOSED FUTURE WASTE LIMIT

STORM WATER BASIN

6-IN HDPE DR-11 SOLID PIPE BYPASS W/ 6-IN QUICK CONNECT C-16 1

MAINTENANCE BUILDING

C-20 2 CELL ACCESS ROAD

TIE IN ROAD TO EXISTING ROAD

CHAIN LINK FENCE

SEDIMENTATION PONDS

SOIL
STOCKPILE

N

NAD 83

GRAPHIC SCALE
0 50 100 200
(IN FEET)
1 INCH = 100FEET

Foth

2026 SITE 2 PHASE 5B - STAGE 1 CONSTRUCTION

CEDAR RAPIDS/LINN COUNTY
SOLID WASTE AGENCY
MARION, IA

REVISIONS			
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DESIGNED	TMH	AUGUST 2026
CHECKED	CGO	AUGUST 2026

SHEET TITLE:

TOP OF
DRAINAGE
LAYER

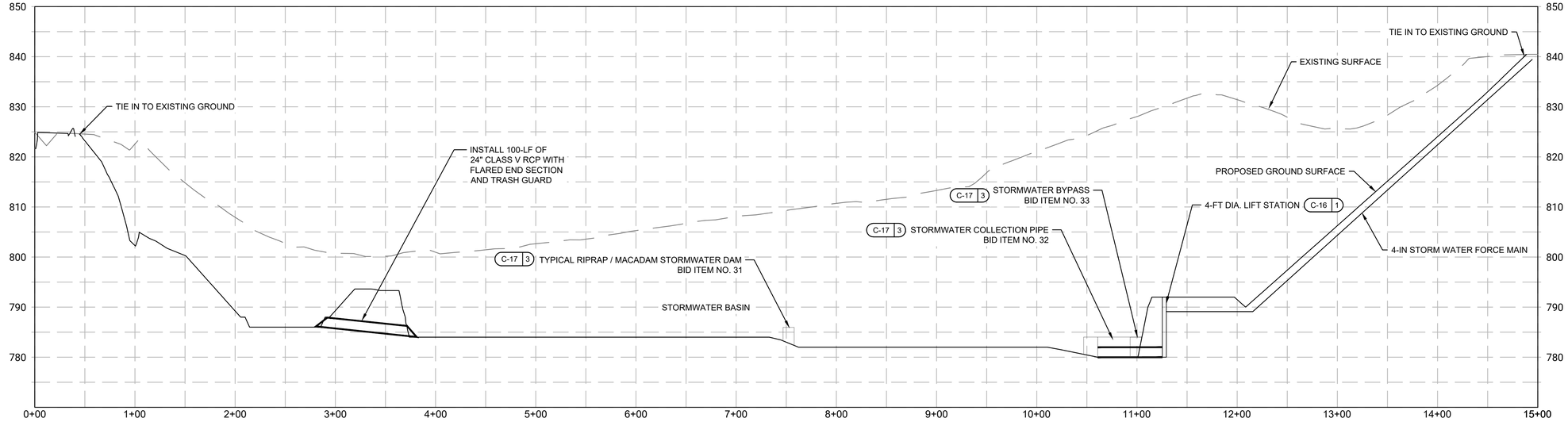
(ISSUED FOR BID)

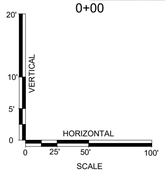
PROJECT NO: 26C004.00

SHEET NUMBER
C-10

Thursday, August 20, 2026 10:54:28 AM Layout: top of drainage
DWG Filename: c-10 top of drainage.dwg
DWG Folder Location: ACCDocs\Foth\CRLCSWA-Cell 5B Design & Const-\Project Files\CAD\Drawings

WEST - EAST SECTION

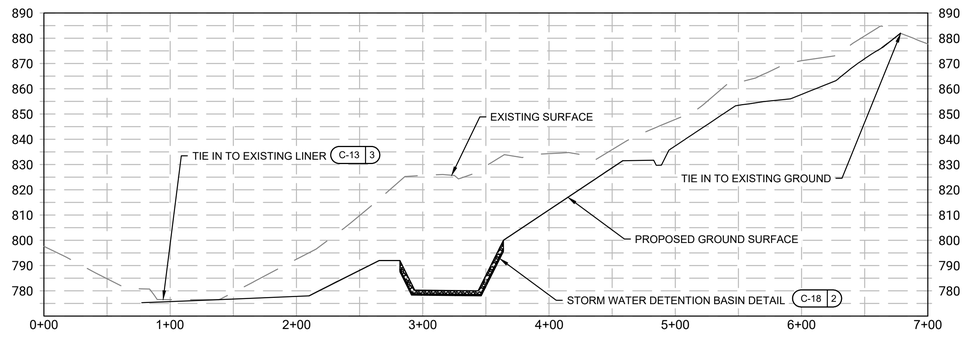


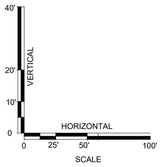


1 / C-11 **WEST TO EAST STORM WATER DETENTION BASIN SECTION**

SCALE: NONE

NORTH - SOUTH SECTION





2 / C-11 **NORTH TO SOUTH SECTION**

SCALE: NONE

Thursday, August 20, 2026 10:35:41 AM
DWG Filename: c-11 profiles.dwg Layout: c-11 profiles
DWG Folder Location: ACCDocs\Foth\CRLCSWA-Cell 5B Design & Const-\Project Files\CAD\Drawings

Foth

2026 SITE 2 PHASE 5B - STAGE 1 CONSTRUCTION

CEDAR RAPIDS/LINN COUNTY SOLID WASTE AGENCY MARION, IA

REVISIONS NO.	BY	DATE	DESCRIPTION
1			
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DATE OF PREPARATION

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SHEET TITLE:

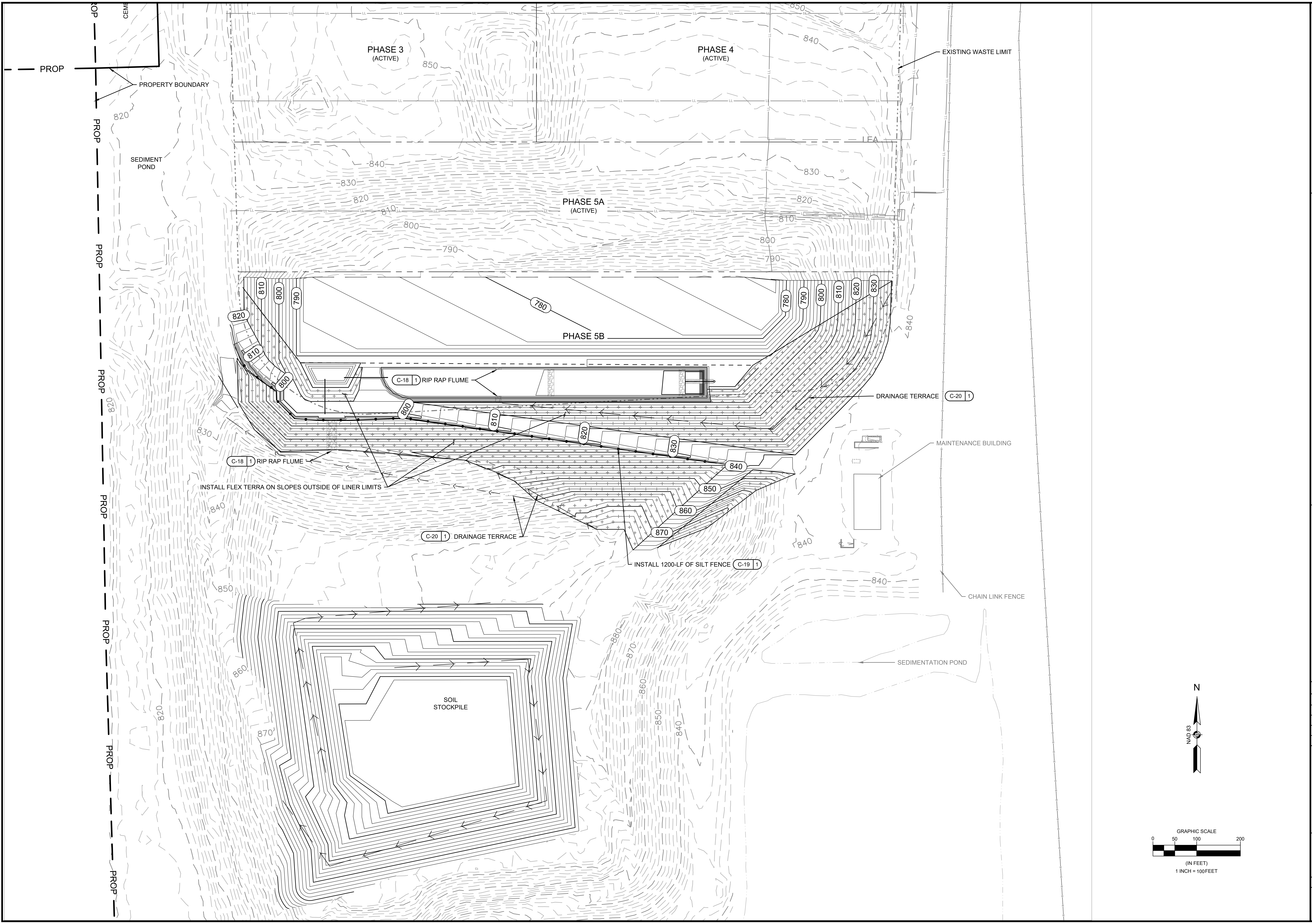
CROSS-SECTIONS

(ISSUED FOR BID)

PROJECT NO: 26C004.00

SHEET NUMBER

C-11



Thursday, August 20, 2026 10:36:14 AM
DWG Filename: c-12 erosion control plan.dwg Layout: erosion control plan - 12
DWG Folder Location: ACCDocs\Foth\CRLCSWA-Cell 5B Design & Const-\Project Files\CAD\Drawings

2026 SITE 2 PHASE 5B - STAGE 1 CONSTRUCTION

CEDAR RAPIDS/LINN COUNTY
SOLID WASTE AGENCY
MARION, IA

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DESIGNED	TMH	AUGUST 2026
CHECKED	CGO	AUGUST 2026

SHEET TITLE:

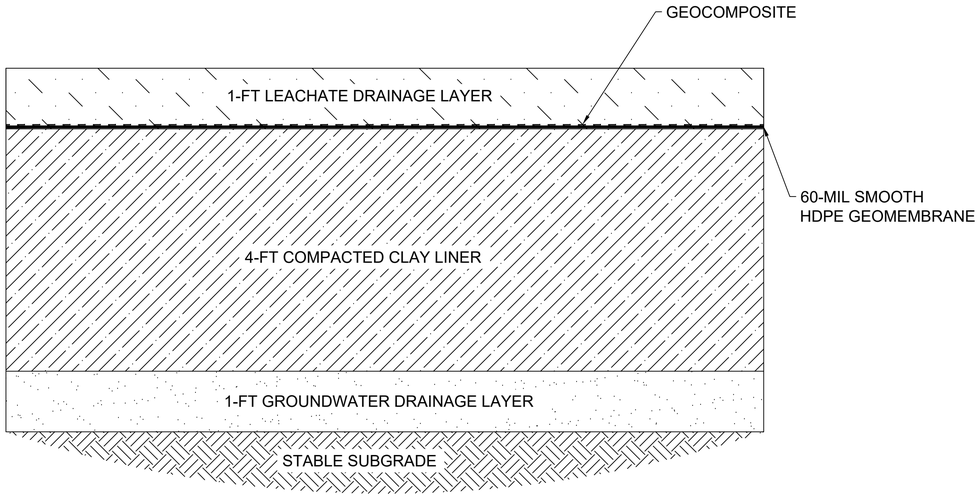
EROSION
CONTROL
PLAN

(ISSUED FOR BID)

PROJECT NO: 26C004.00

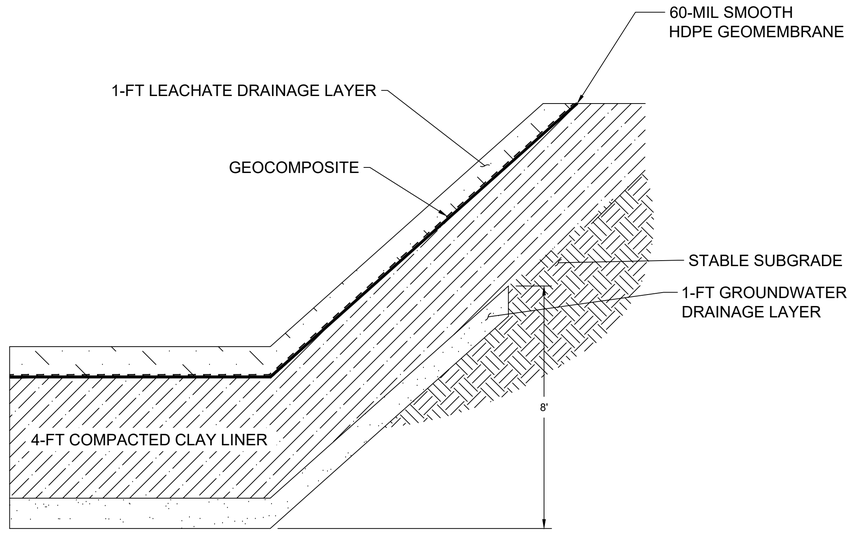
SHEET NUMBER

C-12



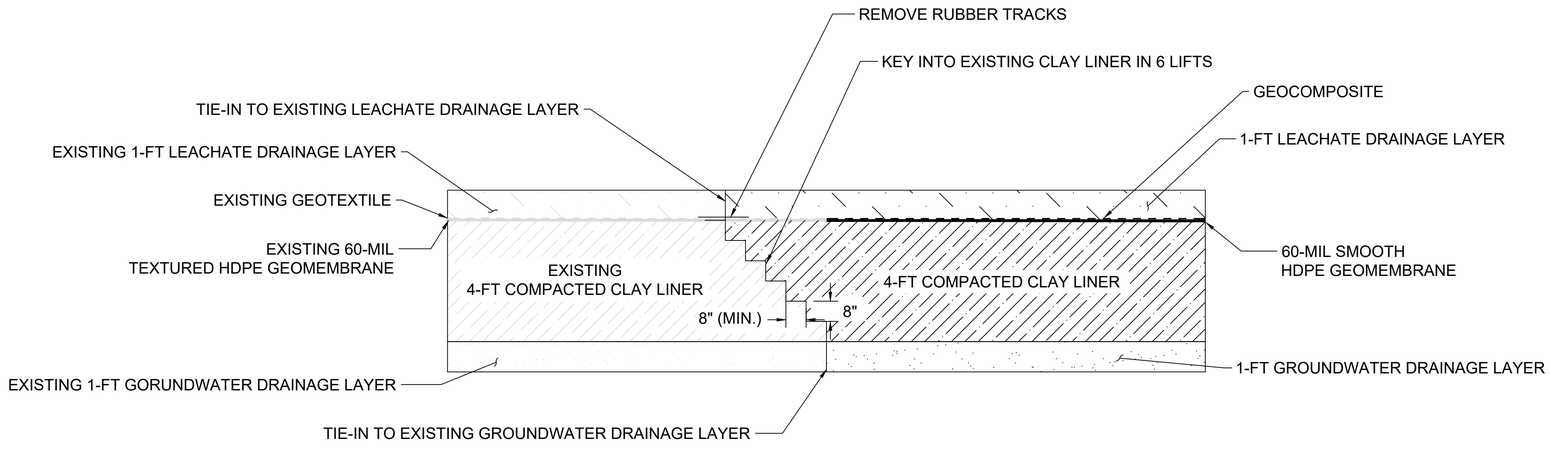
1 C-13 LINER SECTION (TYP.)

