February 21, 2025

Geoffrey Spain
Environmental Engineer
Iowa Department of Natural Resources
6200 Park Avenue Suite 200
Des Moines, Iowa 50321

HLW Engineering Group
Engineering Management

RE: LEACHATE STORAGE LAGOON
BENTON COUNTY SANITARY LANDFILL
IDNR PERMIT NO. 06-SDP-02-81P
HLW PN 6043-23B.420

Dear Mr. Spain:

Enclosed for the review and approval of the Department is one set of Construction Plans and Bidding Requirements and Contract Documents for the construction of a project at the Benton County Sanitary Landfill entitled "Leachate Storage Lagoon".

The Leachate Storage Lagoon project consists of the construction of a composite lined leachate storage lagoon with a capacity of approximately 1,195,300 gallons. The existing leachate storage lagoon will be abandoned as a part of this project. The composite liner design is in accordance with all current IDNR regulations.

A completed "Iowa Department of Natural Resources Municipal Solid Waste Unit Construction Request" is included in Appendix A.

Anticipated leachate generation calculations and seven day storage requirements are unchanged due to the construction of the new leachate storage lagoon. The most recent leachate generation calculations were included in the supporting documentation submitted for the Phase III Cell H project dated January 26, 2023 (Doc #105601) and approved by IDNR in the February 14, 2023 SDP Permit Revision.

A Quality Control and Assurance Plan covering the construction of the leachate storage lagoon is included in Appendix B.

The Benton County Solid Waste Disposal Commission has set March 18, 2025 as the bid date for this project. Thank you in advance for your prompt response, and please contact me if you have any questions.

Respectfully submitted,
HLW Engineering Group, LLC

Douglas J. Luzbetak, P.E.
Project Manager

cc: Eric Werner, Landfill Manager, Benton County SLF (with 2 sets of Bidding Requirements/Contract Documents)

ATTACHMENT A

Iowa Department of Natural Resources
Municipal Solid Waste Unit Construction Request

Submittal Date: 2/21/25

Sanitary Disposal Project: Benton County SLF	Engineer: Doug Luzbetak
Permit Number: 06-SDP-02-81P	Engineering Firm: HLW Engineering
Contact Person: Eric Werner	Firm Address: 204 W. Broad, PO Box 314 Story City, IA 50248
Address: 7904-20th Avenue, Blairstown, IA 52209	Firm Telephone: 515-733-4144
Telephone: 319-454-6392	Email: dluzbetak@hlwengineering.com
Email: bentonlandfill@netins.net	

		Check Box for Source →	√	√
Construction Request Status	Yes/No/NA	Comment, Value and/or Date	Owner	Eng.
1. Has the cell design been previously approved via permit or amendment? Date.	NA	Project for construction of a new leachate storage lagoon	☐	☐
2. Has this project been through public notice? Date.	No		☐	☐
3. Provide cell name to be constructed and estimated lifespan.	NA	Project for construction of a new leachate storage lagoon	☐	☐
4. Has the overall MSWLF Unit design been approved, which includes the proposed cell? Date.	NA		☐	☐
5. Expected Construction Start Date (month/year)		June, 2025	☐	☐
6. Expected Construction Finish Date (month/year)		November, 2025	☐	☐
7. Remaining Capacity in Existing Constructed Cells (CuYd)		Over 1 year	☐	☐
8. Proposed Cell Area (acres)	NA		☐	☐
9. Proposed Cell Waste Fill Volume (CuYd)	NA		☐	☐
Siting	Yes/No/NA	Comment, Value and/or Date	Owner	Eng.
1. List date of siting approval:		March 7, 2022 Permit Revision	☐	☐
2. Each construction request triggers an update of:				
a. 113.6(2) “a” Airports		Included in 2022 Conceptual Development Plan (CDP), Doc #102352, approved in March 7, 2022 Permit Revision.	☐	☐
b. 113.6(2) “b” Floodplains		Included in 2022 CDP	☐	☐
c. 113.6(2) “f” Unstable Areas		Included in the Master Plan (Doc #82923)	☐	☐
d. 113.6(2) “i" Separation from Groundwater	NA	Leachate storage lagoon will be constructed with a groundwater diversion layer	☐	☐

		Check Box for Source →	√	√
Design Content Template	Yes/No/NA	Location in Design Report or Value or Date	Owner	Eng.
1. 113.7(1) Pre-design Meeting	NA		☐	☐
2. 113.7(2)"a" Plans and Specifications	Yes	Submitted 2/21/25	☐	☐
3. 113.7(3) General Site Design - Any changes?			☐	☐
4. 113.7(4) Subgrade				
a. Field Observations – Addressed in quality control and assurance plan?	Yes		☐	☐
b. Strength of Materials – List minimum factor of safety for slope stability.		All slopes are per applicable regulations	☐	☐
c. Settlement or Swell Calculations	NA		☐	☐
d. Subgrade Removal – Addressed in quality control and assurance plan?	Yes		☐	☐
e. Frozen Materials - Addressed in quality control and assurance plan?	Yes		☐	☐
f. Details of Groundwater Control, if used:			☐	☐
1. Type of System		Geonet	☐	☐
2. Thickness		200 mil	☐	☐
3. Material(s)		Geonet composite	☐	☐
4. Piezometer	NA		☐	☐
5. Name of Outfall (to be added to HMSP)		GU-L	☐	☐
6. Drainage Area per Outfall (acres)		0.7 acres	☐	☐
7. Modeling or Calculations that Separation will be Attained under Entire Cell			☐	☐
5. 113.7(5) MSWLF Unit Liners and Leachate Collection Systems.				
a. Alternative liner design – list date of approved design	NA		☐	☐
b. Any soil amendments proposed?	No		☐	☐
1. If yes, submit method of placement and include in quality control and quality assurance plan			☐	☐
c. Recompacted Clay Liner				
1. Source of Soil		On site borrow	☐	☐
2. Proposed Number and Location of In Situ Hydraulic Conductivity Tests and Statistical Significance of Testing		5	☐	☐
3. List Required Hydraulic Conductivity		$1x10^{-7}$ cm/sec or less	☐	☐
4. Proposed Number and Location of Moisture/Density tests and Statistical Significance of Testing		5 per lift per acre	☐	☐
5. Thickness of Liner		2.25'	☐	☐

		Check Box for Source →	√	√
Design Content Template	Yes/No/NA	Location in Design Report or Value or Date	Owner	Eng.
6. Maximum Liner Slope		33%	☐	☐
7. Minimum Liner Slope		2%	☐	☐
d. Flexible Membrane Liner				
1. Material and Thickness		60 mil HDPE	☐	☐
2. Texture	Yes	Textured on sideslope, textured or smooth on base	☐	☐
3. Smoothness of Subgrade		Addressed in specifications	☐	☐
4. Location and Frequency of Destructive Testing		Every 500' of seam at a minimum	☐	☐
e. If proposing a geonet/drainage media system include specifications:				
1. List Geonet Transmissivity.	NA		☐	☐
2. Provide Evaluation of Geonet Performance under Field Conditions			☐	☐
3. Overlying Drainage Media			☐	☐
a. Thickness			☐	☐
b. Hydraulic Conductivity			☐	☐
f. Drainage Material other than Non-calcareous Sand or Gravel	NA		☐	☐
1. If tire chips are proposed, provide detailed material quality control and assurance plan.			☐	☐
2. If auto shredder residue is proposed, provide plan to demonstrate that material is non-hazardous.			☐	☐
g. Granular Drainage Media	NA			
1. Size			☐	☐
2. Hydraulic Conductivity			☐	☐
3. Maximum Fines Content (Passing #200 Sieve)			☐	☐
4. Is geotextile needed? If yes, list geotextile specification. If no, provide an evaluation of the impact of the granular drainage media on the liner (113.7(5)"b"(7)1).			☐	☐
h. Any proposed manholes placed on liner or in new cell for access to leachate lines for cleaning or inspection?	No		☐	☐
1. If yes, submit design that considers the effect of stresses on manhole and liners below manhole.			☐	☐
i. Any plans to do leachate recirculation or bioreactor operations? If yes, submit plans or list date of approved plans.	Yes	Approved in Special Provision X.5 of SDP	☐	☐

		Check Box for Source →	√	√
Design Content Template	Yes/No/NA	Location in Design Report or Value or Date	Owner	Eng.
		Permit		
j. Piping				
1. Provide method to clean and inspect leachate collection pipe.	Yes	Cleanouts will be installed	☐	☐
2. List pipe size and minimum slope.	Yes	3" (minimum), 1% (minimum)	☐	☐
3. Provide pipe strength calculations.	NA		☐	☐
4. Provide filter design to impede fines migration into pipe perforations.	NA		☐	☐
k. Include proposed leachate head measurement(s) devices, locations and methods.	NA		☐	☐
l. Has seven day storage requirement been met and approved with additional capacity for new proposed cell?	NA		☐	☐
m. Any increases in leachate storage or additional conveyances needed outside of the MSWLF unit and submitted? If yes:	Yes	New lagoon will have a capacity of approx. 1,195,300 gallons	☐	☐
1. Describe Containment and Countermeasures.	Yes	Leachate pipe outside of the waste boundary will be dual walled.	☐	☐
2. Does containment meet or exceed cell liner performance?	Yes	Yes	☐	☐
n. What is anticipated leachate generation rate and how will leachate be treated?	NA	No additional leachate will be generated by this project	☐	☐
1. Include evaluation that estimates increase in leachate.	NA		☐	☐
a. Pre-Construction Model Results Compared to Actual Leachate Generation – Test of Model Calibration	NA		☐	☐
b. Post-Construction Model Results	NA		☐	☐
6. 113.7(6) Quality Control and Assurance Program.				
a. Name of QC&A Officer		Douglas J. Luzbetak	☐	☐
b. Name of Delegated Persons, if any.		Glenn Hunter	☐	☐
c. Date of Approved QC&A plan		Submitted 2/21/25	☐	☐
d. Statistical Significance of All Testing			☐	☐
7. 113.7(7) Vertical and Horizontal Expansions of MSWLF Units.				
a. Analyze Slope Stability. What is minimum factor of safety?	NA		☐	☐

		Check Box for Source →	√	√
Design Content Template	Yes/No/NA	Location in Design Report or Value or Date	Owner	Eng.
b. For vertical expansions perform a lines-of-sight analysis.	NA		☐	☐
8. 113.7(8) Run-on and Runoff Control Systems. Review impact of new construction. Include allowance for siltation in channels, if used.			☐	☐
		Check Box for Source →	√	√
Operating Requirements (update as needed)	Yes/No/NA	Comment, Value and/or Date	Owner	Eng.
1. 113.8(2)"b" First Lift, Plan for Achieving Compliance.	NA		☐	☐
2. 113.8(2) "c" Fill Sequencing – impact of new construction	NA		☐	☐
3. 113.8(2)"g" Disposal Operations and Activities. If construction is adjacent to existing waste how will leachate seeps be controlled and or captured?	NA		☐	☐
4. 113.8(4) Development and Operations Plan (DOPs). Update if necessary.	NA		☐	☐
5. 113.8(5) Emergency Response and Remedial Action Plan (ERRAP). Update if necessary.	NA	Updated ERRAP included in the Master Plan (Doc #82923)	☐	☐
Air Quality and Landfill Gas	Yes/No/NA	Comment, Value and/or Date	Owner	Eng.
1. 113.9(1) Air Criteria. Check compliance with air quality bureau of DNR.	NA		☐	☐
2. 113.9(2) Landfill gas. Update gas monitoring plan if necessary.	NA		☐	☐
Groundwater Monitoring	Yes/No/NA	Comment, Value and/or Date	Owner	Eng.
113.10(1)"b" - A new MSWLF unit must be in compliance with the groundwater monitoring requirements specified in subrules 113.10(2), 113.10(4), 113.10(5) and 113.10(6) before waste can be placed in the unit.	NA		☐	☐
113.10(2)"a" and "b" – New monitoring points approved and installed?	Yes	GU-L to monitor the groundwater diversion system for the lagoon.	☐	☐
113.10(2)"d" - Properly abandon monitoring wells that are in the new cell area and submit documentation to DNR.	NA		☐	☐
113.10(2)"e" - Provide an updated HMSP if necessary including the addition of any sampling points from an underdrain used to maintain 5-foot separation.	NA		☐	☐
113.10(4) – Groundwater Sampling and Analysis Requirements – fully implemented?	Yes		☐	☐
113.10(5) – Detection Monitoring Program – fully implemented?	Yes		☐	☐
113.10(6) – Assessment Monitoring Program – fully implemented or not applicable?	Yes		☐	☐
Closure and Post-Closure Plans	Yes/No/NA	Comment, Value and/or Date	Owner	Eng.
1. 113.12(3) Updates to Closure Plan a. Final Grades b. Storm Water System c. Update Soil Balance through Closure	NA		☐	☐
2. 113.13(3) Updated Post-closure Plan, if necessary	NA		☐	☐

Facility Name: Benton County SLF

Contact Signature:  Date: 2/21/25

Typed: Douglas J. Luzbetak, P.E.

This document is intended solely as guidance, and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. This guidance does not establish or affect legal rights or obligations and is not finally determinative of any of the issues addressed. This guidance does not create any rights enforceable by any party in litigation with the State of Iowa or the Department of Natural Resources. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.

ATTACHMENT B

Quality Control and Assurance Plan

QC&A Officer: Douglas J. Luzbetak, P.E.
HLW Engineering Group, LLC
204 West Broad Street
PO Box 314
Story City, Iowa 50248
(515)733-4144
FAX: (515)733-4146
Cell: (515)290-0247
dluzbetak@hlwengineering.com

Resident Project Representative (RPR):
Glenn Hunter
HLW Engineering Group

The quality control and assurance requirements will be as specified in the plans and specifications for the Leachate Storage Lagoon project submitted to IDNR for review and approval along with this document, and in accordance with applicable IDNR rules and regulations. Listed below are general requirements for the Quality Control and Assurance (QC&A) Plan.

Subgrade: The RPR will observe subgrade preparation and look for the presence of stumps, roots, boulders, debris, frozen soil, litter, and other unsuitable materials. Unsuitable materials are as listed above or are defined as any material not having adequate stability to act as a proper foundation for the liner system, and shall be determined by the QC&A Officer. Unsuitable materials on the subgrade will be removed and replaced with suitable material as necessary. If core outs are required, the unsuitable foundation materials shall be cored out to a minimum depth of 2' below surface elevation and be replaced with soil materials capable of providing a suitable foundation.

The subgrade will be proof rolled or scarified and recompacted prior to the start of earthwork. The subgrade will be observed by the RPR prior to earthfill installation.

Groundwater Diversion Layer: A 200 mil HDPE geonet with 8 ounces per square yard of nonwoven, needle punched fabric bonded to each side of the geonet will be utilized for the groundwater diversion layer under the leachate storage lagoon.

Prior to geonet installation the Contractor shall provide the manufacturer's raw materials and roll certifications to the Owner. The materials delivered to the project shall be checked against the roll certifications to insure that the proper material was delivered to the site. Geonet rolls that do not have proper certifications will not be allowed to be used on the project. Geonet cores will be connected to adjacent geonet cores using plastic zip ties or other methods recommended by the Manufacturer. Geotextile seams shall be heat tacked or sewn to limit fabric movement during soil placement.

Compacted Clay Component of the Base Liner: The base liner will be constructed from glacial till materials approved by the QC&A Officer. The hydraulic conductivity of potential base liner soils will be evaluated by determining in the laboratory hydraulic conductivity of sample soils in relation to the Standard Proctor Density and Standard Proctor moisture content. The maximum allowable hydraulic conductivity of a base liner soil is $1x10^{-7}$ cm/sec.

The material will be placed in lifts no thicker than 8 inches after compaction. The initial lift may be placed in a single 11 inch (compacted depth). The entire lift shall meet the compaction and moisture requirements for compacted base liner construction. The base liner will be tested for moisture and density control by the RPR with a nuclear density meter at a *minimum* interval of five tests per 8 inch lift per acre of base liner constructed. The minimum allowable density is 95% of the determined Standard Proctor Density. Minimum moisture content is the optimum moisture content as determined by the Standard Proctor Method. Areas where the moisture/density tests fail will have moisture adjusted (if necessary), be recompacted, and be retested until passing tests are achieved. The soil may have to be removed and replaced to obtain passing tests.

Laboratory hydraulic conductivity tests using shelby tubes will also be performed. A minimum of five (5) shelby tube samples will be collected from the base liner. The minimum of five shelby tube samples were chosen to represent the potential variation of hydraulic conductivities and will reduce the possibility that passing results occurred by chance. Additional shelby tube samples may be taken at the discretion of the QC&A Officer if inconsistencies in the sampling results are noted by the QC&A Officer or the geotechnical laboratory. The voids created by the shelby tubes in the base liner will be backfilled with bentonite material.

The subgrade will be surveyed by HLW personnel prior to the start of clay liner installation to establish starting grades for the liner. Progress stakes will be provided for the clay liner by HLW personnel as necessary, and the surface of the compacted clay liner will be surveyed prior to the installation of the FML to document liner thickness of a minimum of 2.25'. The surface of the clay liner shall be graded to a tolerance of 0 to 0.1'.

All laboratory test results, hydraulic conductivity/compaction/moisture content curves and plots, field density tests, and shelby tube test results will be submitted to the IDNR in the QC&A Report prior to certification of the lagoon for leachate storage.

Flexible Membrane Liner: The flexible membrane liner (FML) will be 60 mil HDPE. The FML shall meet the requirements of Geosynthetic Research Institute (GRI) GM-13 "Test Methods, Test Properties and Testing Frequency for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes" and Section 06600 of the construction specifications (attached).

Prior to FML installation the Contractor shall provide the manufacturer's raw materials and roll certifications to the Owner. The materials delivered to the project shall be checked against the roll

certifications to insure that the proper material was delivered to the site. Geomembrane rolls that do not have proper certifications will not be allowed to be used on the project.

The FML installer shall provide written acceptance of the subgrade surface daily prior to the commencement of FML installation.

All field seams shall be made by either double fusion (hot wedge) or extrusion welding. The RPR will be on site during welding of the FML. All seams shall be non destructively tested by the FML installer using air pressure testing for double fusion seams and vacuum box testing for extrusion welded seams.

A minimum of one destructive test will be performed by the FML installer per 500 linear feet of seam. The location of destructive tests will be determined by the RPR. Destructive tests will be done on slope areas as much as practical. The distance between test locations may be decreased during construction at the discretion of the QC&A Officer. The destructive tests must meet the requirements listed in GRI GM-19a "Seam Strength and Related Properties of Thermally Bonded Homogeneous Polyolefin Geomembranes/Barriers". A minimum of two destructive test samples will be sent to an Independent Laboratory for testing.

Seams that fail the non-destructive or destructive testing shall be repaired/retested as per Section 06600 of the construction specifications (attached).

Panel information and test results on the FML will be submitted to IDNR in the QC&A Report.

Groundwater/Leachate Piping: The HDPE piping used for the groundwater conveyance and leachate piping will be fusion welded in accordance with manufacturers recommendations. The connections to the existing piping will be made in the presence of the RPR. Rock backfilling of the pipes will also be done in the presence of the RPR. Dual wall pipe will be used for leachate conveyance outside of the lagoon boundary to meet the containment requirements of IAC 567-113.7(5)b(10).

Tees, fittings and other appurtenances shall conform to the plans and specifications and manufacturers recommendations.

Manholes: Manholes that will contain leachate will be backfilled with either a 50:50 mixture of bentonite and sand, AquaBlok as manufactured by AquaBlok, Ltd., or an equivalent material to meet the containment requirements of IAC 567-113.7(5)b(10).

The manholes will be installed and backfilled in the presence of the RPR.

Miscellaneous Construction Items: Valving, pumps, and other construction items shall be in general accordance with the plans and specifications.

Quality Control and Assurance Report: A Quality Control and Assurance Report will be submitted to IDNR upon the completion of construction. A copy of the report will also be maintained at the landfill. At a minimum, the report shall include the following:

- Title page and index
- Name and permit number of the Benton County Sanitary Landfill
- Contact information for the QC&A Officer
- Contact information for all contractors associated with the construction of the project
- Applicable soil and FML test results
- Copies of the Resident Project Representative's reports
- Representative photos of the construction process
- A signed/sealed statement by the QC&A Officer that the unit was constructed in general accordance with rule IAC 567-113.7 and the approved plans and specifications.

Record Drawings showing variations from the plans will also be submitted to the IDNR with the QC&A Report.

06600 - FLEXIBLE MEMBRANE LINER

PART 1 - GENERAL

1.01 SCOPE

A. This work describes parameters for the manufacture, supply, and installation of High Density Polyethylene (HDPE) geomembrane liner systems. These Specifications encompass the furnishing of all labor, materials, transportation, handling, storage, supervision, tools, and other equipment that may be necessary to install and test the liner installation as described herein and in associated Plans.

1.02 QUALIFICATIONS OF MANUFACTURER AND INSTALLER

A. The Installer shall be the Manufacturer or an Installation Contractor approved by the Manufacturer to install the Manufacturer's geomembrane. Installation Contractors approved by the Manufacturer are considered to be Manufacturer's Representatives for the purpose of this specification.

B. Installation shall be performed under the constant direction of a single Field Installation Supervisor who shall remain on site and be responsible, throughout the liner installation, for liner layout, seaming, patching, testing, repairs, and all other activities by the Installer. This Installation Supervisor shall be experienced in the installation and seaming of HDPE geomembrane. Actual seaming shall be performed by individuals having experience seaming HDPE geomembrane, using the same type of seaming apparatus specified.

PART 2 - MATERIALS

2.01 GEOMEMBRANE RAW MATERIALS

A. The geomembrane shall be manufactured of new, first-quality resin produced in the United States or Canada and shall be compounded and manufactured specifically for the intended purpose. The resin manufacturer shall certify each batch for the properties listed in GRI GM13.

2.02 GEOMEMBRANE ROLLS

A. The geomembrane shall be a minimum 22.5 ft seamless width High Density Polyethylene. Carbon black shall be added to the resin if the resin is not compounded for ultra-violet resistance. The geomembrane rolls shall meet the physical and mechanical properties listed in GRI GM13. The geomebrane shall conform to the following:

1. The surface of the geomembrane shall not have striations, pinholes, or bubbles and shall be free of holes, blisters, undispersed raw materials, or any contamination by foreign matter.
2. The geomembrane shall be supplied in rolls. Labels on each roll shall identify the thickness of the material, the length and width of the roll, batch and roll numbers, and name of manufacturer.

2.03 SUBMITTALS

A. The Manufacturer shall provide the following information as Shop Drawings for Engineer review and approval prior to installation:

1. List of material properties.

2. A list documenting completed facilities similar to the facility being constructed. Each entry in this list should specify the name and purpose of the facility, its location and date of installation, the name of the owner, the project manager, designer, fabricator (if any), and the installer, as well as the name and telephone number of the contact at the facility who can discuss the project. In addition, the geomembrane thickness and total square footage of the installation surface should be included.
3. Certification that all resin used in the manufacture of geomembrane for this job meets the specifications.
4. Certification that the geomembrane and extrudate produced for this project have the same properties.
5. Roll certifications.

B. The Installation Contractor shall provide the following information as Shop Drawings for Engineer review and approval prior to installation:

1. Insurance coverage
2. Installation capabilities
3. Information on equipment and personnel.
4. A list of completed facilities similar to the facility being constructed, for which the Installation Contractor has installed an HDPE geomembrane. For each installation, the following information shall be provided
   a. Name and purpose of facility, its location, and date of installation.
   b. Name of owner, design engineer, manufacturer, fabricator, if applicable, and name and telephone number of contact at the facility who can discuss the project.
   c. Thickness of geomembrane and surface area of the installed geomembrane.
   d. Type of seaming, patching, and tacking equipment.
   e. A copy of the manufacturer's and/or fabricator's approval letter(s) and/or license(s), if applicable.
   f. Resume of the qualifications of the Installation Supervisor assigned to this project.
5. Proposed Installation Panel layout identifying seams, panel sequencing, and details.
6. Any proposed variance or deviation from these documents shall be submitted in writing by the Installer to the Owner's Representative a minimum of fourteen (14) working days prior to the scheduled start of geomembrane installation and will be accepted/rejected by the Owner's Representative prior to start of installation activities.

2.04 WARRANTY

A. A written Warranty shall be obtained from the Manufacturer (for material) and the Installation Contractor (for workmanship). These documents shall warrant both the quality of the material for a period of not less than ten (10) years and the quality of the workmanship for a period of not less than two (2) years.

2.05 WELDING, SEAMING, AND TESTING EQUIPMENT

A. Shall be maintained in adequate numbers to avoid delaying work.

B. Electric generators shall not be placed directly on the geomembrane.

2.06 FIELD SEAMS

A. The field seams (hot wedge and extrusion) shall meet the following specifications

1. Shear Strength shall meet the requirements contained in GRI GM19.

2. Peel Strength shall meet the requirements contained in GRI GM19.

2.07 QUALITY CONTROL SPECIFICATIONS

A. Raw Materials shall be in accordance with GRI GM13.

B. Finished Product shall be tested and inspected in accordance with GRI GM13.

PART 3 - EXECUTION

3.01 MATERIALS LOGISTICS

A. The geomembrane rolls or panels shall be packaged and shipped by appropriate means so that no damage is caused.

B. Off-loading and storage of the geomembrane is the responsibility of the Contractor. The Manufacturer/Installer/Contractor shall be responsible for replacing any damaged or unacceptable material at no cost to the Owner. No off-loading shall be done unless an Owner's Representative is present. Damage during off-loading shall be documented by the Owner's Representative and Contractor. All damaged rolls must be separated from the undamaged rolls until the proper disposition of that material has been determined by the Owner's Representative. The Owner's Representative will be the final authority on determination of damage.

C. On-Site Storage

1. The geomembrane shall be stored so as to be protected from puncture, dirt, grease, water, moisture, mud, mechanical abrasions, excessive heat, or other damage.
2. The rolls shall be stored on a level prepared surface (not wooden pallets). The Manufacturer's Representative shall inspect the material in storage prior to placement including any damaged rolls.

3.02 EARTHWORK

A. The Installer shall observe and render an opinion on initial surface conditions and, on a daily basis, shall accept that the surface on which the geomembrane will be installed is suitable for installation. Attachment 1 (or an alternate form approved by the Engineer) shall be completed to document this acceptance. After the supporting soil surface has been accepted, it shall be the Installer's responsibility to indicate to the Owner's Representative any change to its condition due to natural causes or other occurrences that may require repair work.

B. The subgrade shall be free of sticks, roots, sharp objects, angular stones larger than ½ inch, or debris of any kind. The subgrade should provide a firm, smooth, unyielding foundation with no sudden sharp or abrupt changes or breaks in grade and without depressions (ie sheepsfoot depressions, equipment tracks, etc.).

3.03 ANCHOR TRENCH

A. The anchor trench shall be excavated to the line, grade, and width recommended by the Manufacturer prior to liner system placement. The Installer shall verify that the anchor trench has been constructed according to the Manufacturer's recommendations.

B. Slightly rounded corners shall be provided in the trench where the geomembrane adjoins the trench so as to avoid sharp bends in the geomembrane.

3.04 METHOD OF PLACEMENT

A. The Manufacturer's Representative shall observe and render an opinion of initial placement technique and be responsible for the following:

1. Equipment will not be allowed to operate on the geomembrane except as below:
   a. Only low pressure ATVs and UTVs will be considered.
   b. The tires shall be reviewed for the presence of trapped stones, sticks, or other debris prior to the ATV or UTV driving on the geomembrane.
   c. Refueling of ATVs, UTVs, or generators is not allowed on the geomembrane.
2. No equipment or tools shall damage the geomembrane by handling, trafficking, or other means.
3. No personnel working on the geomembrane shall smoke, wear damaging shoes, or engage in other activities that could damage the geomembrane.
4. The method used to unroll the panels shall not cause scratches or crimps in the geomembrane and shall not damage the supporting soil or underlying geotextile (if present).
5. The method used to place the panels shall minimize wrinkles. Wrinkles shall be identified as to proper location and compensation shall be identified on the Installer's drawings. Ballast shall be used to prevent relocation of the compensating wrinkles by wind.
6. Adequate loading (e.g., sand bags or similar items that will not damage the geomembrane) shall be placed to prevent uplift by wind (in case of high winds, continuous loading is recommended along edges of panels to minimize risk of wind flow under the panels.)
7. Panels displaced or damaged by wind shall be removed and are not allowed to be reused.
8. Direct contact with the geomembrane shall be minimized, i.e., the geomembrane in traffic areas is protected by geotextiles, extra geomembrane, or other suitable materials.
9. Do not allow personnel on wet or slippery geomembranes without adequate safety precautions.

3.05 WEATHER CONDITIONS

A. Geomembrane deployment shall proceed between ambient temperatures of 32 degrees F to 100 degrees F. The Installer shall take adequate precautions for variations in temperatures during geomembrane placement. Placement can proceed below 32 degrees F only after it has been verified by the Manufacturer that the material can be seamed according to the Specifications and is approved by the Owner's Representative.

B. Geomembrane placement shall not be done during any precipitation, in the presence of excessive moisture (e.g., fog, rain, dew) or in the presence of excessive winds, as determined by the Installation Supervisor.

3.06 FIELD SEAMING

A. All field seams shall be double fusion seams (hot wedge) where practical. Extrusion welded seams may be used in areas unable to be double fusion welded.

B. Material to be seamed shall be cleaned of soil, dust, and other debris and dry.

C. Seams shall be oriented parallel to the line of maximum slope, i.e., oriented down, not across the slope as much as practical. Panels shall be oriented to minimize cross seams on side slopes. Cross seams shall be staggered, and only one cross seam shall be allowed per panel slope length. Cross seams will not be allowed on adjacent panels. Cross seams will only be allowed on the lower half of each slope, but not allowed within 5’ of the toe of the slope.

D. In corners and odd-shaped geometric locations, the number of field seams shall be minimized.

E. Panel overlap shall be oriented to result in unobstructed flow toward base of slope/leachate collection pipe.

F. Seams shall be aligned with the least possible number of wrinkles and "fishmouths". If a fishmouth or wrinkle is found, it shall be relieved and cap-stripped.

G. The panel layout shall minimize seams in the leachate pipe trench. Panels in the leachate pipe trenches are to be oriented in the direction of pipe flow. Longitudinal seams are not allowed in the leachate pipe trench.

H. Seam Overlap

1. Align seam overlaps consistent with the requirements of the welding equipment being used.
2. The procedure used to temporarily bond adjacent panels together shall not damage the geomembrane; in particular, the temperature of hot air at the nozzle of any spot welding apparatus shall be controlled such that the geomembrane is not damaged.

I. Approved equipment for field seaming are hot shoe fusion welders and extrusion welders.

3.07 SEAM TESTING

A. Trial welds shall be conducted on geomembrane liner to verify that seaming conditions are satisfactory. Trial welds shall be conducted at the beginning of each seaming period, at the discretion of the Owner's Representative, and at least once each 4 hours, for each seaming apparatus used that day.

B. All trial welds shall be made at a location selected by the Owner's Representative in the area of the seaming and in contact with the subgrade. The trial weld samples shall be approximately 8 feet long with the seam centered lengthwise. A minimum of 4 specimens 1 inch wide shall be cut from the trial weld by the Installer. The Installer shall test specimens in the presence of the Owner's Representative for shear and peel. If a trial weld fails to meet field seam specifications, the seaming apparatus and/or seamer shall not be accepted and shall not be used for seaming until the deficiencies are corrected and two consecutive successful full trial welds are achieved.

C. Non-Destructive Seam Testing

1. The Installer shall non-destructively test all field seams over their full length in the presence of the Owner's Representative. Testing shall be by air pressure testing for double fusion seams and by vacuum box testing for extrusion welded seams. All test equipment shall be furnished by the Installer. Non-destructive tests shall be as follows:

a. Air Pressure Testing

(1) Shall be performed in accordance with ASTM D5820, Standard Practice for Pressurized Air Channel Evaluation of Dual Seamed Geomembranes

b. Vacuum Box Testing

(1) Shall be performed in accordance with ASTM D5641, Standard Practice for Geomembrane Seam Evaluation by Vacuum Chamber.

2. The air test shall be performed as follows:
   a. Seal one end of the seam to be tested.
   b. Insert needle or other approved pressure feed device through the sealed end of the channel created by the double wedge fusion weld.
   c. Energize the air pump to verify the unobstructed passage of air through the channel. If this step is not done Step g shall be done.
   d. Seal the other end of the channel.
   e. Energize the air pump to a pressure of approximately 30 psi, close valve, and sustain pressure for approximately 5 minutes.
   f. If loss of pressure exceeds 3 psi, or pressure does not stabilize, locate faulty area, repair and retest.
   g. Puncture opposite end of seam (end opposite of air pump/pressure gage) to release air. If air is not released at opposite end, locate and test seam on both sides of blockage. This is only required if Step c is not done.
   h. Remove needle or other approved pressure feed device and seal.
3. The vacuum box test shall be performed as follows
   a. Excess sheet overlap shall be trimmed away.
   b. Clean the window, gasket surfaces and check for leaks.
   c. Energize the vacuum pump and reduce the tank pressure to approximately 3-5 psi.
   d. Wet a strip of geomembrane approximately 12 inches wide by the length of the box plus 12 inches (6 inches per side) with a soapy solution of liquid detergent and water.
   e. Place the box over the wetted area and compress to seal the box against the liner.
   f. Close the bleed valve and open the vacuum valve.
   g. Ensure that a leak tight seal is created.
   h. For a period of approximately 15 seconds, examine the geomembrane through the viewing window for the presence of soap bubbles.
   i. If no bubbles appear after 15 seconds, close the vacuum valve and open the bleed valve, move the box over the next adjoining area with a minimum 3 inches overlap and repeat the process.
   j. All areas where soap bubbles appear shall be marked and repaired and then retested.

D. Destructive Seam Testing

1. The Installer shall provide the Owner's Representative with a minimum of one destructive test sample per 500 feet of seam length from a location specified by the Owner's Representative. The Installer shall not be informed in advance of the sample location.
2. In order to obtain test results prior to completion of liner installation, samples shall be cut by the Installer as the seaming progresses. Sampling times and locations shall be determined by the Owner's Representative. The Owner's Representative must witness the obtainment of all field test samples and the Installer shall mark all samples with their location roll and seam number. The Installer shall also record in written form the date, time, location, roll seam number, ambient temperatures, and pass or fail description. A copy of the information must be attached to each sample portion. All holes in the geomembrane resulting from obtaining the seam samples shall be immediately repaired. All patches shall be vacuum tested.

3. The samples shall be a minimum of 12 inches wide by 24 inches long with the seam centered lengthwise. The sample shall be cut into two equal length pieces, half to be given to the Installer and the other half to be given to the Owner's Representative.

E. The Installer shall cut ten 1 inch wide replicate specimens from his sample and these shall be tested by the Installer. The Installer shall test five specimens for seam strength and five for peel strength in the presence of the Owner's Representative. The test results must meet the requirements in GRI GM 19.

F. The Installer will package and ship at least two seam samples to a Laboratory for testing. The test method and procedures to be used by the Independent Laboratory shall be the same used in field testing, where seam samples are 1 inch wide, and the grip separation rate is 2 ipm. The test results must meet the requirements in GRI GM 19. Cost of these tests shall be the responsibility of the Installer.

G. The following procedures shall apply whenever a sample fails the field destructive test

1. The Installer shall cap strip the seam between the failed location and any passed test location.
2. The Installer can retrace the welding path to an intermediate location (at a minimum of 10 feet from the location of the failed test), at the discretion of the Owner's Representative, and take a small sample for an additional field test. If this test passes, then the seam shall be cap stripped between that location and the original failed location. If the test fails, then the process is repeated.
3. Over the length of seam failure, the Installer shall either cut out the old seam, reposition the panel and reseam, or add a cap strip, as required by the Owner's Representative.
4. After reseaming or placement of the cap strip, additional destructive field test(s) shall be taken within the reseamed area. The reseamed sample shall be found acceptable if test results are acceptable. If test results are not acceptable, this process shall be repeated until the reseamed length is judged satisfactory by the Owner's Representative.

H. In the event that a sample fails a laboratory destructive test, then the above procedures shall be followed, considering laboratory tests exclusively.

I. The Owner's Representative will document all actions taken in conjunction with destructive test failures.

3.08 DEFECTS AND REPAIRS

A. All seams and non-seam areas of the geomembrane shall be inspected daily by the Installer in the presence of the Owner's Representative for defects, holes, blisters, undispersed raw materials, and any sign of contamination by foreign matter. Because light reflected by the geomembrane helps to detect defects, the surface of the geomembrane shall be clean at the time of inspection. The geomembrane surface shall be brushed, blown, or washed by the Installer if the amount of dust or mud inhibits inspection. The Owner's Representative shall decide if cleaning of the geomembrane is needed to facilitate inspection. Cleaning, if required, shall be at no expense to the Owner.

1. Each suspect location in seam and non-seam areas shall be non-destructively tested as appropriate in the presence of the Owner's Representative. Each location that fails the non-destructive testing shall be marked by the Installer and repaired accordingly.

2. Repair Procedures
    a. Defective seams shall be restarted/reseamed as described in these specifications.
    b. Small holes shall be repaired by extrusion cap welding. If the hole is larger than 1/4 inch, it shall be patched.
    c. Tears shall be repaired by patching. Where the tear is on a slope or an area of stress and has a sharp end it must be rounded prior to patching.
    d. Blisters, large holes, undispersed raw material, and contamination by foreign matter shall be repaired by patches.
    e. Surfaces of HDPE which are to be patched shall be abraded and cleaned no more than 15 minutes prior to the repair. No more than 10% of the thickness shall be removed.
    f. Patches shall be round or oval in shape, made of the same geomembrane, and extend a minimum of 6 inches beyond the edge of defects. All patches shall have their top edge beveled with an angle prior to placement on the geomembrane. Patches shall be applied using approved methods only.

B. The welding process shall restart by grinding the existing seam and rewelding a new seam. Welding shall commence where the grinding started and must overlap the previous seam by at least 2 inches. Reseaming over an existing seam without regrinding shall not be permitted.

C. Each repair shall be non-destructively tested, except when the Owner's Representative requires a destructive seam sample obtained from a repaired seam. Repairs that pass the non-destructive test shall be taken as an indication of an adequate repair. Failed tests indicate that the repair shall be repeated and retested until passing test results are achieved.

D. Recording of Results: daily documentation of all non-destructive and destructive testing shall be provided to the Owner's Representative by the Installer. This documentation shall identify all seams that initially failed the test and include evidence that these seams were repaired and successfully retested.

3.09 BACKFILLING OF ANCHOR TRENCH

A. The anchor trench shall be backfilled and compacted by the general contractor as approved by the Installer in the presence of the Owner's Representative. Trench backfill material shall be placed in 8 inch thick loose lifts and compacted by wheel rolling with light, rubber tired equipment or other light compaction methods.

B. Care shall be taken when backfilling the trenches to prevent any damage to the geomembrane, geotextiles, or geonets. At no time shall construction equipment come into direct contact with the geomembrane, geotextile, or geonet. If damage occurs, it shall be repaired by the Installer prior to the completion of backfilling.

3.10 GEOMEMBRANE ACCEPTANCE

A. The Installer shall retain all ownership and responsibility for the geomembrane until acceptance by the Owner.

B. The geomembrane liner shall be accepted by the Owner when all of the following conditions are met:

1. Installation is finished.

2. Verification of the adequacy of all field seams and repairs, including associated testing, is complete and records submitted to the Owner. Records shall include Record drawing(s) showing panel layout with corresponding geomembrane roll numbers, seam methods/test results, repair locations, etc.
3. All other work associated with the project has been completed in accordance with the Contract Documents.

END OF SECTION

SUBGRADE SURFACE ACCEPTANCE

INSTALLER

Company Name: _____

Address: _____

_____

Field Supervisor: _____

Owner: _____ Project: _____

ACCEPTANCE

The undersigned certifies that they are an authorized representative of _____ and that they have visually reviewed the subgrade and found the surface acceptable for the installation of HDPE geomembrane.

Estimated area accepted: _____ sq. ft.

Installer Acceptance:

Signature: _____

Name: _____

Title: _____

Date: _____

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 of the subgrade during deployment. Structural integrity of the subgrade and maintenance of these conditions are the responsibility of the General Contractor.

BIDDING REQUIREMENTS
AND
CONTRACT DOCUMENTS
FOR

LEACHATE STORAGE LAGOON

BENTON COUNTY SANITARY LANDFILL

Benton County, Iowa

2025

HLW Engineering Group, LLC
204 West Broad Street, PO Box 314
Story City, Iowa 50248
(515) 733-4144

HLW Project Number 6043-23B

LEACHATE STORAGE LAGOON

BENTON COUNTY SANITARY LANDFILL

BENTON COUNTY, IOWA

2025

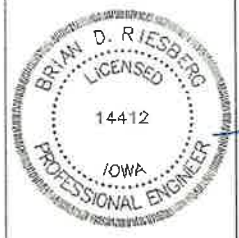
I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

2/22/25

DOUGLAS J. LUZBETAK, P.E. DATE
License number 12654

My license renewal date is December 31, 2026.

Pages or sheets covered by this seal:
All except Division 26 and Figures E1–E5.



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.

22 Feb 2025

BRIAN D. RIESBERG, P.E. DATE
License number 14412

My license renewal date is December 31, 2025.

Pages or sheets covered by this seal:
Division 26, Figures E1–E5.

Prepared by
HLW Engineering Group, LLC
Consulting Engineers
Story City, Iowa 50248

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PART I - BIDDING REQUIREMENTS

Notice of Public Hearing and Notice to Potential Bidders
C-200 - Instruction to Bidders
C-410 - Bid Form
C-430 - Bid Bond

BENTON COUNTY SOLID WASTE DISPOSAL COMMISSION

OFFICIAL NOTICE OF PUBLIC HEARING CONCERNING PROPOSED PUBLIC IMPROVEMENT PROJECT, APPROVAL OF PLANS, SPECIFICATIONS AND FORM OF CONTRACT AND ENGINEER'S ESTIMATED COST AND NOTICE TO POTENTIAL BIDDERS

A public hearing will be held at 6:30 PM (local time) on the 20th of March, 2025, at the Benton County Solid Waste Disposal Commission meeting, Van Horne Community Center, 508 1st Avenue, Van Horne, IA 52346, to consider the Leachate Storage Lagoon Project, approval of plans, specifications and form of contract and engineer's estimated cost of said Project. Further particulars concerning the scope and estimated cost of this public improvement project, including plans and specifications, may be obtained from HLW Engineering Group, 204 West Broad Street, P.O. Box 314, Story City, IA 50248. Phone (515)733-4144. Electronic copies of the Bidding Requirements and Contract Documents may be obtained for no cost from HLW Engineering. Paper copies of the Bidding Requirements and Contract Documents may be obtained from HLW Engineering for a refundable plan deposit of $100.00. This deposit will be refunded if the documents are returned in a re-usable condition within fourteen days after award of the project. If the contract documents are not in a re-usable condition and returned timely, the deposit shall be forfeited.

If the public improvement, plans, specifications, form of contract and engineer's estimated cost of the project are approved by the Benton County Solid Waste Disposal Commission, the Commission will proceed to consider bids solicited according to bid specifications contained in the contract and may accept the lowest acceptable bid or reject all bids. This Notice is hereby published in accordance with a resolution duly adopted by the Benton County Solid Waste Disposal Commission on the 20th day of February, 2025.

Pursuant to Iowa Code §26.5, **notice is given to potential bidders** that written bids in accordance with the detailed bidding specifications must be received prior to 11:00 AM (local time) on the 18th of March, 2025, at the office of the Landfill Manager, Benton County Sanitary Landfill, 7904-20th Avenue, Blairstown, IA 52209, at which time the Manager or their designee will open, read and tabulate the Proposals received. Proposals will be considered by the Benton County Solid Waste Disposal Commission at their regular meeting at the Van Horne Community Center, 508 1st Avenue, Van Horne, IA 52346 which begins at 6:30 PM (local time) on the 20th of March, 2025.

The general nature of the project is the furnishing of all labor, equipment and materials necessary for construction of a new composite lined leachate storage lagoon and removal of the existing leachate storage lagoon and miscellaneous associated work, all as specified in the plans and contract. **The work under the proposed contract cannot start prior to June 16, 2025 without prior approval of the Owner**. The work on Division 1 shall be completed by November 1, 2025, subject to any changes granted by the Owner. The work on Division 2 shall be completed by June 5, 2026, subject to any changes granted by the Owner. Potential bidders must be bid on all Divisions. The project will be awarded as one contract based on the total price of all Divisions. Bids shall be presented on a blank form furnished by the Benton County Solid Waste Disposal Commission, submitted in a sealed envelope marked "Leachate Storage Lagoon, Benton County Sanitary Landfill," and accompanied by a separate envelope containing bid security in the amount of 5% of the bid as defined in Iowa Code §26.8 and specified by the Commission in its bid specifications and contract. Further particulars may be obtained from HLW Engineering Group

Published by authority of the Benton County Solid Waste Disposal Commission.

INSTRUCTIONS TO BIDDERS FOR CONSTRUCTION CONTRACT

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ARTICLE 1—DEFINED TERMS

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

A. *Issuing Office*—The office from which the Bidding Documents are to be issued, and which registers plan holders.

B. The Issuing Office for this project is HLW Engineering Group, 204 West Broad Street, PO Box 314, Story City, Iowa 50248; telephone 515-733-4144; fax 515-733-4146.

ARTICLE 2—BIDDING DOCUMENTS

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

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

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

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

2.05 *Electronic Documents*

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

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

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

B. Unless otherwise stated in the Bidding Documents, the Bidder may use and rely upon complete sets of Electronic Documents of the Bidding Documents, described in Paragraph 2.05.A above. However, Bidder assumes all risks associated with differences arising from transmission/receipt of Electronic Documents versions of Bidding Documents and reproductions prepared from those versions and, further, assumes all risks, costs, and responsibility associated with use of the Electronic Documents versions to derive information that is not explicitly contained in printed paper versions of the documents, and for Bidder's reliance upon such derived information.

ARTICLE 3—QUALIFICATIONS OF BIDDERS

3.01 To demonstrate Bidder's qualifications to perform the Work, after submitting its Bid and, if requested by Owner, within 5 days of Owner's request, Bidder must submit the following information:

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

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

C. Subcontractor and Supplier qualification information.

D. Other required information regarding qualifications.

3.02 Bidder is to submit the following information with its Bid to demonstrate Bidder's qualifications to perform the Work:

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

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

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

ARTICLE 4—PRE-BID CONFERENCE

4.01 A pre-bid conference will not be conducted for this Project.

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

5.01 *Site and Other Areas*

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

5.02 *Existing Site Conditions*

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

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

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

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

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

d. Technical Data contained in such reports and drawings.