SCALE: NONE



2 C-13 LINER SECTION FOR UNDERDRAIN TRANSITION

SCALE: NONE



3 C-13 LINER DETAIL FOR 5A TIE-IN

SCALE: NONE

Foth

2026 SITE 2 PHASE 5B - STAGE 1 CONSTRUCTION

CEDAR RAPIDS/LINN COUNTY
SOLID WASTE AGENCY
MARION, IA

REVISIONS NO.	DESCRIPTION	DATE	BY

DATE OF PREPARATION

	BY	DATE
SURVEYED	FOTH	SEPT. 2025
DRAWN	TMH	AUGUST 2026
DESIGNED	TMH	AUGUST 2026
CHECKED	CGO	AUGUST 2026

SHEET TITLE:

LINER
DETAILS

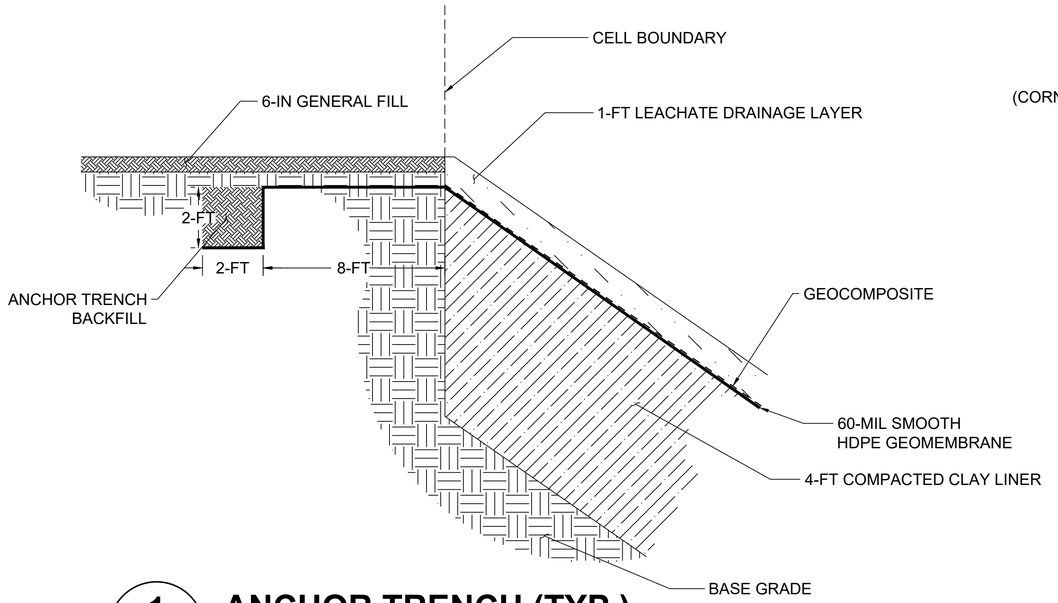
(ISSUED FOR BID)

PROJECT NO: 26C004.00

SHEET NUMBER

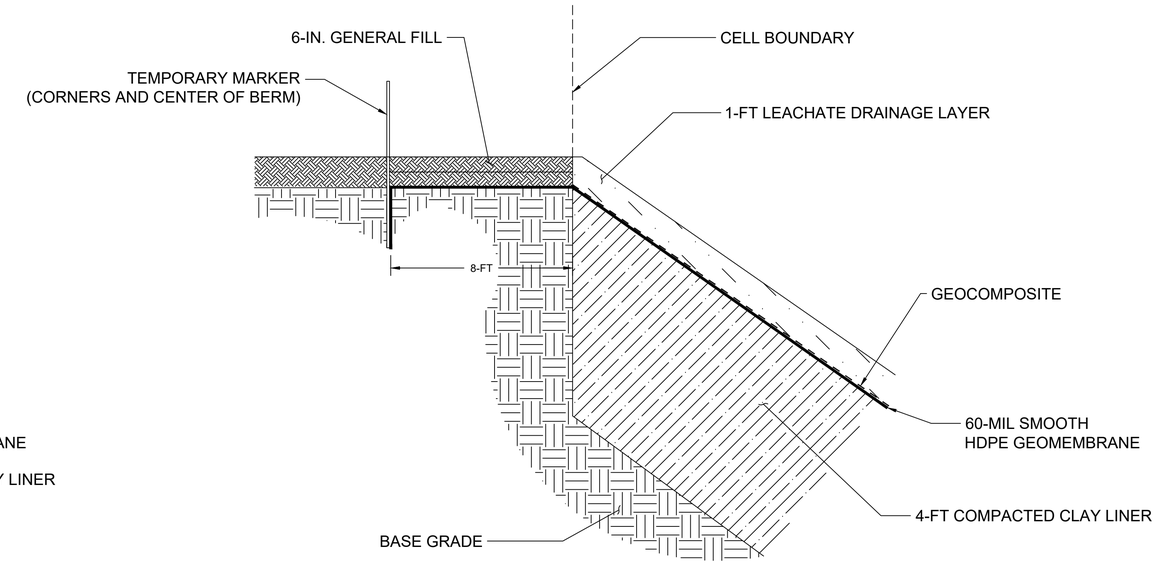
C-13

Thursday, August 20, 2026 10:37:36 AM
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DWG Folder Location: ACCDocs\Foth\CRLCSWA-Cell 5B Design & Const-\Project Files\CAD\Drawings



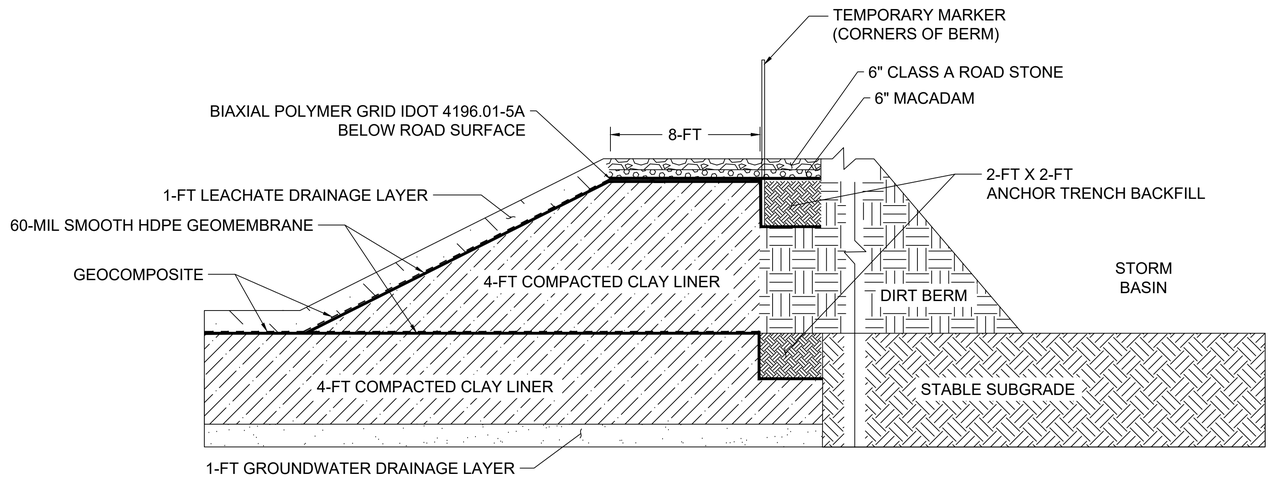
1 / C-14 ANCHOR TRENCH (TYP.)

SCALE: NONE



2 / C-14 LINER EDGE MARKER POST (TYP.)

SCALE: NONE



3 / C-14 NORTH STORM WATER DETENTION BASIN BERM SECTION

SCALE: NONE

NOTES:
1. BERM HEIGHT WILL VARY.
2. BIAXIAL POLYMER GRID, MACADAM, AND ROAD STONE LAYERS WILL COVER THE ENTIRE WIDTH AND LENGTH OF THE TOP OF THE BERM.

Foth

2026 SITE 2 PHASE 5B - STAGE 1 CONSTRUCTION

CEDAR RAPIDS/LINN COUNTY
SOLID WASTE AGENCY
MARION, IA

REVISIONS			
NO.	DESCRIPTION	DATE	BY
1			
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	BY	DATE
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DESIGNED	TMH	AUGUST 2026
CHECKED	CGO	AUGUST 2026

SHEET TITLE:

LINER
DETAILS

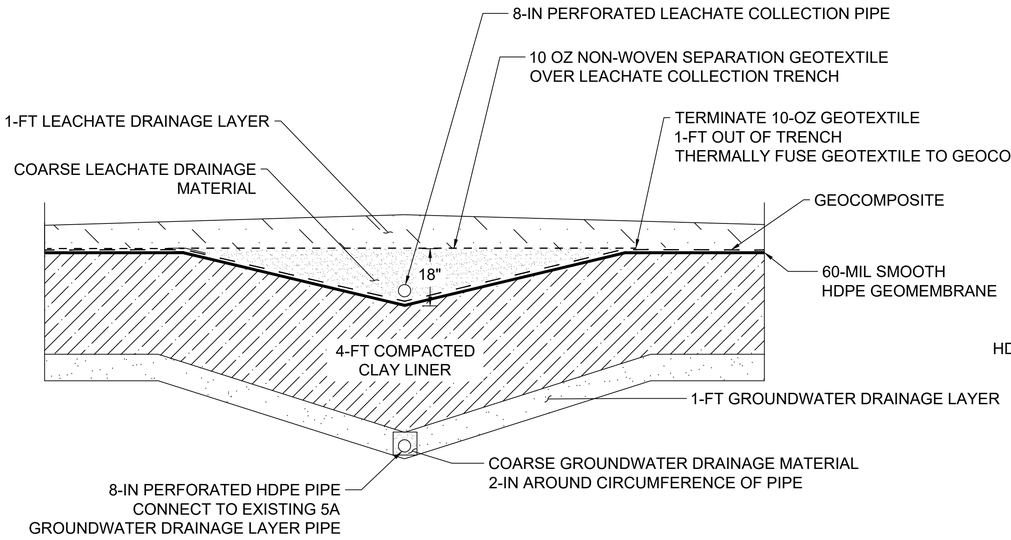
(ISSUED FOR BID)

PROJECT NO: 26C004.00

SHEET NUMBER

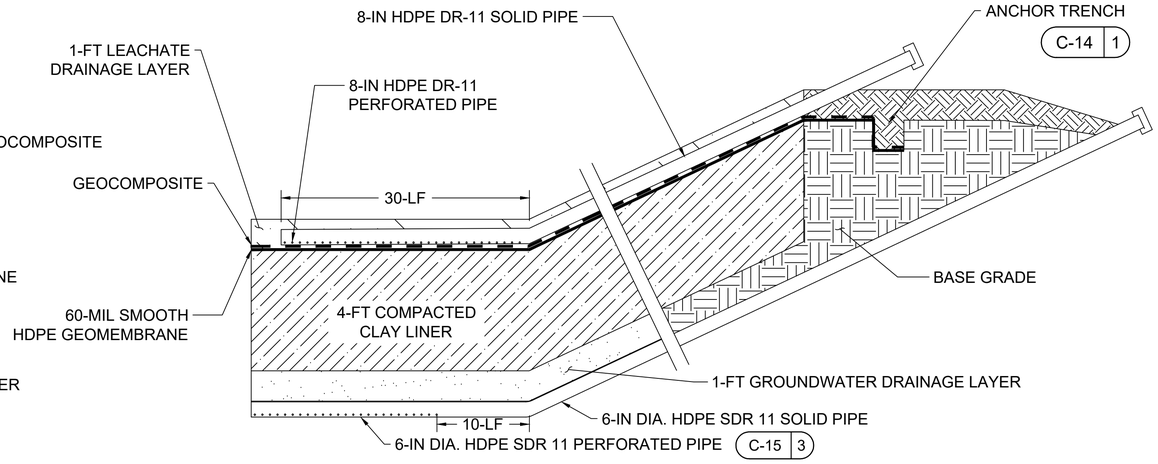
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Thursday, August 20, 2026 10:37:53 AM
DWG Filename: 26c004 details.dwg Layout: c-14 liner 2
DWG Folder Location: ACCDocs\Foth\CRLCSWA-Cell 5B Design & Const-1\Project Files\CAD\Drawings



1 C-15 LEACHATE COLLECTION TRENCH (TYP.)

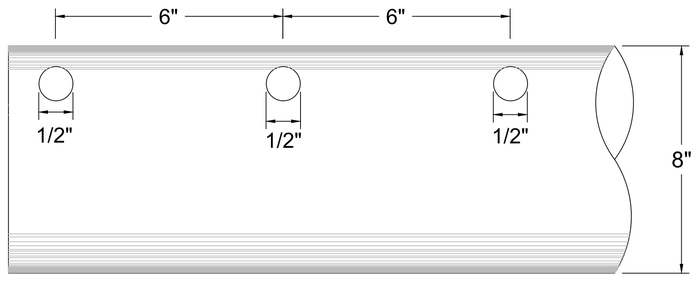
SCALE: NONE



NOTE:
INSTALL LEACHATE DISCHARGE PIPE ABOVE SIDESLOPE RISER

2 C-15 PIEZOMETER AND CLEANOUT RISER DETAIL

SCALE: NONE



NOTE:
1/2-IN DIAMETER HOLES SPACED 120° AROUND PERIMETER AND 6-IN APART

3 C-15 PERFORATED COLLECTION PIPE (TYP.)

SCALE: NONE

Foth

2026 SITE 2 PHASE 5B - STAGE 1 CONSTRUCTION

CEDAR RAPIDS/LINN COUNTY
SOLID WASTE AGENCY
MARION, IA

REVISIONS			
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5			

DATE OF PREPARATION

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SURVEYED	FOTH	SEPT. 2025
DRAWN	TMH	AUGUST 2026
DESIGNED	TMH	AUGUST 2026
CHECKED	CGO	AUGUST 2026

SHEET TITLE:

LEACHATE
DETAILS

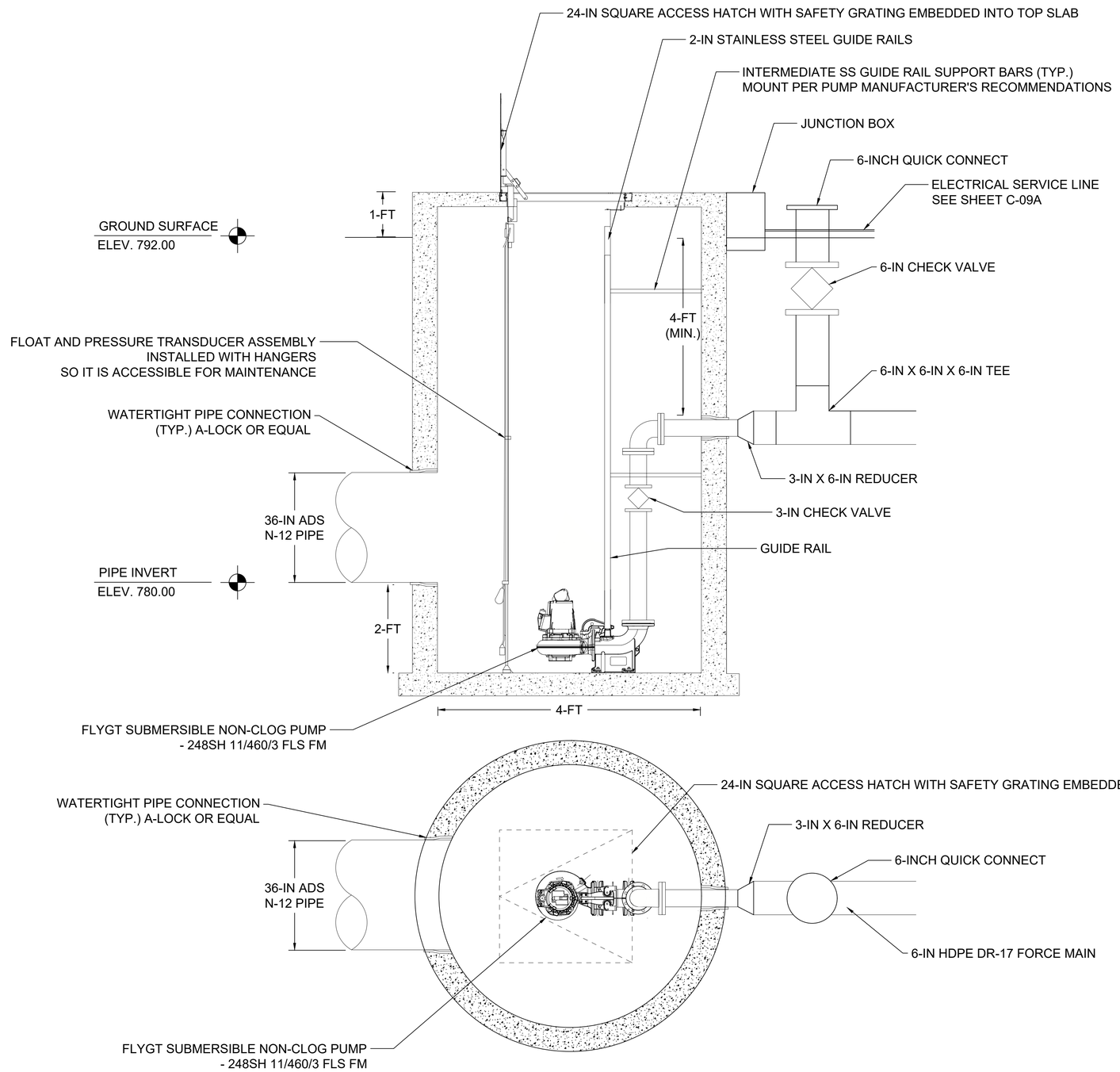
(ISSUED FOR BID)

PROJECT NO: 26C004.00

SHEET NUMBER

C-15

Thursday, August 20, 2026 10:38:10 AM
DWG Filename: 26c004 details.dwg Layout: c-15 leachate
DWG Folder Location: ACCDocs\Foth\CRLCSWA-Cell 5B Design & Const-\Project Files\CAD\Drawings



1 C-16 LIFT STATION PROFILE

SCALE: NONE

Thursday, August 20, 2026 10:38:34 AM
DWG Filename: 26c004 details.dwg Layout: c-16 liftstation
DWG Folder Location: ACCDocs\Foth\CRLCSWA-Cell 5B Design & Const-\Project Files\CAD\Drawings

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2026 SITE 2 PHASE 5B - STAGE 1 CONSTRUCTION

CEDAR RAPIDS/LINN COUNTY SOLID WASTE AGENCY MARION, IA

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DESIGNED	TMH	AUGUST 2026
CHECKED	CGO	AUGUST 2026

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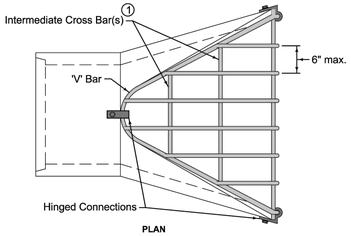
LIFT STATION DETAILS

(ISSUED FOR BID)

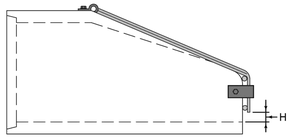
PROJECT NO: 26C004.00

SHEET NUMBER

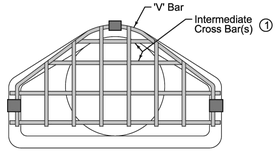
C-16



PLAN



PROFILE



FRONT

NOTE:
PROVIDE GUARD DIMENSIONS TO FIT WITH TYPE OF APRON PROVIDED. ENSURE "V" BAR COMPLETELY RESTS ON APRON.

1 ALL GUARDS MUST INCLUDE AT LEAST ONE INTERMEDIATE CROSS BAR. IF PIPE DIAMETER, OR EQUIVALENT DIAMETER, IS 60 INCHES OR GREATER, USE TWO INTERMEDIATE CROSS BARS EQUALLY SPACED.

ROUND		ARCH		ELLIPTICAL	
PIPE SIZE	H	EQUIVALENT DIAMETER	H	EQUIVALENT DIAMETER	H
12"	2 1/4"	18" to 24"	4"	18"	3"
15"	3"	30" to 36"	5"	24"	4"
18" - 24"	4"	42" to 54"	6"	30" to 36"	5"
27" - 36"	5"	60" to 72"	7"	42" to 54"	6"
42" - 54"	6"			60"	7"
60" - 72"	7"				
78" - 90"	8"				

BAR SIZES				
	PIPE SIZE (DIA. or EQUIV.)	HOLE DIA. REQ'D.	BOLT DIA.	BAR SIZE
ROUND	12" - 24"	2"	3/8"	3/4"
	27" - 48"	3"	3/4"	1"
	54" - 90"	1 1/4"	1"	1 1/2"
ARCH	up to 24" eq.	2"	3/8"	3/4"
	30" to 48"	3"	3/4"	1"
	54" to 72"	1 1/4"	1"	1 1/2"
ELLIPTICAL	up to 24" eq.	2"	3/8"	3/4"
	30" to 48"	3"	3/4"	1"
	54" to 60"	1 1/4"	1"	1 1/2"
BOLT LENGTH = PIPE WALL THICKNESS + 2 1/2"				

SUDAS

REVISION New 10-18-16

4030.224

SHEET 1 of 1

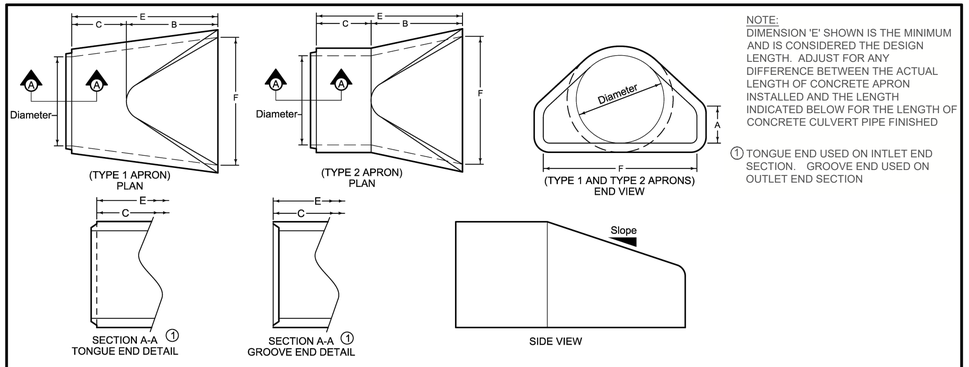
SUDAS Standard Specifications

CONCRETE PIPE APRON GUARD

FIGURE 4030.224 SHEET 1 OF 1

1 C-17 CULVERT WITH TRASH GUARD - SUDAS DETAIL 4030.224

SCALE: NONE



NOTE:
DIMENSION 'E' SHOWN IS THE MINIMUM AND IS CONSIDERED THE DESIGN LENGTH. ADJUST FOR ANY DIFFERENCE BETWEEN THE ACTUAL LENGTH OF CONCRETE APRON INSTALLED AND THE LENGTH INDICATED BELOW FOR THE LENGTH OF CONCRETE CULVERT PIPE FINISHED

1 TONGUE END USED ON INTLET END SECTION. GROOVE END USED ON OUTLET END SECTION

TYPE 1 APRONS						
DIAM.	SLOPE	A	B	MINIMUM C	MINIMUM E	F
12"	2.4:1	4"	2'-0"	4'-4 1/2"	6'-2 1/2"	2'-0"
15"	2.4:1	6"	2'-3"	3'-10"	6'-1"	2'-6"
18"	2.3:1	9"	2'-3"	3'-10"	6'-1"	3'-0"
21"	2.4:1	9"	3'-0 "	3'-1 1/2"	6'-1 1/2"	3'-5"
24"	2.5:1	9"	3'-7 1/2"	2'-6"	6'-1 1/2"	4'-0"
27"	2.5:1	10 1/2"	4'-1 "	2'-0"	6'-1 1/2"	4'-4"
30"	2.5:1	12"	4'-6"	1'-7 1/2"	6'-1 1/2"	5'-0"
36"	2.5:1	15"	5'-3"	2'-9"	8'-0"	6'-0"
42"	2.5:1	21"	5'-3"	2'-9"	8'-0"	6'-6"
48"	2.5:1	24"	6'-0"	2'-0"	8'-0"	7'-0"
54"	1.8:1	27"	5'-0"	3'-0"	8'-0"	7'-6"
60"	1.6:1	29 1/2"	5'-0"	3'-0"	8'-0"	8'-0"
66"	1.7:1	30"	6'-0"	2'-3"	8'-3"	8'-0"
72"	1.6:1	30"	6'-6"	1'-9"	8'-3"	9'-0"
78"	1.8:1	36"	7'-6"	1'-9"	9'-3"	9'-6"
84"	1.3:1	29 1/2"	6'-9"	2'-6 1/2"	9'-3 1/2"	10'-0"

TYPE 2 APRONS						
DIAM.	SLOPE	A	B	MINIMUM C	MINIMUM E	F
12"	2.4:1	4"	2'-0"	4'-4 1/2"	6'-2 1/2"	2'-0"
15"	2.4:1	6"	2'-3"	3'-10"	6'-1"	2'-6"
18"	2.3:1	9"	2'-3"	3'-10"	6'-1"	3'-0"
21"	2.4:1	9"	3'-0"	3'-1 1/2"	6'-1 1/2"	3'-5"
24"	2.5:1	9"	3'-7 1/2"	2'-6"	6'-1 1/2"	4'-0"
27"	2.5:1	10 1/2"	4'-1 "	2'-0"	6'-1 1/2"	4'-4"
30"	2.5:1	12"	4'-6"	1'-7 1/2"	6'-1 1/2"	5'-0"
36"	2.5:1	15"	5'-3"	2'-9"	8'-0"	6'-0"
42"	2.5:1	21"	5'-3"	2'-9"	8'-0"	6'-6"
48"	2.5:1	24"	6'-0"	2'-0"	8'-0"	7'-0"
54"	1.9:1	24 1/2"	5'-5"	2'-7"	8'-0"	7'-6"
60"	1.4:1	24 1/2"	5'-0"	3'-0"	8'-0"	8'-0"
66"	1.7:1	30"	6'-0"	2'-3"	8'-3"	8'-0"
72"	1.4:1	24"	6'-8"	1'-9"	8'-3"	9'-0"
78"	1.8:1	36"	7'-6"	1'-9"	9'-3"	9'-6"
84"	1.5:1	23 1/2"	7'-9 1/2"	1'-9"	9'-3 1/2"	10'-0"