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

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

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

5.03 *Site Visit and Testing by Bidders*

A. Bidder must contact the Owner for permission to conduct any Site Visit(s). Site Visits must be conducted during normal facility open hours.

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

D. Bidder must comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established

by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.

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

5.04 *Owner's Safety Program*

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

5.05 *Other Work at the Site*

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

ARTICLE 6—BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

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

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

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

ARTICLE 7—INTERPRETATIONS AND ADDENDA

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

7.02 Bidder shall submit all questions about the meaning or intent of the Bidding Documents to Engineer in writing.

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

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

Documents unless set forth in an Addendum that expressly modifies or supplements the Contract Documents.

ARTICLE 8—BID SECURITY

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

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

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

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

ARTICLE 9—CONTRACT TIMES

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

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

ARTICLE 10—SUBSTITUTE AND "OR EQUAL" ITEMS

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

10.02 All prices that Bidder sets forth in its Bid will be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as

supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of "or-equal" or substitution requests are made at Bidder's sole risk.

ARTICLE 11—SUBCONTRACTORS, SUPPLIERS, AND OTHERS (NOT USED)

ARTICLE 12—PREPARATION OF BID

12.01 The Bid Form is included with the Bidding Documents.

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

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

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

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

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

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

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

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

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

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

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

12.11 The Bid must contain evidence of Bidder's authority to do business in the state where the Project is located, or Bidder must certify in writing that it will obtain such authority within the time for acceptance of Bids and attach such certification to the Bid.

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

ARTICLE 13—BASIS OF BID

13.01 *Unit Price*

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

B. The "Bid Price" (sometimes referred to as the extended price) for each 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.

13.02 *Divisions*

A. Bidders must bid on all Divisions. The project will be awarded as one contract based on the total price of all Divisions.

ARTICLE 14—SUBMITTAL OF BID

14.01 The Bidding Documents include the Bid Form and, if required, the Bid Bond Form. The Bid Form is to be completed and submitted with the Bid security as required by Article 2 of the Bid Form.

14.02 A Bid must be received no later than the date and time prescribed and at the place indicated in the Advertisement or invitation to bid and must be enclosed in a plainly marked package with the Project title, and, if applicable, the designated portion of the Project for which the Bid is submitted, the name and address of Bidder, and clearly marked "Bid". The Bid shall be accompanied by the Bid security and other required documents which shall be filed in an envelope separate from the one containing the completed Bid Form and clearly marked "Bid Security". If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid must be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid must be addressed to the Benton County Solid Waste Disposal Commission, 7904-20th Avenue, Blairstown, IA 52209.

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

ARTICLE 15—MODIFICATION AND WITHDRAWAL OF BID

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

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

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

ARTICLE 16—OPENING OF BIDS

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

ARTICLE 17—BIDS TO REMAIN SUBJECT TO ACCEPTANCE

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

ARTICLE 18—EVALUATION OF BIDS AND AWARD OF CONTRACT

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

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

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

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

18.05 *Evaluation of Bids*

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

B. In the comparison of Bids, alternates will be applied in the same order of priority as listed in the Bid Form. To determine the Bid prices for purposes of comparison, alternates will be considered, following the order of priority established in the Bid Form. After determination of the Successful Bidder based on this comparative process and on the responsiveness, responsibility, and other factors set forth in these Instructions, the award may be made to said Successful Bidder on its base Bid and any combination of its additive alternate Bids for which Owner determines funds will be available at the time of award.

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

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

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

ARTICLE 19—BONDS AND INSURANCE

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

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

ARTICLE 20—SIGNING OF AGREEMENT

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

ARTICLE 21—SALES AND USE TAXES

21.01 Owner is exempt from Iowa state sales and use taxes on materials and equipment to be incorporated in the Work. Said taxes must not be included in the Bid. Refer to Paragraph SC-7.10 of the Supplementary Conditions for additional information.

ARTICLE 22—CONTRACTS TO BE ASSIGNED (NOT USED)

BID FORM FOR CONSTRUCTION CONTRACT

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

ARTICLE 1—OWNER AND BIDDER

1.01 This Bid is submitted to:

Benton County Solid Waste Disposal Commission
7904-20th Avenue
Blairstown, IA 52209

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

ARTICLE 2—ATTACHMENTS TO THIS BID

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

A. Required Bid security;

(Remainder of page left blank intentionally)

ARTICLE 3—BASIS OF BID

3.01 *Unit Price Bids*

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

Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Amount
1	Mobilization	LS	1	$	$
2	Clearing and Grubbing	LS	1	$	$
3	Excavation, Class 10	Cu. Yd.	15,185	$	$
4	Overexcavation of Unsuitable Material	Cu. Yd.	500	$	$
5	Scarify and Recompact Subgrade	Sq. Yd.	6,200	$	$
6	Compacted Earthfill	Cu. Yd.	8,670	$	$
7	Geonet Drainage Layer	Sq. Yd.	3,515	$	$
8	Groundwater Collection Pipe, 4 In. Dia.	Lin. Ft.	120	$	$
9	Groundwater Conveyance Pipe, 4 In. Dia.	Lin. Ft.	80	$	$
10	Corrugated Metal Pipe, 6 In. Dia.	Lin. Ft.	20	$	$
11	Compacted Base Liner	Cu. Yd.	2,760	$	$
12	Flexible Membrane Liner	Sq. Yd.	3,675	$	$
13	Pipe Penetrations	Each	2	$	$
14	Lagoon Fence	Lin. Ft.	784	$	$
15	Manholes	Each	2	$	$
16	Leachate Conv. Pipe, Dual Wall, 3" by 6"	Lin. Ft.	530	$	$
17	Leachate Conv. Pipe, Dual Wall, 10" by 14"	Lin. Ft.	260	$	$
18	Resilient Wedge Valves	Each	2	$	$
19	Pump Station	LS	1	$	$
20	Loadout Pipe	Lin. Ft.	50	$	$
21	Containment Pad	LS	1	$	$
22	Containment Pad Drain Pipe, 6" by 10"	Lin. Ft.	20	$	$
23	Loadout Support Base	LS	1	$	$
24	Loadout Pipe Support (Relocate)	LS	1	$	$
25	Revetment Stone	Tons	2,120	$	$
26	Road Stabilization Fabric	Sq. Yd.	2,680	$	$
27	Macadam Stone Base	Tons	530	$	$
28	Granular Surfacing	Tons	310	$	$
29	Corrugated Metal Pipe, 36 In. Dia.	Lin. Ft.	146	$	$
30	Aprons, Corrugated Metal, 36 In. Dia.	Each	2	$	$
31	Corrugated Metal Pipe, 24 In. Dia.	Lin. Ft.	100	$	$
32	Aprons, Corrugated Metal, 24 In. Dia.	Each	4	$	$
33	Corrugated Metal Pipe, 18 In. Dia.	Lin. Ft.	192	$	$
34	Aprons, Corrugated Metal, 18 In. Dia.	Each	4	$	$
35	Electrical Infrastructure	LS	1	$	$
36	Remove Existing Leachate Storage Lagoon	LS	1	$	$
37	Seeding	Acres	3	$	$
38	Leachate Mister	LS	1	$	$
Total of All Unit Price Bid Items					$

B. Bidder acknowledges that:

1. each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and

2. estimated quantities are not guaranteed and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Work will be based on actual quantities, determined as provided in the Contract Documents.

ARTICLE 4—TIME OF COMPLETION

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

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

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

5.01 *Bid Acceptance Period*

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

5.02 *Instructions to Bidders*

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

5.03 *Receipt of Addenda*

A. Bidder hereby acknowledges receipt of the following Addenda:

Addendum Number	Addendum Date

ARTICLE 6—BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Bidder's Representations*

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

1. Bidder has examined and carefully studied the Bidding Documents, including Addenda.

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

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

4. Bidder has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing

surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.

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

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

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

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

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

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

11. The submission of this Bid constitutes an incontrovertible representation by Bidder that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

6.02 *Bidder's Certifications*

A. The Bidder certifies the following:

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

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

3. Bidder has not solicited or induced any individual or entity to refrain from bidding.

4. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 6.02.A:

a. Corrupt practice means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process.

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

c. Collusive practice means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels.

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

(Remainder of page left blank intentionally)

BIDDER hereby submits this Bid as set forth above:

Bidder:

_____

(typed or printed name of organization)

By: _____

(individual's signature)

Name: _____

(typed or printed)

Title: _____

(typed or printed)

Date: _____

(typed or printed)

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

Attest: _____

(individual's signature)

Name: _____

(typed or printed)

Title: _____

(typed or printed)

Date: _____

(typed or printed)

Address for giving notices:

_____

_____

Bidder's Contact:

Name: _____

(typed or printed)

Title: _____

(typed or printed)

Phone: _____

Email: _____

Address:

_____

_____

_____

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

BID BOND (PENAL SUM FORM)

Bidder	**Surety**
Name:	Name:
Address *(principal place of business)*:	Address *(principal place of business)*:
Owner	**Bid**
Name: Benton County Solid Waste Disposal Commission	Project *(name and location)*:
Address *(principal place of business)*:	Leachate Storage Lagoon Benton County Sanitary Landfill 7904-20th Avenue Blairstown, IA 52209
7904-20th Avenue Blairstown, IA 52209	Bid Due Date: March 18, 2025
Bond	
Penal Sum:	
Date of Bond:	

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

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

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

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

PART II – CONTRACT DOCUMENTS

A. Contract Forms

C-520 Agreement Between Owner and Contractor
Performance, Payment, and Maintenance Bond
C-510 Notice of Award
C-550 Notice to Proceed
Shop Drawing Transmittal
Supplier/Contractor Statement of Compliance
Shop Drawing Response Comments
C-940 Work Change Directive
C-941 Change Order
C-942 Field Order
C-620 Contractor's Application for Payment
C-625 Certificate of Substantial Completion

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

This Agreement is by and between the Benton County Solid Waste Disposal Commission ("Owner") and _____ ("Contractor").

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

Owner and Contractor hereby agree as follows:

ARTICLE 1—WORK

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows: construction of a new landfill disposal area and miscellaneous associated work.

ARTICLE 2—THE PROJECT

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: Leachate Storage Lagoon, Benton County Sanitary Landfill

ARTICLE 3—ENGINEER

3.01 The Owner has retained HLW Engineering Group ("Engineer") to act as Owner's representative, assume all duties and responsibilities of Engineer, and have the rights and authority assigned to Engineer in the Contract.

3.02 The part of the Project that pertains to the Work has been designed by "Engineer"**.**

ARTICLE 4—CONTRACT TIMES

4.01 *Time is of the Essence*

A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract. Note that work is not allowed to start prior to June 16, 2025 without prior approval of the Owner.

4.02 *Contract Times: Dates*

A. The Work for Division 1 will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before November 1, 2025. The Work for Division 2 will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before June 5, 2026.

4.03 *Liquidated Damages*

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

proceeding, the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay:

1. *Completion:* Contractor shall pay Owner $1,000 for each day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 4.02 above for completion and readiness for final payment of Division 1. Contractor shall pay Owner $1,000 for each day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 4.02 above for completion and readiness for final payment of Division 2.

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

C. The Owner, via the Benton County Solid Waste Disposal Commission, shall be the sole entity to determine whether delay occurred such that liquidated damages should be imposed

ARTICLE 5—CONTRACT PRICE

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

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

Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Amount
1	Mobilization	LS	1	$	$
2	Clearing and Grubbing	LS	1	$	$
3	Excavation, Class 10	Cu. Yd.	15,185	$	$
4	Overexcavation of Unsuitable Material	Cu. Yd.	500	$	$
5	Scarify and Recompact Subgrade	Sq. Yd.	6,200	$	$
6	Compacted Earthfill	Cu. Yd.	8,670	$	$
7	Geonet Drainage Layer	Sq. Yd.	3,515	$	$
8	Groundwater Collection Pipe, 4 In. Dia.	Lin. Ft.	120	$	$
9	Groundwater Conveyance Pipe, 4 In. Dia.	Lin. Ft.	80	$	$
10	Corrugated Metal Pipe, 6 In. Dia.	Lin. Ft.	20	$	$
11	Compacted Base Liner	Cu. Yd.	2,760	$	$
12	Flexible Membrane Liner	Sq. Yd.	3,675	$	$
13	Pipe Penetrations	Each	2	$	$
14	Lagoon Fence	Lin. Ft.	784	$	$
15	Manholes	Each	2	$	$
16	Leachate Conv. Pipe, Dual Wall, 3" by 6"	Lin. Ft.	530	$	$
17	Leachate Conv. Pipe, Dual Wall, 10" by 14"	Lin. Ft.	260	$	$
18	Resilient Wedge Valves	Each	2	$	$
19	Pump Station	LS	1	$	$
20	Loadout Pipe	Lin. Ft.	50	$	$
21	Containment Pad	LS	1	$	$
22	Containment Pad Drain Pipe, 6" by 10"	Lin. Ft.	20	$	$

23	Loadout Support Base	LS	1	$	$
24	Loadout Pipe Support (Relocate)	LS	1	$	$
25	Revetment Stone	Tons	2,120	$	$
26	Road Stabilization Fabric	Sq. Yd.	2,680	$	$
27	Macadam Stone Base	Tons	530	$	$
28	Granular Surfacing	Tons	310	$	$
29	Corrugated Metal Pipe, 36 In. Dia.	Lin. Ft.	146	$	$
30	Aprons, Corrugated Metal, 36 In. Dia.	Each	2	$	$
31	Corrugated Metal Pipe, 24 In. Dia.	Lin. Ft.	100	$	$
32	Aprons, Corrugated Metal, 24 In. Dia.	Each	4	$	$
33	Corrugated Metal Pipe, 18 In. Dia.	Lin. Ft.	192	$	$
34	Aprons, Corrugated Metal, 18 In. Dia.	Each	4	$	$
35	Electrical Infrastructure	LS	1	$	$
36	Remove Existing Leachate Storage Lagoon	LS	1	$	$
37	Seeding	Acres	3	$	$
38	Leachate Mister	LS	1	$	$
Total of All Unit Price Bid Items					$

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

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

ARTICLE 6—PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

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

6.02 *Progress Payments; Retainage*

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

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

a. Ninety-five (95) percent of the value of the Work completed (with the balance being retainage).

b. Ninety-five (95) percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

B. Upon Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to ninety-five (95) percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less 200 percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.

6.03 *Final Payment*

A. Upon final completion and acceptance of the Work, Owner shall pay the remainder of the Contract Price in accordance with Paragraph 15.06 of the General Conditions, less any adjustments for change orders and liquidated damages.

6.04 *Interest*

A. All amounts not paid when due will bear interest at a maximum rate of ten percent (10%) per annum.

ARTICLE 7—CONTRACT DOCUMENTS

7.01 *Contents*

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

1. This Agreement.
2. Performance, Payment and Maintenance Bond.
3. General Conditions – not attached but incorporated by reference.
4. Supplementary Conditions – not attached but incorporated by reference.
5. Specifications as listed in the table of contents of the project manual – not attached but incorporated by reference.
6. Drawings (not attached but incorporated by reference) consisting of 24 figures with each figure bearing the following general title: Leachate Storage Lagoon, Benton County SLF.
7. Addenda (numbers **[number]** to **[number]**, inclusive).
8. Exhibits to this Agreement (enumerated as follows):
    a. Contractor's Bid (pages 1 to 6 inclusive)**.**
10. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
    a. Notice to Proceed.
    b. Work Change Directives.
    c. Change Orders.
    d. Field Orders.
    e. Warranty Bond, if any.

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

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

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

ARTICLE 8—REPRESENTATIONS, CERTIFICATIONS, AND STIPULATIONS

8.01 *Contractor's Representations*

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

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

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

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

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

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

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

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

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

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

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

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

12. Contractor acknowledges that the Owner may apply for federal or state funds, if a source of funding is identified, for this project. Contractor agrees to comply with all document requests of Owner, grant administrator or government agency to process the release of funds.

8.02 *Contractor's Certifications*

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

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

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

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

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

8.03 *Standard General Conditions*

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

(Remainder of page left blank intentionally)

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

This Agreement will be effective on _____ (which is the Effective Date of the Contract).

Owner:	Contractor:
Benton County Solid Waste Disposal Commission	
(typed or printed name of organization)	*(typed or printed name of organization)*
By:	By:
(individual's signature)	*(individual's signature)*
Date:	Date:
(date signed)	*(date signed)*
Name:	Name:
(typed or printed)	*(typed or printed)*
Title:	Title:
(typed or printed)	*(typed or printed)*
	*(If **[Type of Entity]** is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)*
Attest:	Attest:
(individual's signature)	*(individual's signature)*
Title:	Title:
(typed or printed)	*(typed or printed)*
Address for giving notices:	Address for giving notices:
7904-20th Avenue	
Blairstown, IA 52209	
Designated Representative:	Designated Representative:
Name: Eric Werner	Name:
(typed or printed)	*(typed or printed)*
Title: Manager	Title:
(typed or printed)	*(typed or printed)*
Address:	Address:
7904-20th Avenue	
Blairstown, IA 52209	
Phone: (319)454-6392	Phone:
Email: bentonlandfill@netins.net	Email:
*(If **[Type of Entity]** is a corporation, attach evidence of authority to sign. If **[Type of Entity]** is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)*	License No.: _____ *(where applicable)*
	State:

SURETY BOND NO. _____

PERFORMANCE, PAYMENT, AND MAINTENANCE BOND

KNOW ALL BY THESE PRESENTS:

That we, _____, as Principal (hereinafter the "Contractor" or "Principal" and _____, as Surety are held and firmly bound unto the Benton County Solid Waste Disposal Commission, as Obligee (hereinafter referred to as "Owner"), and to all persons who may be injured by any breach of any of the conditions of this Bond in the penal sum of _____ dollars ($_____), lawful money of the United States, for the payment of which sum, well and truly to be made, we bind ourselves, our heirs, legal representatives and assigns, jointly or severally, firmly by these presents.

The conditions of the above obligations are such that whereas said Contractor entered into a contract with the Owner, bearing date the _____ day of _____, 2025, (hereinafter the "Contract") wherein said Contractor undertakes and agrees to construct the following described improvements:

Construction of a Subtitle D composite lined leachate storage lagoon, truck loadout station, and miscellaneous associated work.

and to faithfully perform all the terms and requirements of said Contract within the time therein specified, in a good and workmanlike manner, and in accordance with the Contract Documents.

It is expressly understood and agreed by the Contractor and Surety in this bond that the following provisions are a part of this Bond and are binding upon said Contractor and Surety, to-wit:

1. PERFORMANCE: The Contractor shall well and faithfully observe, perform, fulfill, and abide by each and every covenant, condition, and part of said Contract and Contract Documents, by reference made a part hereof, for the above referenced improvements, and shall indemnify and save harmless the Owner from all outlay and expense incurred by the Owner by reason of the Contractor's default of failure to perform as required. The Contractor shall also be responsible for the default or failure to perform as required under the Contract and Contract Documents by all its subcontractors, suppliers, agents, or employees furnishing materials or providing labor in the performance of the Contract.

2. PAYMENT: The Contractor and the Surety on this Bond hereby agreed to pay all just claims submitted by persons, firms, subcontractors, and corporations furnishing materials for or performing labor in the performance of the Contract on account of which this Bond is given, including but not limited to claims for all amounts due for labor, materials, lubricants, oil, gasoline, repairs on machinery, equipment, and tools, consumed or used by the Contractor or any subcontractor, wherein the same are not satisfied out of the portion of the contract price the Owner is required to retain until completion of the improvement, but the Contractor and Surety shall not be liable to said persons, firms, or corporations unless the claims of said claimants against said portion of the contract price shall have been established as provided by law. The Contractor and Surety hereby bind themselves to the obligations and conditions set forth in Chapter 573 of the Iowa Code, which by this reference is made a part hereof as though fully set out herein.

3. MAINTENANCE: The Contractor and the Surety on this Bond hereby agree, at their own expense:

    A. To remedy any and all defects that may develop in or result from work to be performed under the Contract within the period of two (2) years from the date of acceptance of the

work under the Contract, by reason of defects in workmanship or materials used in construction of said work;

B. To keep all work in continuous good repair; and

C. To pay the Owner's reasonable costs of monitoring and inspection to assure that any defects are remedied, and to repay the Owner all outlay and expense incurred as a result of Contractor's and Surety's failure to remedy any defect as required by this section.

4. GENERAL: Every Surety on this Bond shall be deemed and held bound, any contract to the contrary notwithstanding, to the following provisions:

A. To consent without notice to any extension of time to the Contractor in which to perform the Contract;

B. To consent without notice to any change in the Contract or Contract Documents, which thereby increases the total contract price and the penal sum of this bond, provided that all such changes do not, in the aggregate, involve an increase of more than 20% of the total contract price, and that this bond shall then be released as to such excess increase; and

C. To consent without notice that this Bond shall remain in full force and effect until the Contract is completed, whether completed within the specified contract period, within an extension thereof, or within a period of time after the contract period has elapsed and the liquidated damage penalty is being charged against the Contractor.

D. That no provision of this Bond or of any other contract shall be valid that limits to less that five years after the acceptance of the work under the Contract the right to sue on this Bond.

E. That as used herein, the phrase "all outlay and expense" is not to be limited in any way, but shall include the actual and reasonable costs and expenses incurred by the Owner including interest, benefits, and overhead where applicable. Accordingly, "all outlay and expense" would include but not be limited to all contract or employee expense, all equipment usage or rental, materials, testing, outside experts, attorneys fees (including overhead expenses of the Owner's staff attorneys), and all costs and expenses of litigation as they are incurred by the Owner. It is intended the Contractor and Surety will defend and indemnify the Owner on all claims made against the Owner on account of Contractor's failure to perform as required in the Contract and Contract Documents, that all agreements and promises set forth in the Contract and Contract Documents, in approved change orders, and in this Bond will be fulfilled, and that the Owner will be fully indemnified so that it will be put into the position it would have been in had the Contract been performed in the first instance as required.

In the event the Owner incurs any "outlay and expense" in defending itself against any claim as to which the Contractor or Surety should have provided the defense, or in the enforcement of the promises given by the Contractor in the Contract, Contract Documents, or approved change orders, or in the enforcement of the promises given by the Contractor and Surety in this Bond, the Contractor and Surety agree that they will make the Owner whole for all such outlay and expense, provided that the Surety's obligation under this bond shall not exceed 125% of the penal sum of this bond.

In the event that any actions or proceedings are initiated regarding this Bond, the parties agree that the venue thereof shall be Benton County, State of Iowa. If legal action is required by the Owner to enforce the provisions of this Bond or to collect the monetary obligation incurring to the benefit of the Owner, the Contractor and the Surety agree, jointly, and severally, to pay the Owner all outlay and expense incurred therefor by the Owner. All rights, powers, and remedies of the Owner hereunder shall be cumulative and not

alternative and shall be in addition to all rights, powers, and remedies given to the Owner, by law. The Owner may proceed against surety for any amount guaranteed hereunder whether action is brought against the Contractor or whether Contractor is joined in any such action(s) or not.

NOW THEREFORE, the condition of this obligation is such that if said Principal shall faithfully perform all the promises of the Principal, as set forth and provided in the Contract, in the Contract Documents, and in this Bond, then this obligation shall be null and void, otherwise it shall remain in full force and effect.

When a work, term, or phrase is used in this Bond, it shall be interpreted or construed first as defined in this Bond, the Contract, or the Contract Documents; second, if not defined in the Bond, Contract, or Contract Documents, it shall be interpreted or construed as defined in applicable provisions of the Iowa Code; third, if not defined in the Iowa Code, it shall be interpreted or construed according to its generally accepted meaning in the construction industry; and fourth, if it has no generally accepted meaning in the construction industry, it shall be interpreted or construed according to its common or customary usage.

Failure to specify or particularize shall not exclude terms or provisions not mentioned and shall not limit liability hereunder. The Contract and Contract Documents are hereby made a part of this Bond.

(Remainder of page left blank intentionally)

PRINCIPAL:

Contractor

By

Signature

Title

SURETY:

Surety Company

By

Signature Attorney-in-Fact Officer

Printed Name of Attorney-in-Fact Officer

Company Name

Company Address

City, State, Zip Code

Company Telephone Number

NOTE:

1. **All signatures on this performance, payment, and maintenance bond must be original signatures in ink; copies, facsimile, or electronic signatures will not be accepted.**
2. **This bond must be sealed with the Surety's raised, embossing seal.**
3. **The Certificate or Power of Attorney accompanying this bond must be valid on its face and sealed with the Surety's raised, embossing seal.**
4. **The name and signature of the Surety's Attorney-in-Fact/Officer entered on this bond must be exactly as listed on the Certificate or Power of Attorney accompanying this bond.**

NOTICE OF AWARD

Date of Issuance:			
Owner:	Benton County Solid Waste Disposal Commission	Owner's Project No.:	
Engineer:	HLW Engineering Group	Engineer's Project No.:	6043-23B
Contractor:		Contractor's Project No.:	
Project:	Leachate Storage Lagoon		
Bidder:			
Bidders Address:			

You are notified that Owner has accepted your Bid dated March 18, 2025 for the above Contract, and that you are the Successful Bidder and are awarded a Contract for:

Construction of a leachate storage lagoon, truck loadout station, and miscellaneous associated work

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

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

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

1. Deliver to Owner three counterparts of the Agreement, signed by Bidder (as Contractor).
2. Deliver with the signed Agreement(s) the Contract security (such as required performance and payment bonds) and insurance documentation, as specified in the Instructions to Bidders and in the General Conditions, Articles 2 and 6.
3. Other conditions precedent (if any): 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 10 days after you comply with the above conditions, Owner will return to you one fully signed counterpart of the Agreement, together with any additional copies of the Contract Documents as indicated in Paragraph 2.02 of the General Conditions.

Owner:	Benton County Solid Waste Disposal Commission
By *(signature)*:	
Name *(printed)*:	
Title:	

Copy: Engineer, Owner, & Contractor

NOTICE TO PROCEED

Owner:	Benton County Solid Waste Disposal Commission	Owner's Project No.:	
Engineer:	HLW Engineering Group	Engineer's Project No.:	6043-23B
Contractor:		Contractor's Project No.:	
Project:	Leachate Storage Lagoon		

Effective Date of Contract: _____

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on June 16, 2025.

In accordance with the Agreement:

The date by which readiness for final payment must be achieved is November 1, 2025 for Division 1 and June 5, 2026 for Division 2.

Owner: Benton County Solid Waste Disposal Commission

By *(signature)*: _____

Name *(printed)*: _____

Title: _____

Date Issued: _____

Copy: Engineer, Owner, and Contractor

SHOP DRAWING / O&M MANUAL TRANSMITTAL

Project: **Leachate Storage Lagoon**	Transmittal Date:
Owner: **Benton County Solid Waste Disposal Commission**	Owner's Contract No.:
Engineer: **HLW Engineering Group**	Engineer's Project No.: **6043-23B.600**
Contractor:	

Specification Section:	☐ Shop Drawing	☐ O&M Manual
Transmittal No:	☐ 1st Submittal	☐ Resubmittal (No. ___)

Specification Paragraph Number	Description of Equipment	Manufacturer

As stated in the Contract Documents, the undersigned CONTRACTOR's submission of these Shop Drawings or samples shall constitute a representation to the OWNER and the ENGINEER that the CONTRACTOR has either determined and verified all quantities, dimensions, field construction criteria, materials, catalog numbers and similar data or he assumes full responsibility for doing so, and that he has reviewed and coordinated each Shop Drawing or sample with the requirements of the work and the Contract Documents and he represents to the OWNER and the ENGINEER that item(s) described by these Shop Drawings do comply with the requirements of the Contract Documents. The undersigned Contractor certifies that the equipment included in this submittal complies with the latest requirements of the Occupational Health and Safety Act of 1970 including any standards or regulations established by the U.S. Secretary of Labor in administration of said act, and the Iowa Occupational Safety and Health Statutes.

X_____
(Authorized Signature of Contractor) (Date)

_____
(Firm Name)

NOTE: All pages of this form on which equipment is listed must be signed.

HLW Engineering Group
204 West Broad Street, PO Box 314
Story City, IA 50248
Phone: (515) 733-4144
FAX: (515) 733-4146

Supplier/Contractor Statement of Compliance

Project: **Leachate Storage Lagoon**	Transmittal Date:
Owner: **Benton County Solid Waste Disposal Commission**	Owner's Contract No.:
Engineer: **HLW Engineering Group**	Engineer's Project No.: **6043-23B**
Contractor:	

Specification Section:	Transmittal No:
Equipment Description:	
Supplier/Manufacturer:	

The undersigned hereby states that the information submitted herein accurately describes the material and/or equipment to be provided and that said material and/or equipment conforms with all requirements of the Contract Documents, except as noted below:

1A ☐ No deviations from the Contract Documents included in this submittal.

(OR)

1B ☐ All deviations from the Contract Documents included in this submittal and any modifications required to the project design to accommodate the submitted material and/or equipment are noted below or on attached sheets.

2 ☐ Applicable items are clearly identified and inapplicable data are marked out on all catalog pages included with this submittal.

3 ☐ Applicable receiving, handling and storage requirements are included with this submittal.

List of Deviations:

Supplier Authorized Signature:	Contractor Authorized Signature:
Date:	Date:
Phone:	Phone:

HLW Engineering Group
204 West Broad Street, PO Box 314
Story City, IA 50248
Phone: (515)733-4144
FAX: (515)733-4146

HLW Engineering Group	HLW Office	Owner	HLW Field	Engineer's Subconsultant	General Contractor

SHOP DRAWING RESPONSE COMMENTS

Project: Leachate Storage Lagoon, Benton County Sanitary Landfill

HLW Project No.: 6043-23B.200

Contractor:

Date Received:

Submittal No.:

Item(s):

Manufacturer:

NOTE:

This review is only for general conformance with the design concept of the project and general compliance with the information given in the Contract Documents. Corrections or comments made on the shop drawings during this review do not relieve the Contractor from compliance with the requirements of the Contract Documents. Approval of a specific item shall not include approval of an assembly of which the item is a component. The Contractor is responsible for: dimensions to be confirmed and correlated at the jobsite; information that pertains solely to the fabrication processes or to the means, methods, techniques, sequences and procedures of construction; coordination of the Work of all trades; and for performing all work in a safe and satisfactory manner.

- ☐ A – No Exception Taken
- ☐ B – Address Notations, No Resubmittal
- ☐ C – Revise & Resubmit Items Noted
- ☐ D – Revise & Resubmit Entire Submittal
- ☐ E – Rejected for the Following Reasons

C – Revise & Resubmit Items Noted (do not resubmit entire shop drawing)

D – Revise & Resubmit Entire Submittal: only items specifically noted by Engineer shall be revised. Any other revisions shall be clearly noted on a separate sheet by the Contractor and attached to the resubmittal.

Comments:

1.

2.

3.

By: _____

Date: _____

WORK CHANGE DIRECTIVE NO.: __

Owner:	Benton County Solid Waste Disposal Commission	Owner's Project No.:	
Engineer:	HLW Engineering Group	Engineer's Project No.:	6043-23B
Contractor:		Contractor's Project No.:	
Project:	Leachate Storage Lagoon		
Date Issued:		Effective Date of Work Change Directive:	

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

Description:

[Description of the change to the Work]

Attachments:

[List documents related to the change to the Work]

Purpose for the Work Change Directive:

[Describe the purpose for the change to the Work]

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

Notes to User—Check one or both of the following

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

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

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

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

Basis of estimated change in Contract Price:

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

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

CHANGE ORDER NO.: __

Owner:	Benton County Solid Waste Disposal Commission	Owner's Project No.:	
Engineer:	HLW Engineering Group	Engineer's Project No.:	6043-23B
Contractor:		Contractor's Project No.:	
Project:	Leachate Storage Lagoon		
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:

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

FIELD ORDER NO.: __

Owner:	Benton County Solid Waste Disposal Commission	Owner's Project No.:	
Engineer:	HLW Engineering Group	Engineer's Project No.:	6043-23B
Contractor:		Contractor's Project No.:	
Project:	Leachate Storage Lagoon		
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: _____

Contractor's Application for Payment

Owner:	Benton County Solid Waste Disposal Commission	**Owner's Project No.:**	
Engineer:	HLW Engineering Group	**Engineer's Project No.:**	6043-23B
Contractor:		**Contractor's Project No.:**	
Project:	Leachate Storage Lagoon		
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:**	

Progress Estimate - Unit Price Work | **Contractor's Application for Payment**

Owner:	Benton County Solid Waste Disposal Commission	**Owner's Project No.:**	
Engineer:	HLW Engineering Group	**Engineer's Project No.:**	6043-23B
Contractor:		**Contractor's Project No.:**	
Project:	Leachate Storage Lagoon		
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) ($)	% of Value of Item (J / F) (%)	Balance to Finish (F - J) ($)
					Original Contract						
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
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					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
				Original Contract Totals	$ -		$ -	$ -	$ -		$ -
					Change Orders						
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
					-		-		-		-
				Change Order Totals	$ -		$ -	$ -	$ -		$ -
					Original Contract and Change Orders						
				Project Totals	$ -		$ -	$ -	$ -		$ -

Stored Materials Summary | **Contractor's Application for Payment**

Owner:	Benton County Solid Waste Disposal Commission	**Owner's Project No.:**	
Engineer:	HLW Engineering Group	**Engineer's Project No.:**	6043-23B
Contractor:		**Contractor's Project No.:**	
Project:	Leachate Storage Lagoon		
Contract:			

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

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

CERTIFICATE OF SUBSTANTIAL COMPLETION

Owner:	Benton County Solid Waste Disposal Commission	Owner's Project No.:	
Engineer:	HLW Engineering Group	Engineer's Project No.:	6043-23B
Contractor:		Contractor's Project No.:	
Project:	Leachate Storage Lagoon		

This ☐ Preliminary ☐ Final Certificate of Substantial Completion applies to:

☐ All Work ☐ The following specified portions of the Work:

[Describe the portion of the work for which Certificate of Substantial Completion is issued]

Date of Substantial Completion: **[Enter date, as determined by Engineer]**

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the Work or portion thereof designated above is hereby established, subject to the provisions of the Contract pertaining to Substantial Completion. The date of Substantial Completion in the final Certificate of Substantial Completion marks the commencement of the contractual correction period and applicable warranties required by the Contract.

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

Amendments of contractual responsibilities recorded in this Certificate should be the product of mutual agreement of Owner and Contractor; see Paragraph 15.03.D of the General Conditions.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance, and warranties upon Owner's use or occupancy of the Work must be as provided in the Contract, except as amended as follows:

Amendments to Owner's Responsibilities: ☐ None ☐ As follows:

[List amendments to Owner's Responsibilities]

Amendments to Contractor's Responsibilities: ☐ None ☐ As follows:

[List amendments to Contractor's Responsibilities]

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

[List attachments such as punch list; other documents]

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

Engineer

By *(signature)*: _____

Name *(printed)*: _____

Title: _____

PART II - CONTRACT DOCUMENTS

B. Conditions of the Contract

1. C-700 - General Conditions

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

TABLE OF CONTENTS

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

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

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

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

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

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

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

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

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

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

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

10. *Claim*

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

41. *Submittal*—A written or graphic document, prepared by or for Contractor, which the Contract Documents require Contractor to submit to Engineer, or that is indicated as a Submittal in the Schedule of Submittals accepted by Engineer. Submittals may include Shop Drawings and Samples; schedules; product data; Owner-delegated designs; sustainable design information; information on special procedures; testing plans; results of tests and evaluations, source quality-control testing and inspections, and field or Site quality-control testing and inspections; warranties and certifications; Suppliers' instructions and reports; records of delivery of spare parts and tools; operations and maintenance data; Project photographic documentation; record documents; and other such documents required by the Contract Documents. Submittals, whether or not approved or accepted by Engineer, are not Contract Documents. Change Proposals, Change Orders, Claims, notices, Applications for Payment, and requests for interpretation or clarification are not Submittals.

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

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

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

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

46. *Technical Data*

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

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

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

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

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

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

50. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work. Contractor must sign directive before work begins. No payment will be made by Owner unless all parties (Owner, Contractor and Engineer) have signed.

1.02 *Terminology*

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

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

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

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

1. does not conform to the Contract Documents;

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

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

E. *Furnish, Install, Perform, Provide*

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

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

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

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

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

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

ARTICLE 2—PRELIMINARY MATTERS

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

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

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

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

2.02 *Copies of Documents*

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

B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

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

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

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work

into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

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

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

2.05 *Acceptance of Schedules*

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

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

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

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

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

2.06 *Electronic Transmittals*

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

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

C. Electronic means and communications shall be retained in native form by all parties for a period of two (2) years following the certification of the Engineer for final completion.

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

differing from those used in the drafting or transmittal of the Electronic Documents.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

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

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

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

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

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

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

G. Nothing in the Contract Documents creates:

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

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

3.02 *Reference Standards*

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

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

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

performance of the Work, or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*

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

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

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

B. *Resolving Discrepancies*

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

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

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

3.04 *Requirements of the Contract Documents*

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

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

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

3.05 *Reuse of Documents*

A. Contractor and its Subcontractors and Suppliers shall not:

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

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

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

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

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

4.02 *Starting the Work*

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

4.03 *Reference Points*

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the

established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.04 *Progress Schedule*

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

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

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

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

4.05 *Delays in Contractor's Progress*

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

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

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

1. Severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;

2. Abnormal weather conditions;

3. Acts or failures to act of third-party utility owners or other third-party entities (other than those third-party utility owners or other third-party entities performing other work at or adjacent to the Site as arranged by or under contract with Owner, as contemplated in Article 8); and

4. Acts of war or terrorism.

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

1. Contractor's entitlement to an adjustment of the Contract Times is conditioned on the delay, disruption, or interference adversely affecting an activity on the critical path to completion of the Work, as of the time of the delay, disruption, or interference.

2. Contractor shall not be entitled to an adjustment in Contract Price for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor. Such a concurrent delay by Contractor shall not preclude an adjustment of Contract Times to which Contractor is otherwise entitled.

3. Adjustments of Contract Times or Contract Price are subject to the provisions of Article 11.

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

1. The circumstances that form the basis for the requested adjustment;

2. The date upon which each cause of delay, disruption, or interference began to affect the progress of the Work;

3. The date upon which each cause of delay, disruption, or interference ceased to affect the progress of the Work;

4. The number of days' increase in Contract Times claimed as a consequence of each such cause of delay, disruption, or interference; and

5. The impact on Contract Price, in accordance with the provisions of Paragraph 11.07.

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

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

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

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

5.01 *Availability of Lands*

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

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

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

5.02 *Use of Site and Other Areas*

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

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

2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.13, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or in a court of competent jurisdiction; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

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

C. *Cleaning*: Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment

and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

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

5.03 *Subsurface and Physical Conditions*

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

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

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

3. Technical Data contained in such reports and drawings.

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

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

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

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

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

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

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

5.04 *Differing Subsurface or Physical Conditions*

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

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

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

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

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

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

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

C. *Owner's Statement to Contractor Regarding Site Condition*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

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

E. *Possible Price and Times Adjustments*

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in

Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

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

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

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

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

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

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

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

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

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

F. *Underground Facilities; Hazardous Environmental Conditions*: Paragraph 5.05 governs rights and responsibilities regarding the presence or location of Underground Facilities. Paragraph 5.06 governs rights and responsibilities regarding Hazardous Environmental Conditions. The provisions of Paragraphs 5.03 and 5.04 are not applicable to the presence or location of Underground Facilities, or to Hazardous Environmental Conditions.

5.05 *Underground Facilities*

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

F. *Possible Price and Times Adjustments*

1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, to the extent that any existing Underground Facility at the Site that was not shown

or indicated on the Drawings, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

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

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

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

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

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

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

5.06 *Hazardous Environmental Conditions at Site*

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

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

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

3. Technical Data contained in such reports and drawings.

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

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures

of construction to be employed by Contractor, and safety precautions and programs incident thereto;

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

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

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

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

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

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

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

H. If, after receipt of such written notice, Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special

conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.

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

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

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

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

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

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

C. All bonds must be in the form included in the Bidding Documents or otherwise specified by Owner prior to execution of the Contract, except as provided otherwise by Laws or

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

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

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

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

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

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

6.02 *Insurance—General Provisions*

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

B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized in the state or jurisdiction in which the Project is located to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.

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

D. Contractor shall deliver to Owner, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Contractor has obtained and is maintaining the policies and coverages required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, full disclosure of all relevant exclusions, and evidence of insurance required to be purchased and maintained by

Subcontractors or Suppliers. In any documentation furnished under this provision, Contractor, Subcontractors, and Suppliers may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those applicable to this Contract.

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

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

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

H. Contractor shall require:

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

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

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

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

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

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

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

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

6.03 *Contractor's Insurance*

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

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

1. include at least the specific coverages required;

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

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

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

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

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

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

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

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

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

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

6.04 *Builder's Risk and Other Property Insurance*

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

1. Contractor to maintain insurance for any materials stored on site and not yet installed.

2. Contractor to maintain coverage for damage to liner until cell is complete and project is turned over to owner.

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

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

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

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

6.05 *Property Losses; Subrogation*

A. The builder's risk insurance policy purchased and maintained in accordance with

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

1. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils, risks, or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all individuals or entities identified in the Supplementary Conditions as builder's risk or installation floater insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused.
2. None of the above waivers extends to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.

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

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

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

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

6.06 *Receipt and Application of Property Insurance Proceeds*

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

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

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

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.01 *Contractor's Means and Methods of Construction*

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

B. If the Contract Documents note, or Contractor determines, that professional engineering or other design services are needed to carry out Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures, or for Site safety, then Contractor shall cause such services to be provided by a properly licensed design professional, at Contractor's expense. Such services are not Owner-delegated professional design services under this Contract, and neither Owner nor Engineer has any responsibility with respect to (1) Contractor's determination of the need for such services, (2) the qualifications or licensing of the design professionals retained or employed by Contractor, (3) the performance of such services, or (4) any errors, omissions, or defects in such services.

7.02 *Supervision and Superintendence*

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

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

7.03 *Labor; Working Hours*

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

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

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

7.04 *Services, Materials, and Equipment*

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

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

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

7.05 *"Or Equals"*

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

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

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

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

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

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

4) is not objectionable to Owner.

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

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

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

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

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

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

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

7.06 *Substitutes*

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

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

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

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

    a. will certify that the proposed substitute item will:

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

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

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

    b. will state:

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

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

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

    c. will identify:

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

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

    d. will contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.

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

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

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

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

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

7.07 *Concerning Subcontractors and Suppliers*

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

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

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

D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within 5 days.

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

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

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

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

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

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

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

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

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

7.08 *Patent Fees and Royalties*

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

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

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

7.09 *Permits*

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

B. Contractor to be responsible for coordination of all work with utilities and any modifications of those services.

7.10 *Taxes*

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

7.11 *Laws and Regulations*

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

B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It is not Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this does not relieve Contractor of its obligations under Paragraph 3.03.

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

7.12 *Record Documents*

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

to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

7.13 *Safety and Protection*

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

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

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

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

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

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

D. All damage, injury, or loss to any property referred to in Paragraph 7.13.C.2 or 7.13.C.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

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

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

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

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

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

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

7.14 *Hazard Communication Programs*

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

7.15 *Emergencies*

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

7.16 *Submittals*

A. *Shop Drawing and Sample Requirements*

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

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

b. determine and verify:

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

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

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

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

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

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

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

1. *Shop Drawings*

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

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

2. *Samples*

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

b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the Submittal for the limited purposes required by Paragraph 7.16.C.

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

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

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

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

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

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

document any such approved variation from the requirements of the Contract Documents in a Field Order or other appropriate Contract modification.

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

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

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

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

D. *Resubmittal Procedures for Shop Drawings and Samples*

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

2. Contractor shall furnish required Shop Drawing and Sample submittals with sufficient information and accuracy to obtain required approval of an item with no more than two resubmittals. Engineer will record Engineer's time for reviewing a third or subsequent resubmittal of a Shop Drawing or Sample, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges.

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

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

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

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

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

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

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

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

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

7.17 *Contractor's General Warranty and Guarantee*

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

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

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

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

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

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

2. normal wear and tear under normal usage.

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

1. Observations by Engineer;

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

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

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

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

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

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

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

9. Any correction of defective Work by Owner.

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

7.18 *Indemnification*

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

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

7.19 *Delegation of Professional Design Services*

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

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

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

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

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

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

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

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

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

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

ARTICLE 8—OTHER WORK AT THE SITE

8.01 *Other Work*

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

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

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

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

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

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

8.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:

1. The identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;

2. An itemization of the specific matters to be covered by such authority and responsibility; and

3. The extent of such authority and responsibilities.

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

8.03 *Legal Relationships*

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

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

1. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this Paragraph 8.03.B.

2. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due Contractor.

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

ARTICLE 9—OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

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

9.02 *Replacement of Engineer*

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

9.03 *Furnish Data*

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

9.04 *Pay When Due*

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

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

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

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

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

9.06 *Insurance*

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

9.07 *Change Orders*

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

9.08 *Inspections, Tests, and Approvals*

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

9.09 *Limitations on Owner's Responsibilities*

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

9.10 *Undisclosed Hazardous Environmental Condition*

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

9.11 *Evidence of Financial Arrangements*

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

9.12 *Safety Programs*

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

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

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

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

10.02 *Visits to Site*

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

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

10.03 *Resident Project Representative*

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

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

10.04 *Engineer's Authority*

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

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

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

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

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

10.05 *Determinations for Unit Price Work*

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

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

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

10.07 *Limitations on Engineer's Authority and Responsibilities*

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

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

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

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

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

10.08 *Compliance with Safety Program*

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

ARTICLE 11—CHANGES TO THE CONTRACT

11.01 *Amending and Supplementing the Contract*

A. The Contract may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order, executed in writing by the Owner, Engineer, and Contractor.

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 and executed by the Owner, Engineer, and Contractor.

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

11.02 *Change Orders*

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

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

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

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

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

11.03 *Work Change Directives*

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

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

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

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

11.04 *Field Orders*

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

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

11.05 *Owner-Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Changes involving the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters will be supported by Engineer's recommendation.

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

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

11.06 *Unauthorized Changes in the Work*

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

11.07 *Change of Contract Price*

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

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

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

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

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

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

1. A mutually acceptable fixed fee; or

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

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

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

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

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

e. The amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in Cost of the Work will be the amount of the actual net decrease in Cost of the Work and a deduction of an additional amount equal to 5 percent of such actual net decrease in Cost of the Work; and

f. When both additions and credits are involved in any one change or Change Proposal, the adjustment in Contractor's fee will be computed by determining the sum of the costs in each of the cost categories in Paragraph 13.01.B (specifically, payroll costs, Paragraph 13.01.B.1; incorporated materials and equipment costs, Paragraph 13.01.B.2; Subcontract costs, Paragraph 13.01.B.3; special consultants costs, Paragraph 13.01.B.4; and other costs, Paragraph 13.01.B.5) and applying to each such cost category sum the appropriate fee from Paragraphs 11.07.C.2.a through 11.07.C.2.e, inclusive.