SUDAS

REVISION New 10-18-16

4030.222

SHEET 1 of 1

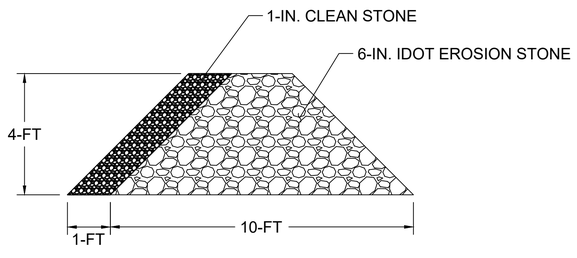
SUDAS Standard Specifications

CIRCULAR CONCRETE APRONS

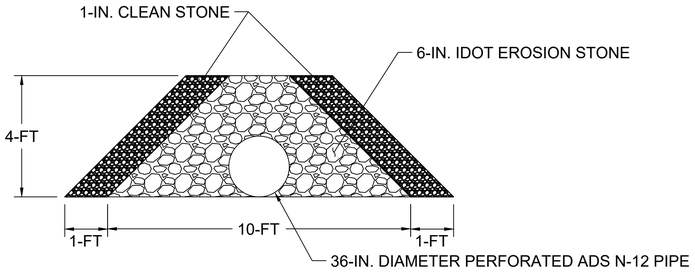
FIGURE 4030.222 SHEET 1 OF 1

2 C-17 CONCRETE APRON - SUDAS DETAIL 4030.222

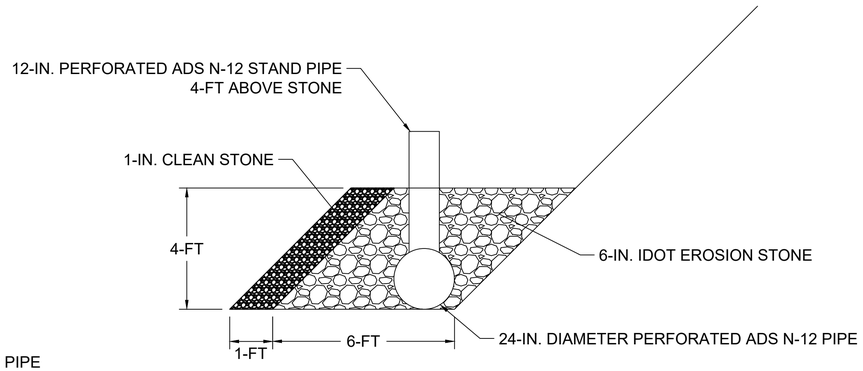
SCALE: NONE



TYPICAL STORMWATER DAM SECTION



STORMWATER COLLECTION PIPE



STORMWATER BYPASS

3 C-17 RIPRAP / MACADAM STORMWATER DAM SECTIONS

SCALE: NONE

Foth

2026 SITE 2 PHASE 5B - STAGE 1 CONSTRUCTION

CEDAR RAPIDS/LINN COUNTY SOLID WASTE AGENCY MARION, IA

REVISIONS			
NO.	DESCRIPTION	DATE	BY

DATE OF PREPARATION

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SURVEYED	FOTH	SEPT. 2025
DRAWN	TMH	AUGUST 2026
DESIGNED	TMH	AUGUST 2026
CHECKED	CGO	AUGUST 2026

SHEET TITLE:

STORMWATER DETAILS

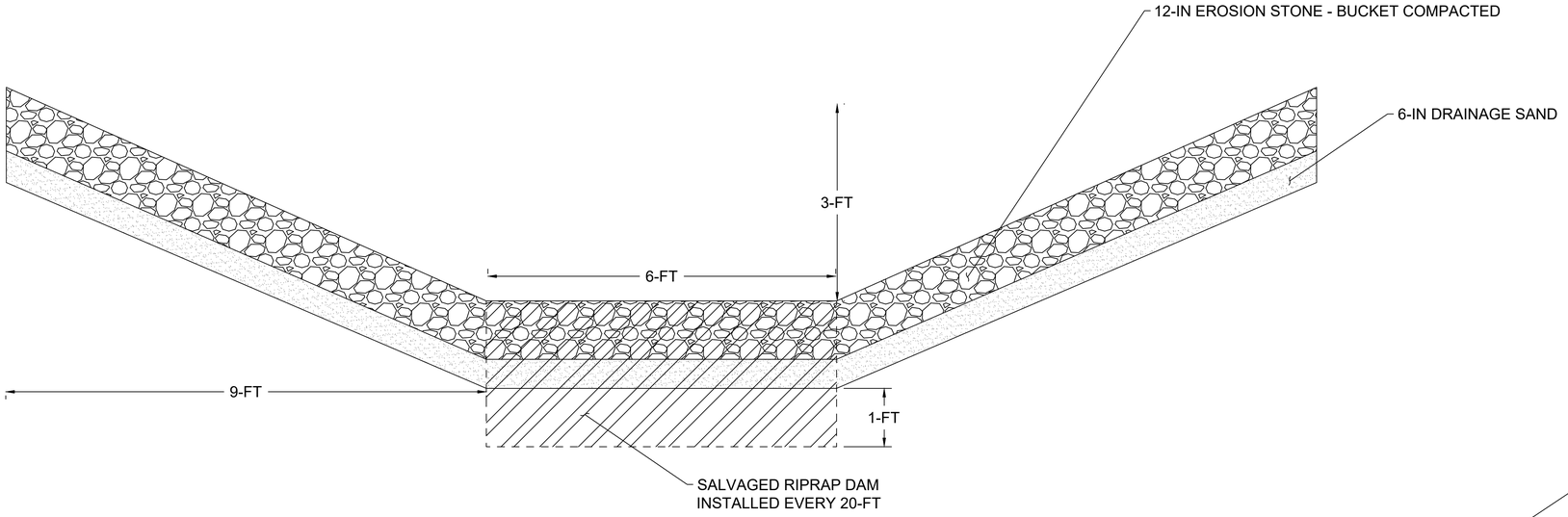
(ISSUED FOR BID)

PROJECT NO: 26C004.00

SHEET NUMBER

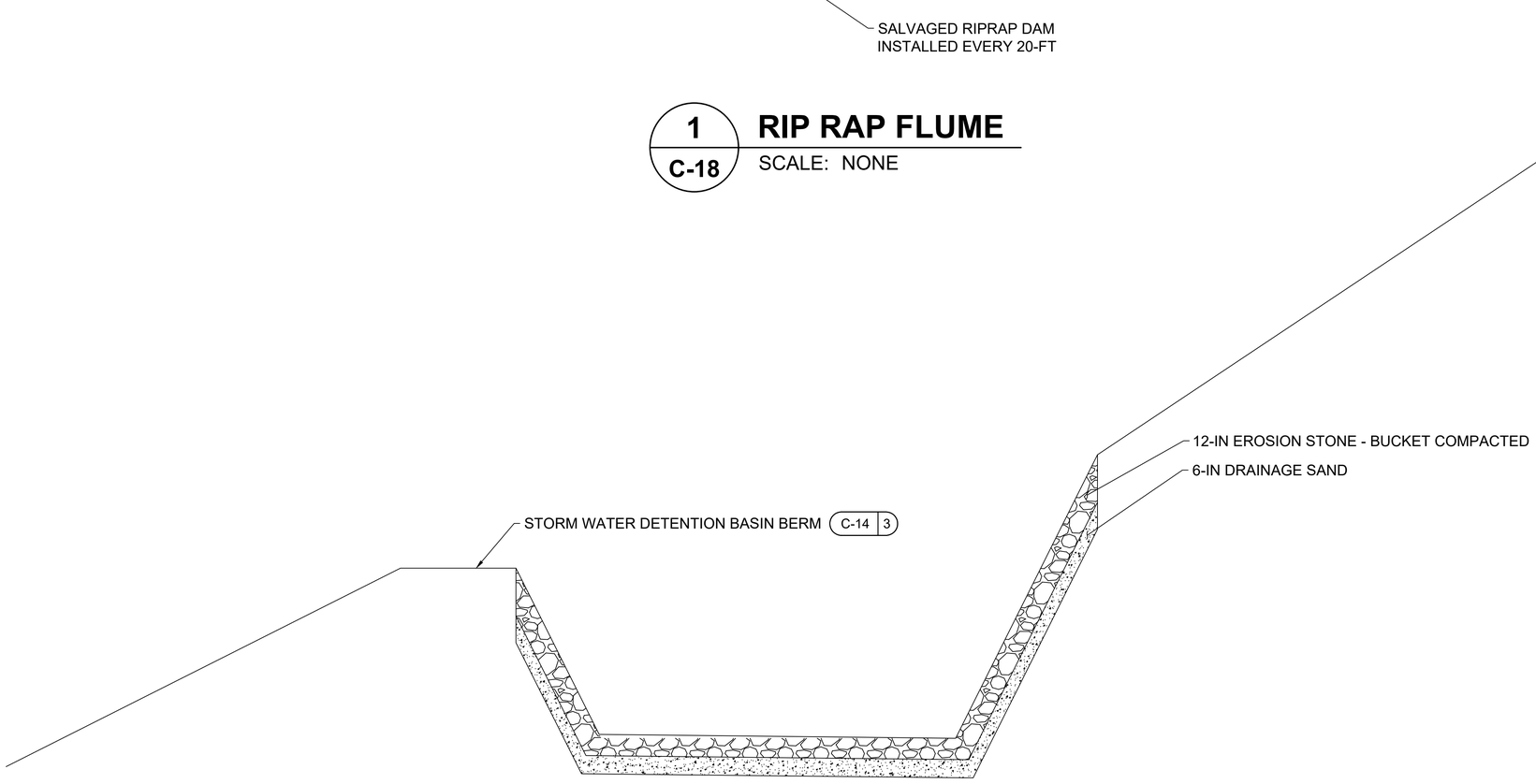
C-17

Thursday, August 20, 2026 10:38:53 AM
DWG Filename: 26c004 details.dwg Layout: c-17 stormwater
DWG Folder Location: ACCDocs\Foth\CRLCSWA-Cell 5B Design & Const-\Project Files\CAD\Drawings



1 / C-18 **RIP RAP FLUME**

SCALE: NONE



2 / C-18 **STORM WATER BASIN PROFILE**

SCALE: NONE

Thursday, August 20, 2026 10:39:13 AM
DWG Filename: 26c004 details.dwg Layout: c-18 stormwater
DWG Folder Location: ACCDocs\Foth\CRLCSWA-Cell 5B Design & Const-\Project Files\CAD\Drawings

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2026 SITE 2 PHASE 5B - STAGE 1 CONSTRUCTION

CEDAR RAPIDS/LINN COUNTY
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SHEET TITLE:

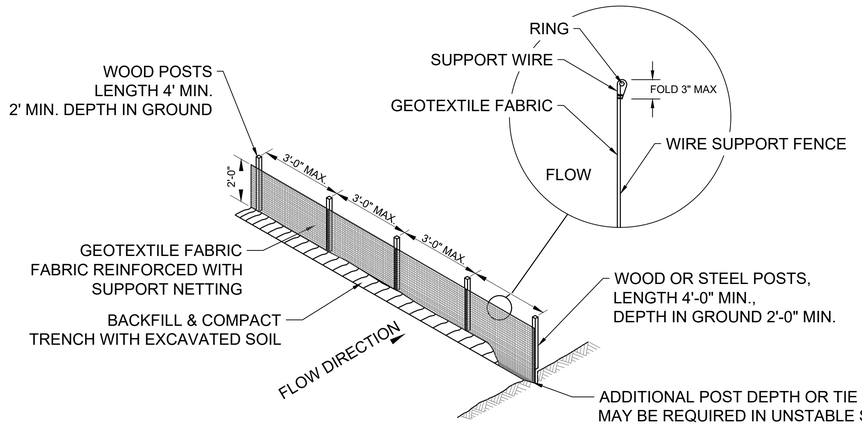
STORMWATER DETAILS

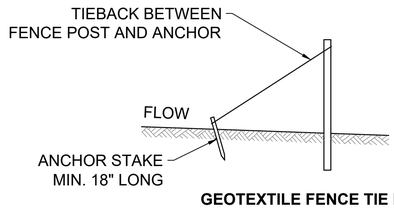
(ISSUED FOR BID)

PROJECT NO: 26C004.00

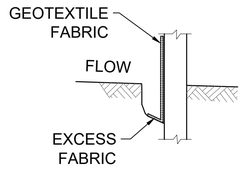
SHEET NUMBER

C-18





GEOTEXTILE FENCE TIE BACK
(WHEN REQUIRED BY THE ENGINEER)



TRENCH DETAIL

NOTE:
1. ATTACH THE FABRIC TO THE POSTS WITH WIRE STAPLES OR WOODEN LATH AND NAILS

1 / C-19 SILT FENCE DETAIL

SCALE: NONE

Foth

2026 SITE 2 PHASE 5B - STAGE 1 CONSTRUCTION

CEDAR RAPIDS/LINN COUNTY SOLID WASTE AGENCY MARION, IA

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CHECKED	CGO	AUGUST 2026

SHEET TITLE:

EROSION CONTROL DETAILS

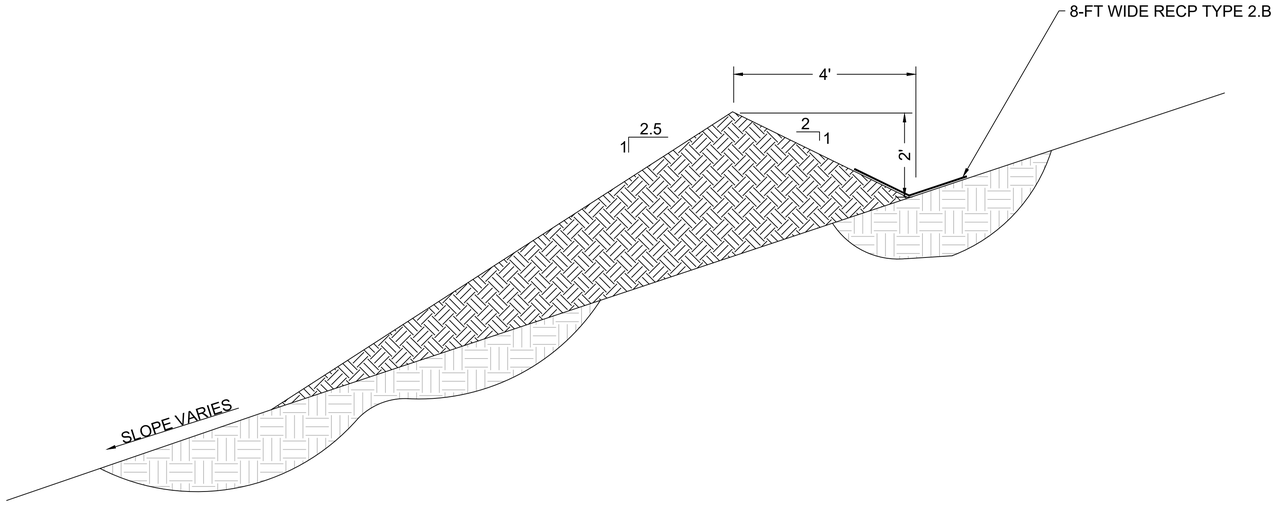
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PROJECT NO: 26C004.00

SHEET NUMBER

C-19

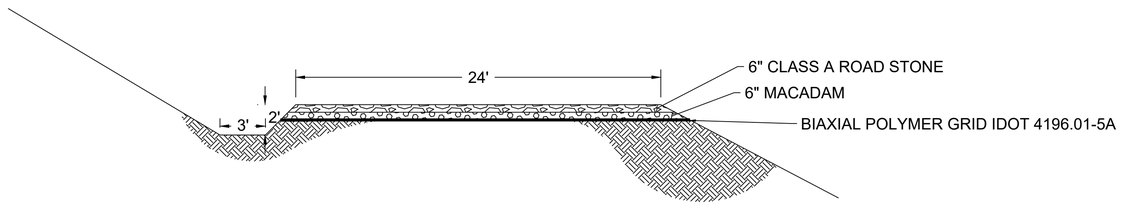
Thursday, August 20, 2026 10:39:35 AM
DWG Filename: 26c004 details.dwg Layout: c-19 erosion
DWG Folder Location: ACCDocs\Foth\CRLCSWA-Cell 5B Design & Const\Project Files\CAD\Drawings