11.08 *Change of Contract Times*

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

B. Delay, disruption, and interference in the Work, and any related changes in Contract Times, are addressed in and governed by Paragraph 4.05.

11.09 *Change Proposals*

A. *Purpose and Content*: Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; contest an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; challenge a set-off against payment due; or seek other relief under the Contract. The Change Proposal will specify any proposed change in Contract Times or Contract Price, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents. Each Change Proposal will address only one issue, or a set of closely related issues.

B. *Change Proposal Procedures*

1. *Submittal*: Contractor shall submit each Change Proposal to Engineer within 30 days after the start of the event giving rise thereto, or after such initial decision.

2. *Supporting Data*: The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal.

    a. Change Proposals based on or related to delay, interruption, or interference must comply with the provisions of Paragraphs 4.05.D and 4.05.E.

    b. Change proposals related to a change of Contract Price must include full and detailed accounts of materials incorporated into the Work and labor and equipment used for the subject Work.

    The supporting data must be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event.

3. *Engineer's Initial Review*: Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal. If in its discretion Engineer concludes that additional supporting data is needed before conducting a full review and making a decision regarding the Change Proposal, then Engineer may request that Contractor submit such additional supporting data by a date specified by Engineer, prior to Engineer beginning its full review of the Change Proposal.

4. *Engineer's Full Review and Action on the Change Proposal*: Upon receipt of Contractor's supporting data (including any additional data requested by Engineer), Engineer will conduct a full review of each Change Proposal and, within 30 days after such receipt of the Contractor's supporting data, either approve the Change Proposal in whole, deny it in whole, or approve it in part and deny it in part. Such actions must be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change

Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

5. *Binding Decision*: Engineer's decision is final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.

C. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties in writing that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice will be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

D. *Post-Completion*: Contractor shall not submit any Change Proposals after Engineer issues a written recommendation of final payment pursuant to Paragraph 15.06.B.

11.10 *Notification to Surety*

A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 12—CLAIMS

12.01 *Claims*

A. *Claims Process*: The following disputes between Owner and Contractor are subject to the Claims process set forth in this article:

1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;

2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents;

3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters; and

4. Subject to the waiver provisions of Paragraph 15.07, any dispute arising after Engineer has issued a written recommendation of final payment pursuant to Paragraph 15.06.B.

B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim rests with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge

and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim will be stated in writing and submitted to the other party, with a copy to Engineer.

D. *Mediation*

1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate will stay the Claim submittal and response process.

2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process will resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process will resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.

E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action will be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.

F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim will be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.

G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim will be incorporated in a Change Order or other written document to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13—COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 *Cost of the Work*

A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:

1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or

2. When needed to determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.

B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work will be in amounts no higher than those commonly incurred in the locality of the Project, will not include any of the costs itemized in Paragraph 13.01.C, and will include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor in advance of the subject Work. Such employees include, without limitation, superintendents, foremen, safety managers, safety representatives, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work will be apportioned on the basis of their time spent on the Work. Payroll costs include, but are not limited to, salaries and wages plus the cost of fringe benefits, which include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, will be included in the above to the extent authorized by Owner.

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

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, which will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee will be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.

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

5. Other costs consisting of the following:

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

b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, which are

consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

1) In establishing included costs for materials such as scaffolding, plating, or sheeting, consideration will be given to the actual or the estimated life of the material for use on other projects; or rental rates may be established on the basis of purchase or salvage value of such items, whichever is less. Contractor will not be eligible for compensation for such items in an amount that exceeds the purchase cost of such item.

c. *Construction Equipment Rental*

1) Rentals of all construction equipment and machinery, and the parts thereof, in accordance with rental agreements approved by Owner as to price (including any surcharge or special rates applicable to overtime use of the construction equipment or machinery), and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs will be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts must cease when the use thereof is no longer necessary for the Work.

2) Costs for equipment and machinery owned by Contractor or a Contractor-related entity will be paid at a rate shown for such equipment in the equipment rental rate book specified in the Supplementary Conditions. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs.

3) With respect to Work that is the result of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price ("changed Work"), included costs will be based on the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, must cease to accrue when the use thereof is no longer necessary for the changed Work.

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

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

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of builder's risk or other property insurance established in accordance with Paragraph 6.04), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses will be included in the Cost of the Work for the purpose of determining Contractor's fee.

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

h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.

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

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

1. Payroll costs and other compensation of Contractor's officers, executives, principals, general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.

2. The cost of purchasing, renting, or furnishing small tools and hand tools.

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

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

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

6. Expenses incurred in preparing and advancing Claims.

7. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee*

1. When the Work as a whole is performed on the basis of cost-plus-a-fee, then:

a. Contractor's fee for the Work set forth in the Contract Documents as of the Effective Date of the Contract will be determined as set forth in the Agreement.

b. for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work, Contractor's fee will be determined as follows:

1) When the fee for the Work as a whole is a percentage of the Cost of the Work, the fee will automatically adjust as the Cost of the Work changes.

2) When the fee for the Work as a whole is a fixed fee, the fee for any additions or deletions will be determined in accordance with Paragraph 11.07.C.2.

2. When the Work as a whole is performed on the basis of a stipulated sum, or any other basis other than cost-plus-a-fee, then Contractor's fee for any Work covered by a Change

Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work will be determined in accordance with Paragraph 11.07.C.2.

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

13.02 *Allowances*

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

B. *Cash Allowances*: Contractor agrees that:

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

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

C. *Owner's Contingency Allowance*: Contractor agrees that an Owner's contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

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

13.03 *Unit Price Work*

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

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.

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

D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision

thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, and the final adjustment of Contract Price will be set forth in a Change Order, subject to the provisions of the following paragraph.

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:

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

b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.

2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.

3. Adjusted unit prices will apply to all units of that item.

ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

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

14.02 *Tests, Inspections, and Approvals*

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

B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work will be governed by the provisions of Paragraph 14.05.

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

D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:

1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;

2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;

3. by manufacturers of equipment furnished under the Contract Documents;

4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and

5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests will be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.

F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering will be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

A. *Contractor's Obligation*: It is Contractor's obligation to assure that the Work is not defective.

B. *Engineer's Authority*: Engineer has the authority to determine whether Work is defective, and to reject defective Work.

C. *Notice of Defects*: Prompt written notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.

D. *Correction, or Removal and Replacement*: Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.

E. *Preservation of Warranties*: When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

F. *Costs and Damages*: In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs,

losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work will be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.

B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.

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

1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.

2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work,

or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work will not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace defective Work as required by Engineer, then Owner may, after 7 days' written notice to Contractor, correct or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.

C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

ARTICLE 15—PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 *Progress Payments*

A. *Basis for Progress Payments*: The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments for Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.

B. *Applications for Payments*

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents.

2. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment must also be accompanied by: (a) a bill of sale, invoice, copies of subcontract or purchase order payments, or other documentation

establishing full payment by Contractor for the materials and equipment; (b) at Owner's request, documentation warranting that Owner has received the materials and equipment free and clear of all Liens; and (c) evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

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

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

C. *Review of Applications*

1. Engineer will, within 20 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. Engineer shall document the date that the Application was received and the date each subsequent resubmittal was received.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

   a. the Work has progressed to the point indicated;

   b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and

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

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

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

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

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

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

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

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

    d. to make any examination to ascertain how or for what purposes Contractor has used the money paid by Owner; or

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

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.

6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:

    a. the Work is defective, requiring correction or replacement;

    b. the Contract Price has been reduced by Change Orders;

    c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

    d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or

    e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due*

1. Thirty (30) 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, unless any liquidated damages are assessed and withheld, notice of such withholding being given to Contractor with seven (7) business days of the Owner issuing payment.

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 written notice within seven (7) business days (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed will be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld will be treated as an amount due as determined by Paragraph 15.01.D.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than 7 days after the time of payment by Owner.

15.03 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify

Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

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

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which will fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have 7 days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.

F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

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

significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. At any time, Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through 15.03.E for that part of the Work.

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

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.04 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *Final Payment*

A. *Application for Payment*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.12), and other documents, Contractor may make application for final payment.

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

   a. all documentation called for in the Contract Documents;

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

   c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.

d. a list of all duly pending Change Proposals and Claims; and

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

3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

B. *Engineer's Review of Final Application and Recommendation of Payment*: If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within 20 days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the final Application for Payment to Owner for payment. Such recommendation will account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Notice of Acceptability*: In support of its recommendation of payment of the final Application for Payment, Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to stated limitations in the notice and to the provisions of Paragraph 15.07.

D. *Completion of Work*: The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment and issuance of notice of the acceptability of the Work.

E. *Final Payment Becomes Due*: Upon receipt from Engineer of the final Application for Payment and accompanying documentation, Owner shall set off against the amount recommended by Engineer for final payment any further sum to which Owner is entitled, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions of this Contract with respect to progress payments. Owner shall pay the resulting balance due to Contractor within 30 days of Owner's receipt of the final Application for Payment from Engineer.

15.07 *Waiver of Claims*

A. By making final payment, Owner waives its claim or right to liquidated damages or other damages for late completion by Contractor, except as set forth in an outstanding Claim,

appeal under the provisions of Article 17, set-off, or express reservation of rights by Owner. Owner reserves all other claims or rights after final payment.

B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted as a Claim, or appealed under the provisions of Article 17.

15.08 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the Supplementary Conditions or the terms of any applicable special guarantee required by the Contract Documents), Owner gives Contractor written notice that any Work has been found to be defective, or that Contractor's repair of any damages to the Site or adjacent areas has been found to be defective, then after receipt of such notice of defect Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

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

B. Owner shall give any such notice of defect within 60 days of the discovery that such Work or repairs is defective. If such notice is given within such 60 days but after the end of the correction period, the notice will be deemed a notice of defective Work under Paragraph 7.17.B.

C. If, after receipt of a notice of defect within 60 days and within the correction period, Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others). Contractor's failure to pay such costs, losses, and damages within 10 days of invoice from Owner will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the failure to pay.

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

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

F. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph are not to be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times directly attributable to any such suspension. Any Change Proposal seeking such adjustments must be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment, or failure to adhere to the Progress Schedule);

2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;

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

4. Contractor's repeated disregard of the authority of Owner or Engineer.

B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) 10 days' written notice that Owner is considering a declaration that Contractor is in default and termination of the Contract, Owner may proceed to:

1. declare Contractor to be in default, and give Contractor (and any surety) written notice that the Contract is terminated; and

2. enforce the rights available to Owner under any applicable performance bond.

C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.

D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within 7 days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.

E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects,

attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

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

G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond will govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate for Convenience*

A. Upon 7 days' written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

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

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

3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.

B. Contractor shall not be paid for any loss of anticipated profits or revenue, post-termination overhead costs, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon 7 days' written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, 7 days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The

provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17—FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

A. *Disputes Subject to Final Resolution*: The following disputed matters are subject to final resolution under the provisions of this article:

1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full, pursuant to Article 12; and

2. Disputes between Owner and Contractor concerning the Work, or obligations under the Contract Documents, that arise after final payment has been made.

B. *Final Resolution of Disputes*: For any dispute subject to resolution under this article, Owner or Contractor may:

1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions;

2. agree with the other party to submit the dispute to another dispute resolution process; or

3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18—MISCELLANEOUS

18.01 *Giving Notice*

A. Whenever any provision of the Contract requires the giving of written notice to Owner, Engineer, or Contractor, it will be deemed to have been validly given only if delivered:

1. in person, by a commercial courier service or otherwise, to the recipient's place of business;

2. by registered or certified mail, postage prepaid, to the recipient's place of business; or

3. by e-mail to the recipient, with the words "Formal Notice" or similar in the e-mail's subject line.

18.02 *Computation of Times*

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

18.03 *Cumulative Remedies*

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

18.04 *Limitation of Damages*

A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project. Contractor is limited to damages submitted in writing to Engineer and Owner prior to application for final payment.

18.05 *Mitigation of Damages*

A. The parties have the obligation under the contract to mitigate their damages as required by Iowa Law.

18.06 *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.

18.07 *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.

18.08 *Controlling Law*

A. This Contract is to be governed by the law of the state of Iowa. The parties agree to any litigation shall be venued in Benton County District Court or the Northern District of Iowa, Cedar Rapids Division.

18.09 *Assignment of Contract*

A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party to this Contract of any rights under or interests in the Contract will be binding on the other party without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract.

18.10 *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.

18.11 *Headings*

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

PART II - CONTRACT DOCUMENTS

B. Conditions of the Contract

2. C-800 - Supplementary Conditions

SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT

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SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT

These Supplementary Conditions amend or supplement EJCDC® C-700, Standard General Conditions of the Construction Contract (2018). The General Conditions remain in full force and effect except as amended.

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

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

ARTICLE 1—DEFINITIONS AND TERMINOLOGY (NOT MODIFIED)

ARTICLE 2—PRELIMINARY MATTERS

2.06 *Electronic Transmittals*

SC-2.06 Delete Paragraphs 2.06.B and 2.06.C in their entirety and insert the following in their place:

B. *Electronic Documents Protocol:* The parties shall conform to the following provisions in Paragraphs 2.06.B and 2.06.C, together referred to as the Electronic Documents Protocol (“EDP” or “Protocol”) for exchange of electronic transmittals.

1. *Basic Requirements*

a. To the fullest extent practical, the parties agree to and will transmit and accept Electronic Documents in an electronic or digital format using the procedures described in this Protocol. Use of the Electronic Documents and any information contained therein is subject to the requirements of this Protocol and other provisions of the Contract.

b. The contents of the information in any Electronic Document will be the responsibility of the transmitting party.

c. Electronic Documents as exchanged by this Protocol may be used in the same manner as the printed versions of the same documents that are exchanged using non-electronic format and methods, subject to the same governing requirements, limitations, and restrictions, set forth in the Contract Documents.

d. Except as otherwise explicitly stated herein, the terms of this Protocol will be incorporated into any other agreement or subcontract between a party and any third party for any portion of the Work on the Project, or any Project-related services, where that third party is, either directly or indirectly, required to exchange Electronic Documents with a party or with Engineer. Nothing herein will modify the requirements of the Contract regarding communications between and among the parties and their subcontractors and consultants.

e. When transmitting Electronic Documents, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items

resulting from the receiving party's use of software application packages, operating systems, or computer hardware differing from those established in this Protocol.

f. Nothing herein negates any obligation 1) in the Contract to create, provide, or maintain an original printed record version of Drawings and Specifications, signed and sealed according to applicable Laws and Regulations; 2) to comply with any applicable Law or Regulation governing the signing and sealing of design documents or the signing and electronic transmission of any other documents; or 3) to comply with the notice requirements of Paragraph 18.01 of the General Conditions.

2. *System Infrastructure for Electronic Document Exchange*

a. Each party will provide hardware, operating system(s) software, internet, e-mail, and large file transfer functions ("System Infrastructure") at its own cost and sufficient for complying with the EDP requirements. With the exception of minimum standards set forth in this EDP, and any explicit system requirements specified by attachment to this EDP, it is the obligation of each party to determine, for itself, its own System Infrastructure.

1) Each Party assumes full and complete responsibility for any and all of its own costs, delays, deficiencies, and errors associated with converting, translating, updating, verifying, licensing, or otherwise enabling its System Infrastructure, including operating systems and software, for use with respect to this EDP.

b. Each party is responsible for its own system operations, security, back-up, archiving, audits, printing resources, and other Information Technology ("IT") for maintaining operations of its System Infrastructure during the Project, including coordination with the party's individual(s) or entity responsible for managing its System Infrastructure and capable of addressing routine communications and other IT issues affecting the exchange of Electronic Documents.

c. Each party will operate and maintain industry-standard, industry-accepted, ISO-standard, commercial-grade security software and systems that are intended to protect the other party from: software viruses and other malicious software like worms, trojans, adware; data breaches; loss of confidentiality; and other threats in the transmission to or storage of information from the other parties, including transmission of Electronic Documents by physical media such as CD/DVD/flash drive/hard drive. To the extent that a party maintains and operates such security software and systems, it shall not be liable to the other party for any breach of system security.

d. In the case of disputes, conflicts, or modifications to the EDP required to address issues affecting System Infrastructure, the parties shall cooperatively resolve the issues; but, failing resolution, the Owner is authorized to make and require reasonable and necessary changes to the EDP to effectuate its original intent. If the changes cause additional cost or time to Contractor, not reasonably anticipated under the original EDP, Contractor may seek an adjustment in price or time under the appropriate process in the Contract.

e. Each party is responsible for its own back-up and archive of documents sent and received during the term of the contract under this EDP, unless this EDP establishes

a Project document archive, either as part of a mandatory Project website or other communications protocol, upon which the parties may rely for document archiving during the specified term of operation of such Project document archive. Further, each party remains solely responsible for its own post-Project back-up and archive of Project documents after the term of the Contract, or after termination of the Project document archive, if one is established, for as long as required by the Contract and as each party deems necessary for its own purposes.

f. If a receiving party receives an obviously corrupted, damaged, or unreadable Electronic Document, the receiving party will advise the sending party of the incomplete transmission.

g. The parties will bring any non-conforming Electronic Documents into compliance with the EDP. The parties will attempt to complete a successful transmission of the Electronic Document or use an alternative delivery method to complete the communication.

C. *Software Requirements for Electronic Document Exchange; Limitations*

1. Each party will acquire the software and software licenses necessary to create and transmit Electronic Documents and to read and to use any Electronic Documents received from the other party (and if relevant from third parties), using the software formats required in this section of the EDP.

2. The parties agree not to intentionally edit, reverse engineer, decrypt, remove security or encryption features, or convert to another format for modification purposes any Electronic Document or information contained therein that was transmitted in a software data format, including Portable Document Format (PDF), intended by sender not to be modified, unless the receiving party obtains the permission of the sending party or is citing or quoting excerpts of the Electronic Document for Project purposes.

3. Software and data formats for exchange of Electronic Documents will conform to the requirements set forth in Exhibit A to this EDP, including software versions, if listed.

SC-2.06 Supplement Paragraph 2.06 of the General Conditions by adding the following paragraph:

D. *Requests by Contractor for Electronic Documents in Other Formats*

1. Release of any Electronic Document versions of the Project documents in formats other than those identified in the Electronic Documents Protocol (if any) or elsewhere in the Contract will be at the sole discretion of the Owner.

2. To extent determined by Owner, in its sole discretion, to be prudent and necessary, release of Electronic Documents versions of Project documents and other Project information requested by Contractor ("Request") in formats other than those identified in the Electronic Documents Protocol (if any) or elsewhere in the Contract will be subject to the provisions of the Owner's response to the Request, and to the following conditions to which Contractor agrees:

a. The content included in the Electronic Documents created by Engineer and covered by the Request was prepared by Engineer as an internal working document for Engineer's purposes solely, and is being provided to Contractor on an "AS IS" basis without any warranties of any kind, including, but not limited to any implied warranties of fitness for any purpose. As such, Contractor is advised and

acknowledges that the content may not be suitable for Contractor's application, or may require substantial modification and independent verification by Contractor. The content may include limited resolution of models, not-to-scale schematic representations and symbols, use of notes to convey design concepts in lieu of accurate graphics, approximations, graphical simplifications, undocumented intermediate revisions, and other devices that may affect subsequent reuse.

b. Electronic Documents containing text, graphics, metadata, or other types of data that are provided by Engineer to Contractor under the request are only for convenience of Contractor. Any conclusion or information obtained or derived from such data will be at the Contractor's sole risk and the Contractor waives any claims against Engineer or Owner arising from use of data in Electronic Documents covered by the Request.

c. Contractor shall indemnify and hold harmless Owner and Engineer and their subconsultants from all claims, damages, losses, and expenses, including attorneys' fees and defense costs arising out of or resulting from Contractor's use, adaptation, or distribution of any Electronic Documents provided under the Request.

d. Contractor agrees not to sell, copy, transfer, forward, give away or otherwise distribute this information (in source or modified file format) to any third party without the direct written authorization of Engineer, unless such distribution is specifically identified in the Request and is limited to Contractor's subcontractors. Contractor warrants that subsequent use by Contractor's subcontractors complies with all terms of the Contract Documents and Owner's response to Request.

3. In the event that Owner elects to provide or directs the Engineer to provide to Contractor any Contractor-requested Electronic Document versions of Project information that is not explicitly identified in the Contract Documents as being available to Contractor, the Owner shall be reimbursed by Contractor on an hourly basis (at $150 per hour) for any engineering costs necessary to create or otherwise prepare the data in a manner deemed appropriate by Engineer.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE (NOT MODIFIED)

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK (NOT MODIFIED)

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

5.03 *Subsurface and Physical Conditions*

SC-5.03 Add the following new paragraphs immediately after Paragraph 5.03.D:

E. The following table lists the reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data, and specifically identifies the Technical Data in the report upon which Contractor may rely:

Report Title	Date of Report	Technical Data
Conceptual Development Plan	February, 2022	Soil Borings

F. The following table lists the drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data, and specifically identifies the Technical Data upon which Contractor may rely:

Drawings Title	Date of Drawings	Technical Data
Construction Observation Report – Phase III Cell G, by Barker Lemar Engineering Consultants	October, 2015	Phase III Cell G liner boundary, liner elevations, leachate and groundwater piping information, landfill infrastructure
Quality Control and Assurance Report- Phase III Cell H Expansion	September, 2023	Phase III Cell H liner boundary, liner elevations, leachate piping information, landfill infrastructure

G. Contractor may examine copies of reports and drawings identified in SC-5.03.E and SC-5.03.F that were not included with the Bidding Documents at HLW Engineering, 204 W. Broad Street, Story City, IA during regular business hours, or may request copies from Engineer.

5.06 *Hazardous Environmental Conditions*

SC-5.06 Add the following new paragraphs immediately after Paragraph 5.06.A.3:

4. The following table lists the reports known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and the Technical Data (if any) upon which Contractor may rely:

Report Title	Date of Report	Technical Data
None		

5. The following table lists the drawings known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and Technical Data (if any) contained in such Drawings upon which Contractor may rely:

Drawings Title	Date of Drawings	Technical Data
None		

ARTICLE 6—BONDS AND INSURANCE

6.03 *Contractor's Insurance*

SC-6.03 Supplement Paragraph 6.03 with the following provisions after Paragraph 6.03.C:

D. *Other Additional Insureds:* As a supplement to the provisions of Paragraph 6.03.C of the General Conditions, the commercial general liability, automobile liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies must include as additional insureds (in addition to Owner and Engineer) the following: none.

E. *Workers' Compensation and Employer's Liability:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance, including, as applicable, United States Longshoreman and Harbor Workers' Compensation Act, Jones Act, stop-gap employer's liability coverage for monopolistic states, and foreign voluntary workers'

compensation (from available sources, notwithstanding the jurisdictional requirement of Paragraph 6.02.B of the General Conditions).

Workers' Compensation and Related Policies	Policy limits of not less than:
Workers' Compensation	
State	Statutory
Applicable Federal (e.g., Longshoreman's)	Statutory
Foreign voluntary workers' compensation (employer's responsibility coverage), if applicable	Statutory
Jones Act (if applicable)	
Bodily injury by accident—each accident	$NA
Bodily injury by disease—aggregate	$NA
Employer's Liability	
Each accident	$500,000
Each employee	$500,000
Policy limit	$500,000
Stop-gap Liability Coverage	
For work performed in monopolistic states, stop-gap liability coverage must be endorsed to either the worker's compensation or commercial general liability policy with a minimum limit of:	$NA

F. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against claims for:

1. damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees,
2. damages insured by reasonably available personal injury liability coverage, and
3. damages because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.

G. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy must be written on a 1996 (or later) Insurance Services Organization, Inc. (ISO) commercial general liability form (occurrence form) and include the following coverages and endorsements:

1. Products and completed operations coverage.
    a. Such insurance must be maintained for three years after final payment.
    b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
2. Blanket contractual liability coverage, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
3. Severability of interests and no insured-versus-insured or cross-liability exclusions.
4. Underground, explosion, and collapse coverage.

5. Personal injury coverage.

6. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together). If Contractor demonstrates to Owner that the specified ISO endorsements are not commercially available, then Contractor may satisfy this requirement by providing equivalent endorsements.

7. For design professional additional insureds, ISO Endorsement CG 20 32 07 04 "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.

H. *Commercial General Liability—Excluded Content:* The commercial general liability insurance policy, including its coverages, endorsements, and incorporated provisions, must not include any of the following:

1. Any modification of the standard definition of "insured contract" (except to delete the railroad protective liability exclusion if Contractor is required to indemnify a railroad or others with respect to Work within 50 feet of railroad property).

2. Any exclusion for water intrusion or water damage.

3. Any provisions resulting in the erosion of insurance limits by defense costs other than those already incorporated in ISO form CG 00 01.

4. Any exclusion of coverage relating to earth subsidence or movement.

5. Any exclusion for the insured's vicarious liability, strict liability, or statutory liability (other than worker's compensation).

6. Any limitation or exclusion based on the nature of Contractor's work.

7. Any professional liability exclusion broader in effect than the most recent edition of ISO form CG 22 79.

I. *Commercial General Liability—Minimum Policy Limits*

Commercial General Liability	**Policy limits of not less than:**
General Aggregate	$2,000,000
Products—Completed Operations Aggregate	$2,000,000
Personal and Advertising Injury	$1,000,000
Bodily Injury and Property Damage—Each Occurrence	$1,000,000

J. *Automobile Liability:* Contractor shall purchase and maintain automobile liability insurance for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy must be written on an occurrence basis.

Automobile Liability	**Policy limits of not less than:**
Bodily Injury	
Each Person	$500,000
Each Accident	$500,000

Automobile Liability	Policy limits of not less than:
Property Damage	
Each Accident	$500,000
[or]	
Combined Single Limit	
Combined Single Limit (Bodily Injury and Property Damage)	$1,000,000

K. *Umbrella or Excess Liability:* Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the Paragraphs above. The coverage afforded must be at least as broad as that of each and every one of the underlying policies.

Excess or Umbrella Liability	Policy limits of not less than:
Each Occurrence	$2,000,000
General Aggregate	$2,000,000

L. *Using Umbrella or Excess Liability Insurance to Meet CGL and Other Policy Limit Requirements:* Contractor may meet the policy limits specified for employer's liability, commercial general liability, and automobile liability through the primary policies alone, or through combinations of the primary insurance policy's policy limits and partial attribution of the policy limits of an umbrella or excess liability policy that is at least as broad in coverage as that of the underlying policy, as specified herein. If such umbrella or excess liability policy was required under this Contract, at a specified minimum policy limit, such umbrella or excess policy must retain a minimum limit of $2,000,000 after accounting for partial attribution of its limits to underlying policies, as allowed above.

6.04 *Builder's Risk and Other Property Insurance*

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

A. *Installation Floater*

1. Contractor shall provide and maintain installation floater insurance on a broad form or "all risk" policy providing coverage for materials, supplies, machinery, fixtures, and equipment that will be incorporated into the Work ("Covered Property"). Coverage under the Contractor's installation floater will include loss from covered "all risk" causes (perils) to Covered Property:

   a. of the Contractor, and Covered Property of others that is in Contractor's care, custody, and control;

   b. while in transit to the Site, including while at temporary storage sites;

   c. while at the Site awaiting and during installation, erection, and testing;

   d. continuing at least until the installation or erection of the Covered Property is completed, and the Work into which it is incorporated is accepted by Owner.

2. The installation floater coverage cannot be contingent on an external cause or risk, or limited to property for which the Contractor is legally liable.

3. The installation floater coverage will be in an amount sufficient to protect Contractor's interest in the Covered Property. The Contractor will be solely responsible for any deductible carried under this coverage.

4. This policy will include a waiver of subrogation applicable to Owner, Contractor, Engineer, all Subcontractors, and the officers, directors, partners, employees, agents and other consultants and subcontractors of any of them.

SC-6.04 Add a new paragraph immediately after Paragraph 6.04.E:

F. *Builder's Risk and Other Property Insurance Deductibles:* The purchaser of any required builder's risk, installation floater, or other property insurance will be responsible for costs not covered because of the application of a policy deductible.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.03 *Labor; Working Hours*

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

C. In the absence of any Laws or Regulations to the contrary, Contractor may perform the Work on holidays, during any or all hours of the day, and on any or all days of the week with prior approval of the Owner.

7.10 *Taxes*

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

A. Owner is exempt from payment of sales and compensating use taxes of the State of Iowa and of cities and counties thereof on all materials to be incorporated into the Work.

1. Owner will furnish the required certificates of tax exemption to Contractor for use in the purchase of supplies and materials to be incorporated into the Work.

2. Owner's exemption does not apply to construction tools, machinery, equipment, or other property purchased by or leased by Contractor, or to supplies or materials not incorporated into the Work.

7.11 *Laws and Regulations*

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

D. If, during the course of construction, evidence of deposits of historical or architectural interest is found, Contractor shall cease operations and immediately notify the Owner, who shall immediately notify the State Historic Preservation Office (SHPO). Once SHPO has been informed of the discovery, activities will cease until an assessment has been made by a qualified archaeologist. No further disturbance of the deposits shall occur until Contractor has been notified by Owner that Contractor may proceed. Compensation to Contractor, if any, for lost time or changes in construction to avoid the find(s) shall be determined in accordance with changed conditions or Change Order provisions of the Contract Documents.

7.13 *Safety and Protection*

SC-7.13 Add the following new paragraph immediately after Paragraph 7.13.J.

K. The Contractor shall note that hydrogen sulfide, methane, leachate, or other hazardous gases, liquids, or materials may be present at areas of the work site, including but not limited to manholes, buildings, control structures, pipes and sewers, treatment structures, pumping stations, and process or control buildings. Contractor shall maintain safe working and access conditions at all times.

ARTICLE 8—OTHER WORK AT THE SITE (NOT MODIFIED)

ARTICLE 9—OWNER'S RESPONSIBILITIES (NOT MODIFIED)

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.03 *Resident Project Representative*

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

C. The Resident Project Representative (RPR) will be Engineer's representative at the Site. RPR's dealings in matters pertaining to the Work in general will be with Engineer and Contractor. RPR's dealings with Subcontractors will only be through or with the full knowledge or approval of Contractor. The RPR will:

1. *Conferences and Meetings:* Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings (but not including Contractor's safety meetings), and as appropriate prepare and circulate copies of minutes thereof.

2. *Safety Compliance:* Comply with Site safety programs, as they apply to RPR, and if required to do so by such safety programs, receive safety training specifically related to RPR's own personal safety while at the Site.

3. *Liaison*

   a. Serve as Engineer's liaison with Contractor. Working principally through Contractor's authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.

   b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.

   c. Assist in obtaining from Owner additional details or information, when required for Contractor's proper execution of the Work.

4. *Review of Work; Defective Work*

   a. Conduct on-Site observations of the Work to assist Engineer in determining, to the extent set forth in Paragraph 10.02, if the Work is in general proceeding in accordance with the Contract Documents.

   b. Observe whether any Work in place appears to be defective.

   c. Observe whether any Work in place should be uncovered for observation, or requires special testing, inspection or approval.

5. *Inspections and Tests*

    a. Observe Contractor-arranged inspections required by Laws and Regulations, including but not limited to those performed by public or other agencies having jurisdiction over the Work.

    b. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Work.

6. *Payment Requests:* Review Applications for Payment with Contractor.

7. *Completion*

    a. Participate in Engineer's visits regarding Substantial Completion.

    b. Assist in the preparation of a punch list of items to be completed or corrected.

    c. Participate in Engineer's visit to the Site in the company of Owner and Contractor regarding completion of the Work, and prepare a final punch list of items to be completed or corrected by Contractor.

    d. Observe whether items on the final punch list have been completed or corrected.

D. The RPR will not:

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

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

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

4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of construction.

5 Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.

6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.

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

8. Make recommendations for the applicability of the payment or non-payment of liquidated damages.

ARTICLE 11—CHANGES TO THE CONTRACT

11.02 *Change Orders*

SC-11.02 Add the following new Paragraph 11.02.B:

B. All Change Orders must be in writing provided by the Contractor and signed by the Contractor prior to delivery to the Engineer. Change orders are subject to approval by the Engineer and Commission. Commission agrees to call a Commission meeting if necessary to approve these Change Orders if time is of the essence. Change Orders shall be individually listed on each pay application.

ARTICLE 12—CLAIMS (NOT MODIFIED)

ARTICLE 13—COST OF WORK; ALLOWANCES, UNIT PRICE WORK

13.03 *Unit Price Work*

SC-13.03 Delete Paragraph 13.03.E in its entirety and insert the following in its place:

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:

a. the extended price of a particular item of Unit Price Work amounts to 5 percent or more of the Contract Price (based on estimated quantities at the time of Contract formation) and the variation in the quantity of that particular item of Unit Price Work actually furnished or performed by Contractor differs by more than 25 percent from the estimated quantity of such item indicated in the Agreement; and

b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.

2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.

3. Adjusted unit prices will apply to all units of that item.

ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCCEPTANCE OF DEFECTIVE WORK (NOT MODIFIED)

ARTICLE 15—PAYMENTS TO CONTRACTOR, SET OFFS; COMPLETIONS; CORRECTION PERIOD

15.01 *Progress Payments*

SC-15.01 Delete Paragraph 15.01.D in its entirety, and insert the following:

D. Owner agrees to pay each pay application within thirty (30) days of approval of the pay application by the Engineer. Interest is 10% per annum on any delinquent amount due under the contract. Contractor agrees to provide all necessary documents required to comply with state and federal regulations. Any required information that is not provided within three (3) days of request shall delay the payment by an equal number of days until the information is provided. There shall be no interest calculated until the necessary information is provided. Following notice to the Contractor of not less than seven (7) business days, the withholding of payments due to the imposition of liquidated damages shall not constitute a breach of this agreement and shall not trigger the imposition of interest as provided for in this paragraph.

15.03 *Substantial Completion*

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

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

15.08 *Correction Period*

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

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

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION (NOT MODIFIED)

ARTICLE 17—FINAL RESOLUTIONS OF DISPUTES (NOT MODIFIED)

ARTICLE 18—MISCELLANEOUS (NOT MODIFIED)

EXHIBIT A—SOFTWARE REQUIREMENTS FOR ELECTRONIC DOCUMENT EXCHANGE

Item	Electronic Documents	Transmittal Means	Data Format	Note (1)
a.1	General communications, transmittal covers, meeting notices and responses to general information requests for which there is no specific prescribed form.	Email	Email	
a.2	Meeting agendas, meeting minutes, RFI's and responses to RFI's, and Contract forms.	Email w/ Attachment	PDF	(2)
a.3	Contactors Submittals (Shop Drawings, "or equal" requests, substitution requests, documentation accompanying Sample submittals and other submittals) to Owner and Engineer, and Owner's and Engineer's responses to Contractor's Submittals, Shop Drawings, correspondence, and Applications for Payment.	Email w/ Attachment	PDF	
a.4	Correspondence; milestone and final version Submittals of reports, layouts, Drawings, maps, calculations and spreadsheets, Specifications, Drawings and other Submittals from Contractor to Owner or Engineer and for responses from Engineer and Owner to Contractor regarding Submittals.	Email w/ Attachment or LFE	PDF	
a.5	Layouts and drawings to be submitted to Owner for future use and modification.	Email w/ Attachment or LFE	DWG	
a.6	Correspondence, reports and Specifications to be submitted to Owner for future word processing use and modification.	Email w/ Attachment or LFE	DOC	
a.7	Spreadsheets and data to be submitted to Owner for future data processing use and modification.	Email w/ Attachment or LFE	EXC	
a.8	Database files and data to be submitted to Owner for future data processing use and modification.	Email w/ Attachment or LFE	DB	

Notes	
(1)	All exchanges and uses of transmitted data are subject to the appropriate provisions of Contract Documents.
(2)	Transmittal of written notices is governed by Paragraph 18.01 of the General Conditions.

Key	
Email	Standard Email formats (.htm, .rtf, or .txt). Do not use stationery formatting or other features that impair legibility of content on screen or in printed copies
LFE	Agreed upon Large File Exchange method (FTP, CD, DVD, hard drive)
PDF	Portable Document Format readable by Adobe® Acrobat Reader
DWG	Autodesk® AutoCAD .dwg format
DOC	Microsoft® Word .docx format
EXC	Microsoft® Excel .xls or .xml format
DB	Microsoft® Access .mdb format

PART II - CONTRACT DOCUMENTS

C. Specifications

01100 - PROJECT REQUIREMENTS

PART 1 – GENERAL

1.01 SCOPE OF WORK

A. General Description of the Work: The work to be performed under these Contract Documents consists of the construction of a leachate storage lagoon and miscellaneous improvements at the Benton County Sanitary Landfill in Benton County, Iowa.

"STAGING/STORAGE AREA" The designated Contractor staging/storage areas are shown on Figure 1 and 2. The Contractor is responsible for maintenance and restoration of the staging/storage areas during the project and at the completion of the project. Maintenance may include, but is not limited to, dust control, grading, erosion control, etc. The staging/storage areas are adjacent to existing landfill infrastructure - note that all infrastructure may not be shown on the Figures. Any damage to the staging/storage areas or the existing landfill infrastructure caused by the Contractor's operations shall be repaired by the Contractor at their expense. Cost of staging/storage maintenance and restoration shall be incidental to the bid items below.

"ACCESS ROAD/HAUL ROAD MAINTENANCE" The Contractor will share portions of the access road with landfill staff during the project. The Contractor is responsible for access and haul road maintenance needed due to Contractor negligence during periods of Contractor use. Road maintenance may include, but is not limited to, dust control, grading, adding rock to maintain existing surfacing, etc. Contractor is to coordinate hauling operations to have minimal interference with normal landfill operations. Note that all infrastructure may not be shown on the Figures. Any damage to the access road or the existing landfill infrastructure caused by Contractors negligent operations shall be repaired at the Contractor's expense. Cost of road maintenance shall be incidental to the bid items below.

The Contractor shall note that leachate, methane gas, or other hazardous material and/or gases will be present at areas of the work site, including but not limited to manholes, control structures, pipelines and sewers, pumping stations, and buildings. Contractor shall maintain safe working conditions at all times. No smoking or vaping is allowed on site with the exception of the designated area outside of the front gate. The smoking and vaping ban includes Contractor's equipment and private vehicles operated on landfill property.

The Divisions of the work as are follows:

Division 1: Installation of leachate storage lagoon, manholes, leachate conveyance piping, pump station, removal of existing leachate storage lagoon, seeding, and associated work. Bid Items No. 2 through 37.

Division 2: Installation and initial operation of leachate mister and associated work. Bid Item No. 38.

Specifications governing the work performed on this project are as listed in Part II.C of these Contract Documents, the Iowa Department of Transportation Electronic Reference Library current Specifications (referenced as IDOT Spec.), and the Iowa Statewide Urban Design and Specifications Standard Specifications Manual (SUDAS). The following further describes the work involved for each Bid Item:

DIVISION 1

1. **MOBILIZATION:** As per IDOT Spec. 2533.

2. **CLEARING AND GRUBBING:** Work under this item includes all labor, equipment, and materials to clear and grub vegetative materials in the construction area. Clearing and grubbing shall be in accordance with IDOT Spec.

2101. The cleared and grubbed material shall be stockpiled in the location shown on Figures 1 and 2. The material is not to be burned.

Payment is on a lump sum basis upon completion of the work as determined by the Engineer.

3. **EXCAVATION, CLASS 10:** Work under this item includes all labor, equipment, and materials for excavation to the lagoon liner subgrade elevation and excavation to attain the design contours outside of the lagoon (including removal of earthfill associated with existing lagoon). The top of liner grades, design contours, and ground contours are shown on Figures 3 and 4. Work under this item shall be in accordance with the Plans and IDOT Spec. 2102 except as modified in this Section or in the plan details.

   A portion of the excavated material may be suitable for use in the compacted earthfill. Material for use in the compacted earthfill must be segregated from other material. Determination of suitability of material for use in the compacted earthfill shall be made by the Engineer.

   The Contractor shall fill any overexcavation not approved by the Engineer at no cost to the Owner. All fill in areas of overexcavation not approved by the Engineer shall be placed and compacted as per Bid Item No. 6.

   The Contractor is to stockpile excess or unsuitable excavated material at the approximate location shown on Figures 1 and 2. The stockpile shall be constructed with a maximum sideslope of 2.5:1. Contractor shall coordinate hauling operations with the Landfill Manager to not interfere with normal landfill operations.

   Incidental to this item is the removal of the existing 36" CMP, 12" CMP, and two (2) 36" RCP's at the locations shown on Figures 3 and 4. The Contractor shall haul the CMP material to the scrap metal pile and shall stockpile the RCP adjacent to the clearing stockpile.

   The bid quantity of excavation has been estimated from survey data taken in January, 2024. Payment shall be based on the quantity of excavation as measured by the Engineer. Payment for adjusted quantities shall be based on the unit price per cubic yard.

4. **OVEREXCAVATION OF UNSUITABLE MATERIAL:** Work under this item includes all labor, equipment, and materials to overexcavate any unsuitable material encountered on the subgrade of the new leachate storage lagoon. Unsuitable material on the subgrade is defined as any material not having adequate stability to act as a proper foundation for the liner system and shall be determined by the Engineer. Any areas of unsuitable material encountered shall be cored out to a minimum depth of 2' below subgrade elevation. Any overexcavation to remove unsuitable material as directed by the Engineer shall be measured in the field and the quantity paid for under this item. Contractor shall stockpile excavated unsuitable material at the approximate location shown on Figures 1 and 2. Areas where unsuitable material is removed shall be backfilled and compacted as per Bid Item No. 6. Fill required to backfill any areas of unsuitable material excavation shall be incidental to this item. Payment for this item shall be based on the field measurement by the Engineer. The cubic yard quantity shall include the cost of the overexcavation and subsequent backfill. The quantity given in the bid documents for overexcavation of unsuitable material is an estimate only. If no overexcavation is required, there will be no payment due for this item to the Contractor.

5. **SCARIFY AND RECOMPACT SUBGRADE:** Work under this item includes all labor, equipment, and materials to scarify and recompact the subgrade of the leachate storage lagoon and any areas receiving road stabilization fabric.

The subgrade shall be scarified to a depth of 8 inches and recompacted to a minimum of 95% Standard Proctor density. The subgrade shall be graded to a tolerance of 0 to –0.1'. The subgrade surface shall be relatively smooth and compact; free of clods, bumps, protrusions, depressions, rocks, etc. The subgrade surface shall be reviewed by the Engineer prior to placement of material on the subgrade.

Payment for this item shall be per square yard of subgrade scarified and recompacted as measured by the Engineer.

6. **COMPACTED EARTHFILL:** Work under this item includes all labor, equipment, and material to install the compacted earthfill required to establish subgrade elevations in the leachate storage lagoon, to construct portions of the leachate storage lagoon dikes, and to backfill the existing leachate storage lagoon to establish the design grades. Compacted earthfill shall be installed to the contours shown on Figure 3.

   The compacted earthfill shall be constructed of any material from the excavation area or borrow area which is free of boulders, significant amounts of sand, and organic material and has a suitable moisture content and structure for compactive activities to occur. The borrow area shall be benched and in a useable condition for landfill equipment at completion of the project. The Engineer shall approve/disapprove material for compacted earthfill.

   Compacted earthfill is to be placed in lifts not to exceed 8" in thickness. Soils used in the compacted earthfill shall be compacted to a minimum of 95% Standard Proctor density, with a moisture content –2% to +5% of optimum. Any areas that do not meet requirements shall be scarified, have moisture content adjusted if necessary and be recompacted and retested until passing tests are obtained.

   Cost of labor, hauling, etc. to apply water to obtain the required moisture in the compacted earthfill (if necessary) shall be incidental to this item. Application of water shall be as per IDOT Spec. 2107. It is the Contractors responsibility to obtain water if necessary. If water is added to the fill to obtain the required moisture content, a minimum of four (4) passes of a disk shall be made to fully incorporate the moisture throughout the lift. If the moisture is not uniformly incorporated throughout the lift, more passes with the disk may be required. The disk shall be designed and operated to cut and stir to the full depth of the lift.

   The quantity of the compacted earthfill has been determined based on survey from January, 2024. Payment shall be based on the quantity of compacted earthfill as measured by the Engineer. There will be no adjustment for shrinkage or swell of the material.

7. **GEONET DRAINAGE LAYER:** Work under this item includes all labor, equipment, and materials to install the geonet drainage layer on the subgrade of the lagoon as shown on Figure 7. The geonet drainage layer shall consist of a drainage net heat bonded between two layers of geotextile filter fabric. Work shall be in accordance with the Plans and Section 02555 of these Specifications.

   The drainage net shall be HDPE, with a minimum thickness of 200 mil. The geotextile filter fabric shall be a nonwoven, needle punched fabric with a minimum fabric weight of 8 ounces per square yard of fabric and meet the requirements in Section 06605 of these Specifications. The HDPE nets shall be joined together using plastic ties. The top layer of geotextile shall be heat tacked or sewn to adjacent panels. Quantity in overlaps shall be incidental to this item.

   Payment for this item shall be per square yard of lagoon subgrade covered with geonet drainage layer as measured by the Engineer.

8. **GROUNDWATER COLLECTION PIPE, 4 IN. DIA.:** Work under this item includes all labor, equipment and material to install the perforated groundwater collection pipe under the leachate storage lagoon at the location shown on Figures 4 and 7. Work shall be in accordance with the Plans and Section 02575 of these Specifications. The pipe shall be HDPE SDR 11. All joints shall be made with fusion welding. The pipe shall be perforated with 1/4 in. diameter holes placed as shown on Figure 7. All bends and elbows required for installation of the pipe shall be long radius sweep bends. Cost of bends and fittings required for installation and connections shall be included in this item.

   The bedding for the pipe shall be ½ inch to 1½ inch clean crushed limestone. A plant gradation for the rock shall be submitted to the Engineer for approval prior to construction. Bedding stone shall be hand placed in thin lifts under the haunches of the pipe.

   The geotextile filter fabric shall be a nonwoven, needle punched fabric with a minimum fabric weight of 10 ounces per square yard of fabric. Minimum fabric overlap is to be 1 foot. No seaming of this fabric is required. The geotextile filter fabric shall meet the requirements in Section 06605 of these Specifications. The geotextile filter fabric shall be removed from the top of the groundwater collection pipe trench immediately prior to geonet drainage layer installation.

   The perforated groundwater collection pipe shall be capped with a welded cap at the upgradient end of the pipe. Cost of capping is incidental to this item.

   A seepage block is required at the location where the perforated pipe is connected to the non-perforated pipe. The seepage block shall be constructed as shown on Figure 10 and shall consist of a minimum of 500 pounds of powdered or chipped bentonite mixed with soil and compacted in place, AquaBlok as manufactured by AquaBlok, Ltd., or a preapproved equal. Cost of seepage block is incidental to this item.

   The Contractor shall remove all cuttings and solids from the pipes prior to and following installation as necessary. All pipe trench excavation, bedding and backfill, geotextile, connections, tees and fittings shall be incidental to this item. Payment for work under this item is per linear foot of perforated 4 inch diameter groundwater collection pipe installed as measured by the Engineer. The measurement shall be through all tees and fittings.

9. **GROUNDWATER CONVEYANCE PIPE, 4 IN. DIA.:** Work under this item includes all labor, equipment and material to install the non-perforated groundwater conveyance pipe at the location shown on Figure 4. Work shall be in accordance with the Plans and Section 02575 of these Specifications. The pipe shall be HDPE SDR 11. All joints shall be made with fusion welding. All bends and elbows required for installation of the pipe shall be long radius sweep bends. Cost of bends and fittings required for installation and connections shall be included in this item.

   The pipe shall be bedded in Class A roadstone, 3/8” minus limestone chips, or a preapproved equal. Rock bedding material shall be placed in thin lifts under the haunches of the pipe. Rock bedding and backfill shall be compacted with a hand tamper. Soil backfill above pipe shall be placed in lifts not to exceed 8” in thickness and compacted to a minimum of 95% Standard Proctor density, with moisture content -2% to +5% of optimum. Rock and soil backfill shall be as shown on Figure 11 and are incidental to this item.

   The Contractor shall remove all cuttings and solids from the pipes prior to and following installation as necessary. All pipe trench excavation, bedding and

backfill, connections, tees and fittings shall be incidental to this item. Payment for work under this item is per linear foot of non-perforated 4 inch diameter groundwater conveyance pipe installed as measured by the Engineer. The measurement shall be through all tees and fittings.

10. **CORRUGATED METAL PIPE, 6 IN. DIA.:** Work under this item includes all labor, equipment, and materials to install the corrugated metal pipe at the outlet of the 4" diameter groundwater conveyance pipe. Work to be as per IDOT Spec. 2417. Aluminized Type 2 coated steel CMP to be used. Minimum thickness is to be 16 gage. Pipe shall be in accordance with IDOT 4141.02.B. The outlet shall be equipped with an IDOT Spec. removable fork type animal guard which shall be incidental to the pipe. Connection to the HDPE pipe shall be watertight and is incidental to the pipe. 4" or 8" diameter CMP meeting the requirements above can be used at the discretion of the Contractor.

    Payment under this item shall be per linear foot of pipe installed as measured by the Engineer.

11. **COMPACTED BASE LINER:** Work under this item includes all labor, equipment and material to install the compacted base liner in the leachate storage lagoon. The location and limits of compacted base liner construction are shown on Figures 3, 4, and 7. Work shall be in accordance with the Plans and Section 02330 of these Specifications. Note that minimum qualifications for the Contractor installing the compacted base liner are included in Section 02330.

    The base liner for the leachate storage lagoon shall be constructed from select glacial till from the borrow area. The borrow area shall be benched and in a useable condition for landfill equipment at completion of the project. Proctor information on suitable soil in the borrow area is included in Part II, Section D of these Specifications. Additional suitable soils may be encountered. The till shall be free from significant quantities of sand, rock, and organic material. The Engineer shall approve/disapprove material for the compacted base liner. The total liner thickness is 2.25 feet. The finish elevations of the liner shall be as shown on Figures 3 and 4. The top of the liner shall be graded to a tolerance of 0 to +0.1'.

    Compacted base liner material is to be placed in lifts as per Section 02330. The fill shall be placed to a minimum of 95% Standard Proctor density with moisture 0 to +5% above optimum moisture. Each lift shall be tested to confirm it meets moisture and density requirements before the next lift may be placed. A minimum of five field moisture/density tests per acre per lift will be taken to verify that the compacted base liner meets the specified moisture and density limits. Any areas that do not meet requirements shall be scarified, have moisture content adjusted if necessary and be recompacted and retested until passing tests are obtained.

    A minimum of 5 Shelby tube hydraulic conductivity tests will be taken from the compacted base liner. The Owner will supply the Shelby tubes and pay for testing, the Contractor shall assist in obtaining the samples. Additional Shelby tube tests may also be taken at the discretion of the Engineer. Test results documenting hydraulic conductivities less than the IDNR hydraulic conductivity requirement ($1x10^{-7}$ cm/sec) must be obtained from the Shelby tubes before FML installation can begin.

    Cost of labor, hauling, etc. to apply water to obtain the required moisture in the compacted base liner (if necessary) shall be incidental to this item. Application of water shall be as per IDOT Spec. 2107. It is the Contractors responsibility to obtain water if necessary. If water is added to the fill to obtain the required moisture content, a minimum of four (4) passes of a disk shall be made to fully incorporate the moisture throughout the lift. If the moisture is not uniformly incorporated throughout the lift, more passes with the disk may be required. The disk shall be designed and operated to cut and stir to the full depth of the lift.

The surface of the compacted base liner shall be compacted with a smooth drum roller and be smooth and free of all rocks, stones, sticks, roots, sharp objects, or debris of any kind. The surface should provide a firm, smooth, unyielding foundation for the FML with no sudden sharp or abrupt changes or breaks in grade, and without depressions (ie sheepsfoot depressions, equipment tracks, etc.).

The compacted base liner surface must be approved by the FML installer in writing on a daily basis before FML installation is allowed. Minimum requirements for soil surface under FML are contained in Section 06600 of these Specifications.

The quantity of the compacted base liner has been estimated by determining the proposed compacted base liner area in the leachate storage lagoon for a 2.25 foot uniform depth. The payment quantity will be determined by the Engineer by measuring the area of base liner in the field for a uniform 2.25 foot depth and the quantity paid per cubic yard of base liner placed. There will be no adjustment for shrinkage or swell of the material.

12. **FLEXIBLE MEMBRANE LINER (FML):** Work under this item includes all labor, equipment, and material to install the flexible membrane liner (FML) in the leachate storage lagoon as shown on the Figures. The FML shall be a 60 mil high density polyethylene (HDPE) FML as detailed in Section 06600 of these Specifications. Textured (both sides) FML shall be used on the lagoon sideslopes. Smooth or textured material may be used on the lagoon base. The FML subbase shall be prepared in accordance with Bid Item No. 11 and with the manufacturer's recommendations for a 60 mil HDPE FML.

    The General Contractor shall have at least one person on site, capable of operating earthmoving equipment, and have adequate earthmoving equipment on site at all times during FML installation to assist with subgrade repairs/modifications if necessary. FML installation will not be allowed if General Contractor personnel/earthmoving equipment are not on site.

    Destructive testing shall be as per Section 06600 of these Specifications. The Contractor, at their expense, shall send at least two destructive samples to an independent laboratory for testing.

    During installation, the unattached edges of the FML shall be anchored using method(s) recommended by the manufacturer to prevent uplift and movement of the FML. The FML is to be placed in an anchor trench on the perimeter of the installation area. Anchor trenches are to be as per the Manufacturers recommendations. FML material in the anchor trench is incidental to this item and is not included in the pay quantity.

    Any FML material damaged prior to acceptance of the project by the Owner shall be repaired at the Contractor's expense.

    Ballast tubes shall be provided and installed as per Figure 8. The upgradient end of each ballast tube shall be extended into the FML anchor trench for stability. Cost of ballast tubes is incidental to this item.

    Air vents shall be provided and installed as per Figure 9. Cost of air vents is incidental to this item.

    Payment for this item shall be per square yard of liner covered with FML in the leachate storage lagoon as measured by the Engineer. The 2' of FML material on top of the lagoon dike is included in the pay quantity. All seams, anchor trenches, testing, etc. are incidental to this item.

13. **PIPE PENETRATIONS:** Work under this item includes all labor, equipment and material to install the pipe penetrations through the flexible membrane liner as

shown on Figure 15.

Two pipe penetrations are required in the leachate storage lagoon. The pipe penetrations shall have flexible membrane liner boots as per Figure 15. The boots shall meet the requirements of the flexible membrane liner manufacturer. Portions of the pipes behind the penetrations shall be surrounded with a 50:50 bentonite/sand mixture, AquaBlok as manufactured by AquaBlok, Ltd., or a preapproved equivalent as shown on Figure 15. Granular bentonite is to be used, bentonite chips are not acceptable. The granular bentonite shall be thoroughly mixed with sand to provide a uniform mixture. Backfill is incidental to this item.

Incidental to this item is the geosynthetic clay liner (GCL) to be installed under the flexible membrane liner boots as shown on Figure 15. The GCL shall be Bentoliner NS as manufactured by Solmax or preapproved equal. The GCL shall extend a minimum of 1' past the edge of the hole in the FML required for the pipe penetration. The GCL shall be covered with FML immediately after installation to avoid hydration from surface water or precipitation. GCL that is hydrated prior to being covered shall be removed and replaced at the Contractor's expense. Installation of the GCL shall be as per manufacturers recommendations.

Cost of pipe boots, backfill, hardware, and end seals are incidental to this item. Payment for this item shall be as per pipe penetration properly installed as determined by the Engineer.

14. **LAGOON FENCE:** Work under this item includes all labor, equipment, and material to install fence around the leachate storage lagoon at the approximate location shown on Figures 3 and 4.

    Fence shall be deer fence in accordance with IDOT Spec. 2519, IDOT Standard Road Plan MI-103, and this section. Materials shall be in accordance with IDOT Spec. 4154. A 20' wide gate shall be installed at a location chosen by the Owner. Gate is to be as tall as the fence and be manufactured as per IDOT Specifications. Gate shall be measured and paid for as lineal feet of fence constructed. A "deer gate" is not required.

    Payment is per linear foot of fence installed as measured by the Engineer.

15. **MANHOLES:** Work under this item includes all labor, equipment, and material to install the manholes at the locations shown on Figures 3 and 4. Rim and flowline elevations are included on Figure 5 (control manhole) and Figure 18 (loadout manhole). Work shall be as per SUDAS Section 6010 for Sanitary Sewer Manholes. The control manhole shall be 4' in diameter and the loadout manhole shall be 5' diameter.

    The control manhole and loadout manhole shall have flat tops with hinged aluminized access doors with stainless steel hardware. Access doors to be Halliday Model No. S1R2424 for the 4' diameter manhole and Halliday Model No. S1R2436 for the 5' diameter manhole or preapproved equals. Cost of access door shall be incidental to this item.

    The interior of the manholes shall be coated with two (2) coats of Series 61 Tneme-Liner as manufactured by Tnemec or preapproved equal. Each coat shall be a minimum of 10 mils in thickness and shall be applied as per manufacturers recommendations.

    A poured invert is not required in the manholes.

    The manholes shall be backfilled as shown on Figure 13. Bentonite/sand backfill is to be a 50:50 bentonite/sand mixture. Granular bentonite is to be used, bentonite chips are not acceptable. The granular bentonite shall be thoroughly mixed with sand in a masonry mixer or another method approved by the Engineer to provide a uniform mixture. The mixture cannot be mixed on the ground. As an alternative

to the bentonite/sand mixture, AquaBlok as manufactured by AquaBlok, Ltd., or a preapproved equal can be used.

A vent shall be installed in the loadout manhole. The vent shall be 4" diameter Schedule 40 or Schedule 80 PVC pipe and be extended to approximately 1' above the top of the manhole. The vent shall have a screen to prevent animals from entering the vent and the vent opening shall be oriented to not let precipitation into the manhole. The vent penetration shall be sealed with grout and the vent shall be placed to not conflict with access door operation, pump removal, use of cleanout, or valve operation. Installation of the vent is incident to this item.

Manhole steps are not required. All excavation required to install the manholes, backfill, interior coating, and castings and appurtenances shall be incidental to the manholes. Payment for this item shall be per manhole properly installed as determined by the Engineer.

16. **LEACHATE CONVEYANCE PIPE, DUAL WALL, 3" by 6":** Work under this item includes all labor, equipment, and materials to install the leachate conveyance pipe at the approximate location shown on Figures 4 and 5. Work shall be in accordance with the Plans and Section 02575 of these Specifications. Pipe and fittings materials shall be 3" (SDR 11) by 6" (SDR 17) HDPE dual wall pipe. All bends and elbows required for installation of the pipe shall be long radius sweep bends. Cost of bends and fittings required for installation and connections shall be included in this item. End seals are to be used at any point where the containment pipe is terminated. All joints shall be made with fusion welding unless noted.

    The 3" by 6" pipe cannot be connected to the existing force main until the new lagoon is constructed and approved for leachate storage.

    The Contractor shall do exploratory excavations along the existing force main alignment to determine the location, depth, and pipe type and dimensions of the force main prior to starting conveyance pipe installation. The new pipe shall be connected to the existing pipe using a Hymax Grip Coupler or preapproved equal.

    The pipe shall be bedded in Class A roadstone, 3/8" minus limestone chips, or a preapproved equal. Rock bedding material shall be placed in thin lifts under the haunches of the pipe. Soil backfill above pipe shall be placed in lifts not to exceed 8" in thickness and compacted to a minimum of 95% Standard Proctor density, with moisture content -2% to +5% of optimum. Rock and soil backfill shall be as shown on Figure 11 and are incidental to this item.

    The existing force main pipe downgradient of the connection point can be abandoned in place.

    The Contractor shall remove all cuttings and solids from the pipes prior to and following installation as necessary. All pipe trench excavation, bedding and backfill, connections, tees and fittings shall be incidental to this item. Payment for work under this item is per linear foot of 3" by 6" leachate conveyance pipe installed as measured by the Engineer. The measurement shall be through all tees and fittings.

17. **LEACHATE CONVEYANCE PIPE, DUAL WALL, 10" by 14":** Work under this item includes all labor, equipment, and materials to install the leachate conveyance pipe at the locations shown on Figures 3 and 4. Work shall be in accordance with the Plans and Section 02575 of these Specifications. Pipe and fittings materials shall be 10" (SDR 11) by 14" (SDR 17) HDPE dual wall pipe. Cost of bends and fittings required for installation and connections shall be included in this item. Only the carrier pipes will penetrate the manhole walls and connections shall be watertight. End seals are to be used at any point where the

containment pipe is terminated. All joints shall be made with fusion welding unless noted.

The 10" by 14" leachate conveyance pipe shall be installed from the control manhole to the leachate storage lagoon and from the leachate storage lagoon to the loadout manhole. Two 10" by 14" pipe stubs 10 feet in length shall also be installed on the north and south side of the control manhole. The pipe stubs shall have flanged ends with stainless steel blind flange plates, stainless steel backup rings, and stainless steel hardware. Cost of flanges, backup rings, and hardware is incidental to this item.

The leachate conveyance pipe shall be bedded in Class A roadstone, 3/8" minus limestone chips, or a preapproved equal. Rock bedding material shall be placed in thin lifts under the haunches of the pipe. Rock bedding and backfill shall be compacted with a hand tamper. Soil backfill above pipe shall be placed in lifts not to exceed 8" in thickness and compacted to a minimum of 95% Standard Proctor density, with moisture content -2% to +5% of optimum. Rock and soil backfill shall be as shown on Figure 11 and are incidental to this item.

Cleanouts as shown on Figure 12 are to be installed east of the control manhole and east of the loadout manhole. Cost of cleanouts are incidental to this item.

The Contractor shall remove all cuttings and solids from the pipes prior to and following installation as necessary. All pipe trench excavation, bedding and backfill, connections, tees and fittings shall be incidental to this item. Payment for work under this item is per linear foot of 10" by 14" leachate conveyance pipe installed as measured by the Engineer. The measurement shall be through all tees and fittings.

18. **RESILIENT WEDGE VALVES:** Work under this item includes installation of the 10" diameter resilient wedge valves at the locations shown on Figure 4. Resilient wedge valves shall be standard design, cast iron body, fully bronze mounted, rubber seated wedge, bubble-tight, and have an unobstructed waterway. All cast iron parts shall be epoxy coated to withstand corrosive atmosphere and low pH conditions. Valves shall turn clockwise to close and shall be provided with 2" square operative nut. The valves shall be equipped with valve stem extensions that extend to within 3' of the ground surface. Cast iron valve boxes with lids and a valve wrench shall be provided to operate valves from above the ground.

    The valves shall be connected to the piping using flanged connections. Flanges shall have stainless steel backup rings and stainless steel hardware. The connections shall be backfilled with a 50:50 bentonite/sand mixture, AquaBlok as manufactured by AquaBlok, Ltd., or a preapproved equal. Cost of connection and backfilling is incidental to this item.

    Payment for this item shall be per valve and valve box properly installed as determined by the Engineer.

19. **PUMP STATION:** Work under this item includes all labor, equipment, and material to install pump, discharge piping, check valve, rail removal system, reducers, and associated material in the leachate pump station.

    The pump shall be a 5 horsepower VSD 47-1 pump with slotted intake as manufactured by EPG or preapproved equal. The pump shall operate on 230 VAC 1 phase power and shall be equipped with a 30' long 12 AWG motor lead (minimum). The pump shall be equipped with a thermal sensor inside the motor/pump with 50' jacketed cable, to be connected to an intrinsically safe switch located in the control panel-with an inner door mounted LED alarm light. The pump shall be equipped with a check valve. The check valve shall have a 1/4" diameter hole drilled to drain leachate from the loadout pipe to prevent freezing.

Incidental to this item is a stainless-steel rail and anchoring system with 3" NW3SS stainless steel disconnect and ¼" stainless-steel pull-out cable and SS clamps or chain. The rail system shall be installed to allow pump removal/installation through the access hatch.

Connection to the loadout pipe, including a pipe reducer, shall be incidental to this item.

Electrical work required for installation of the pump and controls is included in Bid Item No. 35.

Incidental to this item is start up of the pump based on manufacturer's recommendations.

The system shall be operated using clean water at the completion of the installation of the pump station and loadout pipe to document the proper operation of the system.

Payment is on a lump sum basis upon completion of the work as determined by the Engineer.

20. **LOADOUT PIPE:** Work under this item shall include all labor, materials, and equipment to install the loadout pipe at the locations shown on Figures 18 and 19. Pipe and fittings materials shall be 4" Schedule 80 PVC pipe. Pipe shall be attached to the loadout pipe support using stainless steel straps or clamps. Straps to be placed at a maximum spacing of 3'. Pipe joints shall be solvent welded. Cost of bends and fittings required for installation and connections shall be included in this item.

    The loadout pipe will pass through the top of the loadout manhole. The loadout pipe penetration shall be sealed with grout and the loadout pipe shall be placed to not conflict with access door operation, pump removal, use of cleanout, or valve operation.

    Incidental to this item is the rubber hose shown on Figure 19. Hose to be connected to the loadout pipe using a mechanical coupling.

    Two ball valves with flanged ends shall be installed in the loadout pipe at the approximate locations shown on Figure 18. Flanges shall have stainless steel backup rings and stainless steel hardware. The ball valves shall be Type-21/21A as manufactured by Ashai/America or preapproved equal. One of the ball valves shall be connected to a 4" stainless steel female camlock connection as shown on Figure 18. The Contractor shall be responsible to confirm compatibility with landfill equipment prior to ordering the camlock. Camlock is incidental to this item.

    The horizontal portion of the loadout pipe shall be blocked/braced for support at the elbow location shown on Figure 18. Cost of blocking/bracing is incidental to this item.

    The contractor shall remove all cuttings and solids from the pipes prior to installation. All pipe trench excavation, bedding and backfill, elbows and fittings, connections to the loadout structure, valves, and camlock shall be incidental to this item. Payment for work under this item is per linear foot of pipe installed as measured by the Engineer.

21. **CONTAINMENT PAD:** Work under this item includes all labor, equipment, and material to install the concrete containment pad as shown on Figure 17 at the location shown on Figure 4. The concrete shall be as per SUDAS Section 7010. Class C mix to be used.

Reinforcement shall be #5 bars on 12" spacing as shown on Figure 17. Reinforcement shall be epoxy coated.

Incidental to this item is the granular subbase under the pad and the expansion joint and metal grate for the slab drain shown on Figure 17. Metal grate to have nominal ½" openings.

Payment is on a lump sum basis upon completion of the work as determined by the Engineer.

22. **CONTAINMENT PAD DRAIN PIPE, 6" by 10":** Work under this item includes all labor, equipment, and materials to install the containment pad drain pipe at the approximate location shown on Figure 17. Work shall be in accordance with the Plans and Section 02575 of these Specifications. Pipe and fittings materials shall be 6" (SDR 11) by 10" (SDR 17) HDPE dual wall pipe. Only the carrier pipes will penetrate the containment pad and the manhole wall and the connections shall be watertight. All bends and elbows required for installation of the pipe shall be long radius sweep bends. Cost of bends and fittings required for installation and connections shall be included in this item. End seals are to be used at any point where the containment pipe is terminated. All joints shall be made with fusion welding unless noted.

    The pipe shall be bedded in Class A roadstone, 3/8" minus limestone chips, or a preapproved equal. Rock bedding material shall be placed in thin lifts under the haunches of the pipe. Soil backfill above pipe shall be placed in lifts not to exceed 8" in thickness and compacted to a minimum of 95% Standard Proctor density, with moisture content -2% to +5% of optimum. Rock and soil backfill shall be as shown on Figure 11 and are incidental to this item.

    The Contractor shall remove all cuttings and solids from the pipes prior to and following installation as necessary. All pipe trench excavation, bedding and backfill, connections, tees and fittings shall be incidental to this item. Payment for work under this item is per linear foot of 6" by 10" containment pad drain pipe installed as measured by the Engineer. The measurement shall be through all tees and fittings.

23. **LOADOUT SUPPORT BASE:** Work under this item includes all labor, equipment, and material to install a new loadout support base. The Owner has the new base on site. The base is approximately 4' tall with a 2' by 2' steel plate top and bottom connected by 4 steel rods. There are four steel bolts on the top plate for installation of the loadout pipe support (Bid Item No. 24). The Contractor shall provide stainless steel nuts and washers to fit the bolts on the loadout support base. A picture of the loadout support base is included in Part II, Section F of these Specifications.

    The base is to be installed in concrete as shown on Figure 19. Rebar is to be installed in the concrete around the base as shown on Figure 19. The concrete shall be as per SUDAS Section 7010. Class C mix to be used.

    Work under this item includes excavation to install the base and concrete backfill. Excavation, rebar, hardware, and concrete backfill shall be incidental to this item. Payment is on a lump sum basis upon completion of the work as determined by the Engineer.

24. **LOADOUT PIPE SUPPORT (RELOCATE):** Work under this item includes all labor, equipment, and material to relocate the existing metal loadout pipe support from the existing support base and install it on the new support base (Bid Item No. 23). The existing loadout support base can be abandoned in place. A picture of the existing loadout pipe support is included in Part II, Section D of these

Specifications.

Payment is on a lump sum basis upon completion of the work as determined by the Engineer.

25. **REVETMENT STONE:** Work under this item includes all labor, materials, and equipment to install the revetment stone in the riprap drainage ways, at the outlet of one of the 18" CMP pipes, and at the outlet of the 6" CMP pipe at the locations shown on Figures 3 and 4. Revetment stone shall be Class D or E revetment stone as per SUDAS Section 9040. All revetment stone shall have a rock thickness of 2' and be underlain by a geotextile fabric. Geotextile underlying the revetment shall be incidental to the revetment. Geotextile is to meet the requirements of SUDAS Section 9040.

    Payment shall be per ton of revetment stone placed as evidenced by weigh tickets.

26. **ROAD STABILIZATION FABRIC:** Work under this item includes all labor, equipment, and material to install the road stabilization fabric in the access road as shown on Figure 16 in the hatched areas shown on Figures 3 and 4. Road stabilization fabric shall be Geotex 315ST as manufactured by Propex or preapproved equal. All seams shall be overlapped a minimum of 3 feet or as per manufacturers recommendations. Quantity in overlaps shall be incidental to this item.

    Payment is per square yard of road subbase receiving road stabilization fabric as measured by the Engineer.

27. **MACADAM STONE BASE:** Work under this item shall be as per IDOT Spec. 2210. Rock to be macadam stone base material as per IDOT Spec. 4122. Rock to be placed as shown on Figure 16 on the access road in the hatched areas shown on Figures 3 and 4. 4" of macadam stone shall be placed as a base course.

    Payment shall be based on the actual tons of rock placed as evidenced by delivery tickets.

28. **GRANULAR SURFACING:** Work under this item shall be as per IDOT Spec. 2312. Rock to be Class A crushed Stone as per IDOT Spec. 4120. Rock to be placed as shown on Figure 16 on the access road in the hatched areas shown on Figures 3 and 4. 2" of granular surfacing shall be placed over the macadam stone as a surface course.

    Payment shall be based on the actual tons of rock placed as evidenced by delivery tickets.

29. **CORRUGATED METAL PIPE, 36 IN. DIA.:** Work under this item shall include all labor, equipment and materials to install the corrugated metal pipe at the location shown on Figures 3 and 4. Work to be as per IDOT Spec. 2417. Aluminized Type 2 coated steel CMP to be used. Minimum thickness is to be 14 gage. Pipe shall be in accordance with IDOT 4141.02.B. Earth backfill shall be placed as per Bid Item No. 6 but incidental to this item. All pipe trench excavation, bedding and backfill, connections, tees and fittings shall be incidental to this item. Payment under this item shall be per linear foot of pipe installed as measured by the Engineer.

30. **APRONS, CORRUGATED METAL, 36 IN.:** Work under this item includes all labor, equipment, and materials to install the aprons on the ends of the 36" CMP. Aprons shall be as per IDOT Standard Detail DR-203. Payment for this item shall be per apron properly installed as determined by the Engineer.

31. **CORRUGATED METAL PIPE, 24 IN. DIA.:** Work under this item shall include all labor, equipment and materials to install the corrugated metal pipe at the

locations shown on Figure 4. Work to be as per IDOT Spec. 2417. Aluminized Type 2 coated steel CMP to be used. Minimum thickness is to be 14 gage. Pipe shall be in accordance with IDOT 4141.02.B. Earth backfill shall be placed as per Bid Item No. 6 but incidental to this item. All pipe trench excavation, bedding and backfill, connections, tees and fittings shall be incidental to this item. Payment under this item shall be per linear foot of pipe installed as measured by the Engineer.

32. **APRONS, CORRUGATED METAL, 24 IN.:** Work under this item includes all labor, equipment, and materials to install the aprons on the ends of the 24" CMPs. Aprons shall be as per IDOT Standard Detail DR-203. Payment for this item shall be per apron properly installed as determined by the Engineer.

33. **CORRUGATED METAL PIPE, 18 IN. DIA.:** Work under this item shall include all labor, equipment and materials to install the corrugated metal pipe at the locations shown on Figures 3 and 4. Work to be as per IDOT Spec. 2417. Aluminized Type 2 coated steel CMP to be used. Minimum thickness is to be 14 gage. Pipe shall be in accordance with IDOT 4141.02.B. Earth backfill shall be placed as per Bid Item No. 6 but incidental to this item. All pipe trench excavation, bedding and backfill, connections, tees and fittings shall be incidental to this item. Payment under this item shall be per linear foot of pipe installed as measured by the Engineer.

34. **APRONS, CORRUGATED METAL, 18 IN.:** Work under this item includes all labor, equipment, and materials to install the aprons on the ends of the 18" CMPs. Aprons shall be as per IDOT Standard Detail DR-203. Payment for this item shall be per apron properly installed as determined by the Engineer.

35. **ELECTRICAL INFRASTRUCTURE:** Work under this item includes all labor, equipment, and material to complete the electrical infrastructure needed to operate the leachate loadout pump and leachate mister. Electrical work is to be as per Division 26 of the Specifications and shown on Figures E1-E5.

    Although not individually specified, the Contractor is to provide and install all electrical wire, disconnects, breakers, switches, controls, panels, and other devices as specified in Division 26 and shown on Figures E1-E5

    The East-Central Iowa Rural Electric Cooperative (ECIREC) will bring power to the lagoon area and install the utility transformer with fiberglass base at the approximate location shown on Figure E1. Grading and the installation of leachate conveyance infrastructure will also occur in this area. It is the Contractor's responsibility to coordinate the installation of the transformer with the ECIREC.

    Contractor responsible for all permits, coordination with utilities, protection of existing infrastructure, and meeting applicable laws and regulations. Any electrical shutdowns needed to be closely coordinated with the Owner.

    Payment is on a lump sum basis upon completion of the work as determined by the Engineer.

36. **REMOVE EXISTING LEACHATE STORAGE LAGOON:** Work under this item includes all labor, equipment, and material to remove the existing leachate storage lagoon at the location shown on Figure 3.

    Removal of the existing lagoon cannot start until the new lagoon is constructed and approved for leachate storage.

    Removal shall include the FML liner and associated infrastructure including the perimeter fence. Pipes that are 1' below the design grades shown on Figure 3 can be abandoned in place. Removed material shall be hauled to the landfill active area by the Contractor.

The Owner will remove the majority of the leachate from the lagoon; however, it is anticipated that there will be approximately 3' of leachate/sludge remaining in the lagoon that the Owner will not remove. The depth of sludge is unknown. Sludge shall be removed and hauled to the landfill active area by the Contractor. Leachate shall be hauled or pumped to the new leachate storage lagoon by the Contractor.

The excavation required to partially remove the lagoon dikes will be paid for under Bid Item No. 3. The backfill required to fill in the lagoon is to be as per Bid Item No. 6 and will be paid for under that item.

Payment is on a lump sum basis upon completion of the work as determined by the Engineer.

37. **SEEDING:** Work under this item includes all labor, equipment, and materials to install Type 2 seeding in general accordance with SUDAS Specification 9010 and this section.

All areas with soil surface disturbed by Contractors operations shall be seeded at the completion of the project with the exception of the borrow area and the excess/unsuitable soil stockpile.

Incidental to this item is applying fertilizer and mulch. Fertilizer shall be as per SUDAS 9010.2.03.A.1 for Conventional Seeding, Permanent. Mulch shall be as per SUDAS 9010.2.07A for Conventional Seeding. A minimum of 2,000 pounds of mulch shall be applied per acre seeded.

Payment is per acre of area seeded as measured by the Engineer. Any areas unnecessarily disturbed due to construction without the permission of the Engineer or Owner shall be fertilized, seeded and mulched in accordance with this section at no additional cost to the Owner.

DIVISION 2

38. **LEACHATE MISTER:** Work under this item includes all labor, equipment, and material to provide and install the leachate mister. The leachate mister is to be EcoMister HD-19 as manufactured by Slimline Manufacturing or preapproved equal. The following revisions from the standard EcoMister HD-19 setup are required:

- The 2" pressure line between the pump skid and the mister shall be 50 feet in length.
- The primer pump must have enough cable provided to reach approximately 5 feet above the top of the barge.

Electrical work required for installation of the leachate mister is included in Bid Item 35.

The following extra parts shall be provided with the equipment:

10 teflon nozzles
2 bearing sets for the turbine
1 self cleaning filter

Start up of the mister will occur when at least 4' of leachate is available in the lagoon and temperatures are above 40 degrees. Incidental to this item is start up of the mister and staff training on mister operations by a manufacturer's representative.

Payment is on a lump sum basis upon completion of the work as determined by the Engineer.

1.02 COORDINATION

A. The Contractor shall plan, schedule, and coordinate his operations in a manner that will facilitate the simultaneous progress of the Work under the various Sections of this Contract.

B. The Work shall be coordinated with the Owner to minimize interference with operation of the landfill. Access roads shall not be blocked during the landfill's normal hours of operations unless the Contractor makes provisions to allow landfill traffic access to the active landfilling area.

1.03 SCHEDULE

A. The Contractor shall develop a specific and detailed construction schedule indicating coordination of construction, placement into operation of new facilities, and demolition/removal from service of existing facilities.

B. Each Contractor shall have labor and materials on hand so their work can progress according to the construction schedule. It shall be the responsibility of the General Contractor to see that all Sub-contractors adhere to the construction schedule.

C. Progress meetings:

1. Progress meetings will be held at least weekly and at other times as requested by the Owner or required by progress of the Work.
2. Contractor, Engineer, and all subcontractors active on the site shall be represented at each meeting. Contractor may at his discretion or at the request of the Engineer have representatives of suppliers, manufacturers, and other subcontractors attend meetings.
3. The Engineer shall preside at the meetings and provide for keeping and distribution of notes. The purpose of these meetings will be to review the progress of the Work, maintain coordination of efforts, discuss changes in schedule, and resolve any issues that may come up in a timely manner.

1.04 WORK BY PUBLIC UTILITIES

A. Work by public utilities shall be coordinated by the Contractor and paid directly to the utility by the Owner. In general, work required by utilities is to protect other utilities during construction.

1.05 LAND FOR CONSTRUCTION PURPOSES

A. Contractor will be permitted to use available land belonging to or leased by the Owner, on or near the site of the Work, for construction purposes and for the storage of materials and equipment. The location and extent of the areas available to the Contractor shall be as indicated on the Drawings. Any additional right-of-way desired by the Contractor shall be acquired at his expense, and the Contractor shall hold harmless the Owner and Engineer from claims for damages made by the owners of such additional right-of-way.

B. Any storage of materials and equipment within a flood plain is not allowed.

1.06 SITE ACCESS

A. The Contractor will not block or hinder landfill operations or landfill traffic. The landfill is open to the public Monday through Friday 8:00 AM to 3:30 PM and Saturday 8:00 AM to 11:30 AM. The landfill is secured by locked gates during hours not open to the public. The Contractor will be given all hours access to the landfill property. The Contractor is responsible for gate security when the landfill is not open to the public.

1.07 NOTICES

A. The Contractor shall notify owners of adjacent properties and utilities when any aspect of the Work may affect them. When it is necessary to temporarily deny access by owners or tenants to their property, or when any utility service connection must be interrupted, the Contractor shall give notices sufficiently in advance to enable the affected persons to provide for their needs.

B. Notices, whether given orally or in writing, shall include appropriate information concerning the interruption and instruction on how to limit their inconvenience.

1.08 LINES AND GRADES

A. All Work shall be done to the lines, grades and elevations indicated on the Drawings.

B. At least two basic horizontal and two vertical control points will be established or designated by the Engineer or Owner. These points shall be used as datum for the Work. All additional survey, layout, and measurement Work shall be performed by the Engineer or Owner as part of the Work.

1.09 SALVAGE OF MATERIALS AND EQUIPMENT

A. Existing materials and equipment removed and not reused or salvaged to Owner as a part of the Work shall become the Contractor’s property and shall be removed from the site. The Contractor shall be responsible for proper disposal of such materials. Contractor shall carefully remove in a manner to prevent damage all materials and equipment specified or indicated to be salvaged and reused or to remain property of the Owner. The Contractor shall store and protect salvaged items specified or indicated to be reused in the Work.

B. Existing materials and equipment removed by the Contractor shall not be reused in the Work except where so specified or indicated. Salvaged items not to be reused in the Work, but to remain Owner's property, shall be delivered by Contractor in good condition to Owner.

C. Any items damaged in removal, storage, or handling through carelessness or improper procedures shall be replaced by Contractor in kind or with new items. Contractor may at his option furnish and install new items in lieu of those specified or indicated to be salvaged and reused, in which case such removed items will become the Contractor's property.

1.10 CONNECTIONS TO EXISTING FACILITIES

A. Unless otherwise specified or indicated, Contractor shall make all necessary connections to existing facilities including structures, drain lines, and utilities such as water, sewer, gas, telephone, and electric. In each case, Contractor shall receive permission from Owner or the owning utility prior to undertaking connections. Contractor shall protect facilities against deleterious substances and damage.

B. Connections to existing facilities which are in service shall be thoroughly planned in advance, and all required equipment, materials, and labor shall be on hand at the time of undertaking the connections. Work shall proceed continuously if necessary to complete connections in the minimum time. Operation of valves, hydrants, or other appurtenances on existing utilities, when required, shall be by or under the direct supervision of the owning utility.

1.11 UNFAVORABLE CONSTRUCTION CONDITIONS

A. During unfavorable weather, wet ground, or other unsuitable construction conditions, the Contractor shall confine his operations to work which will not be affected adversely by such conditions.

B. No portion of the Work shall be constructed under conditions which would affect adversely the quality or efficiency thereof, unless special means or precautions are taken by the Contractor to perform the work in a proper and satisfactory manner.

1.12 CLEAN UP

A. Contractor shall keep the premises occupied by the Contractor free from accumulations of waste materials and rubbish at all times. Contractor shall provide adequate trash receptacles about the work site, promptly empty containers when filled, and properly dispose of waste materials at his expense. Wastes shall not be buried or burned on the site or disposed of in storm drains, sewers, streams or waterways.

B. Construction materials shall be neatly stored by Contractor when not in use. Contractor shall promptly remove splattered concrete, asphalt, oil, paint, corrosive liquids, and cleaning solutions from surfaces to prevent marring or other damage.

PART 2 – PRODUCTS NOT USED

PART 3 – EXECUTION NOT USED

END OF SECTION

01300 - SUBMITTALS

PART 1 – GENERAL

1.01 SCOPE OF WORK

A. This Section outlines submittals required by the General Conditions, Supplementary Conditions and such other submittals by the Contractor to the Owner/Engineer as may be required herein.

1.02 SUBSTITUTES AND "OR-EQUAL ITEMS"

A. Base Bid Equipment:

1. Substitute Base Bid equipment manufacturers must be preapproved as indicated in the Bidding Documents. If preapproved by the Engineer, the Base Bid price shall include all associated costs of changes in structures, buildings, piping, wiring, equipment or other components of the Work necessary to accommodate the substitute equipment, as well as the cost of all additional drawings requested by the Engineer to illustrate to the satisfaction of the Engineer that such changes will not adversely affect the design concept or other components of the Work.
2. Pre-approval of a product, manufacturer or supplier in no way removes or reduces the obligation that each item meets the requirements indicated in the Contract Documents.

B. Other Equipment: Pre-Bid approval of other substitute equipment or materials is not required. Requests and submittals shall be subject to General Conditions, Articles 7.05 and 7.06.

1.03 REFERENCED SECTIONS

A. Bonds and Insurance: See Article 2.01 of the General Conditions for submittal requirements.

B. Preliminary Progress Schedule: See Article 2.03 of the General Conditions for submittal requirements.

C. Preliminary Schedule of Submittals: See Article 2.03 of the General Conditions for submittal requirements.

1.04 PROGRESS REPORTS

A. A written progress report shall be furnished to the Engineer with each application for progress payment. Each report shall include sufficient narrative to describe current and anticipated delaying factors, effects on the construction schedule, and proposed corrective action. Any Work reported complete, but which is not readily apparent to the Engineer, must be substantiated with satisfactory evidence.

1.05 SHOP DRAWINGS

A. Shop Drawing Schedule: The Contractor shall submit the shop drawing schedule to the Engineer within ten days after the Effective Date of the Agreement. The shop drawing schedule shall be in tabular form listing all materials and equipment for which shop drawings are required, the date for intended submission of the drawing to the Engineer for review, and the date required for its return to avoid delay in any activity beyond the scheduled start date.

B. Submittals:

1. Note if agreed upon by Owner, Contractor, and Engineer, electronic shop drawing submittals will be allowed. The electronic submittals shall meet all the applicable requirements spelled out below.
2. Engineering data covering all equipment, fabricated materials, and construction materials which become a permanent part of the Work under this Contract shall be submitted to Engineer for review. These data shall include drawings and descriptive information in sufficient detail to show the kind, size, arrangement, and operation of component materials and devices; the external connections, anchorages, and supports required; performance characteristics; and dimensions needed for installation and correlation with other materials and equipment.
3. Submittals shall be accompanied by the Shop Drawing Transmittal form included in these Contract Documents duly signed and dated by the Contractor. Engineer will not accept submittals from anyone other than Contractor. Submittals shall be consecutively numbered in direct sequence of submittal and without division by subcontractor or trades. Resubmittals shall bear the number of the first submittal followed by a letter (A, B, etc.) to indicate the sequence of the resubmittal. Items contained in each submittal should be grouped with like items. All items contained in the submittal shall be listed separately on the form with the applicable Specification paragraph number, description and intended use of the item, name of manufacturer/supplier, and submittal reference number; missing information may be cause for rejection without review. When catalog pages are submitted, applicable items shall be clearly identified and inapplicable data marked out.
4. The Contractor shall submit five (5) copies, one of which will be returned. It will be the Contractor's responsibility to transfer Engineer's notes and review status on any additional copies desired by the Contractor. Any copies in excess of the five copies required will be returned un-marked to the Contractor. Each copy of all submittals, regardless of origin, shall be stamped with the approval of Contractor. Contractor's stamp of approval is a representation to the Owner and Engineer that Contractor accepts full responsibility for determining and verifying all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar data, and that he has reviewed or coordinated each submittal with the requirements of the Work and the Contract Documents.
5. Submittals for all material and/or equipment shall also include the Supplier/ Contractor Statement of Compliance form included in these Contract Documents, duly signed and dated by the supplier or manufacturer and the Contractor. This form shall be prepared by the supplier or manufacturer of the submitted data, stating that the item(s) covered is in compliance with the Contract Documents. Failure to submit this form may be cause for rejection without review. All deviations from the Contract Documents shall be identified on each submittal and shall be tabulated in the Supplier/Contractor Statement of Compliance form and attached to the Shop Drawing Transmittal form. Such submittals, as pertinent to the deviation, shall indicate essential details of all changes proposed by Contractor including modifications to other facilities that may be a result of the deviation and all required piping and wiring diagrams.
6. Submittals for all material and/or equipment shall also include receiving, handling and storage requirements.
7. The Contractor shall accept full responsibility for the completeness of each submittal, and, in the case of a resubmittal, shall verify that all exceptions previously noted by Engineer have been taken into account. In the event that more than one resubmittal is required because of failure of Contractor to account for exceptions previously noted, Contractor shall reimburse Owner for the charges of Engineer for review of the additional submittals.

8. Engineer’s review of drawings and data submitted by Contractor will cover only general conformity to the Drawings and Specifications, external connections, and dimensions which affect the layout. Engineer’s review does not indicate a thorough review of all dimensions, quantities, and details of the material, equipment, device, or item shown. Engineer’s review of submittals shall not relieve Contractor from responsibility for errors, omissions, or deviations, nor responsibility for compliance with the Contract Documents.
9. The Engineer's Shop Drawing Response Comments, appropriately completed, will accompany all submittals when returned to the Contractor. Review status designations listed on the Engineer's response form are defined as follows:
    a. A - No Exception Taken: Fabrication, delivery, and installation may proceed as indicated in the submittal and in accordance with the Contract Documents.
    b. B - Address Notations, No Re-submittal: The submittal generally conforms with the design concept and the Contract Documents, and notations noted are considered minor or for Contractor information. Fabrication, delivery, and installation may proceed at the Contractor's discretion in accordance with the submittal, notations, and the Contract Documents. No re-submittal of information is required
    c. C - Revise and Resubmit Items Noted: The submittal generally conforms to the design concept and the Contract Documents, however certain items require explanation or re-submittal. Make revisions noted for specific items and re-submit only those items and respond to specific questions regarding the submittal.
    d. D - Revise and Resubmit Entire Submittal: The submittal generally conforms with the design concept and the Contract Documents; however, corrections noted are considered significant. Make all corrections noted and re-submit entire submittal for further review.
    e. E - Rejected for the Following Reasons: The submittal and/or content do not comply with requirements of the Contract Documents as specifically noted. Resubmit in accordance with Contract Documents.
10. Engineer's submittal review period shall be 21 consecutive calendar days in length and shall commence on the first calendar day immediately following the date of arrival of the submittal or resubmittal in the Engineer's office. The time required for delivery of the submittal or resubmittal to the Contractor shall not be considered a part of the submittal review period. Special mailing or delivery requirements of the Contractor shall be at his expense.
11. Any need for more than one re-submittal, or any other delay in obtaining Engineer's review of submittals, shall not entitle Contractor to extension on the Contract Time unless delay of the Work is directly caused by a change in the Work authorized by a Change Order or by failure of Engineer to review any submittal within the submittal review period.

1.06 SURVEY AND LAYOUT DATA

A. All field books, notes, and other data developed by Contractor in performing surveys and layouts as a part of the Work shall be neat and legible and made available to the Engineer for examination throughout the construction period. Copies shall be furnished to the Resident Project Representative for use in checking Contractor's layout.

B. All such data shall be submitted to Engineer with other documentation required for final acceptance of the Work to be transmitted to the Owner by Engineer with other records upon completion of the Work.

1.07 RECORD DOCUMENTS

A. The Contractor shall submit with the application for final payment the Record Documents to Engineer including Drawings, Specifications, Addenda, written Amendments, Change Orders, Work Change Directives, Field Orders, written

interpretations and clarifications, and final samples and shop drawings. The Record Documents shall be in good condition, show the actual installed location and dimensions, and all changes made during construction.

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION – NOT USED

END OF SECTION

01400 - QUALITY CONTROL

PART 1 – GENERAL

1.01 SCOPE OF WORK

A. This section describes quality control testing to be performed by the Owner and Contractor. In general, laboratory and/or field testing will not be required unless specifically required by the Specifications; however, if the quality of the material is questionable or unknown, the Contractor shall furnish acceptable proof of its quality and conformance to the described and specified standards.

1.02 QUALITY ASSURANCE

A. All tests to determine compliance with the Contract Documents shall be performed by an independent commercial testing firm acceptable to the Engineer. The testing firm's laboratory shall be staffed with experienced technicians, properly equipped and fully qualified to perform the tests in accordance with the specified standards.

B. Testing services provided by Owner are for the sole benefit of Owner; however, test results shall be available to Contractor. Testing necessary to satisfy Contractor's internal quality control procedures shall be the sole responsibility of Contractor.

1.03 TESTING SERVICES

A. Services Furnished by Contractor:

1. Contractor shall obtain Engineer’s acceptance of the testing firm prior to performance of testing services, and shall pay all costs for these services.
2. Unless other specified, Contractor shall provide all testing services in connection with the following:
    a. All testing on Flexible Membrane Liner as required in Section 06600.
    b. Gradation tests on backfill materials.
    c. Pump start up operation and testing as recommended by the Manufacturer.
    d. Leachate mister start up operation and testing as recommended by the Manufacturer.
    e. Force main pressure test as stipulated in Section 01100.
    f. All other tests and engineering data stipulated in the Specifications and required for Engineer’s review.