NOTE:
GRADE DRAINAGE TERRACES AT MINIMUM 1% SLOPE

1 C-20 DRAINAGE TERRACE

SCALE: NONE



2 C-20 CELL ACCESS ROAD & DITCH DETAIL

SCALE: NONE

Foth

2026 SITE 2 PHASE 5B - STAGE 1 CONSTRUCTION

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MARION, IA

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SHEET TITLE:

MISCELLANEOUS DETAILS

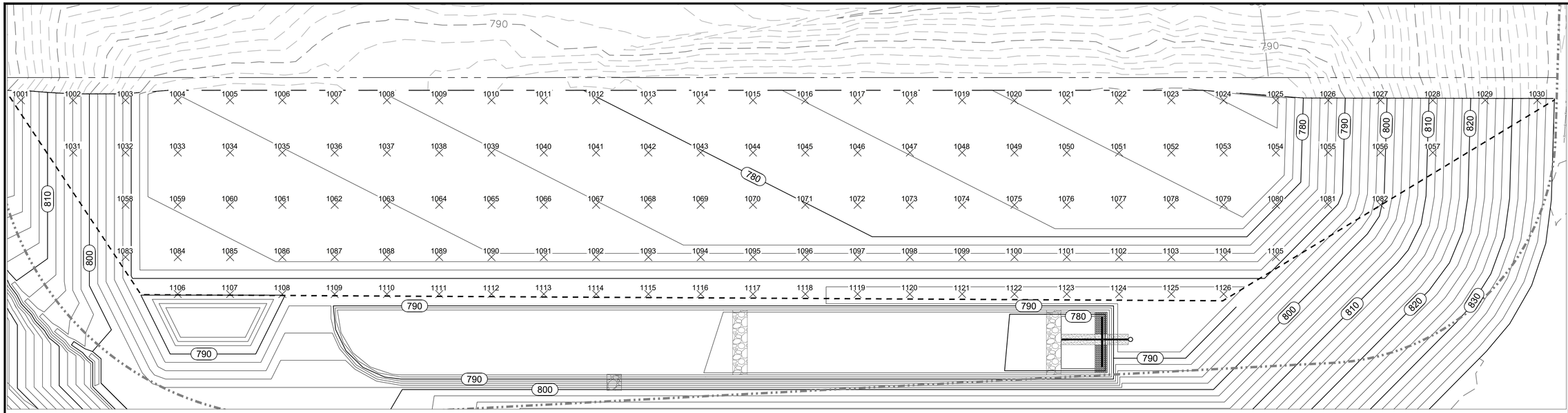
(ISSUED FOR BID)

PROJECT NO: 26C004.00

SHEET NUMBER

C-20

Thursday, August 20, 2026 10:39:55 AM
DWG Filename: 26c004 details.dwg Layout: c-20 misc
DWG Folder Location: ACCDocs\Foth\CRLCSWA-Cell 5B Design & Const-\Project Files\CAD\Drawings



N

NAD 83

GRAPHIC SCALE
0 50 100 200
(IN FEET)
1 INCH = 100FEET

Point No.	X	Y	Subgrade Elevation		GW Drainage Elevation		Clay Elevation		Leachate Elevation	
			Design	As-Built	Design	As-Built	Design	As-Built	Design	As-Built
1001	3500124.91	5448248.67	811.36		812.36		816.36		817.36	
1002	3500124.91	5448298.67	798.87		799.87		803.87		804.87	
1003	3500124.91	5448348.67	786.37		787.37		791.37		792.37	
1004	3500124.91	5448398.67	779.10		780.10		784.10		785.10	
1005	3500124.91	5448448.67	778.61		779.61		783.61		784.61	
1006	3500124.91	5448498.67	778.11		779.11		783.11		784.11	
1007	3500124.91	5448548.67	777.61		778.61		782.61		783.61	
1008	3500124.91	5448598.67	777.10		778.10		782.10		783.10	
1009	3500124.91	5448648.67	776.60		777.60		781.60		782.60	
1010	3500124.91	5448698.67	776.09		777.09		781.09		782.09	
1011	3500124.91	5448748.67	775.58		776.58		780.58		781.58	
1012	3500124.91	5448798.67	775.07		776.07		780.07		781.07	
1013	3500124.91	5448848.67	774.54		775.54		779.54		780.54	
1014	3500124.91	5448898.67	774.02		775.02		779.02		780.02	
1015	3500124.91	5448948.67	773.49		774.49		778.49		779.49	
1016	3500124.91	5448998.67	772.97		773.97		777.97		778.97	
1017	3500124.91	5449048.67	772.47		773.47		777.47		778.47	
1018	3500124.91	5449098.67	771.97		772.97		776.97		777.97	
1019	3500124.91	5449148.67	771.47		772.47		776.47		777.47	
1020	3500124.91	5449198.67	770.98		771.98		775.98		776.98	
1021	3500124.91	5449248.67	770.48		771.48		775.48		776.48	
1022	3500124.91	5449298.67	769.98		770.98		774.98		775.98	
1023	3500124.91	5449348.67	769.49		770.49		774.49		775.49	
1024	3500124.91	5449398.67	769.00		770.00		774.00		775.00	
1025	3500124.91	5449448.67	769.00		770.00		774.00		775.00	
1026	3500124.91	5449498.67	780.94		781.94		785.94		786.94	
1027	3500124.91	5449548.67	793.43		794.43		798.43		799.43	
1028	3500124.91	5449598.67	805.93		806.93		810.93		811.93	
1029	3500124.91	5449648.67	818.43		819.43		823.43		824.43	
1030	3500124.91	5449698.67	830.95		831.95		835.95		836.95	
1031	3500074.91	5448298.67	798.87		799.87		803.87		804.87	
1032	3500074.91	5448348.67	786.37		787.37		791.37		792.37	
1033	3500074.91	5448398.67	780.05		781.05		785.05		786.05	
1034	3500074.91	5448448.67	779.54		780.54		784.54		785.54	
1035	3500074.91	5448498.67	779.08		780.08		784.08		785.08	
1036	3500074.91	5448548.67	778.59		779.59		783.59		784.59	
1037	3500074.91	5448598.67	778.09		779.09		783.09		784.09	
1038	3500074.91	5448648.67	777.59		778.59		782.59		783.59	
1039	3500074.91	5448698.67	777.09		778.09		782.09		783.09	
1040	3500074.91	5448748.67	776.58		777.58		781.58		782.58	
1041	3500074.91	5448798.67	776.07		777.07		781.07		782.07	
1042	3500074.91	5448848.67	775.56		776.56		780.56		781.56	

Point No.	X	Y	Subgrade Elevation		GW Drainage Elevation		Clay Elevation		Leachate Elevation	
			Design	As-Built	Design	As-Built	Design	As-Built	Design	As-Built
1043	3500074.91	5448898.67	775.05		776.05		780.05		781.05	
1044	3500074.91	5448948.67	774.53		775.53		779.53		780.53	
1045	3500074.91	5448998.67	774.00		775.00		779.00		780.00	
1046	3500074.91	5449048.67	773.48		774.48		778.48		779.48	
1047	3500074.91	5449098.67	772.95		773.95		777.95		778.95	
1048	3500074.91	5449148.67	772.46		773.46		777.46		778.46	
1049	3500074.91	5449198.67	771.96		772.96		776.96		777.96	
1050	3500074.91	5449248.67	771.46		772.46		776.46		777.46	
1051	3500074.91	5449298.67	770.96		771.96		775.96		776.96	
1052	3500074.91	5449348.67	770.47		771.47		775.47		776.47	
1053	3500074.91	5449398.67	769.97		770.97		774.97		775.97	
1054	3500074.91	5449448.67	769.85		770.85		774.85		775.85	
1055	3500074.91	5449498.67	781.31		782.31		786.31		787.31	
1056	3500074.91	5449548.67	793.80		794.80		798.80		799.80	
1057	3500074.91	5449598.67	806.30		807.30		811.30		812.30	
1058	3500024.91	5448348.67	786.37		787.37		791.37		792.37	
1059	3500024.91	5448398.67	780.91		781.91		785.91		786.91	
1060	3500024.91	5448448.67	780.43		781.43		785.43		786.43	
1061	3500024.91	5448498.67	779.98		780.98		784.98		785.98	
1062	3500024.91	5448548.67	779.74		780.74		784.74		785.74	
1063	3500024.91	5448598.67	779.11		780.11		784.11		785.11	
1064	3500024.91	5448648.67	778.58		779.58		783.58		784.58	
1065	3500024.91	5448698.67	778.08		779.08		783.08		784.08	
1066	3500024.91	5448748.67	777.81		778.81		782.81		783.81	
1067	3500024.91	5448798.67	777.11		778.11		782.11		783.11	
1068	3500024.91	5448848.67	776.57		777.57		781.57		782.57	
1069	3500024.91	5448898.67	776.06		777.06		781.06		782.06	
1070	3500024.91	5448948.67	775.82		776.82		780.82		781.82	
1071	3500024.91	5448998.67	775.21		776.21		780.21		781.21	
1072	3500024.91	5449048.67	774.51		775.51		779.51		780.51	
1073	3500024.91	5449098.67	773.99		774.99		778.99		779.99	
1074	3500024.91	5449148.67	773.82		774.82		778.82		779.82	
1075	3500024.91	5449198.67	772.94		773.94		777.94		778.94	
1076	3500024.91	5449248.67	772.50		773.50		777.50		778.50	
1077	3500024.91	5449298.67	772.50		773.50		777.50		778.50	
1078	3500024.91	5449348.67	772.11		773.11		777.11		778.11	
1079	3500024.91	5449398.67	770.95		771.95		775.95		776.95	
1080	3500024.91	5449448.67	774.57		775.57		779.57		780.57	
1081	3500024.91	5449498.67	783.44		784.44		788.44		789.44	
1082	3500024.91	5449548.67	794.65		795.65		799.65		800.65	
1083	3499974.91	5448348.67	786.37		787.37		791.37		792.37	
1084	3499974.91	5448398.67	782.37		783.37		787.37		788.37	

Point No.	X	Y	Subgrade Elevation		GW Drainage Elevation		Clay Elevation		Leachate Elevation	
			Design	As-Built	Design	As-Built	Design	As-Built	Design	As-Built
1085	3499974.91	5448448.67	781.95		782.95		786.95		787.95	
1086	3499974.91	5448498.67	780.90		781.90		785.90		786.90	
1087	3499974.91	5448548.67	780.90		781.90		785.90		786.90	
1088	3499974.91	5448598.67	780.81		781.81		785.81		786.81	
1089	3499974.91	5448648.67	780.81		781.81		785.81		786.81	
1090	3499974.91	5448698.67	779.90		780.90		784.90		785.90	
1091	3499974.91	5448748.67	779.90		780.90		784.90		785.90	
1092	3499974.91	5448798.67	779.90		780.90		784.90		785.90	
1093	3499974.91	5448848.67	779.90		780.90		784.90		785.90	
1094	3499974.91	5448898.67	779.90		780.90		784.90		785.90	
1095	3499974.91	5448948.67	779.90		780.90		784.90		785.90	
1096	3499974.91	5448998.67	779.90		780.90		784.90		785.90	
1097	3499974.91	5449048.67	779.90		780.90		784.90		785.90	
1098	3499974.91	5449098.67	779.90		780.90		784.90		785.90	
1099	3499974.91	5449148.67	779.90		780.90		784.90		785.90	
1100	3499974.91	5449198.67	779.90		780.90		784.90		785.90	
1101	3499974.91	5449248.67	779.90		780.90		784.90		785.90	
1102	3499974.91	5449298.67	779.90		780.90		784.90		785.90	
1103	3499974.91	5449348.67	779.90		780.90		784.90		785.90	
1104	3499974.91	5449398.67	779.90		780.90		784.90		785.90	
1105	3499974.91	5449448.67	783.35		784.35		788.35		789.35	
1106	3499939.56	5448398.67	785.01		786.01		790.01		791.01	
1107	3499939.56	5448448.67	785.01		786.01		790.01		791.01	
1108	3499939.56	5448498.67	785.62		786.62		790.62		791.62	
1109	3499939.56	5448548.67	785.56		786.56		790.56		791.56	
1110	3499939.56	5448598.67	785.49		786.49		790.49		791.49	
1111	3499939.56	5448648.67	785.43		786.43		790.43		791.43	
1112	3499939.56	5448698.67	785.35		786.35		790.35		791.35	
1113	3499939.56	5448748.67	785.29		786.29		790.29		791.29	
1114	3499939.56	5448798.67	785.22		786.22		790.22		791.22	
1115	3499939.56	5448848.67	785.16		786.16		790.16		791.16	
1116	3499939.56	5448898.67	785.09		786.09		790.09		791.09	
1117	3499939.56	5448948.67	786.18		787.18		791.18		792.18	
1118	3499939.56	5448998.67	787.00		788.00		792.00		793.00	
1119	3499939.56	5449048.67	787.00		788.00		792.00		793.00	
1120	3499939.56	5449098.67	787.00		788.00		792.00		793.00	
1121	3499939.56	5449148.67	787.00		788.00		792.00		793.00	
1122	3499939.56	5449198.67	787.00		788.00		792.00		793.00	
1123	3499939.56	5449248.67	787.00		788.00		792.00		793.00	
1124	3499939.56	5449298.67	787.00		788.00		792.00		793.00	
1125	3499939.56	5449348.67	787.00		788.00		792.00		793.00	
1126	3499939.56	5449398.67	787.00		788.00		792.00		793.00	

Foth

2026 SITE 2 PHASE 5B - STAGE 1 CONSTRUCTION

CEDAR RAPIDS/LINN COUNTY SOLID WASTE AGENCY MARION, IA

REVISIONS

NO.	BY	DATE	DESCRIPTION
1			
2			
3			
4			
5			

DATE OF PREPARATION

	BY	DATE
SURVEYED	FOTH	SEPT. 2025
DRAWN	TMH	AUGUST 2026
DESIGNED	TMH	AUGUST 2026
CHECKED	CGO	AUGUST 2026

SHEET TITLE:

ELEVATION TABLE

(ISSUED FOR BID)

PROJECT NO: 26C004.00

SHEET NUMBER

C-21

Thursday, August 20, 2026 10:53:05 AM
DWG Filename: c-21 elevation table.dwg Layout: c-21 elevation table
DWG Folder Location: ACCDocs\Foth\CRLCSWA-Cell 5B Design & Const-\Project Files\CAD\Drawings

Quality Control and Assurance Plan

2026 Site 2 Phase 5B – Stage 1 Construction
Permit No. 57-SDP-01-72



Cedar Rapids Linn County Solid Waste Agency
Marion, Iowa

August 2026

Project ID: 26C004

Solving our clients' toughest science and engineering challenges.