B. Services Furnished by Owner: Unless otherwise specified, Owner shall provide for tests made on the following materials and equipment:

1. Laboratory proctor and hydraulic conductivity tests on soil materials for compacted base liner.
2. In-place field moisture and density tests on fill and backfill
3. Shelby tube testing from compacted base liner.
4. Other materials and equipment at the discretion of Owner.

C. Testing, including sampling, will be performed by Engineer, Resident Project Representative, or the testing firm’s laboratory personnel for the Owner in the general manner indicated in the Specifications. Owner, Engineer or Resident Project Representative shall determine the exact time, location, and number of tests including samples.

D. Contractor shall furnish all sample materials at no additional cost to Owner and cooperate in the testing activities including sampling. Contractor shall interrupt the

Work when necessary to allow testing including sampling to be performed. Contractor shall have no claim for an increase in Contract Price or Contract Times due to such interruptions. When testing activities including sampling are performed in the field by Engineer, Resident Project Representative, or testing firm's personnel, Contractor shall furnish personnel and facilities to assist in the activities as needed.

E. Transmittal of Test Reports: Written reports of tests and engineering data furnished by Contractor for Engineer's review of material and equipment proposed for use in the Work shall be submitted in the same manner as is specified for Shop Drawings. The testing firm retained by the Contractor shall furnish PDF files of signed and/or certified reports.

1.04 OFFSITE INSPECTION

A. When Specifications require inspection of materials or equipment during the production, manufacturing, or fabrication process, or before shipment, such services will be performed by Engineer or independent testing or inspection firm acceptable to Engineer. The cost of such inspections shall be borne by Owner.

B. Contractor shall give appropriate written notice to Engineer not less than 10 days before offsite inspection services are required, and shall provide for the producer, manufacturer, or fabricator to furnish safe access and proper facilities and to cooperate with inspecting personnel in the performance of their duties. Copies of all reports on offsite inspections shall be given to Engineer and Contractor.

1.05 MANUFACTURER'S FIELD SERVICES

A. The manufacturer of the equipment specified for this Project shall provide an experienced, competent, and authorized representative to visit the site of the Work and inspect, check, adjust if necessary, and approve the equipment installation. The cost of manufacturer's field services shall be included in the Contract Price.

B. In each case, the manufacturer's representative shall be present when the equipment is placed in service. The manufacturer's representative shall revisit the jobsite as often as necessary to resolve or correct any problems with the equipment and/or installation and operation to the satisfaction of the Engineer.

C. Each manufacturer's representative shall furnish to Owner through Engineer a written report certifying that the equipment has been properly installed, lubricated, and aligned; free from any undue stress imposed by connecting piping or anchoring; and has been satisfactorily operated under full load conditions.

PART 2 – PRODUCTS - NOT USED

PART 3 – EXECUTION – NOT USED

END OF SECTION

01500 - TEMPORARY FACILITIES

PART 1 – GENERAL

1.01 SCOPE OF WORK

A. This section describes the temporary facilities necessary for the execution of the work by Contractor. The Contractor, in examining the site, shall note that all construction operations and storage of equipment, materials, and tools shall be confined to the limitations of the site and additional lands acquired by the Owner as defined on the Site Plan of the Drawings.

1.02 TEMPORARY BUILDINGS

A. During the performance of the Work, the Contractor shall designate a resident superintendent. A field office is not required. All Record Documents shall be maintained by the resident superintendant, and any communications given to the resident superintendent shall be deemed to have been delivered to the Contractor.

B. The Contractor shall erect and maintain temporary buildings and structures as necessary to secure and protect materials and equipment utilized in the execution of the work. At the end of the construction, all temporary buildings shall be removed from the site and other lands used by the Contractor.

1.03 TEMPORARY UTILITIES

A. Electrical Power: The Contractor shall provide and pay all charges for electrical power for temporary building(s) and for heating, lighting, operation of Contractor's equipment, or for any other use by the Contractor.

B. Telephone: The Contractor shall provide and pay all charges for telephone service to his field office and other locations as deemed necessary by the Contractor.

C. Water: If weather conditions and water levels are sufficient, water for construction may be available in the on site sediment basin, provided:

1. Water available may be limited by weather conditions or water levels. In the event of limited water availability, the Contractor shall make arrangements to provide (and pay for) water from another source.
2. Contractor shall procure water on site in the location and in the manner designated by the Engineer and Owner.
3. Contractor at his own expense shall make authorized modifications, connections, and provide means for delivering the water to the work site.
4. Contractor shall provide adequately against waste and needless use of water.
5. Contractor responsible for restoring areas where water is obtained to pre-construction conditions.

D. Sanitary Facilities:

1. The Contractor shall furnish temporary sanitary facilities at the site for the needs of all construction workers and others performing work or furnishing services on the Project. The Contractor's personnel, subcontractor's personnel, and others performing work or furnishing services for the Contractor will not be allowed to use the Owner’s sanitary facilities.
2. The Contractor shall enforce the use of such temporary sanitary facilities by all personnel at the site. Sanitary facilities shall be of reasonable capacity, properly maintained throughout the construction period, and obscured from public view to the greatest practical extent. If chemical toilets are provided, at least one toilet will be furnished for each 20 individuals.

E. Natural or LP Gas: The Contractor shall provide and pay all charges for natural or LP gas service to temporary buildings or other facilities operated and maintained by the Contractor.

1.04 MAINTENANCE OF TRAFFIC

A. Landfill Traffic: The Contractor shall conduct his work to minimize interference with all landfill traffic. The Contractor is to take any precautions necessary to ensure that existing landfill infrastructure is not damaged during work at the site. This may require temporary modifications to existing structures. The Contractor is responsible for maintaining/restoring any roads damaged by Contractors negligent operations to original conditions. Haul road maintenance/restoration may include, but is not limited to, dust control, grading, adding rock to maintain surfacing, etc. The Contractor is responsible for placing signage along the haul road if specified in Section 01100.

B. Detours: Where required by the authority having jurisdiction that traffic be maintained and whenever it is necessary to cross, obstruct, or close roads, driveways and sidewalks, whether public or private, the Contractor shall provide and maintain suitable and safe detours or other temporary expedients for the accommodation of public and private travel, and shall give reasonable notice to owners before interfering with private drives.

C. Iowa Department of Transportation (IDOT) Requirements: If construction involves any work on IDOT right-of-way, the Contractor shall be responsible for meeting all requirements of the IDOT with regard to safety, signage, detours and other requirements at no additional cost to the Owner.

D. Parking: The Contractor shall prepare and maintain suitable parking area(s) for use of all Contractor’s personnel and others performing work or furnishing services for the Contractor in connection with the Work. No parking by the Contractor's personnel will be permitted where parking may interfere with public traffic or the Owner's operations.

1.05 BARRICADES AND TEMPORARY CONSTRUCTION FENCING

A. All roads and drives which are closed to traffic shall be protected by effective barricades and warning signs. All open trenches and other excavations shall have suitable barricades, signs, lights, and temporary fencing to provide adequate protection. Other obstructions such as material piles and equipment shall be protected with similar warning signs, fencing, and lights operating from sunset to sunrise.

B. All barricades, signs, lights, fencing, and other protective devices shall be installed and maintained in conformity with applicable statutory requirements, or as required by the authority having jurisdiction.

1.06 ENVIRONMENTAL PROTECTION

A. Dust Control:

1. The Contractor shall take reasonable measures to prevent unnecessary dust. Earth surfaces subject to dusting shall be kept moist with water or by application of a chemical dust suppressant. Dust prone materials in piles or in transit shall be covered when practical to prevent blowing.
2. Buildings and operating facilities which are affected adversely by dust shall be adequately protected from dust. Existing and new equipment which may be adversely affected by dust shall be adequately protected.

B. Temporary drainage facilities and erosion control:

1. The Contractor shall provide for the drainage of storm water and such water as may be applied or discharged on the site in the performance of the Work.

Drainage facilities shall be adequate to prevent damage to the Work, the site, and adjacent property.

2. Existing drainage channels and conduits shall be cleaned, enlarged, or supplemented as necessary to carry all increased runoff attributable to the Contractor's operations. The Contractor shall prevent erosion of soil on the site and adjacent properties resulting from construction activities. Effective measures such as silt fences, dikes, ditch checks, preservation of natural vegetation, and suitable ground cover shall be initiated prior to clearing, grading, excavation, or other operations that will disturb natural protection of soils.

C. Pollution Control: The Contractor shall prevent the pollution of soil, surface watercourses, and groundwater by controlling sanitary wastes, sediments, debris, chemicals, solvents, and other substances utilized in the performance of the Work. No sanitary wastes will be permitted to enter any drain other than a sanitary sewer. No sediment, debris, or other substances will be permitted to enter sanitary sewers.

1.07 PROTECTION OF TREES AND PLANTS

A. All trees and other vegetation which must be removed to perform the Work shall be removed and properly disposed of by the Contractor; however, no trees or cultured plants shall be unnecessarily removed unless their removal is indicated on the Drawings. All trees and plants not removed shall be protected against injury from construction operations by the Contractor.

B. The Contractor shall take extra measures to protect trees designated to be preserved, such as erecting barricades, trimming to prevent damage from construction equipment, and installing underground facilities by hand or tunneling methods. Designated trees shall not be endangered by stockpiling excavated material or storing equipment against the trunk.

C. When injury or removal of trees designated to be preserved cannot be avoided, or when removal and replacement is indicated on the Drawings, each tree injured beyond repair or removed shall be replaced with a similar tree of the nearest size available.

1.08 DAMAGE TO EXISTING PROPERTY

A. The Contractor will be held responsible for any damage to existing structures, Work, materials, or equipment because of his operations and shall repair or replace any damaged structures, Work, materials, or equipment to the satisfaction of, and at no additional cost to, the Owner. The Contractor shall protect all existing structures and property from damage and shall provide bracing, shoring, or other means necessary for such protection.

B. The Contractor shall be responsible for all damage to streets, roads, curbs, sidewalks, highways, shoulders, ditches, embankments, culverts, bridges, or other public or private property, which may be caused by transporting equipment, materials, or personnel to or from the Work. The Contractor shall make satisfactory and acceptable arrangements with the agency having jurisdiction over the damaged property concerning its repair or replacement.

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION – NOT USED

END OF SECTION

02330 - COMPACTED LANDFILL BASE LINER

PART 1 - GENERAL

1.01 SCOPE

A. Work under this item includes all labor and equipment to install a compacted base liner as shown on the Plans and as described in Section 01100 of these Specifications and this Section.

1.02 REFERENCE SPECIFICATIONS

A. All reference to ASTM or Iowa Department of Natural Resources (IDNR) specifications shall be to the latest specifications or method of test adopted by these agencies for the materials indicated. Intent of specifying a minimum standard proctor density and moisture is to provide a base liner with an in place hydraulic conductivity of less than $1X10^{-7}$cm/sec.

1.03 QUALIFICATIONS

A. Contractor installing compacted landfill base liner shall have completed at least three successful compacted base liner projects within the last five years. Exceptions may be made if documentation is provided showing that the Contractor has installed soils with controlled compaction and moisture requirements.

B. Contractor installing compacted base liner shall use GPS guided equipment.

PART 2 - PRODUCTS

2.01 MATERIALS

A. The base liner shall be constructed from clay soils classified as CH, CL, or SC as per ASTM D2487.

B. Soils used in the base liner shall be free from significant quantities of sand, rock, and organic material.

C. The Engineer or his designee shall designate the areas of borrow and approve/disapprove material for the base liner.

D. Unsuitable material for the base liner shall be hauled to a stockpile location approved by the Owner's Representative.

E. The base liner soil shall have a lab tested recompacted hydraulic conductivity less than $1X10^{-7}$ cm/sec (0.00028 ft/day) at the specified minimum standard proctor density and moisture content.

F. The Engineer shall determine the suitability of the soil for use as the base liner material based on the results of lab hydraulic conductivity tests performed by the Engineer.

G. The base liner material shall be placed with moisture and density control as specified in Section 01100.

2.02 SUBMITTALS

A. Results of field density and shelby tube tests shall be submitted to IDNR prior to the placement of solid waste.

PART 3 - EXECUTION

3.01 INSTALLATION

A. The base liner shall be constructed in accordance with Iowa Administrative Code 567, Subrule113.7(5)"a".

B. Base liner lift placement.

1. The base liner shall be placed in 8 inch lifts unless otherwise specified.
2. Prior to placement of each lift of the compacted base liner, the previous lift shall be scarified to a depth of at least 1.5 inches to promote bonding.
3. Compaction equipment shall be used to ensure that each lift is kneaded into the previously placed lift.
4. If the moisture content of the surface of a lift falls below specification requirements before the next lift is placed, the lift shall be scarified and/or have moisture adjusted before the next lift is added. If scarification or moisture adjustment is not sufficient, the surface of the lift shall be removed to expose material meeting project requirements prior to adding the next lift.
4. If a groundwater diversion layer is specified and the compacted clay component of the base liner is at least 2.25' thick, the initial lift may be placed in a single 11 inch (compacted depth) lift to avoid damaging the groundwater diversion layer.
5. The total liner thickness shall be as specified in Section 01100.

C. Unless specified otherwise in the plans and specifications, the soil shall be compacted to a minimum of 95% standard proctor density (ASTM D698) with moisture 0-5% above optimum.

D. The surface of the base liner shall be smooth and free of all rocks, stones, sticks, roots, sharp objects, or debris of any kind.

E. Prior to flexible membrane liner installation, the following are required:

1. Rolling entire soil surface under flexible membrane liner with a steel wheeled roller is required, unless alternate finishing methods are approved by the FML installer and the Engineer.
2. The surface should provide a firm, smooth, unyielding foundation for the flexible membrane liner with no sudden, sharp or abrupt changes or breaks in grade, and without depressions (i.e. sheepsfoot depression, tracks, etc.).
3. The surface shall be free of debris, roots, or angular stones larger than ½ inch.
4. Any voids in the surface resulting from rock or debris removal shall be backfilled with a bentonite/soil or bentonite/sand mixture.
5. The FML Installer shall, on a daily basis, certify that the surface on which the FML will be installed is acceptable. After the supporting soil surface has been accepted, it shall be the Installer's responsibility to indicate to the Owner's Representative any change to its condition due to natural causes or occurrences that may require repair work.

F. The grade shall be placed to minimum 0 to 0.1' above the Plan grade.

G. No standing water or excessive moisture shall be allowed on the surface.

H. Any portion of the base liner that undergoes freezing conditions, unless protected with an insulating layer approved by the Engineer, shall be reworked to meet project specifications or removed and replaced.

I. The base liner shall be keyed into existing slopes to seal the groundwater diversion system from surface water.

J. Care must be taken during base liner construction not to damage the groundwater diversion layer, subbase, or site infrastructure.

3.02 TESTING

A. A minimum of five (5) field density tests shall be taken per lift per acre to verify that base liner soils meet compaction and moisture requirements. Any areas that do not meet requirements shall be scarified, have moisture content adjusted if necessary and be recompacted and retested until passage. Tests documenting that each lift in a particular area meet the specified moisture and density requirements must be completed prior to placement of the next lift in that area.

B. A minimum of five (5) shelby tube samples will be taken from the test pad (if applicable) and/or from the compacted base liner. Any areas that do not meet requirements shall be scarified, have moisture content adjusted if necessary and be recompacted and retested until passage or the material will be replaced. Tests documenting that the shelby tube samples meet the hydraulic conductivity requirements must be completed prior to placement of the flexible membrane liner.

3.03 QUANTITY

A. The payment quantity of the base liner will be determined by the Engineer as specified in Section 01100. There will be no adjustment for shrinkage or swell of the material.

3.04 APPROVAL

Approval of the base liner will be based on field moisture/density testing as well as the results of the Shelby tube sampling. The base liner shall be accepted by the Owner when all of the following conditions are met:

A. Installation is finished.

B. Verification of the testing is complete.

C. All other work associated with the project has been completed in accordance with the Contract Documents.

END OF SECTION

02555 - GROUNDWATER DIVERSION LAYER

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The work shall consist of furnishing and installing a groundwater diversion layer as shown on the Plans or as specified herein.

1.02 APPLICABLE RULES

A. Purpose of groundwater diversion layer is to establish an adequate separation between groundwater and solid waste. Groundwater diversion layers are discussed in IAC 567-113.6(2)i.

PART 2 - MATERIALS

2.01 MATERIALS

A. Groundwater diversion layer materials shall conform to the requirements listed in Section 01100, this Section and the requirements shown on the Plans. Groundwater diversion layers normally consist of one of the two configurations below (or some combination thereof):

1. Geonet: Geonet composite will have geotextile filter fabric bonded to each side. Geonet must be designed to withstand applicable loads and retain hydraulic conductivity.
2. Fabric/rock: A 4" layer of crushed stone with a geotextile filter fabric on top only or on top and bottom (as specified in Section 01100).

2.02 GEONET GROUNDWATER DIVERSION LAYER

A. Materials

1. Geonet shall be manufactured from high density polyethylene.
2. Geonet shall have a minimum transmissivity of $1x10^{-4}$ square meters per second in accordance with ASTM D4716.
3. Geonet shall have filter fabric on top and bottom.
   a. The fabric weight shall be as specified in Section 01100.
   b. The fabric shall be heat bonded to the net. The bond between the fabric and the net shall have a minimum peel strength of 1 lbs/in in accordance ASTM D7005.
   c. The fabric must meet the requirements in Section 06605, "Geotextiles".
4. Collection pipes shall HDPE or PVC pipe as specified in Section 01100.
5. Collection pipes shall be bedded in material specified in Section 01100.

B. Submittals

1. Contractor responsible for providing certifications geonet meets Specifications.
2. Contractor responsible for providing certifications geotextile filter fabric meets Specifications.

2.03 ROCK/FABRIC GROUNDWATER DIVERSION LAYER

A. Materials

1. The four (4) inch thick layer of stone shall be crushed rock in general accordance with Section 01100 of the Specifications.
2. Geotextile fabric must meet requirements set out in Section 01100.
3. Geotextile must also meet the requirements in Section 06605, "Geotextiles".
4. Collection pipes shall be HDPE or PVC pipe as specified in Section 01100.
5. Collection pipes shall be bedded in material specified in Section 01100.

B. Submittals

1. Contractor responsible for providing certifications geotextile meets Specifications.
2. Contractor responsible for submitting rock gradation before installation begins.
3. If requested by the Engineer, a representative sample of the rock shall be submitted to the Engineer for testing and review prior to construction. The Engineer may test the material for hydraulic conductivity; the minimum hydraulic conductivity for the rock is 0.01 cm/sec.

PART 3 - EXECUTION

3.01 DELIVERY, HANDLING AND STORAGE

A. Geotextile and geonet delivered to jobsite shall be handled and stored as described in Section 06605, "Geotextiles".

3.02 EXCAVATION

A. Shall be to the lines and grades shown on the Plans. Excavation shall be in conformance with IDOT Spec. 2102 and Section 01100 of these Specifications.

3.03 INSTALLATION

A. General Installation

1. Subgrade surface shall be relatively smooth and be without sharp depressions, projections, sharp points, etc. The Engineer shall review the subgrade surface before groundwater diversion layer installation begins.
2. Care must be taken not to damage or move the groundwater diversion layer during cover soil placement. If cover soil placement causes damage or movement, the Contractor shall discontinue cover soil placement until alternate methods for cover soil placement are submitted to the Engineer.
3. Cover materials shall be placed over the groundwater diversion layer starting at the bottom of slopes.

B. Geonet Groundwater Diversion Layer

1. Installation shall be in accordance with GRI-GN2 and GRI-GC13 "Joining and Attaching Geonets and Drainage Composites" published by the Geosynthetic Research Institute.
2. Geonet shall be connected to adjacent nets using plastic zip ties or other methods recommended by the Manufacturer. Fasteners shall be a contrasting color from the geocomposite to facilitate visual inspection of connections. Space fasteners a maximum of 5 feet along the sides of the rolls and a maximum of 0.75 feet along the ends of the rolls. The geonet shall be placed and anchored as recommended by the Manufacturer.

3. The top fabric layer of the geonet composite shall be connected to adjacent panels through heat bonding or sewing. The connection shall be continuous along the entire seam.
4. On slopes, the geonet composite shall be secured as recommended by the Manufacturer. The Contractor may need to add additional measures (i.e. weights or anchoring) to hold the composite in place to prevent movement due to wind or placement of the overlay soil.

C. Rock/Fabric Groundwater Diversion Layer

1. The bottom fabric (if used) shall be placed in close and uniform contact with the subgrade.
2. 4 inches of clean crushed limestone placed in a single lift on top of the subgrade or bottom fabric (if used). The rock shall be placed to avoid damage and/or movement of the bottom fabric (if used). Rock shall be placed to a uniform thickness of 4 inches plus or minus 1/2 inch. Rock surface shall be relatively smooth and be without sharp depressions, projections, sharp points, etc. prior to placement of the top fabric. The Engineer shall review the rock surface before the top fabric is placed.
3. A layer of geotextile fabric placed on top of the clean rock prior to the installation of the compacted base liner. The top fabric shall be connected to adjacent panels by heat bonding or sewing. The connection shall be continuous along the entire seam.

3.04 APPROVAL

A. The groundwater diversion layer shall be accepted by the Owner when all of the following conditions are met

1. Installation is finished.
2. Verification of the adequacy of all field repairs, including associated testing, is complete.
3. Record drawings are provided to the Owner as required.
4. All other work associated with the project has been completed in accordance with the Contract Documents.

END OF SECTION

02575 - HIGH DENSITY POLYETHYLENE PIPE

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The work shall consist of furnishing and installing High Density Polyethylene (HDPE) pipe and fittings as shown on the Plans or as specified herein.

1.02 REFERENCE SPECIFICATIONS

A. All reference to ASTM, AWWA, ANSI, Iowa Department of Transportation (IDOT) or Federal specifications shall be to the latest specifications or methods of test adopted by these agencies for the materials indicated.

PART 2 - MATERIALS

2.01 MATERIALS

A. The pipe shall conform to the requirements listed in the applicable section(s) of Section 01100, this Section and the requirements shown on the Plans.

B. Pipe and Fittings

1. The pipe supplied under this Specification shall be high density, high molecular weight, polyethylene pipe. The pipe shall meet the requirements of PE4710. The fittings supplied shall be made from polyethylene resin which meets this same specification.
2. The pipe shall be as uniform as commercially practicable in density and other specified physical properties and free from visible cracks, holes, foreign inclusions, or other defects.
3. Pipe supplied under this specification shall have IPS (Iron Pipe Size) OD unless otherwise specified.

C. Sweep elbows

1. Sweep elbows shall be manufactured in one continuous piece from HDPE pipe of the diameter and SDR rating specified in Section 01100.
2. Segments are not allowed in sweep elbows.
3. The manufacturing process shall produce a single piece bend at the angle specified with a deviation of +/- 2 degrees.

D. Dual containment pipe system

1. Experience of manufacturer shall be not less than 10 years of manufacturing and production of dual contained piping and related fittings.
2. The dual containment pipe system shall consist of pre-assembled HDPE carrier and containment pipe, centralizers, and fittings.
3. Pipe and joints shall be supplied to the job site ready for simultaneous butt fusion. The installer shall show that the materials are capable of butt fusion and shall provide a procedure to consistently produce sound welds.
4. Centralizers welded to the carrier pipe shall support the carrier pipe within the containment pipe. Centralizers should have at least two openings that will permit the flow of liquid between the carrier pipe and the containment pipe. Centralizer support spacing and other pipe system requirements shall be as per the manufacturers recommendations based on burial depth and other factors.
5. The centralizers shall be machined from pipe grade resin sheet stock HDPE.
6. Bending dual containment pipe instead of using manufactured elbows and

fittings is not allowed.

7. End termination fittings shall be used to seal the system at the ends. The fitting shall be simultaneously butt fused to the carrier and containment pipe to seal the annular space.

E. Submittals

1. The Contractor shall submit certifications that the pipe meets the Specifications.
2. The heat fusion butt weld operator shall be certified for butt fusion welding of high density polyethylene pipe.

PART 3 - EXECUTION

3.01 DELIVERY, HANDLING AND STORAGE

A. Pipe shall be delivered to the job site and handled by means which provides adequate support to the pipe and does not subject it to undue stresses or damage. When handling and placing HDPE pipe, care shall be taken to prevent impact blows, abrasion damage, and gouging or cutting (by metal surfaces or rocks). All special handling requirements of the manufacturer shall be strictly observed.

B. Pipe shall be stored on clean, level, dry ground to prevent undue scratching or gouging of the pipe. If the pipe must be stacked for storage, such stacking should be done in accordance with the pipe manufacturer's recommendations. The handling of the pipe should be done in such a manner that it is not damaged by dragging over sharp objects or cut by chokers or lifting equipment.

C. No on site fabrication of dual containment piping is allowed.

D. Segments of pipe having cuts or gouges in excess of 10% of the wall thickness of the pipe shall be cut out and removed.

E. Each pipe shall be inspected for defects before being lowered into the trench.

3.02 FITTINGS AND JOINTS

A. Unless otherwise specified in Section 01100 or shown in the Plans, all joints are to be heat fusion butt welded.

B. Pipe shall be joined in accordance with the manufacturer's recommendations. Laying deflections shall be within the manufacturer's recommended tolerances. Pipe ends shall be cut square and be deburred to provide uniform smooth surfaces for the jointing process.

C. Each joint must be visually inspected inside and outside for damage, dirt, moisture, or any other abnormalities prior to fusing.

D. On both the inside and outside of the pipe, perforations shall be free of cuttings, frayed edges, or any materials that would reduce the effective opening.

E. Backup rings, bolts, steel fittings, etc. shall be stainless steel.

F. Flange adapters shall be used to connect pipe to valves and similar materials.

3.03 INSTALLATION

A. EXCAVATION shall be to the lines and grades shown on the Plans. Excavation shall be in conformance with IDOT Spec. 2102 and Section 01100 of these Specifications.

B. LAYING PIPE

1. The pipe complete with fittings and other related appurtenances shall be installed to the lines and grades shown on the Plans. The pipe shall be laid so that there is no reversal of grade between joints unless otherwise shown in the Plans. The pipe shall not be dropped or dumped on the bedding or into the pipe trench.
2. Pipe installation in water is not allowed except where approved by the Engineer.
3. Just prior to placement, each pipe section shall be inspected to insure that all foreign materials are removed from the inside of the pipe. At the end of work each day or when work is stopped for any extended period, all open ends of the pipeline shall be sealed off by a suitable cover or plug to prevent dirt, water, or other substances from entering the pipe.
4. Not more than 100' of trench shall be open in advance of or behind laying, unless permitted by the Engineer. However, the excavation of trenches shall be fully completed a sufficient distance ahead of pipe laying to provide ample working space and for safety. Contractor is required to install adequate trench protection (sheeting, shoring, bracing, barricading, etc.) to prevent ground movement, damage to adjacent structures and/or utilities, and to prevent trench entry.
5. The open ends of the pipe shall be sealed to prevent dirt, water, or other substances from entering the pipe. The interior of the pipe shall be carefully freed from all dirt, joint materials, or superfluous material of every description as the work progresses. If directed by the Engineer, pipes shall be flushed with water upon completion to remove debris.
6. During installation, the pipe shall be firmly and uniformly bedded throughout its entire length, to the depth and in the manner noted in Section 01100 or as shown on the Plans. Blocking or mounding beneath the pipe shall not be used to bring the pipe to final grade.
7. For details on bedding and backfill material and methods, see Section 01100.

3.04 TESTING

A. If required by Section 01100, leak testing is to be as per manufacturers recommendations. Method of testing shall be supplied as a Shop Drawing and be approved by the Engineer.

3.05 APPROVAL

A. The HDPE pipe shall be accepted by the Owner when all of the following conditions are met:

1. Installation is finished.
2. Verification of the adequacy of all field joints and repairs, including associated testing, is complete.
3. Record drawings are provided to the Owner as required.
4. All other work associated with the project has been completed in accordance with the Contract Documents.

END OF SECTION

06600 - FLEXIBLE MEMBRANE LINER

PART 1 - GENERAL

1.01 SCOPE

A. This work describes parameters for the manufacture, supply, and installation of High Density Polyethylene (HDPE) geomembrane liner systems. These Specifications encompass the furnishing of all labor, materials, transportation, handling, storage, supervision, tools, and other equipment that may be necessary to install and test the liner installation as described herein and in associated Plans.

1.02 QUALIFICATIONS OF MANUFACTURER AND INSTALLER

A. The Installer shall be the Manufacturer or an Installation Contractor approved by the Manufacturer to install the Manufacturer's geomembrane. Installation Contractors approved by the Manufacturer are considered to be Manufacturer's Representatives for the purpose of this specification.

B. Installation shall be performed under the constant direction of a single Field Installation Supervisor who shall remain on site and be responsible, throughout the liner installation, for liner layout, seaming, patching, testing, repairs, and all other activities by the Installer. This Installation Supervisor shall be experienced in the installation and seaming of HDPE geomembrane. Actual seaming shall be performed by individuals having experience seaming HDPE geomembrane, using the same type of seaming apparatus specified.

PART 2 - MATERIALS

2.01 GEOMEMBRANE RAW MATERIALS

A. The geomembrane shall be manufactured of new, first-quality resin produced in the United States or Canada and shall be compounded and manufactured specifically for the intended purpose. The resin manufacturer shall certify each batch for the properties listed in GRI GM13.

2.02 GEOMEMBRANE ROLLS

A. The geomembrane shall be a minimum 22.5 ft seamless width High Density Polyethylene. Carbon black shall be added to the resin if the resin is not compounded for ultra-violet resistance. The geomembrane rolls shall meet the physical and mechanical properties listed in GRI GM13. The geomebrane shall conform to the following:

1. The surface of the geomembrane shall not have striations, pinholes, or bubbles and shall be free of holes, blisters, undispersed raw materials, or any contamination by foreign matter.
2. The geomembrane shall be supplied in rolls. Labels on each roll shall identify the thickness of the material, the length and width of the roll, batch and roll numbers, and name of manufacturer.

2.03 SUBMITTALS

A. The Manufacturer shall provide the following information as Shop Drawings for Engineer review and approval prior to installation:

1. List of material properties.

2. A list documenting completed facilities similar to the facility being constructed. Each entry in this list should specify the name and purpose of the facility, its location and date of installation, the name of the owner, the project manager, designer, fabricator (if any), and the installer, as well as the name and telephone number of the contact at the facility who can discuss the project. In addition, the geomembrane thickness and total square footage of the installation surface should be included.
3. Certification that all resin used in the manufacture of geomembrane for this job meets the specifications.
4. Certification that the geomembrane and extrudate produced for this project have the same properties.
5. Roll certifications.

B. The Installation Contractor shall provide the following information as Shop Drawings for Engineer review and approval prior to installation:

1. Insurance coverage
2. Installation capabilities
3. Information on equipment and personnel.
4. A list of completed facilities similar to the facility being constructed, for which the Installation Contractor has installed an HDPE geomembrane. For each installation, the following information shall be provided
   a. Name and purpose of facility, its location, and date of installation.
   b. Name of owner, design engineer, manufacturer, fabricator, if applicable, and name and telephone number of contact at the facility who can discuss the project.
   c. Thickness of geomembrane and surface area of the installed geomembrane.
   d. Type of seaming, patching, and tacking equipment.
   e. A copy of the manufacturer's and/or fabricator's approval letter(s) and/or license(s), if applicable.
   f. Resume of the qualifications of the Installation Supervisor assigned to this project.
5. Proposed Installation Panel layout identifying seams, panel sequencing, and details.
6. Any proposed variance or deviation from these documents shall be submitted in writing by the Installer to the Owner's Representative a minimum of fourteen (14) working days prior to the scheduled start of geomembrane installation and will be accepted/rejected by the Owner's Representative prior to start of installation activities.

2.04 WARRANTY

A. A written Warranty shall be obtained from the Manufacturer (for material) and the Installation Contractor (for workmanship). These documents shall warrant both the quality of the material for a period of not less than ten (10) years and the quality of the workmanship for a period of not less than two (2) years.

2.05 WELDING, SEAMING, AND TESTING EQUIPMENT

A. Shall be maintained in adequate numbers to avoid delaying work.

B. Electric generators shall not be placed directly on the geomembrane.

2.06 FIELD SEAMS

A. The field seams (hot wedge and extrusion) shall meet the following specifications

1. Shear Strength shall meet the requirements contained in GRI GM19.

2. Peel Strength shall meet the requirements contained in GRI GM19.

2.07 QUALITY CONTROL SPECIFICATIONS

A. Raw Materials shall be in accordance with GRI GM13.

B. Finished Product shall be tested and inspected in accordance with GRI GM13.

PART 3 - EXECUTION

3.01 MATERIALS LOGISTICS

A. The geomembrane rolls or panels shall be packaged and shipped by appropriate means so that no damage is caused.

B. Off-loading and storage of the geomembrane is the responsibility of the Contractor. The Manufacturer/Installer/Contractor shall be responsible for replacing any damaged or unacceptable material at no cost to the Owner. No off-loading shall be done unless an Owner's Representative is present. Damage during off-loading shall be documented by the Owner's Representative and Contractor. All damaged rolls must be separated from the undamaged rolls until the proper disposition of that material has been determined by the Owner's Representative. The Owner's Representative will be the final authority on determination of damage.

C. On-Site Storage

1. The geomembrane shall be stored so as to be protected from puncture, dirt, grease, water, moisture, mud, mechanical abrasions, excessive heat, or other damage.
2. The rolls shall be stored on a level prepared surface (not wooden pallets). The Manufacturer's Representative shall inspect the material in storage prior to placement including any damaged rolls.

3.02 EARTHWORK

A. The Installer shall observe and render an opinion on initial surface conditions and, on a daily basis, shall accept that the surface on which the geomembrane will be installed is suitable for installation. Attachment 1 (or an alternate form approved by the Engineer) shall be completed to document this acceptance. After the supporting soil surface has been accepted, it shall be the Installer's responsibility to indicate to the Owner's Representative any change to its condition due to natural causes or other occurrences that may require repair work.

B. The subgrade shall be free of sticks, roots, sharp objects, angular stones larger than ½ inch, or debris of any kind. The subgrade should provide a firm, smooth, unyielding foundation with no sudden sharp or abrupt changes or breaks in grade and without depressions (ie sheepsfoot depressions, equipment tracks, etc.).

3.03 ANCHOR TRENCH

A. The anchor trench shall be excavated to the line, grade, and width recommended by the Manufacturer prior to liner system placement. The Installer shall verify that the anchor trench has been constructed according to the Manufacturer's recommendations.

B. Slightly rounded corners shall be provided in the trench where the geomembrane adjoins the trench so as to avoid sharp bends in the geomembrane.

3.04 METHOD OF PLACEMENT

A. The Manufacturer's Representative shall observe and render an opinion of initial placement technique and be responsible for the following:

1. Equipment will not be allowed to operate on the geomembrane except as below:
   a. Only low pressure ATVs and UTVs will be considered.
   b. The tires shall be reviewed for the presence of trapped stones, sticks, or other debris prior to the ATV or UTV driving on the geomembrane.
   c. Refueling of ATVs, UTVs, or generators is not allowed on the geomembrane.
2. No equipment or tools shall damage the geomembrane by handling, trafficking, or other means.
3. No personnel working on the geomembrane shall smoke, wear damaging shoes, or engage in other activities that could damage the geomembrane.
4. The method used to unroll the panels shall not cause scratches or crimps in the geomembrane and shall not damage the supporting soil or underlying geotextile (if present).
5. The method used to place the panels shall minimize wrinkles. Wrinkles shall be identified as to proper location and compensation shall be identified on the Installer's drawings. Ballast shall be used to prevent relocation of the compensating wrinkles by wind.
6. Adequate loading (e.g., sand bags or similar items that will not damage the geomembrane) shall be placed to prevent uplift by wind (in case of high winds, continuous loading is recommended along edges of panels to minimize risk of wind flow under the panels.)
7. Panels displaced or damaged by wind shall be removed and are not allowed to be reused.
8. Direct contact with the geomembrane shall be minimized, i.e., the geomembrane in traffic areas is protected by geotextiles, extra geomembrane, or other suitable materials.
9. Do not allow personnel on wet or slippery geomembranes without adequate safety precautions.

3.05 WEATHER CONDITIONS

A. Geomembrane deployment shall proceed between ambient temperatures of 32 degrees F to 100 degrees F. The Installer shall take adequate precautions for variations in temperatures during geomembrane placement. Placement can proceed below 32 degrees F only after it has been verified by the Manufacturer that the material can be seamed according to the Specifications and is approved by the Owner's Representative.

B. Geomembrane placement shall not be done during any precipitation, in the presence of excessive moisture (e.g., fog, rain, dew) or in the presence of excessive winds, as determined by the Installation Supervisor.

3.06 FIELD SEAMING

A. All field seams shall be double fusion seams (hot wedge) where practical. Extrusion welded seams may be used in areas unable to be double fusion welded.

B. Material to be seamed shall be cleaned of soil, dust, and other debris and dry.

C. Seams shall be oriented parallel to the line of maximum slope, i.e., oriented down, not across the slope as much as practical. Panels shall be oriented to minimize cross seams on side slopes. Cross seams shall be staggered, and only one cross seam shall be allowed per panel slope length. Cross seams will not be allowed on adjacent panels. Cross seams will only be allowed on the lower half of each slope, but not allowed within 5’ of the toe of the slope.

D. In corners and odd-shaped geometric locations, the number of field seams shall be minimized.

E. Panel overlap shall be oriented to result in unobstructed flow toward base of slope/leachate collection pipe.

F. Seams shall be aligned with the least possible number of wrinkles and "fishmouths". If a fishmouth or wrinkle is found, it shall be relieved and cap-stripped.

G. The panel layout shall minimize seams in the leachate pipe trench. Panels in the leachate pipe trenches are to be oriented in the direction of pipe flow. Longitudinal seams are not allowed in the leachate pipe trench.

H. Seam Overlap

1. Align seam overlaps consistent with the requirements of the welding equipment being used.
2. The procedure used to temporarily bond adjacent panels together shall not damage the geomembrane; in particular, the temperature of hot air at the nozzle of any spot welding apparatus shall be controlled such that the geomembrane is not damaged.

I. Approved equipment for field seaming are hot shoe fusion welders and extrusion welders.

3.07 SEAM TESTING

A. Trial welds shall be conducted on geomembrane liner to verify that seaming conditions are satisfactory. Trial welds shall be conducted at the beginning of each seaming period, at the discretion of the Owner's Representative, and at least once each 4 hours, for each seaming apparatus used that day.

B. All trial welds shall be made at a location selected by the Owner's Representative in the area of the seaming and in contact with the subgrade. The trial weld samples shall be approximately 8 feet long with the seam centered lengthwise. A minimum of 4 specimens 1 inch wide shall be cut from the trial weld by the Installer. The Installer shall test specimens in the presence of the Owner's Representative for shear and peel. If a trial weld fails to meet field seam specifications, the seaming apparatus and/or seamer shall not be accepted and shall not be used for seaming until the deficiencies are corrected and two consecutive successful full trial welds are achieved.

C. Non-Destructive Seam Testing

1. The Installer shall non-destructively test all field seams over their full length in the presence of the Owner's Representative. Testing shall be by air pressure testing for double fusion seams and by vacuum box testing for extrusion welded seams. All test equipment shall be furnished by the Installer. Non-destructive tests shall be as follows:

a. Air Pressure Testing

(1) Shall be performed in accordance with ASTM D5820, Standard Practice for Pressurized Air Channel Evaluation of Dual Seamed Geomembranes

b. Vacuum Box Testing

(1) Shall be performed in accordance with ASTM D5641, Standard Practice for Geomembrane Seam Evaluation by Vacuum Chamber.

2. The air test shall be performed as follows:
   a. Seal one end of the seam to be tested.
   b. Insert needle or other approved pressure feed device through the sealed end of the channel created by the double wedge fusion weld.
   c. Energize the air pump to verify the unobstructed passage of air through the channel. If this step is not done Step g shall be done.
   d. Seal the other end of the channel.
   e. Energize the air pump to a pressure of approximately 30 psi, close valve, and sustain pressure for approximately 5 minutes.
   f. If loss of pressure exceeds 3 psi, or pressure does not stabilize, locate faulty area, repair and retest.
   g. Puncture opposite end of seam (end opposite of air pump/pressure gage) to release air. If air is not released at opposite end, locate and test seam on both sides of blockage. This is only required if Step c is not done.
   h. Remove needle or other approved pressure feed device and seal.
3. The vacuum box test shall be performed as follows
   a. Excess sheet overlap shall be trimmed away.
   b. Clean the window, gasket surfaces and check for leaks.
   c. Energize the vacuum pump and reduce the tank pressure to approximately 3-5 psi.
   d. Wet a strip of geomembrane approximately 12 inches wide by the length of the box plus 12 inches (6 inches per side) with a soapy solution of liquid detergent and water.
   e. Place the box over the wetted area and compress to seal the box against the liner.
   f. Close the bleed valve and open the vacuum valve.
   g. Ensure that a leak tight seal is created.
   h. For a period of approximately 15 seconds, examine the geomembrane through the viewing window for the presence of soap bubbles.
   i. If no bubbles appear after 15 seconds, close the vacuum valve and open the bleed valve, move the box over the next adjoining area with a minimum 3 inches overlap and repeat the process.
   j. All areas where soap bubbles appear shall be marked and repaired and then retested.

D. Destructive Seam Testing

1. The Installer shall provide the Owner's Representative with a minimum of one destructive test sample per 500 feet of seam length from a location specified by the Owner's Representative. The Installer shall not be informed in advance of the sample location.
2. In order to obtain test results prior to completion of liner installation, samples shall be cut by the Installer as the seaming progresses. Sampling times and locations shall be determined by the Owner's Representative. The Owner's Representative must witness the obtainment of all field test samples and the Installer shall mark all samples with their location roll and seam number. The Installer shall also record in written form the date, time, location, roll seam number, ambient temperatures, and pass or fail description. A copy of the information must be attached to each sample portion. All holes in the geomembrane resulting from obtaining the seam samples shall be immediately repaired. All patches shall be vacuum tested.

3. The samples shall be a minimum of 12 inches wide by 24 inches long with the seam centered lengthwise. The sample shall be cut into two equal length pieces, half to be given to the Installer and the other half to be given to the Owner's Representative.

E. The Installer shall cut ten 1 inch wide replicate specimens from his sample and these shall be tested by the Installer. The Installer shall test five specimens for seam strength and five for peel strength in the presence of the Owner's Representative. The test results must meet the requirements in GRI GM 19.

F. The Installer will package and ship at least two seam samples to a Laboratory for testing. The test method and procedures to be used by the Independent Laboratory shall be the same used in field testing, where seam samples are 1 inch wide, and the grip separation rate is 2 ipm. The test results must meet the requirements in GRI GM 19. Cost of these tests shall be the responsibility of the Installer.

G. The following procedures shall apply whenever a sample fails the field destructive test

1. The Installer shall cap strip the seam between the failed location and any passed test location.
2. The Installer can retrace the welding path to an intermediate location (at a minimum of 10 feet from the location of the failed test), at the discretion of the Owner's Representative, and take a small sample for an additional field test. If this test passes, then the seam shall be cap stripped between that location and the original failed location. If the test fails, then the process is repeated.
3. Over the length of seam failure, the Installer shall either cut out the old seam, reposition the panel and reseam, or add a cap strip, as required by the Owner's Representative.
4. After reseaming or placement of the cap strip, additional destructive field test(s) shall be taken within the reseamed area. The reseamed sample shall be found acceptable if test results are acceptable. If test results are not acceptable, this process shall be repeated until the reseamed length is judged satisfactory by the Owner's Representative.

H. In the event that a sample fails a laboratory destructive test, then the above procedures shall be followed, considering laboratory tests exclusively.

I. The Owner's Representative will document all actions taken in conjunction with destructive test failures.

3.08 DEFECTS AND REPAIRS

A. All seams and non-seam areas of the geomembrane shall be inspected daily by the Installer in the presence of the Owner's Representative for defects, holes, blisters, undispersed raw materials, and any sign of contamination by foreign matter. Because light reflected by the geomembrane helps to detect defects, the surface of the geomembrane shall be clean at the time of inspection. The geomembrane surface shall be brushed, blown, or washed by the Installer if the amount of dust or mud inhibits inspection. The Owner's Representative shall decide if cleaning of the geomembrane is needed to facilitate inspection. Cleaning, if required, shall be at no expense to the Owner.

1. Each suspect location in seam and non-seam areas shall be non-destructively tested as appropriate in the presence of the Owner's Representative. Each location that fails the non-destructive testing shall be marked by the Installer and repaired accordingly.

2. Repair Procedures
    a. Defective seams shall be restarted/reseamed as described in these specifications.
    b. Small holes shall be repaired by extrusion cap welding. If the hole is larger than 1/4 inch, it shall be patched.
    c. Tears shall be repaired by patching. Where the tear is on a slope or an area of stress and has a sharp end it must be rounded prior to patching.
    d. Blisters, large holes, undispersed raw material, and contamination by foreign matter shall be repaired by patches.
    e. Surfaces of HDPE which are to be patched shall be abraded and cleaned no more than 15 minutes prior to the repair. No more than 10% of the thickness shall be removed.
    f. Patches shall be round or oval in shape, made of the same geomembrane, and extend a minimum of 6 inches beyond the edge of defects. All patches shall have their top edge beveled with an angle prior to placement on the geomembrane. Patches shall be applied using approved methods only.

B. The welding process shall restart by grinding the existing seam and rewelding a new seam. Welding shall commence where the grinding started and must overlap the previous seam by at least 2 inches. Reseaming over an existing seam without regrinding shall not be permitted.

C. Each repair shall be non-destructively tested, except when the Owner's Representative requires a destructive seam sample obtained from a repaired seam. Repairs that pass the non-destructive test shall be taken as an indication of an adequate repair. Failed tests indicate that the repair shall be repeated and retested until passing test results are achieved.

D. Recording of Results: daily documentation of all non-destructive and destructive testing shall be provided to the Owner's Representative by the Installer. This documentation shall identify all seams that initially failed the test and include evidence that these seams were repaired and successfully retested.

3.09 BACKFILLING OF ANCHOR TRENCH

A. The anchor trench shall be backfilled and compacted by the general contractor as approved by the Installer in the presence of the Owner's Representative. Trench backfill material shall be placed in 8 inch thick loose lifts and compacted by wheel rolling with light, rubber tired equipment or other light compaction methods.

B. Care shall be taken when backfilling the trenches to prevent any damage to the geomembrane, geotextiles, or geonets. At no time shall construction equipment come into direct contact with the geomembrane, geotextile, or geonet. If damage occurs, it shall be repaired by the Installer prior to the completion of backfilling.

3.10 GEOMEMBRANE ACCEPTANCE

A. The Installer shall retain all ownership and responsibility for the geomembrane until acceptance by the Owner.

B. The geomembrane liner shall be accepted by the Owner when all of the following conditions are met:

1. Installation is finished.

2. Verification of the adequacy of all field seams and repairs, including associated testing, is complete and records submitted to the Owner. Records shall include Record drawing(s) showing panel layout with corresponding geomembrane roll numbers, seam methods/test results, repair locations, etc.
3. All other work associated with the project has been completed in accordance with the Contract Documents.

END OF SECTION

SUBGRADE SURFACE ACCEPTANCE

INSTALLER

Company Name: _____

Address: _____

_____

Field Supervisor: _____

Owner: _____ Project: _____

ACCEPTANCE

The undersigned certifies that they are an authorized representative of _____ and that they have visually reviewed the subgrade and found the surface acceptable for the installation of HDPE geomembrane.

Estimated area accepted: _____ sq. ft.

Installer Acceptance:

Signature: _____

Name: _____

Title: _____

Date: _____

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 of the subgrade during deployment. Structural integrity of the subgrade and maintenance of these conditions are the responsibility of the General Contractor.

06605 - GEOTEXTILES

PART 1 - GENERAL

1.01 SCOPE

A. This work shall consist of furnishing and installing non-woven geotextiles as shown on the plans or as specified herein.

1.02 REFERENCE SPECIFICATIONS

A. All reference to ASTM, Iowa Department of Transportation or Federal specifications shall be to the latest specifications or methods of test adopted by these agencies for the materials indicated.

PART 2 - MATERIALS

2.01 MATERIALS

A. The geotextile shall conform to the requirements listed in IDOT Spec. 4196, Section 01100, this Section and the requirements shown on the Plans.

1. The geotextile shall meet the physical requirements of Table 1.
2. The geotextile shall be free of holes, tears, defects, and patch-repairs of defects.
3. The geotextile shall be composed of needle-punched, discontinuous (staple) fibers or continuous fibers. Fibers used in manufacture of the geotextile shall consist of a material composed of at least 85 percent by weight polyolefins, polyesters, or polyamides.
4. The geotextile and threads used in sewing the geotextile (if necessary) shall be chemically resistant to commonly encountered hazardous and municipal landfill leachate, rot and mildew.
5. The geotextile and threads used in sewing the geotextile (if necessary) shall also contain stabilizers or inhibitors to limit degradation due to ultraviolet (UV) light exposure.
6. Polymeric thread used for sewing (if necessary) shall exhibit chemical and UV resistance equal to or exceeding that of the geotextile and shall be of contrasting color to the geotextile being sewn.

2.02 SUBMITTALS

A. The geotextile materials supplied under these specifications shall be first quality products specifically manufactured for filtration applications and shall have demonstrated by prior use their suitability for such applications.

B. Submittals from Manufacturer

1. The geotextile Manufacturer shall provide at least three references of geotextile used in similar projects.
2. Prior to installation, the geotextile Manufacturer shall provide certification that the geotextile material meets or exceeds the specified minimum average roll values provided in Table 1.
3. For needle punched geotextiles, the Manufacturer shall certify that the geotextile has been continuously inspected using permanent on-line full-width metal detectors and does not contain any needles.

C. Submittals by installer

1. The installer of the geotextile shall provide records and references of successfully installing geotextile in similar applications.

PART 3 - EXECUTION

3.01 DELIVERY, HANDLING AND STORAGE

A. The geotextile shall be labeled, stored, and handled in accordance with ASTM D-4873, "Guide for Identification, Storage, and Handling of Geotextiles."

B. Each roll shall be marked or tagged to identify the manufacturer, type, length, width and production identification number.

C. The geotextile shall be kept dry and wrapped in a waterproof wrapping such that it is protected from UV light and the elements during shipping and storage. Torn wrappers shall be repaired within 48 hours, using an approved protective covering.

D. Geotextile rolls shall be stored in a manner which protects them from the elements.

E. If stored outdoors, geotextiles shall be elevated and protected with a waterproof, opaque cover.

F. The Contractor shall keep the geotextile in its protective covering until it is ready for installation.

G. The Contractor shall handle all geotextiles in such a manner as to ensure the geotextile is not damaged.

3.02 INSTALLATION

A. The geotextile shall not be installed until conformance test results are reviewed and the geotextile is approved by the Owner, Engineer, or other Owner Representative.

B. The surface on which the geotextile is to be placed shall be prepared to a smooth condition free of debris or obstructions which may cause damage to the geotextile.

C. The surface on which the geotextile is to be placed shall be free of holes, depressions, muddy conditions or standing or flowing water.

D. The surface shall be approved by the Owner, Engineer, or other Owner Representative prior to geotextile placement.

E. Care shall be taken not to entrap stone, excessive dust, or moisture in the geotextile.

F. The Contractor shall not operate equipment directly on the geotextile with the exception of low ground pressure ATVs to deploy geotextile if approved by the Manufacturer.

G. Refueling of equipment on the geotextile is not allowed.

H. No personnel working on the geotextile shall smoke, wear damaging shoes, or engage in other activities that could damage the geotextile.

I. Geotextile shall not be dragged during deployment.

J. Trimming of the geotextile should be performed in a manner that will not damage underlying materials.

K. Geotextiles shall be deployed free of wrinkles and folds.

L. On slopes, the geotextiles shall be anchored at the top and unrolled down the slope.

M. In the presence of wind, all geotextiles shall be weighted with sandbags or other material which will not damage the geotextile.

N. Geotextile uplifted by wind and damaged shall be removed and replaced at no additional cost to the Owner.

O. The geotextile shall be examined over the entire surface after installation to ensure that no potentially harmful objects are present.

3.03 FIELD SEAMING

A. All geotextile seams shall be heat bonded or sewn unless specified in Section 01100.

1. On slopes greater than 10:1 (horizontal:vertical), all seams shall be oriented parallel to (in the direction of) the slope. Seams constructed perpendicular or transverse to the direction of the slope will not be accepted.
2. All seams must be approved by the Owner, Engineer, or other Owner Representative.
3. The installer shall ensure that no soil materials are present within seams or overlaps.

B. Heat Bonded Seams

1. Continuous seams or spot tacking welds may be used as required in Section 01100 and/or Section 02555 (if applicable).
2. For spot tacking welds, the geotextile shall be tacked together at least once for each 3 foot of geotextile seam length.
3. Geotextile panels shall be overlapped a minimum of 6 inches for heat bonded seams or as specified in Section 01100.
4. Geotextile panels shall be completely clean and dry prior to seaming. Heat bonding shall not be performed during rain, snow, or at temperatures below freezing.
5. Any location where the heat bonding process has melted through either geotextile panel shall be repaired at no cost to the Owner.

C. Sewn Seams

1. Seams shall be sewn using a Federal Type 401 stitch. One or two rows of stitching may be used. Each row of stitching shall consist of 4 to 7 stitches per inch.
2. The minimum seam allowance (i.e., the minimum distance from the geotextile edge to the stitch line nearest to the edge) shall be 1.5 in. if a Federal Type SSa (prayer or flat) seam is used. The minimum seam allowance for all other sewn seam types shall be 1.0 inch.

3.04 ANCHORING

A. The geotextile shall be anchored per Manufacturer's recommendations.

3.05 REPAIRS

A. Damaged geotextiles and geotextiles contaminated with dirt shall be repaired immediately at no cost to the Owner.

1. Repairs shall be made with the same geotextile product style as the original material.
2. All repairs shall meet the approval of the Owner, Engineer, or other Owner Representative prior to cover placement.
3. Slopes less than or equal to 10:1
    a. Damaged areas of a size exceeding 25 percent of the roll width shall be removed and replaced across the entire roll width with new material. The new material shall extend a minimum of 12 inches over the adjacent material and be spot sewn or heat bonded to adjacent material.
    b. Damaged areas of a size less than 25 percent of the roll width may be patched.
        (1) All patches must extend a minimum of 12 inches beyond the damaged area in all directions.
        (2) The patch shall be spot sewn or heat bonded so as not to shift out of position during cover placement.
4. Slopes greater than 10:1
    a. Damaged areas of a size exceeding 10 percent of the roll width shall be removed and replaced across the entire roll width with new material. The new material shall extend a minimum of 12 inches over the adjacent material and be sewn to the adjacent material.
    b. Damaged areas of a size less than 10 percent of the roll width may be patched.
        (1) All patches must extend a minimum of 12 inches beyond the damaged area in all directions.
        (2) The patch shall be sewn so as not to shift out of position during cover placement.

3.06 PLACEMENT OF COVER MATERIALS

A. Placement of cover (soils, rock backfill, select waste, geotextile, or geomembrane) on the geotextile shall be accomplished in a manner so as to ensure that the geotextile is not damaged.

B. Cover material shall be placed within the time period specified in the contract documents. If no other time constraints are specified, the geotextile shall be covered within 14 days.

C. Geotextile exposure periods may exceed 14 days when approved by the project design engineer based on evaluation of geotextile resistance to UV degradation and on local evironmental conditions.

D. The cover shall meet the material requirements of the contract documents and shall be approved by the Owner, Engineer, or other Owner Representative prior to placement.

E. Cover material shall be placed such that excess tensile stress is not mobilized in the geotextile.

F. Cover placement operations shall comply with the requirements and limitations of the contract documents and project design documents.

G. Low ground pressure (<5 lbs/in^2) equipment shall be used to place soil or select waste cover. Soil or select waste cover thickness on the geotextile shall be greater than or equal to 1.0 ft. prior to operation of low ground pressure equipment. When approved by the project design engineer, higher ground pressure (≥ 5 lb/in^2) equipment may be operated on the soil or select waste cover.

H. On slopes steeper than 10:1, soil or select waste cover shall be placed beginning at the bottom of the slope and extending upward.

3.07 APPROVAL

A. The geotextile fabric shall be accepted by the Owner when all of the following conditions are met

1. Installation is finished.
2. Verification of the adequacy of all field joints and repairs is complete.
3. As built drawings are provided to the Owner as required.
4. All other work associated with the project has been completed in accordance with the Contract Documents.

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TABLE 1
GEOTEXTILE FILTRATION PROPERTIES

PROPERTY	UNITS	TEST METHOD	SPECIFIED VALUE	SPECIFIED VALUE	SPECIFIED VALUE	SPECIFIED VALUE	SPECIFIED VALUE
Unit Weight	oz/yd^2	ASTM D 5261	6	8	10	12	16
Tensile Strength	lbs	ASTM D 4632	150	200	230	300	370
CBR Puncture Strength	lbs	ASTM D 6241	400	550	700	800	900
Trapezoidal Tear Strength	lbs	ASTM D 4533	65	80	95	115	145
Permittivity	sec^{-1}	ASTM D 4491	1.5	1.3	1.0	0.8	0.6
Apparent Opening Size	US Sieve #	ASTM D 4751	70	70	100	100	100
U.V. Resistance	%	ASTM D 4355	70	70	70	70	70

NOTE: All numerical values represent minimum average roll values (i.e. average of test results from any sampled roll in a lot shall meet or exceed the minimum average roll values in the table) in weaker principal direction. Lot sampled according to ASTM D 4354, "Practice for Sampling Geosynthetics for Testing."

END OF SECTION

SECTION 26 05 00 - BASIC ELECTRICAL REQUIREMENTS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Specification and the accompanying drawings govern the work involved in furnishing, installing, testing and placing into satisfactory operation the Electrical Systems as shown on the drawings and specified herein.

B. Contractor shall provide all new materials as indicated in the schedules on the drawings, and/or in the project specifications, and all items required to make the Electrical System a finished and working system.

C. Description of Systems

1. Complete facility power distribution system including utility service, utility metering, service entrance motor control center, panelboards, transformers, motors, disconnects, starters, receptacles, raceway, wiring, ect.
2. Complete grounding system.
3. Complete power distribution, controls, wiring, ect, for non-electrical equipment supplied for the project (i.e. mechanical or process equipment and the like).
4. Complete control system for automated control of plant process equipment including process equipment control systems, control wiring, instrumentation and interface to controllers provided with selected process equipment.

D. Work and Materials by Others

1. None.

1.02 OWNER-FURNISHED WORK/MATERIALS

A. None.

1.03 WORK SEQUENCE

A. Any construction work and tie-in to existing facilities that could affect Owner's operation of existing systems shall be fully coordinated with the Owner with knowledge and approval of work before the work begins. See other sections of this project manual.

B. Any work that produces excessive noises, outages or other disturbances to Owner's occupation and use of facility shall be coordinated with the Owner and performed during times that will not interfere with Owner's activities. See other portions of the project manual for more details of construction sequence.

1.04 EQUIPMENT CONTROL

A. Although an attempt has been made to identify control requirements for the project via the specifications and/or drawings, no guarantee is given nor should be implied regarding the level of completeness represented by the project documents. Exact requirements are unable to be determined until after purchase of equipment and approval of shop drawings.

B. Contactor shall provide all additional components (i.e. control switches, control transformers, control relays, pressure switches, thermostats, similar devices, and electrical boxes to contain said components) and wiring to achieve complete and working systems, whether detailed or not. For HVAC systems, these types of components are generally, but not always, provided with HVAC temperature controls. In the case of other process and packaged equipment controls, these items are Contractor's field installation responsibility.

C. Ultimately the Contractor is responsible to provide control materials and wiring, and is responsible to coordinate which trade(s) has responsibility of provision and installation.

D. All control wiring, including low voltage (24V and below) for HVAC controls shall be run in conduit to the satisfaction of the Owner and Engineer.

1.05 COMPLIANCE WITH CODES, LAWS, ORDINANCES:

A. Contractor shall conform to all requirements of the local and state Codes, Laws, Ordinances and other regulations having jurisdiction over this installation.

B. The current issue of the National Electrical Code shall be followed.

C. If during bidding, any parts of the project documents are not in accordance with codes or regulations, the Contractor shall notify the Engineer in writing, to request a clarification. If there is insufficient time to follow this procedure, the Contractor shall submit with his proposal a separate price required to make the system comply with codes and regulations.

D. All changes made after letting of the contract in order to comply with codes, regulations, or requirements of authorities having jurisdiction, shall be made by the Contractor without additional cost to the Owner.

E. In the event of discrepancy among codes, regulations, inspectors or other factors, the Engineer shall determine the resolution method.

1.06 PERMITS, FEES, TAXES, INSPECTIONS:

A. Pay all applicable charges for such permits, licenses, inspections and similar that may be required.

B. Pay all applicable fees and taxes imposed by the State, Municipal and/or other regulatory bodies.

1.07 UTILITY COMPANIES:

A. Contractor shall obtain and follow all applicable requirements from the Utilities to complete the project. Modification of designs, details and installation needed to comply with Utility's requirements shall be completed at no cost increase. Contractor shall be responsible for work not completed by the Utilities as detailed on the drawings and other project documents.

B. Contractor shall be responsible to make and pay for new electrical service application. Owner shall pay for utility charges and/or fees, if any, that arise from the new service(s). Contractor shall coordinate schedule and details between Owner and Utility.

1.08 EXAMINATION OF DRAWINGS:

A. The drawings for electrical work are intended to show scope of work only. Contractor shall make minor adjustments and modifications to result in a complete and functioning coordinated system. If adjustments are made, they shall be completed at no additional cost to the Owner.

B. Locations of equipment and devices are shown in general locations only. Drawings are not intended to be scaled. Installation of equipment and devices shall be as coordinated with Owner, Architect/Engineer and other trades. In case of conflict the location of components shall take precedence in order of the following list:

1. Large-diameter Process Piping
2. Light Fixtures
3. Gravity Flow Piping (such as drain, steam and condensate)
4. Electrical Busduct
5. Sheet Metal (ductwork)
6. Cable Trays, including access space
7. Sprinkler Piping and other Piping
8. Conduit and Wireway

C. Items such as junction boxes, pull boxes, conduit fittings, etc., shall be provided by the Contractor as required to facilitate construction, even though they are not shown on the drawings.

D. If an item is called for in the specifications or shown on the drawings, it shall be sufficient to be required of the contract.

E. Determination of quantities of material and equipment required shall be made by the Contractor.

F. Equipment schedules shown on the drawings are provided as an aid, for Contractor's convenience only. Items required by the drawings and specifications are required of the Contractor even if not listed in the schedules.

G. Catalog numbers listed in schedules or other locations are also listed as an aid to the Contractor. In the case of obsolete or incorrect catalog numbers, the descriptions and other ratings shown will prevail. Any accessories required to provide a complete and working system shall be provided even if not detailed or described.

H. Where the words "Provide", "Install", "Supply", "Furnish", "Include" or other similar words are used in the specifications or on the drawings, it shall mean to furnish, install, and connect in a manner to be complete and ready for operation.

1.09 SUBMITTALS

A. The following requirements shall be in addition to the requirements set forth in Division 1 of the project specifications.

B. Submittals shall include all cut sheets, fabrication, installation, wiring, component, descriptive literature, brochures, performance, test data or other information as may be required to verify proposed components, systems, or equipment conform to contract documents.

C. The Contractor shall thoroughly review and approve all shop drawings before submitting them to the Architect/Engineer. Contractor's approval stamp is required on all submittals. Approval will indicate the contractor's review and complete understanding of what is furnished, how it will work as a completed system, and interconnection requirements with other systems.

D. The Contractor shall clearly indicate all deviations from the contract documents on the submittals. If deviations are not indicated by the Contractor, the item shall be required to meet all drawing and specification requirements.

E. When more than one model number or style is presented on a cut sheet or submittal page, the Contractor shall clearly identify which model or style is to be provided. Identification shall be done in a manner that is reproducible with a black & white photocopier. **Highlighter (yellow or otherwise) is not acceptable.**

F. The Contractor shall label each item with designation as shown on the drawings.

G. The Contractor shall provide multiple copies of shop drawings, as detailed in Division 1. Each set of shop drawings shall be identical and shall be bound together with a cover, title sheet and index of submitted items. Cover sheet shall clearly identify Owner, Project Name, Architect/Engineer and Date.

H. Failure to comply with any of the above, or with submittal of equipment, materials, or systems that do not conform to project requirements shall be basis to require resubmission of shop drawings.

I. The Engineer's responsibility shall be to review one set of submittals for each component of the project. If the first submittal requires re-submission for any reason, the Contractor shall be responsible to bear the cost for the Engineer to recheck and handle additional submittals.

PART 2

2.01 MATERIALS

A. Drawings show manufacturers and materials as a basis of design. Substitutions of manufacturer and/or material may be proposed after award of contract. Only products of reputable manufacturers, as determined by the Engineer will be acceptable.

B. At the Engineer's sole discretion, a substitution may be allowed or rejected. The decision will be made with review of Contractor's detailed shop drawings and catalog cut sheets in comparison to the technical requirements set forth in the project drawings and specifications. Submission of

inadequate information for thorough review will be a basis for rejection. **Engineer's decision will be final.**

C. If a proposed material is accepted, the Contractor shall be responsible to provide all supporting devices and accessories required in connection with the interface of that material with the rest if the project. This includes increased power supply components (i.e. feeder breakers, starters, wiring ect.) for pumps, cooling equipment, and similar equipment. If additional costs are incurred by other trades, the Contractor shall negotiate those costs among the trades, with no cost increase to the Owner.

D. If a proposed product or material is rejected, a product meeting the Engineer's requirements shall be supplied without additional cost to the Owner.

E. Except for Process Control System Equipment (Division 25), Engineer's evaluation of proposed substitutions before award of contract will not be made.

F. All items of material having a similar function (i.e. safety switches, panelboards, switchboards, contactors, motor starters, dry type transformers), shall be of the same manufacturer.

PART 3

3.01 JOBSITE SAFETY

A. Neither the professional activities of the Engineer, nor the presence of the Engineer or his or her employees and subconsultants at a construction site, shall relieve the Contractor and any other entity of their obligations, duties and responsibilities including, but not limited to, construction means, methods, sequence, techniques or procedures necessary for performing, superintending or coordinating all portions of the work of construction in accordance with the contract documents and any health or safety precautions required by any regulatory agencies. The Engineer and his or her personnel have no authority to exercise any control over any construction contractor or other entity or their employees in connection with their work or any health or safety precautions. The Contractor is solely responsible for jobsite safety. The Engineer and the Engineer's consultants shall be indemnified and shall be made additional insureds under the Contractor's general liability insurance policy.

3.02 FIELD QUALITY CONTROL

A. The Contractor shall conduct all tests applicable for the equipment both during and after construction of the work.

B. All needed instruments, meters and other devices/materials needed to conduct the tests shall be supplied by the Contractor.

C. All cables and wires shall be tested for shorts and grounds following installation and connection to devices. Shorted or grounded wires shall be removed and replaced.

D. Insulation systems for cables, splices, panels, bus bars, breakers, motors, transformers and other electrical devices shall be tested and comply with applicable IEEE, NEMA and/or NEC standards. Items found not to comply with applicable standards shall be replaced or repaired.

3.03 CONTROL AND INSTRUMENTATION WIRING INSTALLATION

A. Contactor shall provide conduits as sized by notes on the drawings. If no notes or indications are supplied, sizes of **conduits for control and instrumentation circuits** shall conform to National Electrical Code requirements for conduit fill based on the conductors required, and be increased to the next larger trade size. The intent of this specification is to allow installation of extra wiring without need of installing new conduits.

B. The required end result for the control systems and field wiring is to allow full functionality as specified herein AND as modified during shop drawing approvals of process equipment and control panels. Since design documents are based on preliminary information and design-basis process equipment, slight changes to field control wiring are inevitable. This situation will occur almost every time an alternate equipment supplier is utilized.

C. The scope of work required of the installation Contractor includes all of what is specified herein, all of what is shown on the project drawings, as required by approved shop drawings AND includes all wiring and conduit adjustments as needed to allow desired control. Types of adjustments this will include are listed below, but are in no way limited to the following:

1. As a result of increased required conductor quantity, a conduit with no spare space will require a larger conduit. This is also addressed above, within this Article.
2. Bidding documents may indicate wires terminate to a control panel, but instead the wiring needs to terminate inside a motor starter in the same electrical room as the control panel. As a result, longer circuits are required.
3. Bidding documents may detail raceway connections between motor controllers and control panels in the same electrical room, but not detail exact quantity of wiring. Control wiring interconnections shall be supplied as needed by the approved shop drawings.
4. Submersible pumps with a specific type of seal fail detection relay may require local mounting inside a local disconnect or splice box instead of inside a remote panel.
5. Certain equipment may be supplied with factory cables that cannot be removed. Contractor will need to splice factory cable and provide and install a suitable splice box. Note that contractor shall confirm the device will operate correctly with spliced cables prior to cutting.
6. Alternate process equipment was provided instead of the design-basis equipment, and extra valves, instruments, control switches, safety switches, ect, are required as a compliment to the equipment. Extra and different wiring/conduits are required.
7. Other similar types of adjustments.

D. Controlling documents for determination of the full and final scope of installation work shall be the approved shop drawings of process equipment, instrumentation and control panels. When a discrepancy between the bidding documents and the approved shop drawings is discovered, Contractor shall contact Engineer for confirmation. Ultimately, the Contractor is responsible for planning and installation of all field wiring conduits and cable pulls in accordance with approved shop drawings. Circuit information provided with the bidding documents shall not be followed exclusively.

E. Contractor shall be responsible to execute the types of minor changes described above without adjustment to contract price. Significant additions, as judged by Engineer, will be reviewable as possible allowed change orders.

F. Claims for change orders that are based on removal and/or alteration of wiring and/or raceway that was installed in accordance with bidding documents, when the approved shop drawings clearly required something different, will be rejected.

G. Contractor shall NOT be responsible to:

1. Provide extensive changes, as judged by Engineer, without discussion for possible change order.
2. Provide control wiring to a device that was not identified in any way in the bidding documents. **Note:** If a new control device or instrument is required in conjunction with alternate process equipment being provided, different than design-basis, Contractor is responsible for provision of wiring/raceway since it was Contractor's choice to use the non-design-basis equipment.

H. The Engineer shall be the sole and final authority in evaluation and judgment of minor control wiring adjustments in contrast to major control wiring changes, and resulting affects it may have on possible change orders.

3.04 INSTRUCTING THE OWNER'S REPRESENTATIVE

A. Adequately instruct the Owner's designated representative or representatives in the maintenance, care and operation of the complete systems installed under this contract.

B. Instructions shall be set up and given at a specific time, as coordinated between the Contractor and Owner.

C. The Owner has the option to video tape the instruction and training for future reference. Within reason, the Contractor shall facilitate location and method of instructions to allow for video taping.

D. The Architect/Engineer shall be notified of the time and place of verbal instructions to be given so that he or his representative may be present if desirable.

3.05 SYSTEMS COMMISSIONING

A. Electrical systems included in the construction documents are to be complete and fully operational systems. The system start-up, testing, balancing and satisfactory performance is the responsibility of the Contractor. This shall include all calibration and adjustments of electrical equipment controls, balancing of loads, trouble shooting and verification of software and final adjustments that may be required.

B. All operating conditions and control sequences shall be simulated and tested during the start-up period. Testing shall include all interlocks, safety shut-downs, system operations and alarms.

C. The Contractor, subcontractors, and equipment suppliers are expected to have skilled technicians to insure that the systems perform as designed.

3.06 PAINTING

A. The Contractor shall paint any equipment marred or damaged during construction. Paint and color shall match original equipment paint.

3.07 ADJUST AND CLEAN

A. Contractor shall thoroughly clean all equipment and systems prior to the Owner's final acceptance of the project.

B. Contractor shall clean all foreign paint, grease, oil, dirt, labels, stickers, and other foreign material from equipment and fixtures.

C. Contractor shall remove all rubbish, debris, etc., accumulated during the Contractor's operations from the premises.

END OF SECTION

SECTION 26 05 19 - BUILDING WIRE AND CABLE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wire and cable for 600 volts and less.

B. Wiring connectors and connections.

1.02 RELATED SECTIONS

A. Section 26 05 53 - Electrical Identification.

1.03 REFERENCES

A. NECA 1 - Standard Practices for Good Workmanship in Electrical Contracting; National Electrical Contractors Association.

B. NETA STD ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems; International Electrical Testing Association.

C. NFPA 70 - National Electrical Code; National Fire Protection Association.

1.04 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience and with service facilities within 100 miles of Project.

C. Products: Furnish products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 WIRING REQUIREMENTS

A. Concealed Dry Interior Locations: Use only building wire in raceway, building wire with Type THHN insulation in raceway.

B. Exposed Dry Interior Locations: Use only building wire in raceway, building wire with Type THHN insulation in raceway.

C. Above Accessible Ceilings: Use only building wire in raceway, building wire with Type THHN insulation in raceway.

D. Wet or Damp Interior Locations: Use only building wire, building wire with Type THWN insulation in raceway.

E. Exterior Locations: Use only building wire, building wire with Type THWN insulation in raceway.

F. Underground Installations: Use only building wire, building wire with Type THWN or USE insulation in raceway, except where direct-buried type UF is noted on the drawings.

G. Cable Tray Installations: Use only cable rated and listed for the purpose. Use wet/damp location rating.

H. Use solid conductor for feeders and branch circuits 10 AWG and smaller.

I. Use stranded conductors for control circuits.

J. Use conductor not smaller than 12 AWG for power and lighting circuits.

K. Use conductor not smaller than 16 AWG for control circuits.

L. Use 10 AWG conductors for 20 ampere, 120 volt branch circuits longer than 75 feet.

M. Use 10 AWG conductors for 20 ampere, 277 volt branch circuits longer than 200 feet.

N. Conductor sizes are based on copper unless indicated as aluminum or "AL".

O. Aluminum conductors shall not be used.

2.02 BUILDING WIRE

A. Description: Single conductor insulated wire.

B. Conductor: Copper.

C. Insulation Voltage Rating: 600 volts.

D. Insulation: NFPA 70, Type THWN.

E. Insulation: Thermoplastic material rated 75 degrees C.

2.03 SERVICE ENTRANCE CABLE

A. Description: NFPA 70, Type SE.

B. Conductor: Copper.

C. Insulation Voltage Rating: 600 volts.

D. Insulation: Type RH.

2.04 WIRING CONNECTORS

A. Split Bolt Connectors: Allowed

B. Solderless Pressure Connectors: Allowed

C. Spring Wire Connectors: Allowed for #10 AWG and smaller wire.

D. Compression Connectors: Allowed

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that interior of building has been protected from weather.

B. Verify that mechanical work likely to damage wire and cable has been completed.

C. Verify that raceway installation is complete and supported.

D. Verify that field measurements are as indicated.

3.02 PREPARATION

A. Completely and thoroughly swab raceway before installing wire.

3.03 INSTALLATION

A. Install wire and cable securely, in a neat and workmanlike manner, as specified in NECA 1.

B. Route wire and cable as required to meet project conditions.
   1. Wire and cable routing indicated is approximate unless dimensioned.
   2. Where wire and cable destination is indicated and routing is not shown, determine exact routing and lengths required.
   3. Include wire and cable of lengths required to install connected devices within 10 ft of location shown.

C. Use wiring methods indicated.

D. Pull all conductors into raceway at same time.

E. Use suitable wire pulling lubricant for building wire 4 AWG and larger.

F. Protect exposed cable from damage.

G. Support cables above accessible ceiling, using spring metal clips or metal cable ties to support cables from structure or ceiling suspension system. Do not rest cable on ceiling panels.

H. Use suitable cable fittings and connectors.

I. Neatly train and lace wiring inside boxes, equipment, and panelboards.

J. Clean conductor surfaces before installing lugs and connectors.

K. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.

L. Use split bolt connectors for copper conductor splices and taps, 6 AWG and larger. Tape uninsulated conductors and connector with electrical tape to 150 percent of insulation rating of conductor.

M. Use solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller.

N. Use insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.

O. Identify and color code wire and cable under provisions of Section 16075. Identify each conductor with its circuit number or other designation indicated.

3.04 FIELD QUALITY CONTROL

A. Inspect and test in accordance with NETA STD ATS.

END OF SECTION

SECTION 26 05 26 - GROUNDING AND BONDING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Grounding and bonding components.

B. Provide all components necessary to complete the grounding system(s) consisting of:
   1. Metal frame of the building.
   2. Concrete-encased electrode.
   3. New metal water piping.
   4. Rod electrodes.

1.02 REFERENCES

A. NETA STD ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems; International Electrical Testing Association.

B. NFPA 70 - National Electrical Code; National Fire Protection Association.

1.03 PERFORMANCE REQUIREMENTS

A. Grounding System Resistance: 5 ohms.

1.04 SUBMITTALS

A. See Section 01 33 00 - Submittals.

B. Product Data: Provide for grounding electrodes and connections.

C. Test Reports: Indicate overall resistance to ground and resistance of each electrode.

D. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Quality Assurance. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

E. Project Record Documents: Record actual locations of components and grounding electrodes.

F. Certificate of Compliance: Indicate approval of installation by authority having jurisdiction.

1.05 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience with service facilities within 100 miles of Project.

C. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 ELECTRODES

A. Rod Electrodes: Copper.
   1. Diameter: 3/4 inch.
   2. Length: 10 feet.

B. Foundation Electrodes: 2/0 AWG.

2.02 CONNECTORS AND ACCESSORIES

A. Mechanical Connectors: Bronze
   1. Product: Burndy Hy-Ground

2. Substitutions: Exothermic Welds.

B. Exothermic Connections:

C. Wire: Stranded copper.

D. Grounding Electrode Conductor: Size to meet NFPA 70 requirements, or as shown on the drawings, whichever is larger.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions prior to beginning work.

B. Verify that final backfill and compaction has been completed before driving rod electrodes.

3.02 INSTALLATION

A. Install ground electrodes at locations indicated. Install additional rod electrodes as required to achieve specified resistance to ground.

B. Provide grounding well pipe with cover at each rod location. Install well pipe top flush with finished grade.

C. Install 4 AWG bare copper wire in foundation footing where indicated.

D. Provide grounding electrode conductor and connect to reinforcing steel in foundation footing where indicated. Bond steel together.

E. Provide bonding to meet requirements described in Quality Assurance.

F. Bond together metal siding not attached to grounded structure; bond to ground.

G. Provide grounding and bonding in patient care areas to meet requirements of NFPA 99 and NFPA 70.

H. Equipment Grounding Conductor: Provide separate, insulated conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing. Use of metal conduit as the sole grounding conductor is specifically not allowed.

I. Interface with site grounding system installed.

3.03 FIELD QUALITY CONTROL

A. Inspect and test in accordance with NETA STD ATS except Section 4. Submit test results for review and approval.

END OF SECTION

SECTION 26 05 29 - HANGERS AND SUPPORTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Conduit and equipment supports.

B. Anchors and fasteners.

1.02 REFERENCES

A. NECA 1 - Standard Practices for Good Workmanship in Electrical Contracting; National Electrical Contractors Association.

B. NFPA 70 - National Electrical Code; National Fire Protection Association.

1.03 SUBMITTALS

A. See Section 01 3300 - Submittals.

B. Product Data: Provide manufacturer’s catalog data for fastening systems.

C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.04 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 MATERIALS

A. Hangers, Supports, Anchors, and Fasteners - General:

1. Corrosion-resistant materials of size and type adequate to carry the loads of equipment and conduit, including weight of wire in conduit.

2. Support and fastener material and finishes shall match the conduit types specified, unless otherwise detailed by drawing notes and schedules.

Conduit	Support	Fasteners and hardware
RGS	Cast Metal or Hot dipped galvanized steel	Hot dipped galvanized steel
EMT	Electro-plated steel	Electro-plated steel
PVC	PVC or Fiberglass	PVC coated steel or 316 stainless steel
Fiberglass	PVC or Fiberglass	PVC coated steel or 316 stainless steel

B. Supports: Supports shall match boxes and materials specified for each area.

1. When supports are noted as galvanized, they shall be fabricated of structural steel or formed steel members; galvanized.

2. In highly corrosive areas or other areas noted on the drawings, supports shall be cast aluminum, stainless steel, or fiberglass.

C. Anchors and Fasteners: Where locations require supports made of certain materials, to prevent moisture or chemical corrosion, all associated hardware/fasteners shall match the indicated

support materials.

1. Do not use powder-actuated anchors or spring clips.
2. Concrete Structural Elements: Use precast inserts, expansion anchors, or preset inserts.
3. Steel Structural Elements: Use beam clamps, steel ramset fasteners, or welded fasteners.
4. Concrete Surfaces: Use self-drilling anchors or expansion anchors.
5. Hollow Masonry, Plaster, and Gypsum Board Partitions: Use toggle bolts or hollow wall fasteners.
6. Solid Masonry Walls: Use expansion anchors or preset inserts.
7. Sheet Metal: Use sheet metal screws.
8. Wood Elements: Use wood screws.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install hangers and supports as required to adequately and securely support electrical system components, in a neat and workmanlike manner, as specified in NECA 1.
   1. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.
   2. Obtain permission from Architect/Engineer before drilling or cutting structural members.
   3. Single runs of surface-mounted conduit may be fastened with surface-mounted clamps directly to wall or ceiling area. Multiple conduits shall be racked together.

B. Rigidly weld support members or use hexagon-head bolts to present neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts.

C. Install surface-mounted cabinets and panelboards with minimum of four anchors.

D. In wet and damp locations use steel channel supports to stand cabinets and panelboards 1 inch off wall.

E. Use sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.

F. Aluminum supports and hardware shall not be used in direct contact with concrete or embedded in soil. Where aluminum must penetrate concrete walls/floors, a protective bituminous coating shall be applied to allow grouting around the penetration to seal it.

END OF SECTION

SECTION 26 05 33 - BOXES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall and ceiling outlet boxes.

B. Floor boxes.

C. Pull and junction boxes.

1.02 RELATED SECTIONS

A. Section 26 27 26 - Wiring Devices: Wall plates in finished areas.

1.03 REFERENCES

A. NECA 1 - Standard Practices for Good Workmanship in Electrical Contracting; National Electrical Contractors Association.

B. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies; National Electrical Manufacturers Association.

C. NEMA OS 1 - Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports; National Electrical Manufacturers Association.

D. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); National Electrical Manufacturers Association.

E. NFPA 70 - National Electrical Code; National Fire Protection Association.

1.04 SUBMITTALS

A. See Section 01 33 00 - Submittals.

B. Project Record Documents: Record actual locations and mounting heights of outlet, pull, and junction boxes on project record documents.

1.05 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Products: Provide products listed and classified by Underwriters Laboratories, Inc., as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 OUTLET BOXES

A. Sheet Metal Outlet Boxes (recessed in framed wall): NEMA OS 1, galvanized steel.
   1. Use Concrete Boxes when recessed in masonry walls or ceilings.

B. Nonmetallic Outlet Boxes: NEMA OS 2.

C. Cast Boxes (surface mounted locations): NEMA FB 1, Type FD, aluminum. Provide gasketed cover by box manufacturer. Provide threaded hubs.

D. Wall Plates for Finished Areas: As specified in Section 26 27 26.

2.02 PULL AND JUNCTION BOXES

A. Sheet Metal Boxes: NEMA OS 1, galvanized steel.

B. Surface Mounted Cast Metal Box: NEMA 250, Type 4; flat-flanged, surface mounted junction box:
   1. Material: Galvanized cast iron.

2. Cover: Furnish with ground flange, neoprene gasket, and stainless steel cover screws.

C. In-Ground Cast Metal Box: NEMA 250, Type 6, outside flanged, recessed cover box for flush mounting:
   1. Material: Galvanized cast iron.
   2. Cover: Smooth cover with neoprene gasket and stainless steel cover screws.
   3. Cover Legend: "ELECTRIC".

D. Fiberglass Handholes: Die molded glass fiber hand holes:
   1. Cable Entrance: Pre-cut 6 x 6 inch cable entrance at center bottom of each side.
   2. Cover: Glass fiber weatherproof cover with nonskid finish.

2.03 HINGED COVER ENCLOSURES

A. Construction: NEMA 250, Type 1 steel enclosure.

B. Covers: Continuous hinge, held closed by flush latch operable by screwdriver.

C. Provide interior plywood panel for mounting terminal blocks and electrical components; finish with white enamel.

D. Enclosure Finish: Manufacturer's standard enamel.

2.04 BOX USAGE BY AREAS

A. Unless otherwise noted or scheduled on the drawings, the following box types shall be used. All boxes shall generally match the conduit being applied. Reference the contract drawings and conduit specification 26 0533 for further details. If more than one type of box might be acceptable for an area, the most conservative type of box shall be utilized.

B. RGS and Liquid-tight Flexible Metal Conduit or unspecified damp/wet location: Cast Boxes with water resistant covers with gaskets.

C. EMT or Flexible Metal Conduit: Sheet metal boxes with covers, but no gaskets required.

D. PVC Conduit: Use fiberglass or PVC boxes with water resistant covers.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify locations of floor boxes and outlets in offices and work areas prior to rough-in.

3.02 INSTALLATION

A. Install boxes securely, in a neat and workmanlike manner, as specified in NECA 1.

B. Install in locations as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections, and as required by NFPA 70.

C. Coordinate installation of outlet boxes for equipment connected under Section 26 0583.

D. Set wall mounted boxes at elevations to accommodate mounting heights indicated.

E. Electrical boxes are shown on Drawings in approximate locations unless dimensioned.
   1. Adjust box locations up to 10 feet if required to accommodate intended purpose.

F. Orient boxes to accommodate wiring devices oriented as specified in Section 26 2726.

G. Maintain headroom and present neat mechanical appearance.

H. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.

I. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.

J. Install boxes to preserve fire resistance rating of partitions and other elements, using materials

and methods.

K. Coordinate mounting heights and locations of outlets mounted above counters, benches, and backsplashes.

L. Locate outlet boxes to allow luminaires positioned as shown on reflected ceiling plan.

M. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

N. Use flush mounting outlet box in finished areas.

O. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.

P. Do not install flush mounting box back-to-back in walls; provide minimum 6 inches separation. Provide minimum 24 inches separation in acoustic rated walls.

Q. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.

R. Use stamped steel bridges to fasten flush mounting outlet box between studs.

S. Install flush mounting box without damaging wall insulation or reducing its effectiveness.

T. Use adjustable steel channel fasteners for hung ceiling outlet box.

U. Do not fasten boxes to ceiling support wires.

V. Support boxes independently of conduit.

W. Use gang box where more than one device is mounted together. Do not use sectional box.

X. Use gang box with plaster ring for single device outlets.

Y. Use cast outlet box in exterior locations exposed to the weather and wet locations.

Z. Use cast floor boxes for installations in slab on grade; formed steel boxes are acceptable for other installations.

AA. Set floor boxes level.

AB. Large Pull Boxes: Use hinged enclosure in interior dry locations, surface-mounted cast metal box in other locations.

3.03 ADJUSTING

A. Adjust floor boxes flush with finish flooring material.

B. Adjust flush-mounting outlets to make front flush with finished wall material.

C. Install knockout closures in unused box openings.

3.04 CLEANING

A. Clean interior of boxes to remove dust, debris, and other material.

B. Clean exposed surfaces and restore finish.

END OF SECTION

SECTION 26 05 36 - CONDUIT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Conduit, fittings and conduit bodies.

1.02 RELATED SECTIONS

A. Section 26 05 26 - Grounding and Bonding.

B. Section 26 05 29 - Hangers and Supports.

C. Section 26 05 53 - Electrical Identification.

D. Section 26 05 33 - Boxes.

1.03 REFERENCES

A. ANSI C80.1 - American National Standard Specification for Rigid Steel Conduit -- Zinc Coated.

B. ANSI C80.3 - American National Standard Specification for Electrical Metallic Tubing -- Zinc Coated.

C. NECA 1 - Standard Practices for Good Workmanship in Electrical Contracting; National Electrical Contractors Association.

D. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT); National Electrical Contractors Association.

E. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies; National Electrical Manufacturers Association.

F. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing; National Electrical Manufacturers Association.

G. NFPA 70 - National Electrical Code; National Fire Protection Association.

1.04 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

PART 2 PRODUCTS

2.01 CONDUIT REQUIREMENTS

A. Conduit Size: Comply with NFPA 70.
   1. Minimum Size:
      Interior: 3/4 inch, unless otherwise specified.
      Exterior and blow grade: 1 inch, unless otherwise specified.

B. See drawings for notes and schedules for conduit types in any given location. In absence of notes, the below general guidelines shall apply.

C. Embedded Installations: (Unless otherwise indicated by drawings.)
   1. Direct Buried: Use schedule 40 PVC conduit.
   2. In or Under Slab on Grade: Use schedule 40 PVC conduit.
   3. Minimum Size: 1 inch.
   4. Provide underground transition to RGS metal conduit before turning up to an above grade location unless totally concealed by transformer terminal box, generator base, or similar.

C. Outdoor Locations Above Grade: Use rigid aluminum conduit. Direct buried or concrete

embedded aluminum is not allowed.

D. Interior to Buildings:

1. Instrumentation 4-20mA circuit: Use metal rigid conduit, either aluminum or galvanized steel to match the other conduits used in the areas. Use RGS rigid metal conduits if embedded installation in concrete or soil is planned. Buried or embedded aluminum is not allowed.

2.02 METAL CONDUIT

A. Rigid Steel Conduit: ANSI C80.1.

B. Intermediate Metal Conduit (IMC)

C. Electrical Metallic Tubing (EMT)

D. Fittings and Conduit Bodies: NEMA FB 1; material to match conduit.

2.03 FLEXIBLE METAL CONDUIT

A. Description: Interlocked steel construction.

B. Fittings: NEMA FB 1.

2.04 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

A. Description: Interlocked steel construction with PVC jacket.

B. Fittings: NEMA FB 1.

2.07 NONMETALLIC CONDUIT

A. Description: NEMA TC 2; Schedule 40 PVC.

B. Fittings and Conduit Bodies: NEMA TC 3.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as shown on drawings.

B. Verify routing and termination locations of conduit prior to rough-in.

C. Conduit routing is shown on drawings in approximate locations unless dimensioned. Route as required to complete wiring system.

3.02 INSTALLATION

A. Install conduit securely, in a neat and workmanlike manner, as specified in NECA 1.

B. Install steel conduit as specified in NECA 101.

C. Install nonmetallic conduit in accordance with manufacturer's instructions.

D. Arrange supports to prevent misalignment during wiring installation.

E. Support conduit using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.

F. Group related conduits; support using conduit rack. Construct rack using steel channel; provide space on each for 25 percent additional conduits.

G. Fasten conduit supports to building structure and surfaces under provisions of Section 26 0529.

H. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary

supports.

I. Do not attach conduit to ceiling support wires.

J. Arrange conduit to maintain headroom and present neat appearance.

K. Route exposed conduit parallel and perpendicular to walls.

L. Route conduit installed above accessible ceilings parallel and perpendicular to walls.

M. Route conduit in and under slab from point-to-point.

N. Do not cross conduits in slab.

O. Maintain adequate clearance between conduit and piping.

P. Maintain 12 inch clearance between conduit and surfaces with temperatures exceeding 104 degrees F.

Q. Cut conduit square using saw or pipecutter; de-burr cut ends.

R. Bring conduit to shoulder of fittings; fasten securely.

S. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum.

T. Use conduit hubs to fasten conduit to sheet metal boxes in damp and wet locations.

U. Install no more than equivalent of three 90 degree bends between boxes. Use conduit bodies to make sharp changes in direction, as around beams. Use hydraulic one shot bender to fabricate bends in metal conduit larger than 2 inch size.

V. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.

W. Provide suitable fittings to accommodate expansion and deflection for long runs.

X. Provide suitable pull string in each empty conduit except sleeves and nipples.

Y. Use suitable caps to protect installed conduit against entrance of dirt and moisture.

Z. Ground and bond conduit under provisions of Section 26 05 26.

AA. Identify conduit under provisions of Section 26 05 53.

BB. Apply bituminous coating to any aluminum conduits penetrating concrete walls or floors prior to installation, so concrete/grout seals do not come in contact with the aluminum.

CC. Seal all wall, floor and ceiling penetrations to establish needed barriers for weather, building code classification divisions, fire-proofing, explosive hazard isolation, or other required separations. Use materials suitable for the types of closures and isolations to be made.

3.03 INTERFACE WITH OTHER PRODUCTS

A. Install conduit to preserve fire resistance rating of partitions and other elements, using materials and methods.

B. Route conduit through roof openings for piping and ductwork wherever possible. Where separate roofing penetration is required, coordinate location and installation method with roofing installation.

END OF SECTION

SECTION 26 05 53 - ELECTRICAL IDENTIFICATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nameplates and labels.

B. Wire and cable markers.

C. Conduit markers.

1.02 REFERENCES

A. NFPA 70 - National Electrical Code; National Fire Protection Association.

1.03 SUBMITTALS

A. See Section 01 33 00 - Submittals.

B. Product Data: Provide catalog data for nameplates, labels, and markers.

C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Quality Assurance. Include instructions for storage, handling, protection, examination, preparation and installation of product.