Quality Control and Assurance Plan
2026 Site 2 Phase 5B – Stage 1 Construction

Project ID: 26C004

Prepared for
Cedar Rapids Linn County Solid Waste Agency
1954 County Home Road
Marion, IA 52302

Prepared by
Foth Infrastructure & Environment, LLC

August 2026

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Quality Control and Assurance Plan
2026 Site 2 Phase 5B – Stage 1 Construction

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Appendix B CQA Liner Forms
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List of Abbreviations, Acronyms, and Symbols

ASTM	ASTM International
cm/sec	centimeter per second
CRLCSWA	Cedar Rapids Linn County Solid Waste Agency
CY	cubic yard
FML	flexible membrane liner
Foth	Foth Infrastructure & Environment, LLC
ft	feet/foot
IAC	Iowa Administrative Code
IDNR	Iowa Department of Natural Resources
IDOT	Iowa Department of Transportation
QC&A	Quality Control and Assurance
QC&A Plan	Quality Control and Assurance Plan
TDA	Tire Derived Aggregate

1. Introduction

This Quality Control and Assurance (QC&A) Plan (QC&A Plan) is intended to fulfill the requirements of Iowa Administrative Code (IAC) 567.113.7(6) (Quality Control and Assurance Programs) for the construction of the Cedar Rapids Linn County Solid Waste Agency (CRLCSWA) MSW Cell 5B (CELL) which operates under the Iowa Department of Natural Resources (IDNR) permit number 57-SPD-01-72. This QC&A Plan will form the basis for project-specific QC&A Plans which will include project-specific components and identify the QC&A Officer. The project-specific QC&A Plans may be issued as an amendment to this QC&A Plan, describing project-specific details such as construction components and QC&A Officer.

1.1 Purpose and Scope

The purpose of this QC&A Plan is to ensure that the CELL is constructed in accordance with the requirements of IAC 567.113.7 and the approved plans and specifications. The aspects of construction to be documented according to the QC&A Plan include the groundwater underdrain system, subgrade of the liner system, the liner system (including compacted clay liner and flexible membrane liner), the leachate collection system, final cover system, and any other aspect of construction as identified in the project-specific QC&A Plans or amendments.

The QC&A Plan describes the methods and procedures to ensure quality, which include but may not be limited to review of product and material submittals, observation and documentation of construction aspects, field and lab testing of construction materials, conducting meetings to facilitate quality assurance and identify issues, and the preparation of an observation report.

Where this QC&A Plan differs from the project-specific plans and specifications, the plans and specifications shall supersede.

2. Responsibility and Authority

This section describes the roles and responsibilities of the project team. Each party is responsible for following this QC&A Plan, the approved plans and specifications, the applicable contract documents, and applicable regulations, as described below, unless otherwise stipulated by the contract documents.

2.1 Permitting Agencies

The IDNR has regulatory authority for approval of the permit required for operations and construction of the CELL.

2.2 Facility Owner/Operator

The Owner is the CRLCSWA. The Owner has control of the entities charged with design, QC&A, and construction. The Owner may designate an Owner's Representative. All references to Owner in this document shall implicitly include the Owner's Representative.

2.3 Design Engineer

The Design Engineer is responsible for the design of the project. The Design Engineer reports to the Owner. Duties and responsibilities include, but are not limited to, the following:

- Produce the contract documents, including the plans and specifications.
- Review, generate, and approve all design and/or specification modifications and clarifications.
- Assist the QC&A Officer and Owner in determining the validity of change requests and claims.

2.4 Construction Contractor

The Contractor is responsible for completing all work as specified or indicated in the contract documents. The Contractor shall provide labor, equipment, and materials to complete work and shall be responsible for the work of subcontractors, manufacturers, and installers, unless otherwise specified in the contract documents. The Construction Contractor reports to the Owner. Duties and responsibilities include, but are not limited to, the following:

- Submit all required shop drawings, material samples for required laboratory testing in advance of work beginning, and laboratory results with adequate time for approval from the Engineer or QC&A Officer.
- Perform testing and survey as specified in the contract documents.
- Ensure that the construction is in conformance with the contract documents and standard construction practices for the types of work.
- Ensure all constructed and installed materials meet the specifications listed in the contract documents.

- Maintain as-built records to document the work and changes in the contract documents and submit as-built records to QC&A Officer prior to final payment and acceptance of the project.

2.5 Quality Control and Assurance Officer

The QC&A Officer shall meet the requirements of IAC 567.113.7(6)a including being registered as a Professional Engineer in Iowa. The QC&A Officer shall document compliance with the aspects of construction as described in Section 6 and may delegate supervision or implementation of this QC&A Plan to one or more QC&A Monitor(s). Duties and responsibilities include, but are not limited to, the following:

- Observing and documenting construction activities.
- Review of product and material submittals and verify for conformance with the specifications.
- Sampling and testing of construction materials (unless otherwise assigned in the contract documents).
    - **The Contractor is responsible for completing all sampling and testing of the construction materials for MSW Cell 5B. These tasks shall be completed in the presence of the QC&A Control and Assurance Officer**.
- Verifying plans and specifications.
- Reporting progress directly to the Owner.
- Documenting and informing the Owner and Contractor of nonconforming construction and/or materials.
- Preparing the Construction Observation Report, sealed by a licensed Professional Engineer in Iowa, that documents the construction of the project according to IAC 567.113.7 and the approved plans and specifications.

2.6 Testing Laboratories

Testing labs are responsible for testing soils, and other materials used in construction. Testing labs shall maintain certifications typical for the material to be tested from the appropriate certifying agency. Testing labs may report to the Owner, Contractor, or QC&A Officer, which will be specified in the contract documents.

3. Meetings

The QC&A Plan includes a preconstruction meeting, progress meetings, and dispute resolution meetings if necessary. Documentation of all meetings will be completed by the Design Engineer or QC&A Officer.

3.1 Preconstruction Meeting

Prior to construction, a preconstruction meeting will be held with the Contractor, Design Engineer, Owner, and QC&A Officer. Topics to be discussed during the meeting are outlined in the specifications. The purpose of this meeting includes:

- Familiarize each party with the project-specific QC&A Plan and its role relative to the design criteria, regulations, plans, and specifications.
- Determine if any changes to the QC&A Plan are needed to ensure that the facility will be constructed to meet or exceed the specified design.
- Review the responsibilities and authority of each party, and the lines of communication of the project team.
- Discuss the established procedures or protocol for observations and tests including sampling strategies.
- Discuss the established procedures or protocol for handling construction nonconformance, repairs, and retesting.
- Review methods for documenting and reporting test data.
- Review methods for distributing and storing documents and reports.

3.2 Progress Meetings

Project progress meetings will be held at regularly scheduled intervals during the project. The QC&A Officer is responsible for coordinating, conducting, and documenting these meetings. The meetings will be attended by the construction contractor, the QC&A Officer, and the Owner. The meetings will cover:

- Review of construction progress during the previous week
- Project schedule and upcoming work
- Any construction deficiencies and/or proposed corrective actions
- Anticipated construction problems

3.3 Dispute Resolution Meeting

A special meeting will be held when a construction problem or nonconformance is present and likely to recur. The purpose of the meeting is to define and resolve the issue to prevent future deficiencies. At minimum, the Contractor and QC&A Officer will attend and the meeting will be documented by the QC&A Officer.

4. Construction Observation – Recordkeeping

4.1 Daily Construction Observation Report

A daily Construction Observation Report will be prepared by the QC&A Officer for each day of activity, and will contain (as appropriate) the following information:

- Date, work hours, weather.
- Contractors, subcontractors, and other personnel on site, and purpose.
- Summary of locations at the facility where construction was occurring.
- Summary of any meetings held regarding construction and the attendees.
- Summary of equipment, materials, and personnel utilized in construction.
- Summary of construction progress.
- Summary of the sampling and testing including locations, methods, and results.
- Details of any nonconforming component and the proposed or completed remedy.
- Signature of the inspector.

An example Daily Construction Observation Report form that may be used for the daily report is provided in Appendix A.

4.2 Photographs

Photographs shall be taken to show construction methods, assemblies, issues, deficiencies, etc., and will be the responsibility of the QC&A Officer. Enough photographs shall be obtained to document the construction of each item. Photographs will be taken prior to covering or backfilling, if applicable. Each photograph will be labeled with the following information:

- Date, time, location, and orientation of photograph.
- Name of photographer.
- Location and description of the work.

Construction problems and nonconforming work shall be documented with photographs taken before and after the problem, or when the nonconforming work was corrected. The Contractor shall not cover or backfill piping, fittings, structures, etc., prior to construction photographs having been obtained. Work that has been backfilled prior to photography will require rework by the Contractor at no additional cost to the Owner.

4.3 Test Data Sheets

The QC&A Officer will record all test data results on the test data sheets, examples of which are provided in Appendix A. Independent consultants engaged by the QC&A Officer shall submit their test results or data on forms acceptable to and approved by the QC&A Officer.

4.4 Construction Problem Identification and Design Changes

When deviation from the design plans and specifications or nonconforming work is observed, the QC&A Officer will initially determine the extent of nonconforming work and evaluate if testing errors are present. This evaluation must be cross referenced to laboratory test results, specific test data sheets, and daily Construction Observation Reports to validate or reject the test results. Following the determination that testing errors are not present, the QC&A Officer

will inform the Owner and Contractor of the deficiency. The deficiency may require rework. In certain instances, design modification may be appropriate.

No design changes will be made in the field without approval by the Design Engineer and Owner. Any modifications approved in this manner will be recorded on a field modification form (Appendix A). Any modification request shall include the following:

- Original design given by project plans and specifications.
- Reason(s) for required change in design.
- Proposed design changes including changes in materials, quantities, construction methods, and constructed performance.
- Supporting calculations (if required).

4.5 Document Control and Record Storage

The records maintained during construction activities include, but are not limited to, the following:

- Product submittals
- Daily Construction Observation Report
- Test data sheets from each QC&A Monitor or independent consultants (if any)
- Field log or other field documentation maintained by each QC&A Monitor
- Field notes from all record surveys
- Lab reports
- Any document required by other sections of this QC&A Plan

The use of electronic field forms is acceptable. All document originals will be stored at the construction site until completion of construction. Copies of all documents will be on file in the office of the QC&A Officer. Field modification forms will be included with the Daily Construction Observation Report.

5. Construction Observation – Survey

At a minimum, the record surveys (Contractor Responsibility) shall document the following:

- Subbase, Liner, and Cover Systems
  - Subbase of clay liner/top of intermediate cover on 50-foot grid and at grade breaks.
  - Underdrain piping locations and elevations every 50 feet including all fittings.
  - Top of clay liner/infiltration layer on 50-foot grid, grade breaks, and locations of future tie ins. These survey points must match the same survey points as taken for the subbase of clay liner/top of intermediate cover to verify the layer thickness.
  - Leachate collection trench and anchor trench elevations every 25 feet.
  - Geomembrane location information for begin and end seams, cross seams, repairs, destructive tests, anchor trench, connect to existing liners/covers, and locations of future tie-in edges.
  - Top of erosion control layer on 50-foot grid, grade breaks, and locations of future tie-ins. These survey points must match the same survey points as taken for the subbase of clay liner/top of intermediate cover to verify the layer thickness.
- Leachate Collection System
  - Collection pipe locations and elevations every 25 feet including all fittings.
  - Header pipe locations and elevations every 25 feet including all fittings.
  - Locations and elevations of manholes, fittings, cleanouts, valves, and sumps.
  - Top of protective layer on 50-foot grid and grade breaks. These survey points must match the same survey points as taken for the subbase of clay liner/top of intermediate cover to verify the layer thickness.
  - Transfer piping locations and elevations every 25 feet.
- Utilities
  - Location of conduits and buried utilities every 50 feet including all changes in horizontal and vertical alignments.
  - Location of junction boxes and panel locations.
- Vaults and Manholes
  - All pipe inverts, cover, and ground elevations.
  - Pipe penetration invert elevations.

5.1 Tolerances

Tolerances for each phase of construction are listed in Table 5-1. Areas that do not meet the listed tolerances will be regraded or removed and replaced until the tolerances are met and verified by another survey.

Table 5-1
Summary of Tolerances

Item	Tolerance[1]
1. Underdrain System	
a) Bottom of trench	0.0 to - 0.1 ft
b) Piping	0.0 to ± 0.1 ft
2. Clay Liner/Infiltration Layer	
a) Subbase/top of intermediate cover	0.0 to - 0.1 ft
b) Top of clay liner/infiltration layer	0.0 to + 0.1 ft
3. Leachate Collection System	
a) Header, collection, and transfer piping	± 0.05 ft/100 ft
b) Top of protective layer	0.0 to + 0.1 ft
4. Vaults, Manholes	
a) Structure elevations	± 0.1 ft
b) Pipe penetration invert elevations	± 0.05 ft

Notes:
[1] At each survey location.
ft = feet

Prepared by: TMH
Checked by: ASL

Additionally, the following criteria shall apply:

- The leachate collection system piping shall drain to the sump; low areas shall not be present.
- Compacted clay liner and infiltration layer shall be a minimum of 2.0-feet thick verified by the 100-foot grid survey.
- Protective layer shall be a minimum of 1.0 feet thick (aggregate) or 1.5 (slopes)/ 2.0 (floor) feet (Tire Derived Aggregate [TDA]).
- Tolerances stated in the specifications shall supersede the tolerances in Table 5-1, if different.

6. Construction Components

6.1 Groundwater Underdrain System

6.1.1 Observation

The QC&A Officer shall perform the following functions during construction of the groundwater underdrain system:

- Verify that trenches are constructed to the locations and depths required.
- Review material submittals to verify conformance with the project specifications.
- Observe and document the installation of the piping, bedding, geosynthetics, and backfill to ensure conformance with the project specifications.

6.1.2 Testing and Verification

The pipe bedding material shall be tested by Contractor in accordance with the tests presented in Table 6-1.

Table 6-1
Recompacted Subgrade Quality Testing

Test	Minimum Frequency	Acceptance Test Values
a. Grain Size (ASTM D6913)	2 per source	IDOT Gradation No. 3-Sand
b. Hydraulic Conductivity (ASTM D2434)	2 per source	Min. $1x10^{-3}$ cm/sec

ASTM = ASTM International
cm/sec = centimeters per second
IDOT = Iowa Department of Transportation

Prepared by: TMH
Checked by: ASL

Additionally, the following criteria shall apply:

- Pipe bedding shall be noncalcareous.
- Piping shall drain to the groundwater underdrain sump.