1.04 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Brady Corporation

B. Seton Identification Products

C. Hellermann Tyton

D. Substitutions: As approved by Engineer.

2.02 NAMEPLATES AND LABELS

A. Nameplates:
   1. Engraved three-layer laminated plastic, black letters on white background.
   2. Submit proposed engraving for approval prior to engraving or installation.
   3. Engraving shall contain tag number of the electrical equipment and, if applicable, the equipment it serves, as well as the voltage.

B. Locations:
   1. Each electrical distribution and control equipment enclosure.
   2. Each motor starter, contactor, VFD, etc.
   3. Each disconnect switch.
   4. Each control switch station
   5. Each transformer, panelboard, distribution panel.

C. Letter Size:
   1. Use 1/4 inch letters for identifying individual equipment and loads.
   2. Use 3/8 inch letters for identifying grouped equipment and loads.
   3. Use 1/2 inch letters for identifying equipment or load of ratings 100 amperes or greater capacity.

D. Labels: Nylon reinforced white tape, with printed 3/16 inch black letters. Use only for identification of individual wall switches and receptacles. Every receptacle and switch shall be identified with the panel tag number and breaker number that it is fed from.

2.03 WIRE MARKERS

A. Manufacturers:
   1. Brady.
   2. Panduit.
   2. Substitutions: As approved by Engineer.

B. Description: Cloth or tape or printed-tube type wire markers.

C. Locations: Each conductor at panelboard gutters, pull boxes, outlet boxes, and junction boxes each load connection.

D. Legend:
   1. Power and Lighting Circuits: Branch circuit or feeder number indicated on drawings.
   2. Control Circuits: Control wire number indicated on schematic and interconnection diagrams on drawings.

2.04 UNDERGROUND WARNING TAPE

A. Description: 4 inch wide plastic tape, detectable type colored red with suitable warning legend describing buried electrical lines.

PART 3 EXECUTION

3.01 PREPARATION

A. Degrease and clean surfaces to receive nameplates and labels.

3.02 INSTALLATION

A. Install nameplates and labels parallel to equipment lines.

B. Secure nameplates to equipment front using screws.

C. Secure nameplates to inside surface of door on panelboard that is recessed in finished locations.

D. Identify underground conduits using underground warning tape. Install one tape per trench at 3 inches below finished grade.

END OF SECTION

SECTION 26 05 83 - EQUIPMENT WIRING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Electrical connections to equipment.

1.02 REFERENCES

A. NEMA WD 1 - General Color Requirements for Wiring Devices; National Electrical Manufacturers Association

B. NEMA WD 6 - Wiring Devices - Dimensional Requirements; National Electrical Manufacturers Association

C. NFPA 70 - National Electrical Code; National Fire Protection Association

1.03 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

1.04 COORDINATION

A. Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions for equipment furnished under other sections.

B. Determine connection locations and requirements.

C. Verify power supply characteristics and control requirements prior to installation of conduit or wiring. Adjust wiring and power system devices to match provided equipment.

D. Sequence rough-in of electrical connections to coordinate with installation of equipment.

E. Sequence electrical connections to coordinate with start-up of equipment.

PART 2 PRODUCTS

2.01 MATERIALS

A. Cords and Caps: NEMA WD 6; match receptacle configuration at outlet provided for equipment.
   1. Colors: Conform to NEMA WD 1.
   2. Cord Construction: NFPA 70, Type SO multiconductor flexible cord with identified equipment grounding conductor, suitable for use in damp locations.
   3. Size: Suitable for connected load of equipment, length of cord, and rating of branch circuit overcurrent protection.

B. Disconnect Switches: As specified in Section 26 28 16.

C. Wiring Devices: As specified in Section 26 27 26.

D. Flexible Conduit: As specified in Section 26 05 36.

E. Wire and Cable: As specified in Section 26 05 19.

F. Boxes: As specified in Section 26 05 33.

2.02 EQUIPMENT CONNECTIONS

A. Typical equipment connection requirements may include, but not be limited to the following:
   1. Electrical Connection: Flexible conduit.
   2. Electrical Connection: Cord and plug (NEMA 5-20R).
   3. Disconnect Switch: Unless otherwise specified or shown on the drawings, verify the existence of a disconnect supplied with the equipment. If none is supplied with the

equipment, provide a suitable disconnect.

4. Voltage: As indicated on the drawings.
5. Load rating: As indicated on the drawings and confirmed by the equipment provided.
6. Provide all required materials and devices to accomplish a complete and operational equipment installation, regardless of what is provided or not provided with the equipment.
7. Provide suitable cord and plug connections for equipment that is not furnished with cord and plug sets.

PART 3 EXECUTION

3.01 ELECTRICAL CONNECTIONS

A. Verify and cross-check equipment nameplate power (voltage, phasing, amperage, ect.) and control requirements with design documents prior to connection of any wiring. Make electrical connections in accordance with equipment manufacturer's instructions.

B. Make conduit connections to equipment using flexible conduit. Use liquid tight flexible conduit with watertight connectors in damp or wet locations.

C. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.

D. Provide receptacle outlet to accommodate connection with attachment plug.

E. Provide cord and cap where field-supplied attachment plug is required.

F. Install suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.

G. Install disconnect switches, controllers, control stations, and control devices to complete equipment wiring requirements.

H. Install terminal block jumpers to complete equipment wiring requirements.

I. Install interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.

END OF SECTION

SECTION 26 22 00 - DRY TYPE TRANSFORMERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Two-winding transformers.

1.02 REFERENCES

A. NEMA ST 1 - Specialty Transformers (Except General Purpose Type); National Electrical Manufacturers Association.

B. NEMA ST 20 - Dry-Type Transformers for General Applications; National Electrical Manufacturers Association.

C. NETA STD ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems; International Electrical Testing Association.

D. NFPA 70 - National Electrical Code; National Fire Protection Association.

1.03 SUBMITTALS

A. Product Data: Provide outline and support point dimensions of enclosures and accessories, unit weight, voltage, kVA, and impedance ratings and characteristics, tap configurations, insulation system type, and rated temperature rise.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. ABB

B. Square D

C. Siemens Energy & Automation

D. Substitutions: Engineer Pre-Approved equivalent.

2.02 TWO-WINDING TRANSFORMERS

A. Description: NEMA ST 20, factory-assembled, air cooled dry type transformers, kVA and voltage ratings as scheduled on the drawings.

B. Insulation system and average winding temperature rise for rated kVA as follows:
   1. 1-15 kVA: Class 185 with 80 degrees C rise.
   2. 16-500 kVA: Class 220 with 80 degrees C rise.

C. Case temperature: Do not exceed 35 degrees C rise above ambient at warmest point at full load.

D. Winding Taps:
   1. Transformers Less than 15 kVA: Two 5 percent below rated voltage, full capacity taps on primary winding.
   2. Transformers 15 kVA and Larger: NEMA ST 20.

E. Basic Impulse Level: 10 kV.

F. Ground core and coil assembly to enclosure by means of a visible flexible copper grounding strap.

G. Mounting: Wall or Grade, as indicated by the plan drawings.

H. Coil Conductors: Continuous windings with terminations brazed or welded.

I. Transformer enclosure: NEMA ST 20.
   1. Type 1, unless otherwise shown on drawings or required by location.

2. Ventilated.
3. Provide lifting eyes or brackets.

J. Isolate core and coil from enclosure using vibration-absorbing mounts.

K. Nameplate: Include transformer connection data and overload capacity based on rated allowable temperature rise.

PART 3 EXECUTION

3.01 INSTALLATION

A. Set transformers plumb and level.

B. Use flexible conduit, under the provisions of Section 26 05 36, 2 feet minimum length, for connections to transformer case. Make conduit connections to side panel of enclosure.

C. Mount wall-mounted transformers using integral flanges or accessory brackets furnished by the manufacturer.

D. Mount floor-mounted transformers on vibration isolating pads suitable for isolating the transformer noise from the building structure.

E. Mount trapeze-mounted transformers as indicated.

F. Provide seismic restraints.

G. Provide grounding and bonding in accordance with Section 26 05 26.

3.02 FIELD QUALITY CONTROL

A. Perform field inspection, testing, and adjusting in accordance with the contract documents.

B. Inspect and test in accordance with NETA STD ATS, except Section 4.

C. Perform inspections and tests listed in NETA STD ATS, Section 7.2. In addition to the basic requirements of Section 7.2, include the following:
1. Perform turns ratio tests at all tap positions.
2. Verification that as-left tap connections are as specified.
3. Perform excitation-current tests on each phase.
4. Measure the resistance of each winding at each tap connection.
5. Overpotential test on all high- and low-voltage windings-to-ground.

3.03 ADJUSTING

A. Measure primary and secondary voltages and make appropriate tap adjustments.

END OF SECTION

SECTION 26 24 16 - PANELBOARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Power distribution panelboards.

B. Lighting and appliance panelboards.

1.02 RELATED SECTIONS

A. Section 26 05 26 - Grounding and Bonding.

B. Section 26 05 53 - Electrical Identification.

C. Section 26 09 13 - Electrical Sensing and Measurement.

1.03 REFERENCES

A. NECA 1 - Standard Practices for Good Workmanship in Electrical Contracting; National Electrical Contractors Association.

B. NEMA ICS 2 - Industrial Control and Systems: Controllers, Contactors, and Overload Relays, Rated Not More Than 2000 Volts AC or 750 Volts DC; National Electrical Manufacturers Association.

C. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum); National Electrical Manufacturers Association.

D. NEMA PB 1 - Panelboards; National Electrical Manufacturers Association.

E. NEMA PB 1.1 - General Instructions for Proper Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less; National Electrical Manufacturers Association.

F. NETA STD ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems; International Electrical Testing Association.

G. NFPA 70 - National Electrical Code; National Fire Protection Association.

1.04 SUBMITTALS

A. See Section 01 33 00 - Submittals.

B. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity, integrated short circuit ampere rating, circuit breaker and fusible switch arrangement and sizes.

1.05 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. ABB

B. Square D

C. Siemens Energy & Automation

D. Substitutions: Engineer Pre-Approved equivalent.

2.02 POWER DISTRIBUTION PANELBOARDS

A. Description: NEMA PB 1, circuit breaker type.

B. Service Conditions:
   1. Altitude: 1000 feet.
   2. Temperature: 110 degrees F.

C. Panelboard Bus: Copper, ratings as indicated. Provide copper ground bus in each panelboard.

D. Minimum integrated short circuit rating: As indicated.

E. Molded Case Circuit Breakers: With integral thermal and instantaneous magnetic trip in each pole; UL listed. For air conditioning equipment branch circuits provide circuit breakers UL listed as Type HACR. All breakers shall be bolt-on style.

F. Circuit Breaker Accessories: Trip units and auxiliary switches as indicated.

L. Enclosure: As indicated on drawings.

M. Cabinet Front: Surface type, fastened with concealed trim clamps, hinged door with flush lock, metal directory frame, finished in manufacturer's standard gray enamel.

2.03 LIGHTING AND APPLIANCE PANELBOARDS

A. Description: NEMA PB1, circuit breaker type, lighting and appliance branch circuit panelboard.

B. Panelboard Bus: Copper, ratings as indicated. Provide copper ground bus in each panelboard; provide insulated ground bus where scheduled.

C. Minimum Integrated Short Circuit Rating: As indicated.

D. Molded Case Circuit Breakers: Thermal magnetic trip circuit breakers, bolt-on type, with common trip handle for all poles; UL listed.
   1. Type SWD for lighting circuits.
   2. Type HACR for air conditioning equipment circuits.
   3. Class A ground fault interrupter circuit breakers where scheduled.
   4. Do not use tandem circuit breakers.

E. Enclosure: NEMA PB 1, Type 1.

F. Cabinet Box: 6 inches deep, 20 inches wide for 240 volt and less panelboards, 20 inches wide for 480 volt panelboards.

G. Cabinet Front: Flush cabinet front with concealed trim clamps, concealed hinge, metal directory frame, and flush lock all keyed alike. Finish in manufacturer's standard gray enamel.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install panelboards in accordance with NEMA PB 1.1 and NECA 1.

B. Install panelboards plumb. Install recessed panelboards flush with wall finishes.

C. Height: 6 feet to top of panelboard; install panelboards taller than 6 feet with bottom no more than 4 inches above floor.

D. Provide filler plates for unused spaces in panelboards.

E. Provide typed circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes required to balance phase loads.

F. Provide engraved plastic nameplates under the provisions of Section 26 0553.

G. Provide spare conduits out of each recessed panelboard to an accessible location above

ceiling. Identify each as SPARE.

1. Minimum spare conduits: 5 empty 1 inch.

H. Ground and bond panelboard enclosure according to Section 26 0526.

3.02 FIELD QUALITY CONTROL

A. Perform field inspection and testing in accordance with the contract documents.

3.03 ADJUSTING

A. Measure steady state load currents at each panelboard feeder; rearrange circuits in the panelboard to balance the phase loads to within 20 percent of each other. Maintain proper phasing for multi-wire branch circuits.

END OF SECTION

SECTION 26 27 26 - WIRING DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall switches.

B. Receptacles.

C. Device plates and decorative box covers.

1.02 REFERENCES

A. NECA 1 - Standard Practices for Good Workmanship in Electrical Contracting; National Electrical Contractors Association.

B. NEMA WD 1 - General Color Requirements for Wiring Devices; National Electrical Manufacturers Association.

C. NEMA WD 6 - Wiring Device -- Dimensional Requirements; National Electrical Manufacturers Association.

D. NFPA 70 - National Electrical Code; National Fire Protection Association.

1.03 SUBMITTALS

A. See Section 01 33 00 - Submittals.

B. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.

C. Manufacturer's Installation Instructions.

1.04 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Products: Provide products listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 WALL SWITCHES

A. Wall Switches: Heavy Duty, AC only general-use snap switch, complying with NEMA WD 6 and WD 1.
   1. Body and Handle: Ivory plastic with toggle handle for finished areas, Gray for non-finished areas.
   2. Indicator Light: Lighted handle type switch; red handle.
   3. Locator Light: Lighted handle type switch; red color handle.
   4. Ratings:
      a. Voltage: 120 volts, AC.
      b. Current: 20 amperes.
   5. Ratings: Match branch circuit and load characteristics.

B. Switch Types: Single pole, double pole, 3-way and 4-way.

2.02 RECEPTACLES

A. Receptacles: Heavy duty, complying with NEMA WD 6 and WD 1.
   1. Device Body: Ivory plastic for finished areas, Gray for non-finished areas.
   2. Configuration: NEMA WD 6, type as specified and indicated.

3. All receptacles shall be Industrial Grade regardless of location.

B. Convenience Receptacles: Type 5 - 20.

C. Single Convenience Receptacles.

D. Duplex Convenience Receptacles.

E. GFCI Receptacles: Convenience receptacle with integral ground fault circuit interrupter to meet regulatory requirements.

2.03 WALL PLATES

A. Decorative Cover Plates: Ivory, smooth plastic.

B. Jumbo Cover Plates: Ivory, smooth plastic.

C. Weatherproof Cover Plates: Gasketed cast metal with hinged cover.

D. Unfinished Space Cover Plates: Galvanized Steel.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that outlet boxes are installed at proper height.

B. Verify that wall openings are neatly cut and will be completely covered by wall plates.

C. Verify that floor boxes are adjusted properly.

D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

E. Verify that openings in access floor are in proper locations.

3.02 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.

B. Clean debris from outlet boxes.

3.03 INSTALLATION

A. Install securely, in a neat and workmanlike manner, as specified in NECA 1.

B. Install devices plumb and level.

C. Install switches with OFF position down.

D. Install receptacles with grounding pole on top.

E. Connect wiring device grounding terminal to outlet box with bonding jumper.

F. Install decorative plates on switch, receptacle, and blank outlets in finished areas.

G. Connect wiring devices by wrapping conductor around screw terminal.

H. Use jumbo size plates for outlets installed in masonry walls.

I. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.

J. Install protective rings on active flush cover service fittings.

3.04 INTERFACE WITH OTHER PRODUCTS

A. Coordinate locations of outlet boxes provided under Section 26 05 33 to obtain mounting heights specified.

B. Install wall switch 48 inches above finished floor.

C. Install finished area convenience receptacles 18 inches above finished floor. Receptacles in non-finished areas shall be installed 48 inches above floor level.

D. Install convenience receptacle 6 inches above counter, if drawings shown a receptacle with Subscript “A”, below counter or inside cabinet if drawings show a receptacle with

E. Install dimmer 48 inches above finished floor.

3.05 FIELD QUALITY CONTROL

A. Perform field inspection, testing, and adjusting in accordance with contract documents.

B. Inspect each wiring device for defects.

C. Operate each wall switch with circuit energized and verify proper operation.

D. Verify that each receptacle device is energized.

E. Test each receptacle device for proper polarity.

F. Test each GFCI receptacle device for proper operation.

G. Verify that each telephone jack is properly connected and circuit is operational.

3.06 ADJUSTING

A. Adjust devices and wall plates to be flush and level.

3.07 CLEANING

A. Clean exposed surfaces to remove splatters and restore finish.

END OF SECTION

SECTION 26 29 13 - ENCLOSED MOTOR CONTROLLERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Manual motor controllers.

B. Automatic motor controllers.

C. Combination magnetic motor controllers and disconnects.

1. 02 REFERENCES

A. NECA 1 - Standard Practices for Good Workmanship in Electrical Contracting; National Electrical Contractors Association.

B. NEMA ICS 2 - Industrial Control and Systems: Controllers, Contactors, and Overload Relays, Rated Not More Than 2000 Volts AC or 750 Volts DC; National Electrical Manufacturers Association.

C. NEMA ICS 5 - Industrial Control and Systems: Control Circuit and Pilot Devices; National Electrical Manufacturers Association.

D. NEMA ICS 6 - Industrial Control and Systems: Enclosures; National Electrical Manufacturers Association.

E. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum); National Electrical Manufacturers Association.

F. NETA STD ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems; International Electrical Testing Association.

G. NFPA 70 - National Electrical Code; National Fire Protection Association.

1.03 SUBMITTALS

A. See Section 01 33 00 - Submittals.

B. Product Data: Provide catalog sheets showing voltage, controller size, ratings and size of switching and overcurrent protective devices, short circuit ratings, dimensions, and enclosure details.

1.04 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience and with service facilities within 100 miles of Project.

C. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. ABB

B. Square D

C. Siemens Energy & Automation

D. Allen-Bradley

E. Substitutions: Engineer Pre-Approved equivalent.

2.02 MANUAL CONTROLLERS

A. Manual Motor Controllers: NEMA ICS 2, AC general-purpose, Class A, manually operated, full-voltage controller with overload element, red pilot light, NO auxiliary contact, and push button operator.

B. Fractional Horsepower Manual Controllers: NEMA ICS 2, AC general-purpose, Class A, manually operated, full-voltage controller for fractional horsepower induction motors, with thermal overload unit, red pilot light, and key operator.

C. Motor Starting Switches: NEMA ICS 2, AC general-purpose Class A manually operated, full-voltage controller for fractional horsepower induction motors, without thermal overload unit, with red pilot light and key operator.

D. Enclosures: NEMA ICS 6, Type 1.

2.03 AUTOMATIC CONTROLLERS

A. Magnetic Motor Controllers: NEMA ICS 2, AC general-purpose Class A magnetic controller for induction motors rated in horsepower.

B. Reversing Controllers: Include electrical interlock and integral time delay transition between FORWARD and REVERSE rotation.

C. Two-Speed Controllers: Include integral time delay transition between FAST and SLOW speeds.

D. Static Soft Starters: If shown on the project drawings or otherwise specified, provide open-style soft starter, with accessories and controls as specified herein.

E. Coil Operating Voltage: 120 volts, 60 Hertz.

F. Overload Relays: Temperature-compensated bi-metal thermal.

G. Enclosures: NEMA ICS 6, Type 1.

2.04 ACCESSORIES

A. Auxiliary Contacts: NEMA ICS 2, 2 normally open contacts in addition to seal-in contact.

B. Cover Mounted Pilot Devices: NEMA ICS 5, heavy duty 30mm oiltight type.

C. Pilot Device Contacts: NEMA ICS 5, Form Z, rated A150.

D. Pushbuttons: Unguarded type, 30mm heavy duty oil-tight

E. Indicating Lights: LED , 30mm heavy duty oil-tight.

F. Selector Switches: Rotary type, 30mm heavy duty oil-tight.

G. Control Power Transformers: 120 volt secondary, in each motor starter. Provide fused primary, secondary, and bond unfused leg of secondary to enclosure. Oversize control power transformers to provide power to any devices noted by the drawings.

2.05 DISCONNECTS

A. Combination Controllers: Combine motor controllers with disconnects in common enclosure. Obtain IEC Class 2 coordinated component protection.

B. Thermal Magnetic Circuit Breakers: Integral thermal and instantaneous magnetic trip in each pole; UL listed.

C. Motor Circuit Protector: Circuit breakers with integral instantaneous magnetic trip in each pole; UL listed.

D. Nonfusible Switch Assemblies: NEMA KS 1, enclosed knife switch with externally operable

handle.

E. Fusible Switch Assemblies: NEMA KS 1, enclosed knife switch with externally operable handle. Fuse clips: Designed to accommodate Class R fuses.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install enclosed controllers where indicated, in accordance with manufacturer's instructions.

B. Install securely, in a neat and workmanlike manner, as specified in NECA 1.

C. Provide supports in accordance with Section 26 0529.

D. Height: 5 ft to operating handle.

E. Provide fuses for fusible switches; refer to Section 26 2813 for product requirements.

F. Select and install overload heater elements in motor controllers to match installed motor characteristics.

G. Provide engraved plastic nameplates; refer to Section 26 0553 for product requirements and location.

H. Neatly type label inside each motor controller door identifying motor served, nameplate horsepower, full load amperes, code letter, service factor, and voltage/phase rating. Place label in clear plastic holder.

3.02 FIELD QUALITY CONTROL

A. Perform field inspection and testing in accordance with contract documents.

END OF SECTION

PART II - CONTRACT DOCUMENTS

D. Soils Information

TEAM Services, Inc.

MOISTURE-DENSITY RELATIONSHIP

Job No. 2-5109 Date Rec'd 3/24/15 Date Tested 3/27/15

Project Benton County BCSWC 15004 - Benton County, IA

Source of Material Native - on site

Description of Material Lean CLAY, with sand, medium brown

Material Designation 1

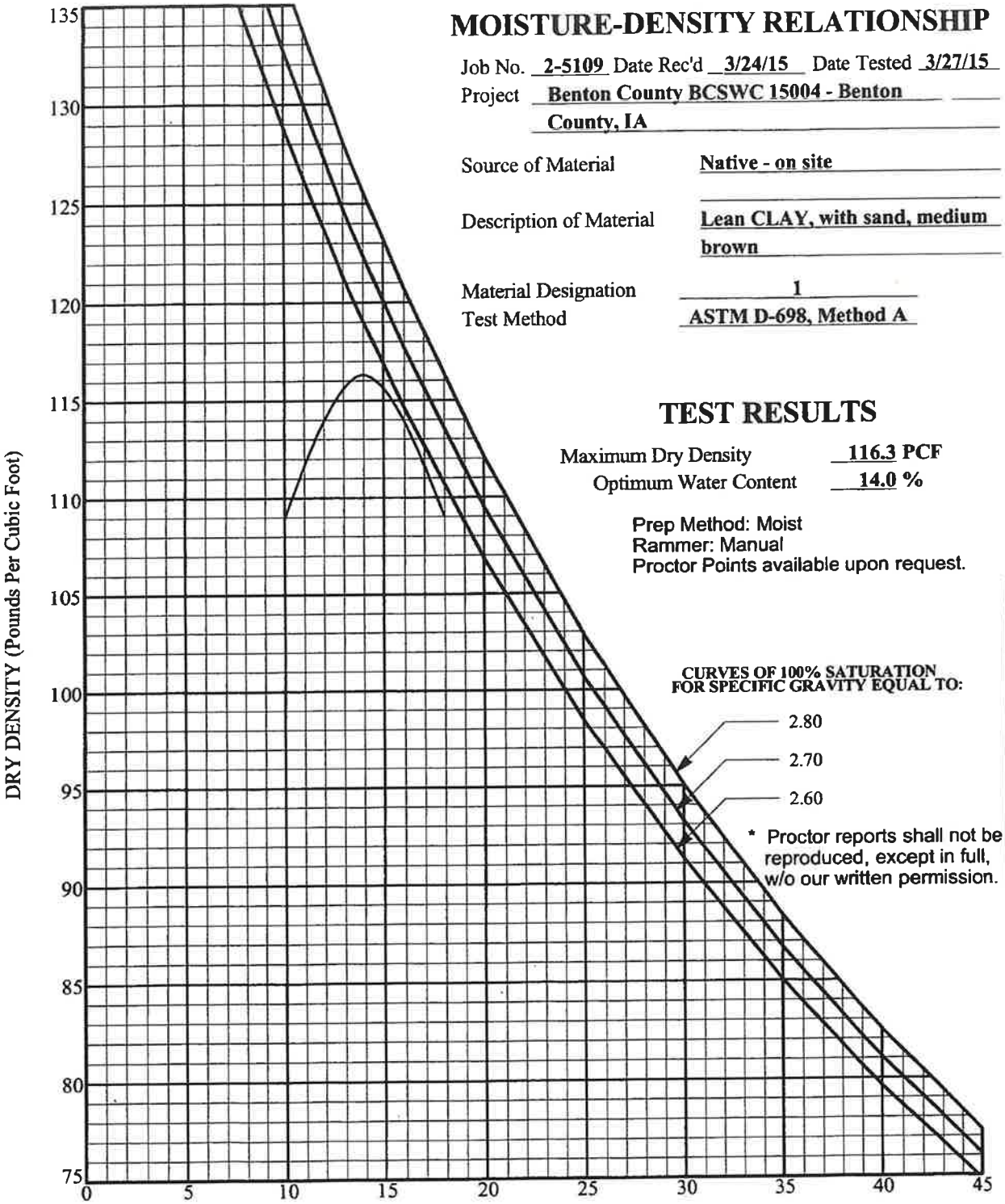
Test Method ASTM D-698, Method A

TEST RESULTS

Maximum Dry Density 116.3 PCF

Optimum Water Content 14.0 %

Prep Method: Moist
Rammer: Manual
Proctor Points available upon request.



TEAM Services, Inc.

MOISTURE-DENSITY RELATIONSHIP

Job No. 2-5109 Date Rec'd 8/18/15 Date Tested 8/18/15

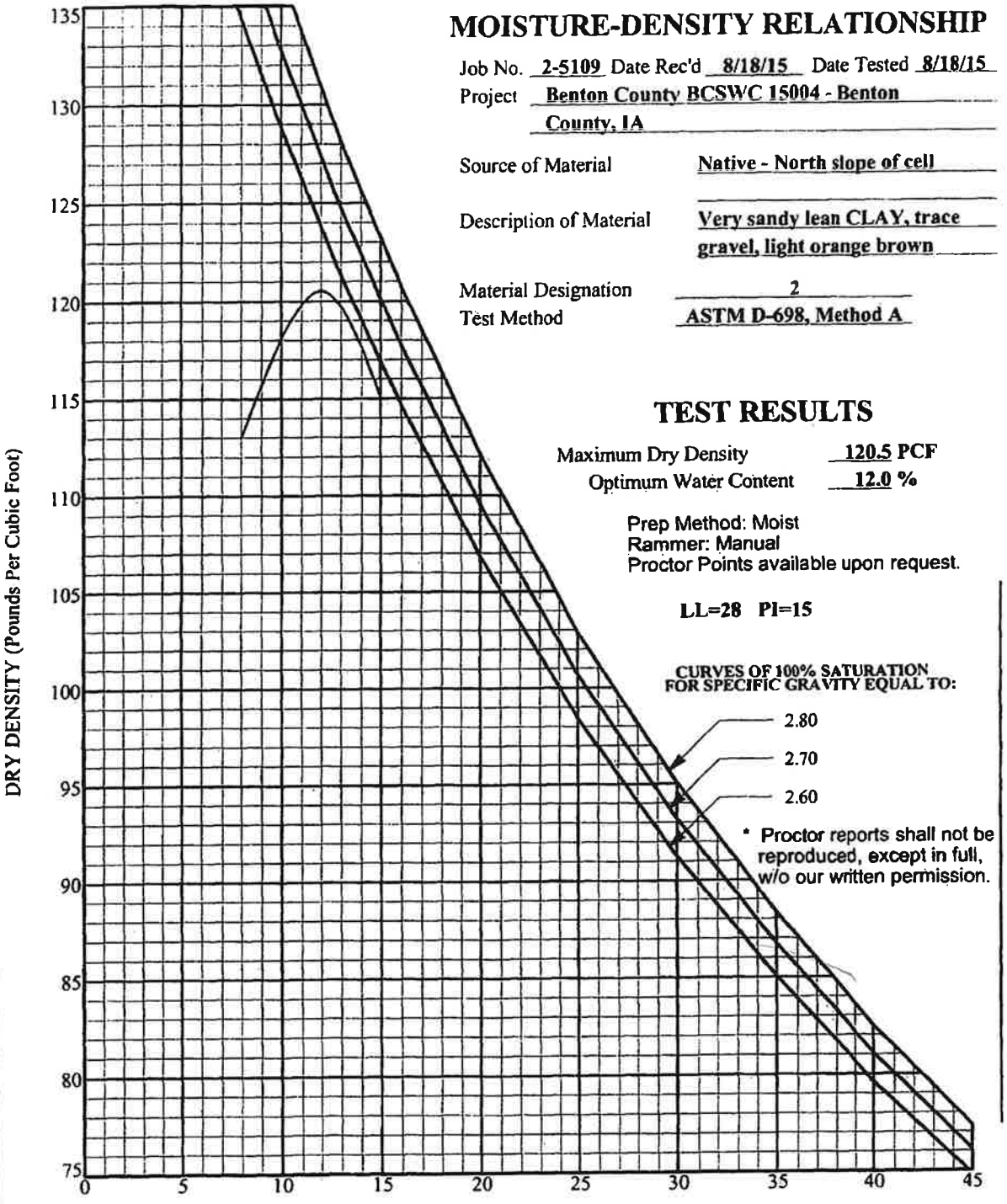
Project Benton County BCSWC 15004 - Benton County, IA

Source of Material: Native - North slope of cell

Description of Material: Very sandy lean CLAY, trace gravel, light orange brown

Material Designation: 2

Test Method: ASTM D-698, Method A



TEST RESULTS

Maximum Dry Density: 120.5 PCF

Optimum Water Content: 12.0 %

Prep Method: Moist
Rammer: Manual
Proctor Points available upon request.

LL=28 PI=15

CURVES OF 100% SATURATION FOR SPECIFIC GRAVITY EQUAL TO:

2.80

2.70

2.60

TEAM Services, Inc.

MOISTURE-DENSITY RELATIONSHIP

Job No. 2-5109 Date Rec'd 8/18/15 Date Tested 8/18/15

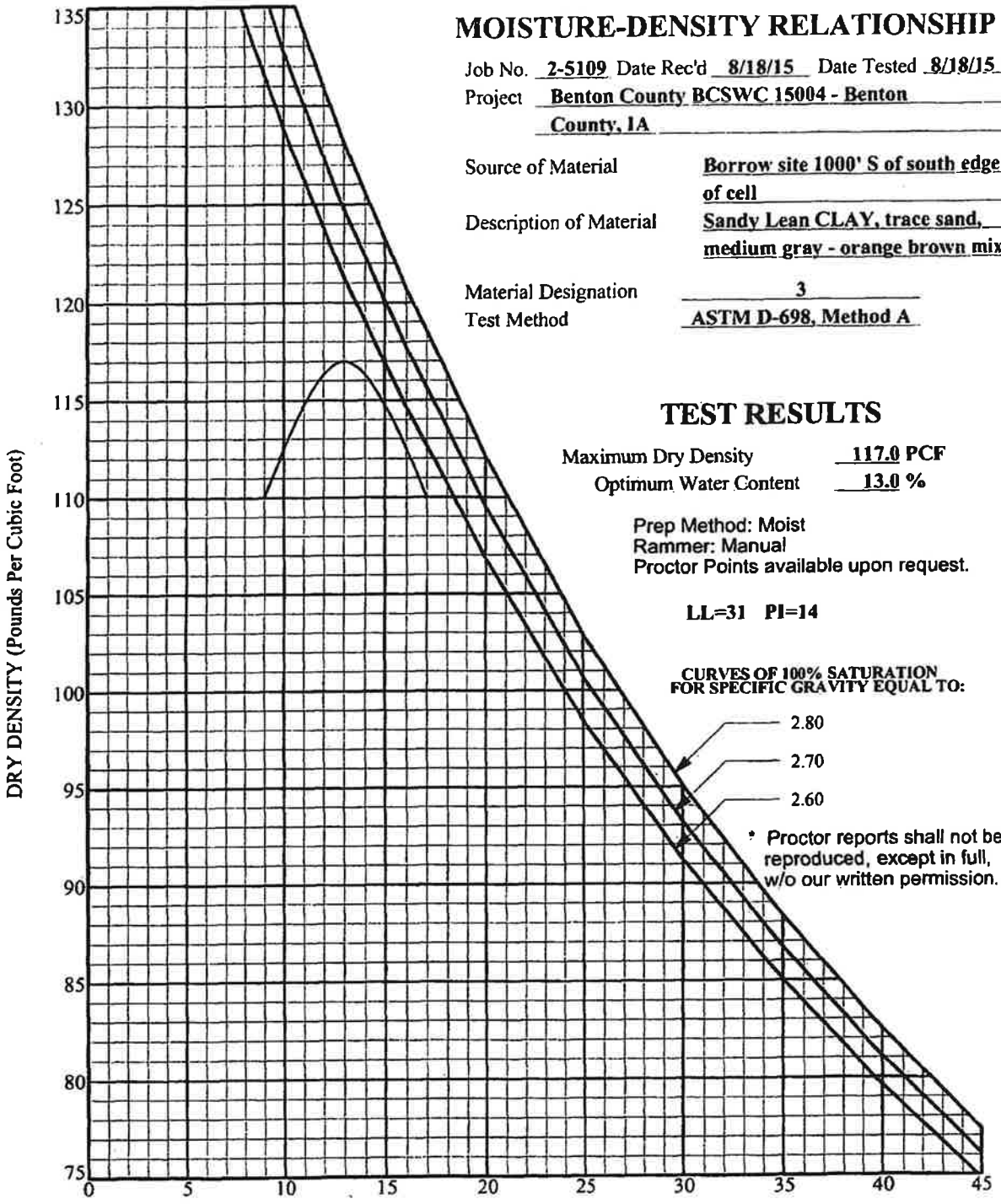
Project Benton County BCSWC 15004 - Benton County, IA

Source of Material: Borrow site 1000' S of south edge of cell

Description of Material: Sandy Lean CLAY, trace sand, medium gray - orange brown mix

Material Designation: 3

Test Method: ASTM D-698, Method A



TEST RESULTS

Maximum Dry Density: 117.0 PCF

Optimum Water Content: 13.0 %

Prep Method: Moist
Rammer: Manual
Proctor Points available upon request.

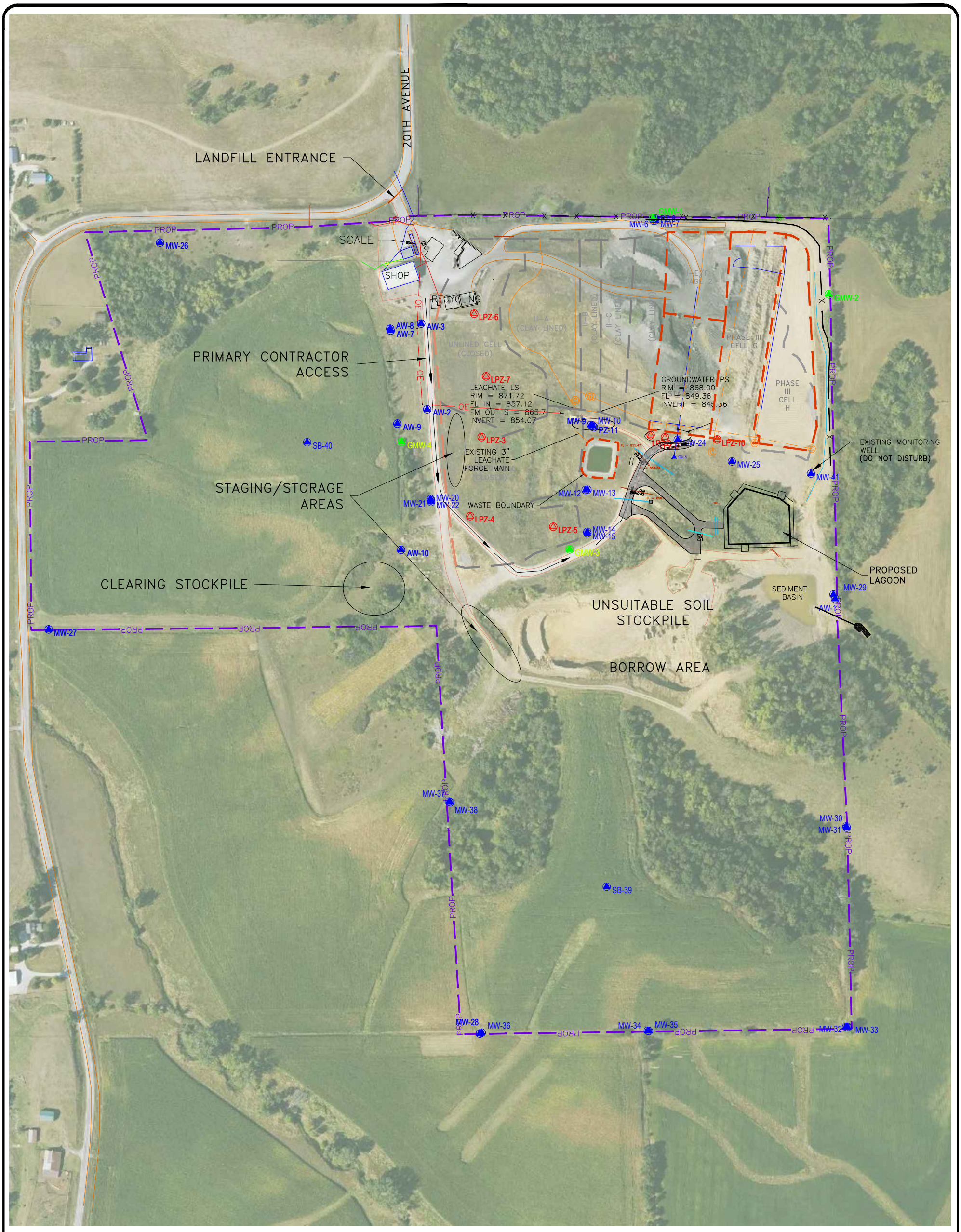
LL=31 PI=14

CURVES OF 100% SATURATION FOR SPECIFIC GRAVITY EQUAL TO:

2.80
2.70
2.60

PART II - CONTRACT DOCUMENTS

E. Figures



AERIAL PROVIDED BY THE IOWA STATE UNIVERSITY GEOGRAPHIC INFORMATION SYSTEMS SUPPORT AND RESEARCH FACILITY IN COOPERATION WITH THE IOWA DEPARTMENT OF NATURAL RESOURCES, THE USDA NATURAL RESOURCES CONSERVATION SERVICES, AND THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

LEGEND

- EXISTING 2' CONTOURS
- EXISTING 10' CONTOURS
- EXISTING FML LINER
- EXISTING LEACHATE SYSTEM
- EXISTING GROUNDWATER COLLECTION
- PROPOSED 2' CONTOURS
- PROPOSED 10' CONTOURS
- PROPOSED 10' FENCE
- PROPOSED WASTE BOUNDARY
- PROPERTY LINE (APPROX.)
- PROPOSED STORMWATER PIPING
- PROPOSED LEACHATE PIPING
- PROPOSED GROUNDWATER PIPING

N

SCALE
0 150 300

AERIAL DATED SEPTEMBER 1, 2023

HLW Engineering Group
204 West Broad Street, P.O. Box 314
Story City, Iowa 50248
Phone: (515) 733-4144
FAX: (515) 733-4146

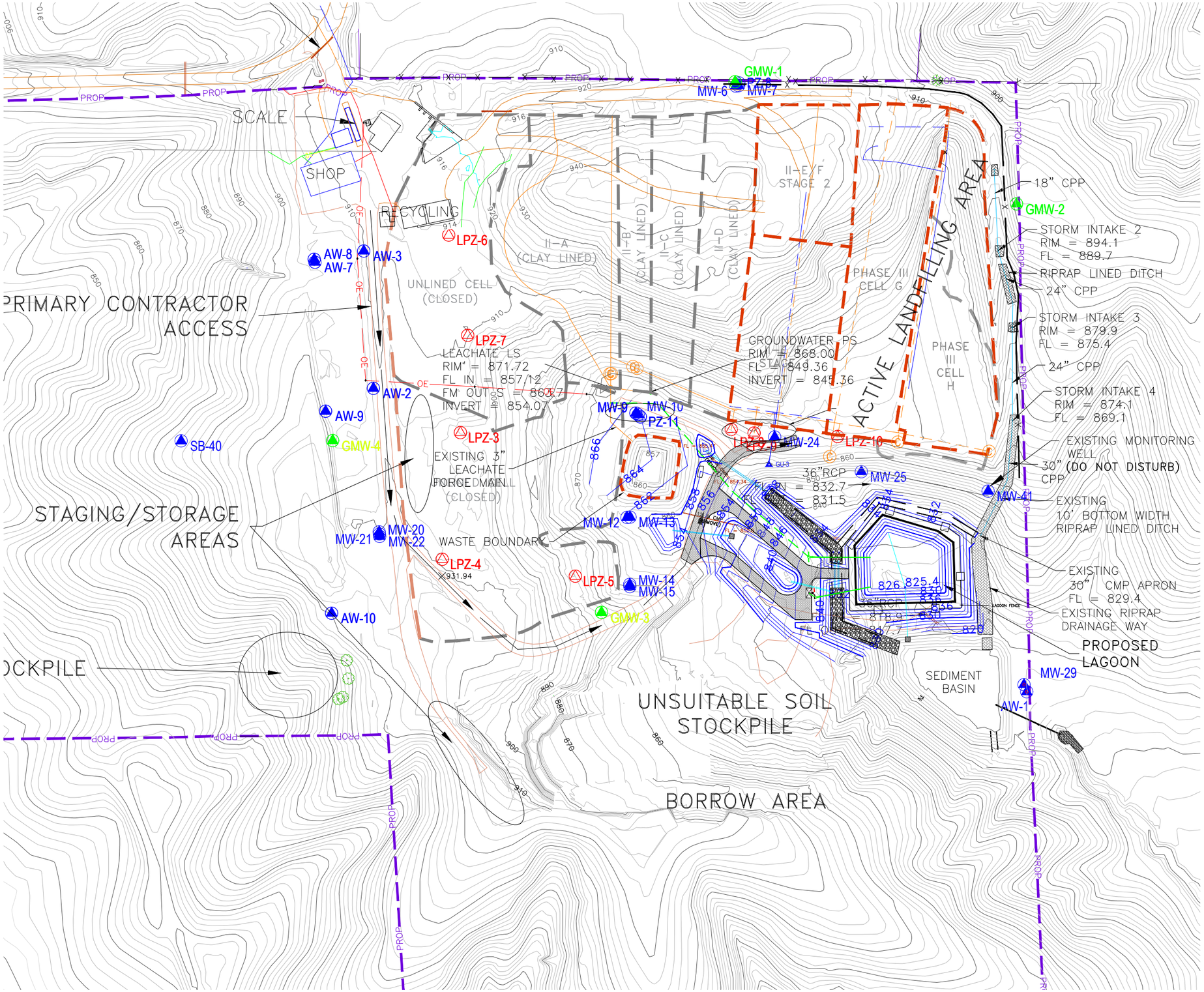
SITE AERIAL

LEACHATE LAGOON PROJECT

BENTON COUNTY SANITARY LANDFILL
BLAIRSTOWN, IOWA

FIGURE: 1

REVISION	NO.	DATE
DRAWN JGH	PROJECT NO. 6043-23B	DATE 2/11/25



LEGEND

- EXISTING 2' CONTOURS
- EXISTING 10' CONTOURS
- EXISTING FML LINER
- EXISTING LEACHATE SYSTEM
- EXISTING GROUNDWATER COLLECTION
- PROPOSED 2' CONTOURS
- PROPOSED 10' CONTOURS
- PROPOSED 10' FENCE
- PROPOSED WASTE BOUNDARY
- PROPERTY LINE (APPROX.)
- PROPOSED STORMWATER PIPING
- PROPOSED LEACHATE PIPING
- PROPOSED GROUNDWATER PIPING

N

SCALE
0 100 200

NOTES:

1. CONTOURS BASED ON TOPOGRAPHIC SURVEY DATED 01/04/24.
2. EXISTING INFRASTRUCTURE AFFECTED BY THIS PROJECT IS BASED ON INFORMATION PROVIDED BY OTHERS. HLW ENGINEERING GROUP SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS THAT MAY HAVE BEEN INCORPORATED AS A RESULT OF ERRONEOUS INFORMATION PROVIDED BY OTHERS.