6.1.3 Acceptance Criteria

The following criteria shall be completed prior to acceptance of this component by the QC&A Officer. Additional criteria, if described in the plans and specifications, may apply.

- Trenches and piping are constructed and installed allowing groundwater to drain to the underdrain sump location.
- Pipe bedding meets the material and lab testing specifications.
- Pipe bedding and geotextile were installed in conformance with the specifications.
- Backfill is installed to the project specifications.

6.2 Subgrade

6.2.1 Observation

The QC&A Officer shall perform the following functions during subgrade preparation:

- Verify that all trees, stumps, roots, boulders, and debris are removed.
- Verify that placement of frozen soil or soil onto frozen ground does not occur.
- Contractor shall perform field moisture and density testing per Table 6-2 in the presence of the QC&A Officer.
- Observe and document proof rolling of the subgrade.
- Verify that the subgrade is constructed and graded to provide a smooth, workable surface on which to construct the liner.

6.2.2 Testing and Verification

The subgrade and all fill materials placed for subgrade (such as underdrain trench backfill, perimeter berm fill materials) shall be tested in accordance with the tests presented in Table 6-2.

Table 6-2
Subgrade Quality Testing

Test	Minimum Frequency	Acceptance Test Values
a. Proctor Density (ASTM D698) and Grain Size (ASTM D6913)	1 each soil type	Not Applicable
b. Field Moisture and Density (ASTM D6938)	50-foot grid/1 foot	95% of Standard Proctor maximum dry density and +/- 3% of optimum moisture
c. Firmness Proof Rolls with CAT 627 or equivalent	on entire subgrade	No rutting >0.5 inch (or QC&A Officer Approval)

Prepared by: TMH
Checked by: ASL

6.2.3 Acceptance Criteria

The following criteria shall be completed prior to acceptance of this component by the QC&A Officer. Additional criteria, if described in the plans and specifications, may apply.

- Deleterious and frozen materials are not present.
- Field moisture and density testing has been completed and met the minimum criteria.
- Proof rolling has been completed, and the subgrade meets the criteria in Table 6-2.
- Survey has been completed verifying that the subgrade surface is within the tolerance in Section 5.

6.3 Clay Liner Borrow Source

Borrow testing for the clay liner will be conducted to ensure suitability of the clay liner material and to develop acceptable ranges of dry density and water content to be used in field testing.

Bulk samples of the clay borrow material shall be collected at a frequency of one bulk sample per 5,000 cubic yards. Samples shall be collected in each material type if different materials are represented in the clay borrow and/or collected from different areas within the borrow to collect representative samples. Bulk samples shall be transported to the laboratory and analyzed as follows:

Table 6-3
Clay Liner Source Quality Testing

Test Description	Test Method	Minimum Frequency	Acceptance Criteria
Grain Size/Hydrometer	ASTM D6913 and D7928	1 per 5,000 CY	No less than 50% by weight passing #200 sieve
Compaction Characteristics, standard effort	ASTM D698	1 per 5,000 CY	NA
Atterberg Limits	ASTM D4318	1 per 5,000 CY	LL ≥25%, PI ≥12%
Hydraulic Conductivity	ASTM D5084	3 per compaction test (see below)	Max $1x10^{-7}$ cm/sec

Note:
CY = cubic yard

Prepared by: TMH
Checked by: ASL

After development of the compaction characteristics, the QC&A Officer will select a minimum of two and potentially all the compaction tests on which to perform hydraulic conductivity testing. The selection of any less than all the compaction tests is based on the uniformity of the clay borrow material and should consider the grain size analysis, Atterberg limits, and compaction characteristics.

Hydraulic conductivity tests will be performed on the soil samples. For each bulk sample selected by the QC&A Officer, the lab will compact three soil samples to 95% maximum dry density (standard effort) at three different water contents. The water contents should be at the optimum water content, less than optimum, and greater than optimum.

Using the results of the hydraulic conductivity testing, the QC&A Officer shall determine the acceptable ranges of water content to be used in field moisture/density testing. Samples at 95% maximum dry density with hydraulic conductivity meeting the acceptance criteria are deemed as having an acceptable water content.

6.4 Compacted Clay Liner

6.4.1 Observation

The QC&A Officer shall perform the following functions during compacted clay liner construction:

- Observe and document that the compacted clay liner material is obtained from the approved clay liner borrow source.
- Observe and document that the clay liner is constructed in lifts no thicker than 6 inches after compaction.
- Observe and document that construction methods achieve uniform coverage by compaction equipment, sufficient bonding between lifts, and prevent the incorporation of deleterious materials into the clay liner material.
- Observe and document keyway splicing to existing compacted clay liners.
- Verify that the compacted clay liner is constructed to grades and lines as shown in the project plan set ("Base Grades").
- Verify that the upper layer is prepared to ensure smoothness and has rocks (all angular and > ½-inch) and similar foreign objects removed.
- Contractor shall collect the soil samples described in Table 6-4 and coordinate transportation to the testing lab in the presence of the QC&A Officer.
- Contractor shall conduct the field moisture density testing per Table 6-4 in the presence of the QC&A Officer.

The Contractor is responsible for filling test holes with bentonite per the contract documents.

6.4.2 Testing and Verification

The compacted clay liner will be tested in the field and lab. Field testing will be conducted as described in Table 6-4 and meet the minimum specifications developed during the Clay Liner Borrow Source testing. Laboratory samples will be collected using thin walled (Shelby) tubes for undisturbed samples and will be tested per Table 6-4.

Table 6-4
Compacted Clay Quality Testing

Test Description	Test Method	Minimum Frequency	Acceptance Criteria
In-Place Density/Moisture	ASTM D6938	5 per lift-acre	95% of maximum dry density, water content to be determined
Grain Size/ Hydrometer	ASTM D6913 and D7928	1 per foot-acre	No less than 50% by weight passing #200 sieve
Moisture Content	ASTM D2216	1 per foot-acre	To be determined

Table 6-4 (continued)

Test Description	Test Method	Minimum Frequency	Acceptance Criteria
Dry Density	ASTM 7263	1 per foot-acre	95% of maximum dry density
Atterberg Limits	ASTM D4318	1 per foot-acre	LL ≥25%, PI ≥12%
Hydraulic Conductivity	ASTM D5084	1 per foot-acre	Max $1x10^{-7}$ cm/sec

Prepared by: TMH
Checked by: ASL

The acceptable values of water content will be determined during the Clay Liner Borrow Source testing and will be based on achieving a hydraulic conductivity of $1x10^{-7}$ cm/sec or less. The dry density (both field and lab testing) will be specified at 95% or greater of the maximum dry density as determined by the Standard Proctor test (ASTM D698). An acceptable range of water content will be determined based on hydraulic conductivity testing as described in Section 6.3.

6.4.3 Acceptance Criteria

The following criteria shall be completed prior to acceptance of this component by the QC&A Officer. Additional criteria, if described in the plans and specifications, may apply.

- Survey has been completed verifying that the compacted clay liner is a minimum of 2-feet thick and meets the tolerance in Table 5.1.
- Uniform compaction effort, lift thickness, and lift bonding were observed and are acceptable.
- Compacted clay liner surface is smooth and free of deleterious material.
- All in-field and laboratory testing has been completed with passing results.
- Any rework has been completed and retested with passing results.
- Test holes have been filled and hydrated.

6.5 Flexible Membrane Liner

6.5.1 Observation and Verification

The QC&A Officer shall perform the following functions during flexible membrane liner (FML) installation:

- Review product submittals for conformance with project specifications.
- Observe the delivery of rolls and record roll and lot numbers. Verify that delivery and storage conditions are in conformance with project specifications.
- Reject any nonconforming or damaged rolls.
- Coordinate conformance testing as required by project specifications.

- Obtain written acceptance of the compacted clay liner for FML placement by the FML installer.
- Verify and document that the installation surface is smooth and free of rocks (all angular and > ½ inch) and other foreign or sharp objects that may damage the liner.
- Observe and document daily equipment testing including but not limited to trial welding. Document the welding equipment calibration and operators.
- Observe and document proper installation of geomembrane panels, including deployment, seam placement, seam preparation, panel welding, repairing, and temporary and permanent anchor systems.
- Observe and document non-destructive testing.
- Identify and mark the location for destructive tests, as described in the project specifications. Observe and document field destructive test samples.
- Observe and document any cuts, tears, holes, or irregularities and the repair of such.
- Observe equipment operation to confirm that none is allowed directly on the geomembrane surface without adequate protection.
- Maintain records on the above items, including product submittals, FML Roll Log, subgrade acceptance, conformance testing data sheets, panel placement log, trial weld log, destructive/non-destructive testing data sheets and reports, installation problem and resolution summaries, photographs, and daily reports.

6.5.2 Field Testing

All FML panels and seams shall meet the specifications and be tested in accordance with the schedule presented in Table 6-5.

Table 6-5
Flexible Membrane Liner Field Quality Testing

Test Description	Test Method	Minimum Frequency	Acceptance Criteria
Thickness	ASTM D5994	5 places per roll	See project specifications
Non-destructive- Seam – air channel	ASTM D5820	All dual wedge seams	<3 psi drop over 5 min
Non-destructive – Seam- vacuum box	ASTM D5641	All extrusion seams	Visual verification
Destructive - Seam Shear Strength	ASTM D6392	1 per 500-ft of seam length[1]	See project specifications
Destructive - Seam Peel Strength	ASTM D6392	1 per 500-ft of seam length[1]	See project specifications

Note: Prepared by: TMH
[1] May be changed to 1,000 ft at the discretion of the CQA Officer depending on test results. Checked by: ASL

Additionally, the following criteria shall apply:

- Destructive testing shall be limited to side slopes in accordance with IAC 567.113.7(6)b.

6.5.3 Acceptance Criteria

The following criteria shall be completed prior to acceptance of this component by the QC&A Officer. Additional criteria, if described in the plans and specifications, may apply.

- Product and manufacturer submittals conform to the project specifications.
- FML material has been delivered and stored according to the project specifications.
- Conformance testing has met the criteria in the project specifications.
- The subgrade was visually observed to be smooth and free of defects, and a subgrade acceptance certificate was provided by the installer.
- The FML was deployed and welded according to the project specifications.
- Daily equipment testing was performed.
- Seam testing, both destructive and non-destructive, was completed at the frequency and met the specified criteria.
- Locations for future tie-ins have been surveyed and protected in accordance with the plans and specifications.
- All nonconforming work has been rectified to the satisfaction of the QC&A Officer.
- All documentation has been received and completed.

6.6 Leachate Collection System

6.6.1 Observation

The QC&A Officer shall perform the following functions during construction of the leachate collection system:

- Review product submittals for conformance with project specifications, including geocomposite drainage net, pipe materials, and trench and pipe bedding aggregates.
- Observe and document the installation of geocomposite drainage net.
- Observe and document the welding and installation of the leachate collection piping and sump riser, if present.
- Observe and document the welding and installation of leachate forcemain, if installed, and document the pressure testing of the piping.
- Verify that leachate collection system components are positioned to ensure proper drainage, if required.

- Verify that no foreign objects are present in pipe bedding or the protective layer material.
- Observe and document that the geocomposite drainage net, leachate collection piping, bedding, and protective layer are installed on the FML in a manner so as to prevent damage to the FML.

6.6.2 Testing and Verification

All Leachate Collection System trench and pipe bedding shall be tested in accordance with the schedule presented in Table 6-6.

Table 6-6
Leachate Collection System Trench and Pipe Bedding

Test Description	Test Method	Minimum Frequency	Acceptance Criteria
Grain Size	ASTM D6913	1 per 5,000 cubic yards and at least 1 per source	IDOT Gradation 3-Sand
Hydraulic Conductivity	ASTM D5084	1 per 5,000 cubic yards and at least 1 per source	Min. $1x10^{-3}$ cm/sec[1]

Note: Prepared by: TMH
[1] Without geosynthetic drainage media. Checked by: ASL

Additionally, the following criteria shall apply:

- All coarse aggregate will be of non-calcareous material.
- Piping within the limits of waste must be verified by survey to have a slope of at least 2% and no greater than 33%.
- TDA.

  No more than 5% of the aggregate shall contain bead wire more than ½ inch. Field counts shall occur once every 100-ton delivered per source up to 500 tons total delivered. If the counts pass the 5% criteria, the counts may be increased to every 500 tons delivered. Counts consist of several random grab samples accumulating to 5 gallons collected. Each chunk of TDA is observed for bead wire not to exceed 5% of the chunks in that 5-gallon sample collected.

6.6.3 Acceptance Criteria

The following criteria shall be completed prior to acceptance of this component by the QC&A Officer. Additional criteria, if described in the plans and specifications, may apply.

- The geocomposite drainage net is installed and tied according to the project specifications.

- The leachate collection sump riser, pump, piping, bedding, forcemain, and any other leachate conveyance components are installed, connected to the existing as required, and functional.
- The protective layer has been installed at the minimum thickness.
- TDA meets the minimum requirements for size and bead wire.

6.7 Other

Construction components not described above may also be subject to project-specific QC&A Plans, such as storm water controls. These project-specific components will be added to the project-specific QC&A plans as necessary. Generally, the QC&A Officer will ensure that products, materials, construction, and installation conform with the project plans and specifications.

7. Construction Observation Report

Upon completion of the construction, the QC&A Officer shall submit a Construction Observation Report to the IDNR. This report contains, at minimum, the following information:

- Contact information for the project team
- Project narrative including narrative of deviations to the approved plans and specifications
- Description of installed materials and equipment
- Field and lab test results and summaries
- Daily reports
- Photographs
- Construction documentation plans
- A signed and sealed statement by the QC&A Officer that the project was completed in accordance with IAC 567.113.7 and the approved plans and specifications.

Appendix A

QA/QC Testing Requirements

APPENDIX A
QA/QC TESTING REQUIREMENTS

PRE-CONSTRUCTION - CONTRACTOR			
Groundwater Drainage Layer	Test	Test Method	# of Tests
	Particle Size	ASTM D6913/D7928	2
	Permeability	ASTM D2434	2
CLAY	Test	Test Method	# of Tests
	Particle Size	ASTM D6913/D7928	2
	Atterberg Limits	ASTM D4318	2
	Soil Classification	ASTM D2487	2
	Proctor	ASTM D698	2
	Permeability	ASTM D5084	2
Leachate Drainage Layer	Test	Test Method	# of Tests
	Particle Size	ASTM D6913/D7928	2
	Permeability	ASTM D2434	2
Coarse Trench	Particle Size	ASTM D6913/D7928	1
	Test	Test Method	# of Tests
Geomembrane	SEE SPEC 31 35 27 - 1.3 SUBMITTALS		

IN PLACE - CONTRACTOR					
Groundwater Drainage Layer	Test	Test Method	Test Frequency		# of Tests
	Permeability	ASTM D2434	1	Test per Acre	7
	Particle Size Distributio	ASTM D6913	1	Test per Acre	7
CLAY	Test	Test Method	Test Frequency		# of Tests
	Particle Size	ASTM D6913/D7928	1	Test per Acre	7
	Atterberg Limits	ASTM D4318	1 test per CY:	5,000	8
	Soil Classification	ASTM D2487	1 test per CY:	5,000	8
	Proctor	ASTM D698	1 test per CY:	5,000	8
	Permeability	ASTM D5084	1 test per CY:	5,000	8
	Nuke Density Testing	ASTM D2922, ASTM D301	1	per 100-foot grid; offset	140
	Permeability	ASTM D5084	Per acre/foot depth	1	25
Geomembrane	Test	Test Method	Test Frequency		# of Tests
	Shear Strength		1 per ft seam length	500	34
	Peel Strength		1 per ft seam length	500	34
Leachate Drainage Layer	Test	Test Method	Test Frequency		# of Tests
	Particle Size	ASTM D6913/D7928	1 test per CY:	2,000	5
	Permeability	ASTM D2434	1 test per CY:	2,000	5
Coarse Trench	Test	Test Method	Test Frequency		# of Tests
	Particle Size	ASTM D6913/D7928	1 test per layer	2	2

Appendix B

CQA Liner Forms

Foth

Trial Weld Testing Summary

Project Name: _____ QC Monitor: _____

Project Number: _____ Material: _____

Sample #	Date	Ambient Temp	Time (AM/PM)	Machine Number	Seamer Initials	Extrusion Temp	Fusion Temp/Speed	Peel (ppi)		Shear (ppi)	Results (P/F)	Comments
								Inside	Outside			
						Barrel	Temp.					
						Preheat	Speed					
						Barrel	Temp.					
						Preheat	Speed					
						Barrel	Temp.					
						Preheat	Speed					
						Barrel	Temp.					
						Preheat	Speed					
						Barrel	Temp.					
						Preheat	Speed					
						Barrel	Temp.					
						Preheat	Speed					
						Barrel	Temp.					
						Preheat	Speed					

Foth

Panel Placement Summary

Project Name: _____ QC Monitor: _____

Project Number: _____ Material: _____

Panel Number	Date	Time (am/pm)	Roll Number	Type (S or T)	Final Width (Feet)	Final Length (Feet)	Panel Damage (Y/N)	Comments

Foth

Panel Seaming Summary

Project Name: _____ QC Monitor: _____

Project Number: _____ Material: _____

Seam Number	Date Seamed	Final Seam Length (feet)	Welder Initials	Weld Type Ext / Wedge	Machine Number	Machine Temp	Machine Speed	Time		Ambient Temp (°F)	Panel Temp	Comments
								Start	Stop			

Foth

Non-Destructive Test Summary

Project Name: _____ QC Monitor: _____

Project Number: _____ Material: _____

Seam Number	Date Tested	Location / Seam Length Tested	Air					Vacuum	Tester Initial	Comments
			Air Pressure				Air Test Results (P/F)	Vac. Test Results (P/F)		
			Start		End					
			PSI	Time	PSI	Time				

Foth

Seam Destructive Test Summary - Field

Project Name: ____________________ QC Monitor: ____________________

Project Number: ____________________ Material: ____________________

Sample #	Seam Number	Date	Welder Int.	Mach #	Description of Sample Location	Peel (ppi)		Shear (ppi)	Results (P/F)	Comments
						Inside	Outside			

Foth

Repair Summary

Project Name: _____ QC Monitor: _____

Project Number: _____ Material: _____

Repair Number	QA Monitor	Operator/ Mach #	Seam # OR Panel #	Repair Location	Description (patch, bead, ext weld, cap, DS, boot)	Size of Repair	Tester Int	QA Monitor	Date	(P/F)

Foth

Roll Log

Project Name: _____ QC Monitor: _____

Project Number: _____ Material: _____

Date Arrived on Site	QA Monitor	Roll Number	Material	Thickness	Textured (y/n)	Damage/Comments

Client: _____ Project #: _____
Project: _____ Date: _____
Prepared by: _____ Page: _____ of _____

Construction Observation Report

Date: _____

Location: _____

Prepared by: _____

	Temperature (°F)		Sky Conditions	Precipitation (inches)	Precipitation Type (select)		Site Conditions (select)	
WEATHER	**Low**	**High**	(e.g., clear, partly cloudy, or cloudy)		**Rain**	**Snow**	**Dry**	**Muddy**
					☐	☐	☐	☐

Contractors on site *(include no. of personnel per contractor)*:

_____

_____

_____

Other personnel on site: ***Purpose:***

_____ _____

_____ _____

_____ _____

_____ _____

Work observation report, comments:

_____

_____

_____

_____

_____

_____

_____

Appendix C

MSW Cell 5B Grid Table

CRLCSWA MSW CELL 5B
LAYER THICKNESS
ELECTRONIC SPREADSHEET AVAILABLE UPON REQUEST

DESIGN INFORMATION				CONTRACTOR - RECORD SURVEY						
				SUBGRADE	TOP OF GW DRAINAGE		TOP OF CLAY LINER		TOP OF LECHATE	
POINT NUMBER	NORTHING	EASTING	PROP SUBGRADE ELEV.	ELEV.	ELEV	1-FT	ELEV	4-FT	ELEV	1-FT
1001	3500124.9	5448249	811.36			0.00		0.00		0.00
1002	3500124.9	5448299	798.87			0.00		0.00		0.00
1003	3500124.9	5448349	786.37			0.00		0.00		0.00
1004	3500124.9	5448399	779.10			0.00		0.00		0.00
1005	3500124.9	5448449	778.61			0.00		0.00		0.00
1006	3500124.9	5448499	778.11			0.00		0.00		0.00
1007	3500124.9	5448549	777.61			0.00		0.00		0.00
1008	3500124.9	5448599	777.10			0.00		0.00		0.00
1009	3500124.9	5448649	776.60			0.00		0.00		0.00
1010	3500124.9	5448699	776.09			0.00		0.00		0.00
1011	3500124.9	5448749	775.58			0.00		0.00		0.00
1012	3500124.9	5448799	775.07			0.00		0.00		0.00
1013	3500124.9	5448849	774.54			0.00		0.00		0.00
1014	3500124.9	5448899	774.02			0.00		0.00		0.00
1015	3500124.9	5448949	773.49			0.00		0.00		0.00
1016	3500124.9	5448999	772.97			0.00		0.00		0.00
1017	3500124.9	5449049	772.47			0.00		0.00		0.00
1018	3500124.9	5449099	771.97			0.00		0.00		0.00
1019	3500124.9	5449149	771.47			0.00		0.00		0.00
1020	3500124.9	5449199	770.98			0.00		0.00		0.00
1021	3500124.9	5449249	770.48			0.00		0.00		0.00
1022	3500124.9	5449299	769.98			0.00		0.00		0.00
1023	3500124.9	5449349	769.49			0.00		0.00		0.00
1024	3500124.9	5449399	769.00			0.00		0.00		0.00
1025	3500124.9	5449449	769.00			0.00		0.00		0.00
1026	3500124.9	5449499	780.94			0.00		0.00		0.00
1027	3500124.9	5449549	793.43			0.00		0.00		0.00
1028	3500124.9	5449599	805.93			0.00		0.00		0.00
1029	3500124.9	5449649	818.43			0.00		0.00		0.00
1030	3500124.9	5449699	830.95			0.00		0.00		0.00
1031	3500074.9	5448299	798.87			0.00		0.00		0.00
1032	3500074.9	5448349	786.37			0.00		0.00		0.00
1033	3500074.9	5448399	780.05			0.00		0.00		0.00
1034	3500074.9	5448449	779.54			0.00		0.00		0.00
1035	3500074.9	5448499	779.08			0.00		0.00		0.00
1036	3500074.9	5448549	778.59			0.00		0.00		0.00
1037	3500074.9	5448599	778.09			0.00		0.00		0.00
1038	3500074.9	5448649	777.59			0.00		0.00		0.00
1039	3500074.9	5448699	777.09			0.00		0.00		0.00
1040	3500074.9	5448749	776.58			0.00		0.00		0.00
1041	3500074.9	5448799	776.07			0.00		0.00		0.00
1042	3500074.9	5448849	775.56			0.00		0.00		0.00
1043	3500074.9	5448899	775.05			0.00		0.00		0.00
1044	3500074.9	5448949	774.53			0.00		0.00		0.00
1045	3500074.9	5448999	774.00			0.00		0.00		0.00
1046	3500074.9	5449049	773.48			0.00		0.00		0.00
1047	3500074.9	5449099	772.95			0.00		0.00		0.00
1048	3500074.9	5449149	772.46			0.00		0.00		0.00
1049	3500074.9	5449199	771.96			0.00		0.00		0.00
1050	3500074.9	5449249	771.46			0.00		0.00		0.00
1051	3500074.9	5449299	770.96			0.00		0.00		0.00
1052	3500074.9	5449349	770.47			0.00		0.00		0.00
1053	3500074.9	5449399	769.97			0.00		0.00		0.00
1054	3500074.9	5449449	769.85			0.00		0.00		0.00
1055	3500074.9	5449499	781.31			0.00		0.00		0.00
1056	3500074.9	5449549	793.80			0.00		0.00		0.00
1057	3500074.9	5449599	806.30			0.00		0.00		0.00
1058	3500024.9	5448349	786.37			0.00		0.00		0.00
1059	3500024.9	5448399	780.91			0.00		0.00		0.00
1060	3500024.9	5448449	780.43			0.00		0.00		0.00
1061	3500024.9	5448499	779.98			0.00		0.00		0.00
1062	3500024.9	5448549	779.74			0.00		0.00		0.00
1063	3500024.9	5448599	779.11			0.00		0.00		0.00
1064	3500024.9	5448649	778.58			0.00		0.00		0.00
1065	3500024.9	5448699	778.08			0.00		0.00		0.00
1066	3500024.9	5448749	777.81			0.00		0.00		0.00
1067	3500024.9	5448799	777.11			0.00		0.00		0.00
1068	3500024.9	5448849	776.57			0.00		0.00		0.00
1069	3500024.9	5448899	776.06			0.00		0.00		0.00
1070	3500024.9	5448949	775.82			0.00		0.00		0.00
1071	3500024.9	5448999	775.21			0.00		0.00		0.00
1072	3500024.9	5449049	774.51			0.00		0.00		0.00
1073	3500024.9	5449099	773.99			0.00		0.00		0.00
1074	3500024.9	5449149	773.82			0.00		0.00		0.00
1075	3500024.9	5449199	772.94			0.00		0.00		0.00
1076	3500024.9	5449249	772.50			0.00		0.00		0.00
1077	3500024.9	5449299	772.50			0.00		0.00		0.00
1078	3500024.9	5449349	772.11			0.00		0.00		0.00
1079	3500024.9	5449399	770.95			0.00		0.00		0.00
1080	3500024.9	5449449	774.57			0.00		0.00		0.00
1081	3500024.9	5449499	783.44			0.00		0.00		0.00
1082	3500024.9	5449549	794.65			0.00		0.00		0.00
1083	3499974.9	5448349	786.37			0.00		0.00		0.00
1084	3499974.9	5448399	782.37			0.00		0.00		0.00
1085	3499974.9	5448449	781.95			0.00		0.00		0.00
1086	3499974.9	5448499	780.90			0.00		0.00		0.00
1087	3499974.9	5448549	780.90			0.00		0.00		0.00
1088	3499974.9	5448599	780.81			0.00		0.00		0.00
1089	3499974.9	5448649	780.81			0.00		0.00		0.00
1090	3499974.9	5448699	779.90			0.00		0.00		0.00
1091	3499974.9	5448749	779.90			0.00		0.00		0.00
1092	3499974.9	5448799	779.90			0.00		0.00		0.00
1093	3499974.9	5448849	779.90			0.00		0.00		0.00
1094	3499974.9	5448899	779.90			0.00		0.00		0.00
1095	3499974.9	5448949	779.90			0.00		0.00		0.00
1096	3499974.9	5448999	779.90			0.00		0.00		0.00
1097	3499974.9	5449049	779.90			0.00		0.00		0.00
1098	3499974.9	5449099	779.90			0.00		0.00		0.00
1099	3499974.9	5449149	779.90			0.00		0.00		0.00
1100	3499974.9	5449199	779.90			0.00		0.00		0.00
1101	3499974.9	5449249	779.90			0.00		0.00		0.00
1102	3499974.9	5449299	779.90			0.00		0.00		0.00
1103	3499974.9	5449349	779.90			0.00		0.00		0.00
1104	3499974.9	5449399	779.90			0.00		0.00		0.00
1105	3499974.9	5449449	783.35			0.00		0.00		0.00
1106	3499939.6	5448399	785.01			0.00		0.00		0.00
1107	3499939.6	5448449	785.01			0.00		0.00		0.00
1108	3499939.6	5448499	785.62			0.00		0.00		0.00
1109	3499939.6	5448549	785.56			0.00		0.00		0.00
1110	3499939.6	5448599	785.49			0.00		0.00		0.00
1111	3499939.6	5448649	785.43			0.00		0.00		0.00
1112	3499939.6	5448699	785.35			0.00		0.00		0.00
1113	3499939.6	5448749	785.29			0.00		0.00		0.00
1114	3499939.6	5448799	785.22			0.00		0.00		0.00
1115	3499939.6	5448849	785.16			0.00		0.00		0.00
1116	3499939.6	5448899	785.09			0.00		0.00		0.00
1117	3499939.6	5448949	786.18			0.00		0.00		0.00
1118	3499939.6	5448999	787.00			0.00		0.00		0.00
1119	3499939.6	5449049	787.00			0.00		0.00		0.00
1120	3499939.6	5449099	787.00			0.00		0.00		0.00
1121	3499939.6	5449149	787.00			0.00		0.00		0.00
1122	3499939.6	5449199	787.00			0.00		0.00		0.00
1123	3499939.6	5449249	787.00			0.00		0.00		0.00
1124	3499939.6	5449299	787.00			0.00		0.00		0.00
1125	3499939.6	5449349	787.00			0.00		0.00		0.00
1126	3499939.6	5449399	787.00			0.00		0.00		0.00