FIGURE: 2

REVISION	NO.	DATE
DRAWN JGH	PROJECT NO. 6043-23B	DATE 2/11/25

OVERALL SITE PLAN
LEACHATE STORAGE LAGOON

BENTON COUNTY SANITARY LANDFILL
BLAIRSTOWN, IOWA

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LPZ-7
LEACHATE LS
RIM = 871.72
FL IN = 857.12
FM OUT S = 863.7
INVERT = 854.07
(DO NOT DISTURB)
GROUNDWATER PS
RIM = 868.00
FL = 849.36
INVERT = 845.36
(DO NOT DISTURB)
H-E/F STAGE 1
PHASE III CELL G
PHASE III CELL H
GU-1
MW-9
MW-10
PZ-11
(DO NOT DISTURB)
LOADOUT SUPPORT LOCATION (EXISTING)
DO NOT DISTURB
WIDEN EXISTING ACCESS ROAD TO 25' WIDE
LPZ-3
LPZ-8
LPZ-9
DP-1
MW-24
EXISTING HAUL ROAD
36 IN CMP
FL IN = 855.5
FL OUT = 838.0
GU-3
EXISTING 3" LEACHATE FORCE MAIN
EXISTING LEACHATE LAGOON (REMOVE)
EXISTING LEACHATE LOADOUT
MW-25
CONTROL MANHOLE
MW-41
RIPRAP DRAINAGE WAY
LEACHATE ACCESS POINT
MW-12
MW-13
(DO NOT DISTURB)
12 IN CMP (REMOVE)
3"x6" HDPE
WASTE BOUNDARY
18 IN CMP
FL IN = 853.5
FL OUT = 852.0
2 - 24" CMP
FL IN = 832.8
FL OUT = 832.3
10"x14" FL = 827.5
EXISTING 30" CMP APRON FL = 829.4
LPZ-4
931.94
LPZ-5
MW-14
MW-15
RIPRAP
NEW ACCESS ROAD
LAGOON FENCE
EXISTING RIPRAP DRAINAGE WAY
GMW-3
18" CMP
FL IN = 838.0
FL OUT = 834.0
FL = 821.4
RIPRAP
GROUNDWATER CONVEYANCE PIPE
RIPRAP DRAINAGE WAY
EXISTING SEDIMENT BASIN
LOADOUT MANHOLE CONTAINMENT PAD
MW-29
AW-1
SHAPED TO DRAIN TO SWALE
SHAPED TO DRAIN TO SWALE

LEGEND
EXISTING 2' CONTOURS
EXISTING 10' CONTOURS
EXISTING FML LINER
EXISTING LEACHATE SYSTEM
EXISTING GROUNDWATER COLLECTION
PROPOSED 2' CONTOURS
PROPOSED 10' CONTOURS
PROPOSED 10' FENCE
FUTURE WASTE BOUNDARY
PROPERTY LINE (APPROX.)
PROPOSED STORMWATER PIPING
PROPOSED LEACHATE PIPING
PROPOSED GROUNDWATER PIPING

N

SCALE
0 50 100

FIGURE: 3

REVISION	NO.	DATE
DRAWN JGH	PROJECT NO. 6043-23B	DATE 2/14/25

GRADING PLAN
LEACHATE STORAGE LAGOON
BENTON COUNTY SANITARY LANDFILL
BLAIRSTOWN, IOWA

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FAX: (515) 733-4146

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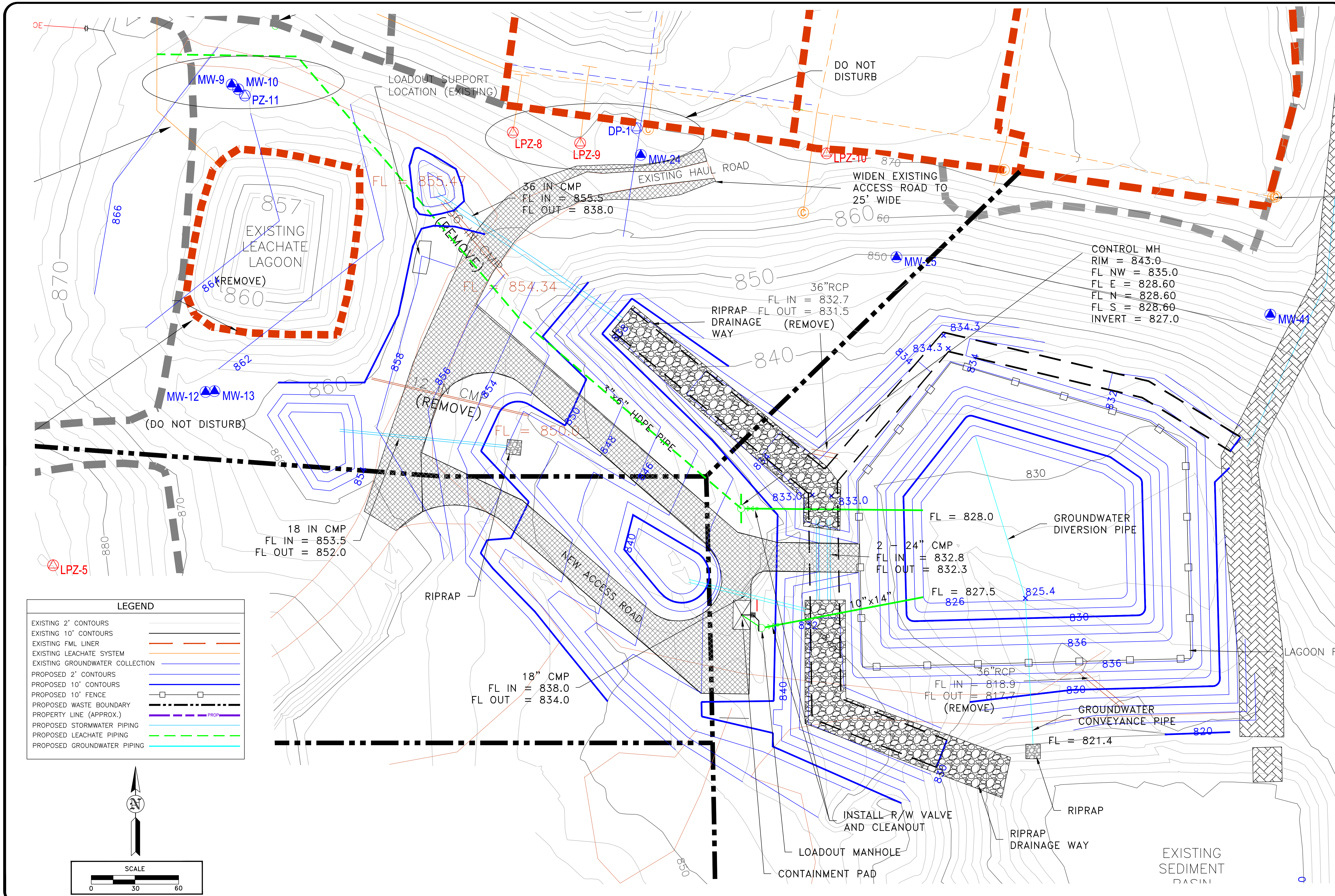
MW-9
MW-10
PZ-11
LOADOUT SUPPORT LOCATION (EXISTING)
DO NOT DISTURB
LPZ-8
LPZ-9
DP-1
MW-24
LPZ-10
EXISTING HAUL ROAD
WIDEN EXISTING ACCESS ROAD TO 25' WIDE
FL = 855.47
36 IN CMP
FL IN = 855.5
FL OUT = 838.0
EXISTING LEACHATE LAGOON
(REMOVE)
FL = 854.34
MW-25
CONTROL MH
RIM = 843.0
FL NW = 835.0
FL E = 828.60
FL N = 828.60
FL S = 828.60
INVERT = 827.0
36"RCP
FL IN = 832.7
FL OUT = 831.5
(REMOVE)
RIPRAP DRAINAGE WAY
MW-41
MW-12
MW-13
(DO NOT DISTURB)
12 IN CMP
(REMOVE)
FL = 850.0
3"x6" HDPE PIPE
834.3
830
FL = 828.0
GROUNDWATER DIVERSION PIPE
2 - 24" CMP
FL IN = 832.8
FL OUT = 832.3
FL = 827.5
825.4
10"x14"
18 IN CMP
FL IN = 853.5
FL OUT = 852.0
LPZ-5
RIPRAP
NEW ACCESS ROAD
18" CMP
FL IN = 838.0
FL OUT = 834.0
36"RCP
FL IN = 818.9
FL OUT = 817.7
(REMOVE)
GROUNDWATER CONVEYANCE PIPE
FL = 821.4
LAGOON F
RIPRAP
INSTALL R/W VALVE AND CLEANOUT
RIPRAP DRAINAGE WAY
LOADOUT MANHOLE
CONTAINMENT PAD
EXISTING SEDIMENT BASIN
LEGEND
EXISTING 2' CONTOURS
EXISTING 10' CONTOURS
EXISTING FML LINER
EXISTING LEACHATE SYSTEM
EXISTING GROUNDWATER COLLECTION
PROPOSED 2' CONTOURS
PROPOSED 10' CONTOURS
PROPOSED 10' FENCE
PROPOSED WASTE BOUNDARY
PROPERTY LINE (APPROX.)
PROPOSED STORMWATER PIPING
PROPOSED LEACHATE PIPING
PROPOSED GROUNDWATER PIPING
N
SCALE
0
30
60

FIGURE: 4

NO.	DATE
REVISION	

DRAWN JGH | PROJECT NO. 6043-23B | DATE 2/11/25

PIPING PLAN
LEACHATE STORAGE LAGOON
BENTON COUNTY SANITARY LANDFILL
BLAIRSTOWN, IOWA

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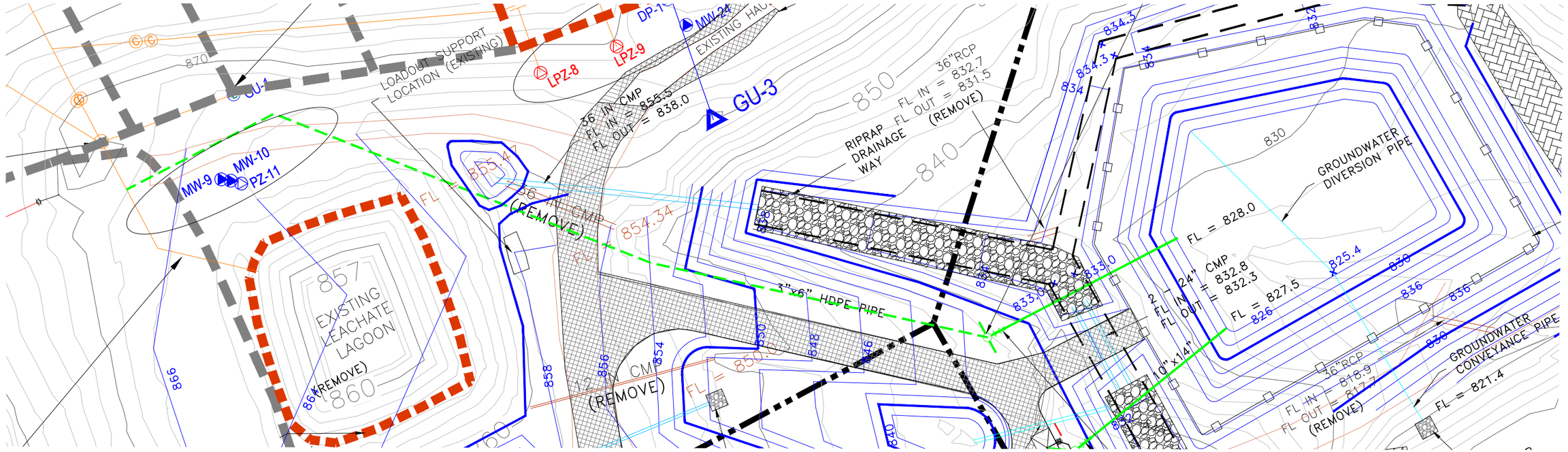
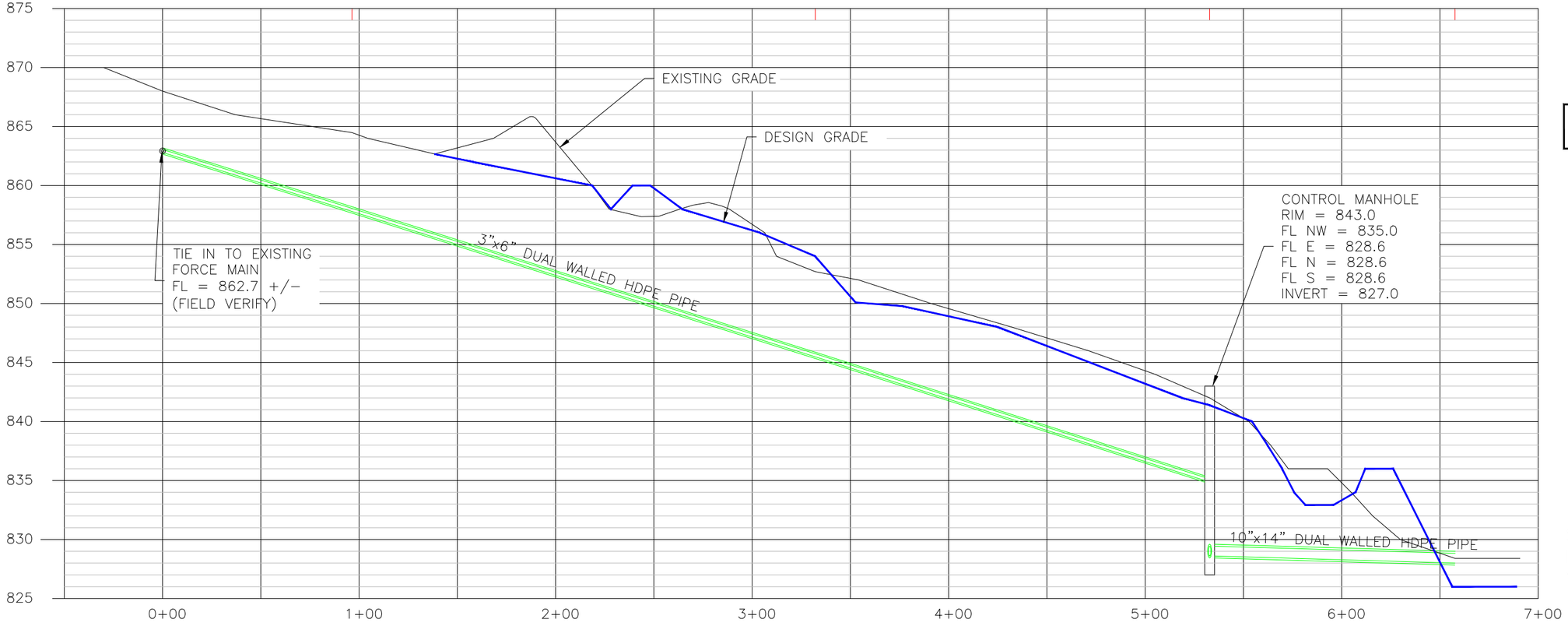
204 West Broad Street, P.O. Box 314
Story City, Iowa 50248
Phone: (515) 733-4144
FAX: (515) 733-4146





SCALE
HORIZ: 1"=60'
VERT: 1"=10'

FIGURE: 5

REVISION	NO.	DATE
DRAWN JGH	PROJECT NO. 6043-23B	DATE 2/14/25

PLAN AND PROFILE
LEACHATE STORAGE LAGOON
BENTON COUNTY SANITARY LANDFILL
BLAIRSTOWN, IOWA

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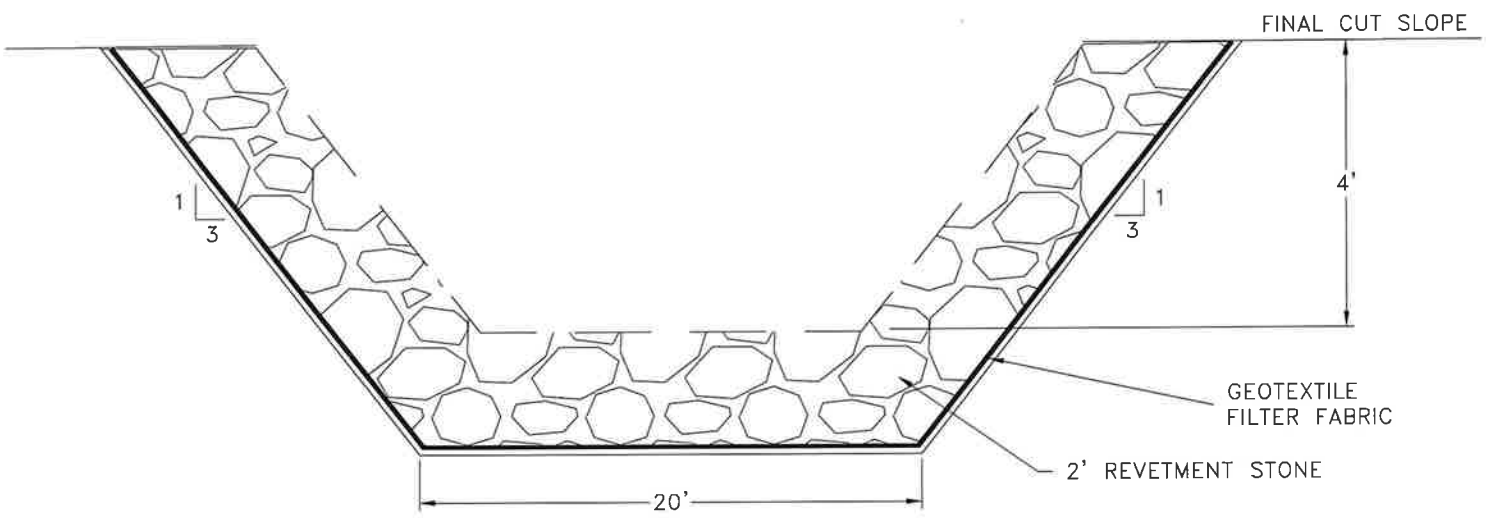

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RIPRAP DRAINAGE WAY
LEACHATE STORAGE LAGOON

BENTON COUNTY SANITARY LANDFILL
BLAIRSTOWN, IOWA

FIGURE: 6

REVISION	NO.	DATE
DRAWN JGH	PROJECT NO. 6043-23B	DATE 02/11/25

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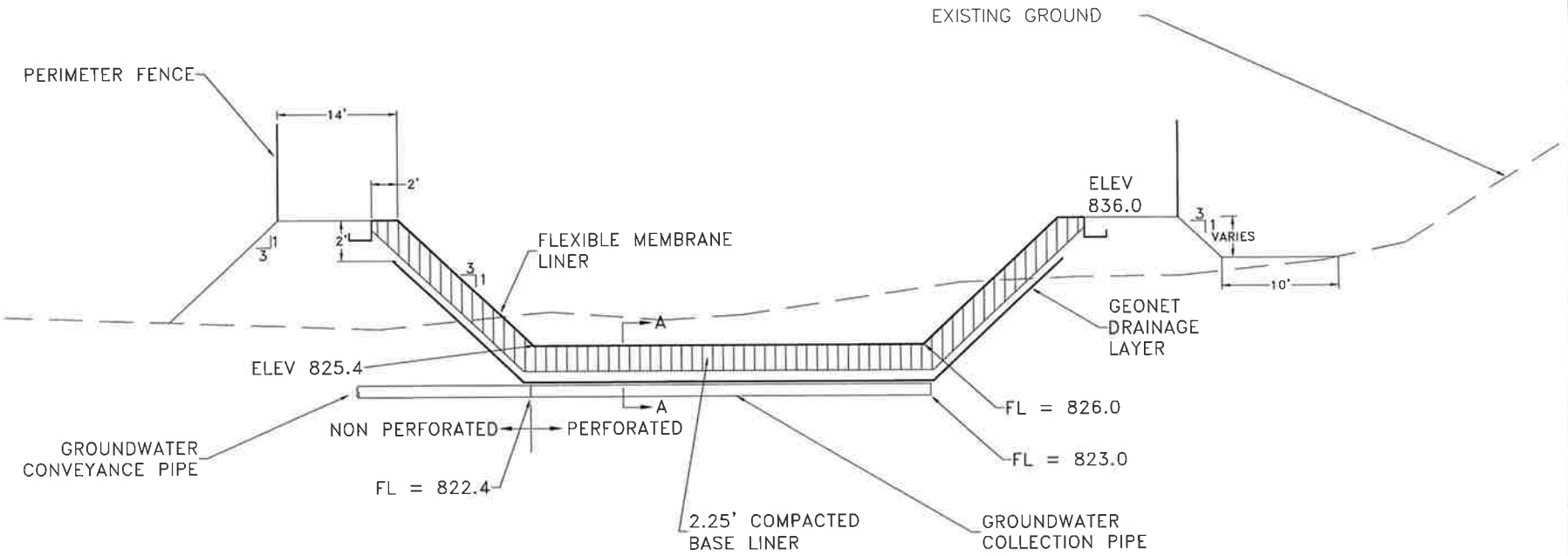
LAGOON CROSS SECTION
LEACHATE STORAGE LAGOON

BENTON COUNTY SANITARY LANDFILL
BLAIRSTOWN, IOWA

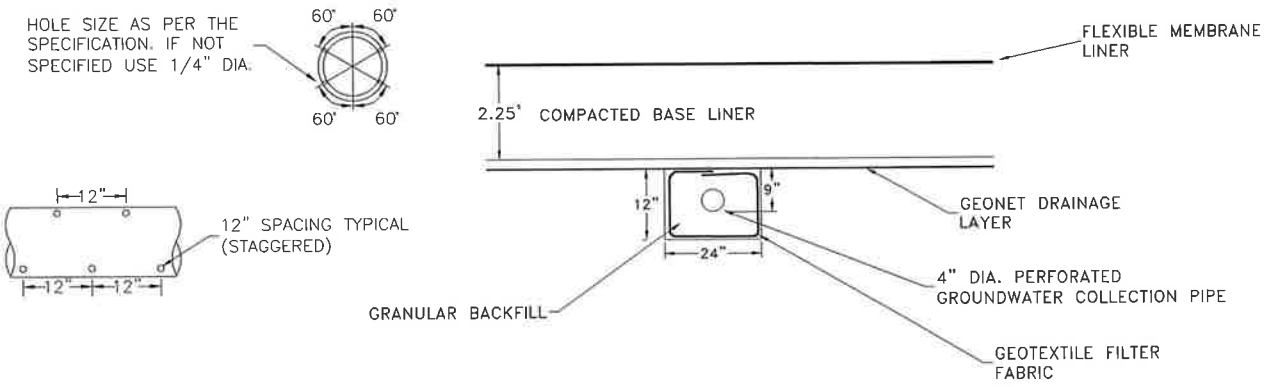
FIGURE: 7

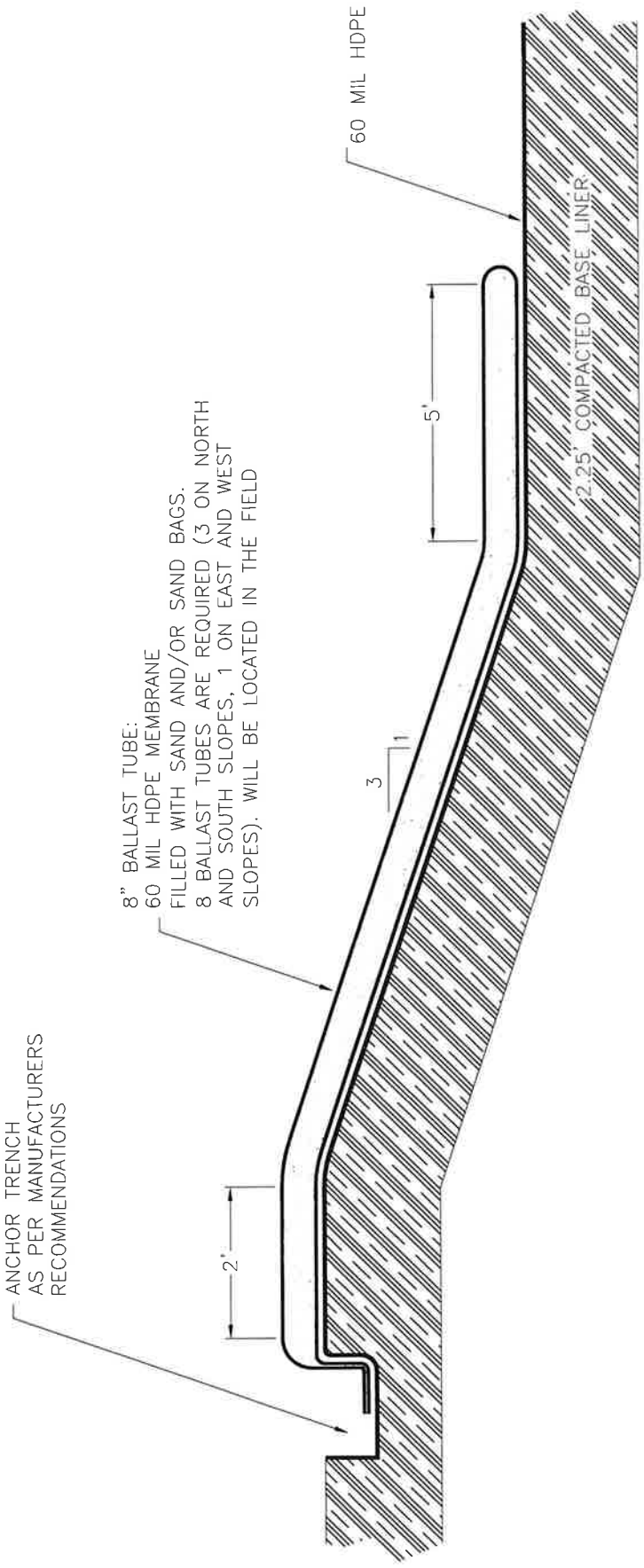
REVISION	NO.	DATE
DRAWN JGH	PROJECT NO. 6043-23B	DATE 2/14/25



NOTES:
1. NOT TO SCALE.
2. VIEW LOOKING WEST
3. GEOTEXTILE TO BE REMOVED FROM TOP OF GROUNDWATER DIVERSION TRENCH TO EXPOSE ROCK IMMEDIATELY BEFORE GEONET INSTALLED.

SECTION A-A





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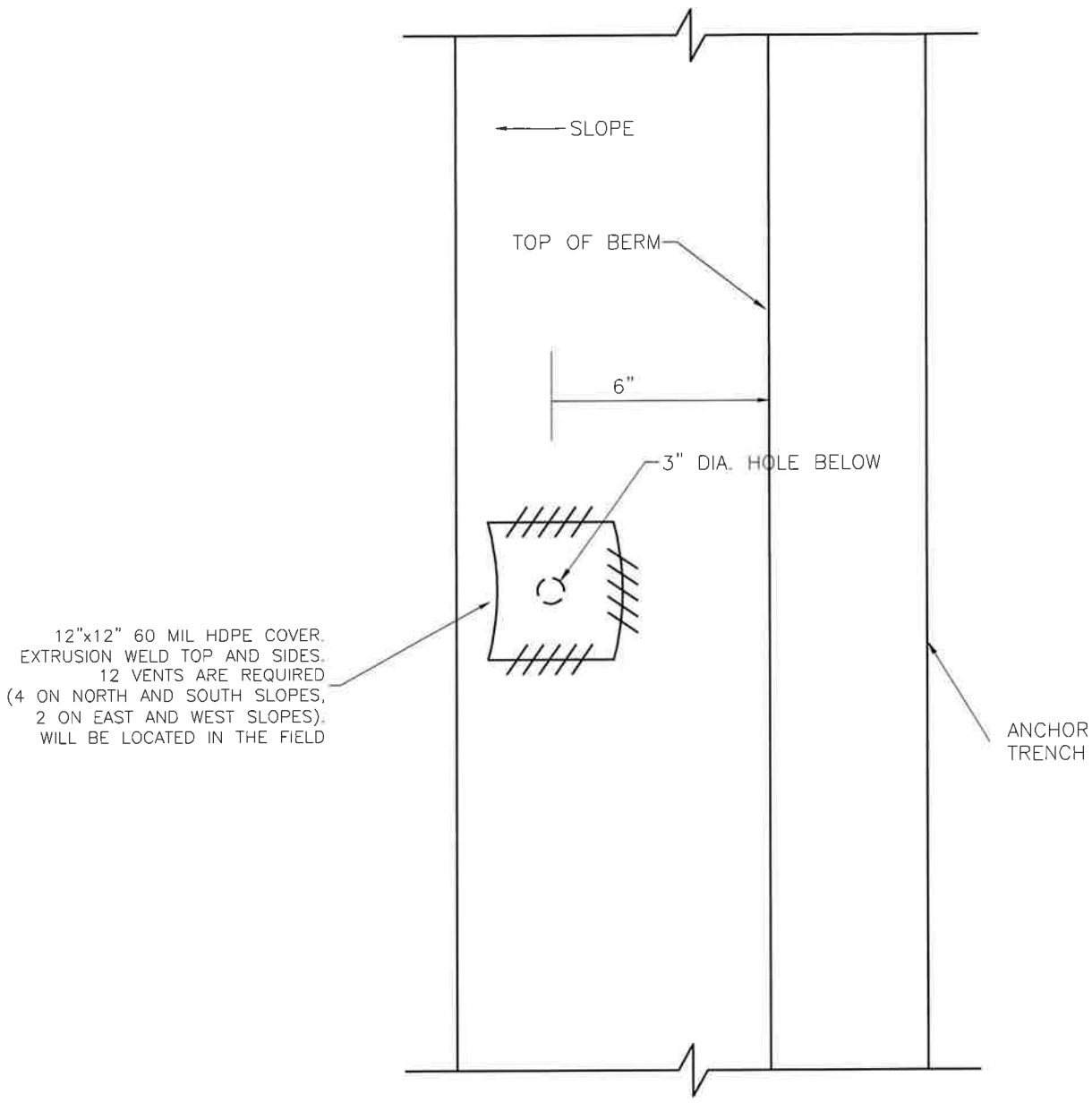
LAGOON BALLAST TUBE

LEACHATE STORAGE LAGOON

BENTON COUNTY SANITARY LANDFILL
BLAIRSTOWN, IOWA

FIGURE: 8

REVISION	NO.	DATE
DRAWN JGH	PROJECT NO. 6043-23B	DATE 5/21/24



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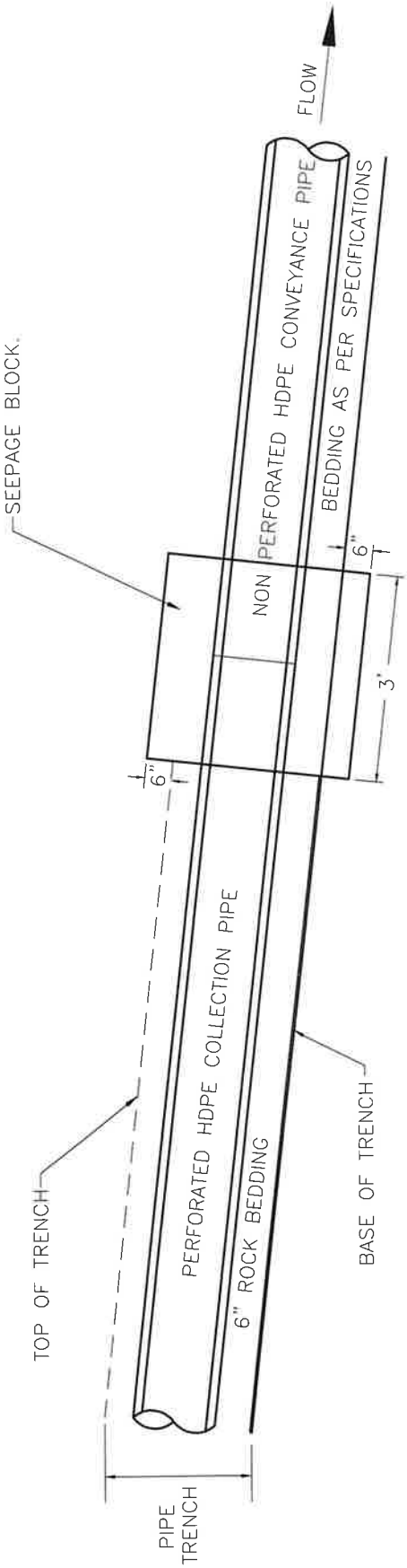
LAGOON AIR VENT

LEACHATE STORAGE LAGOON

BENTON COUNTY SANITARY LANDFILL
BLAIRSTOWN, IOWA

FIGURE: 9

REVISION	NO.	DATE
DRAWN JGH	PROJECT NO. 6043-23B	DATE 5/21/24



LONGITUDINAL SECTION

NOTE:
THE PURPOSE OF THE SEEPAGE BLOCK IS TO FORCE LIQUID MIGRATING IN THE PIPE TRENCH BEDDING INTO THE COLLECTION PIPE.

NOT TO SCALE

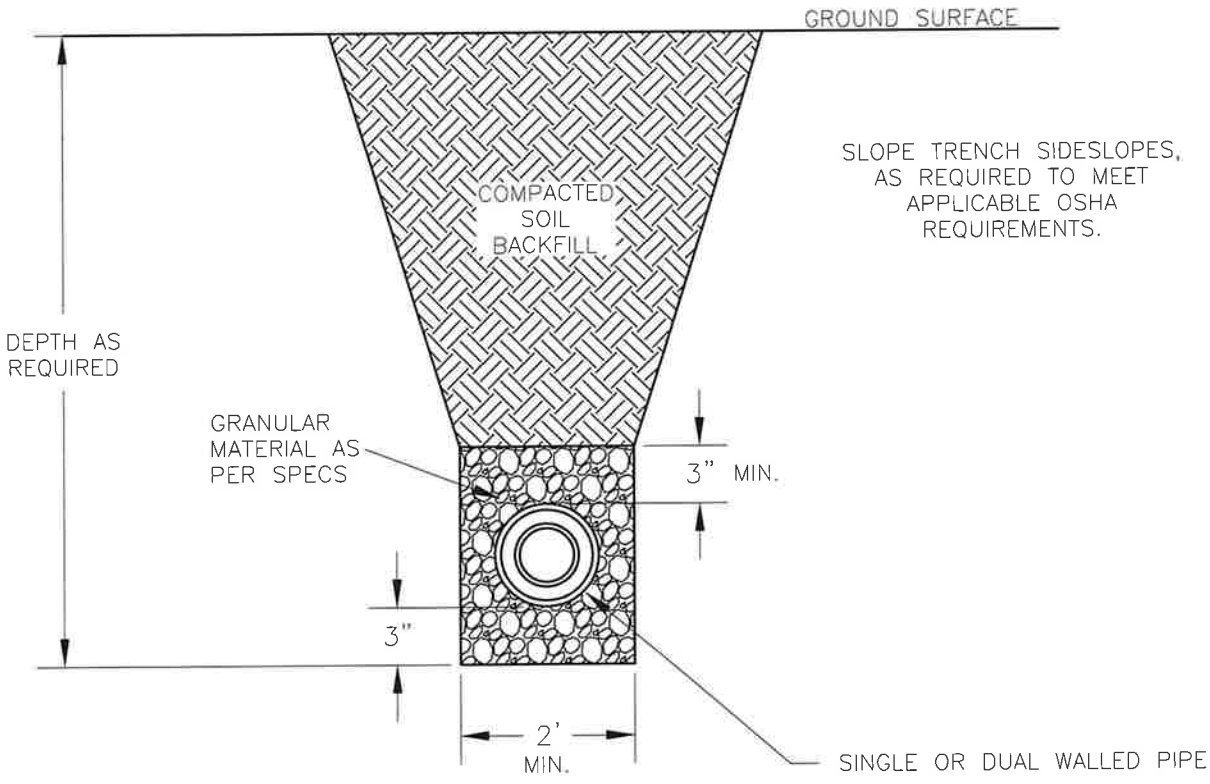
HLW
HLW Engineering Group

SEEPAGE BLOCK
LEACHATE STORAGE LAGOON

BENTON COUNTY SANITARY LANDFILL
BLAIRSTOWN, IOWA

FIGURE: 10

REVISION	NO.	DATE
DRAWN JGH	PROJECT NO. 6043-23B	DATE 5/21/24



NOTE: BEDDING STONE TO BE PLACED AND COMPACTED WITH HAND TAMPERS.

NOT TO SCALE

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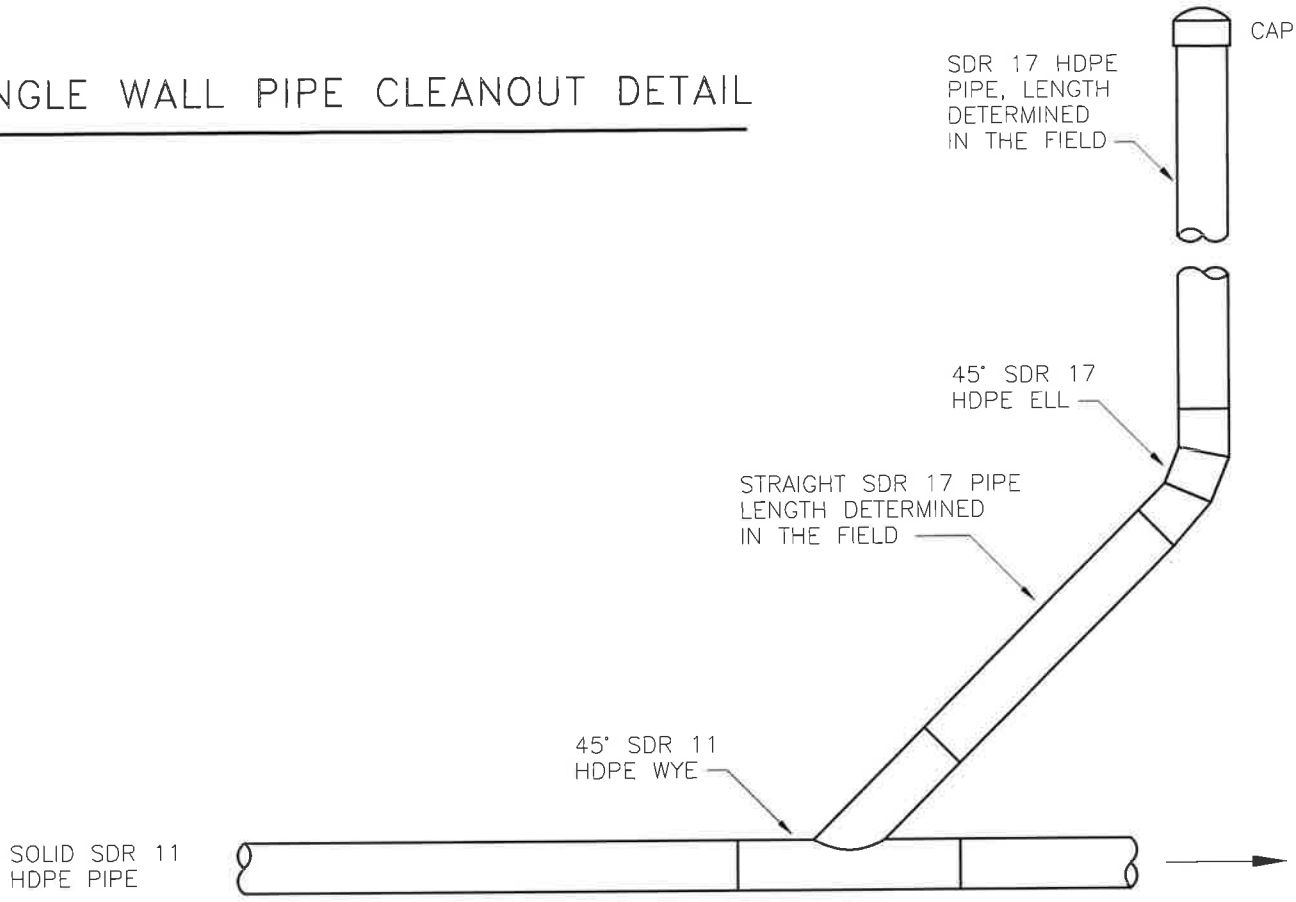
PIPE BEDDING – CONVEYANCE PIPING
LEACHATE STORAGE LAGOON

BENTON COUNTY SANITARY LANDFILL
BLAIRSTOWN, IOWA

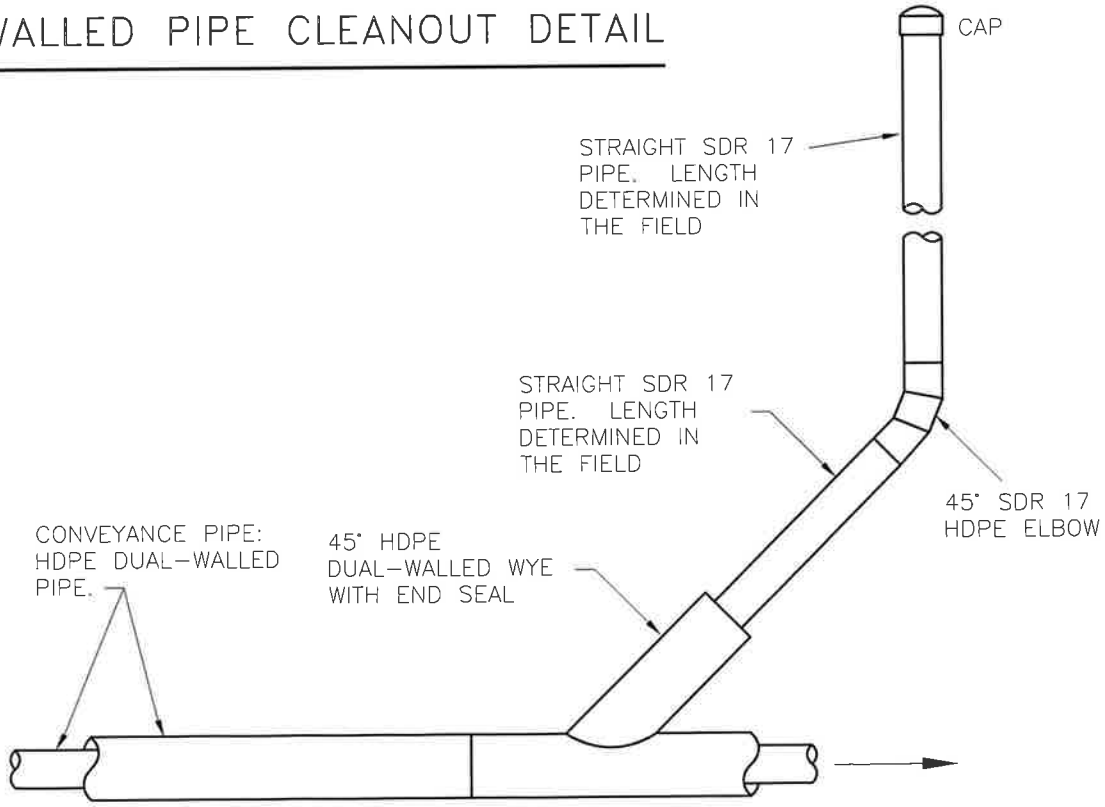
FIGURE: 11

REVISION	NO.	DATE
DRAWN JGH	PROJECT NO. 6043-23B	DATE 3/27/24

SINGLE WALL PIPE CLEANOUT DETAIL



DUAL WALLED PIPE CLEANOUT DETAIL



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PIPE CLEANOUT DETAILS
LEACHATE STORAGE LAGOON

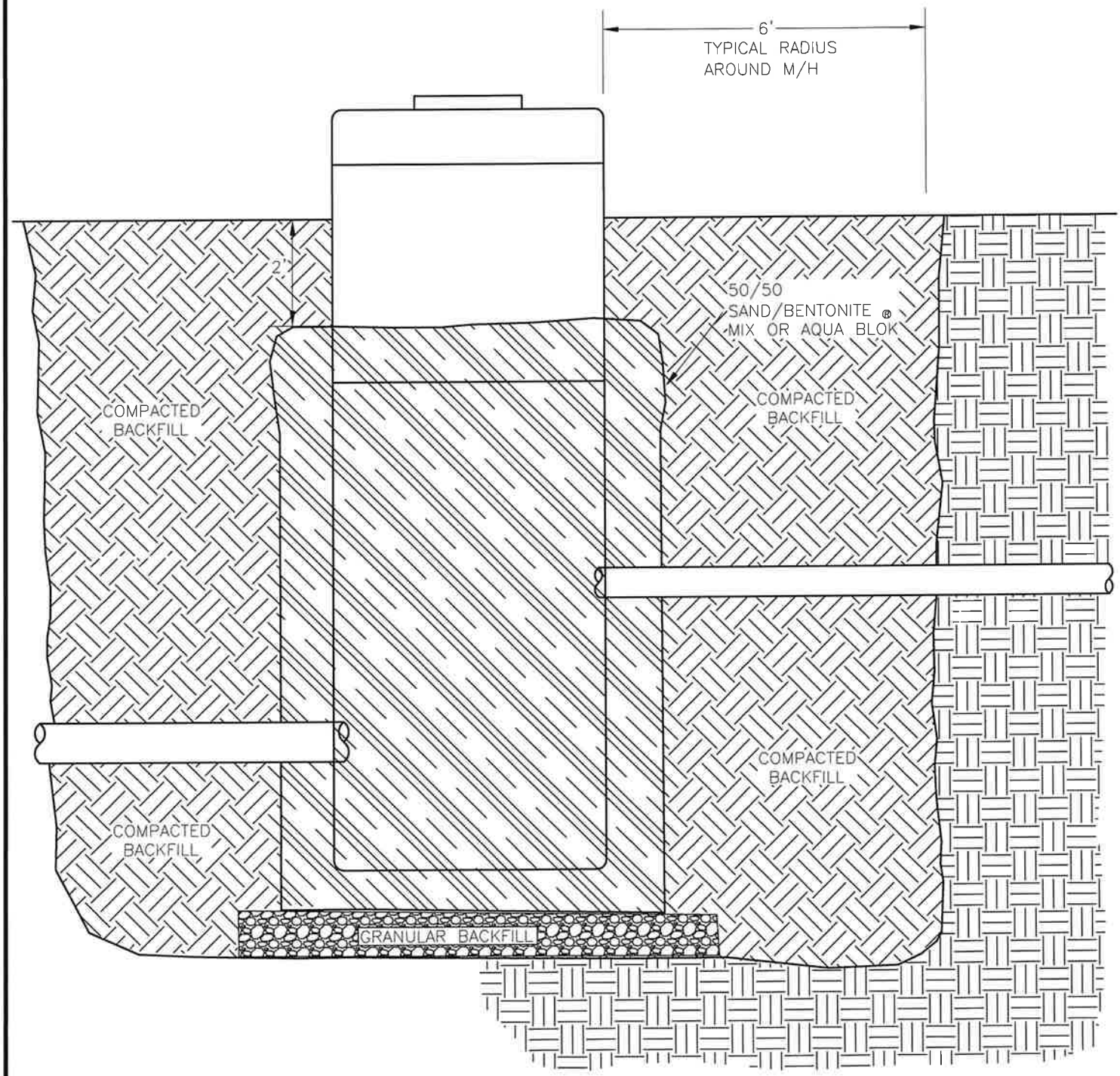
BENTON COUNTY SANITARY LANDFILL
BLAIRSTOWN, IOWA

FIGURE: 12

REVISION	NO.	DATE
DRAWN JGH	PROJECT NO. 6043--23B	DATE 5/21/24

NOTES:

1. THIS DRAWING ILLUSTRATES A CONCEPT. THE MANHOLE CONFIGURATION IS NOT SPECIFIC TO THIS PROJECT.
2. LEACHATE MANHOLES TO BE COMPLETELY SURROUNDED WITH A 50/50 SAND/BENTONITE MIX OF MINIMUM 12" THICKNESS OR MINIMUM 6" THICKNESS OF AQUA BLOK®.
3. BACKFILL WITHIN 6' OF THE MANHOLE IS TO BE PLACED IN 8" LIFTS AND COMPACTED TO 95% PROCTOR.



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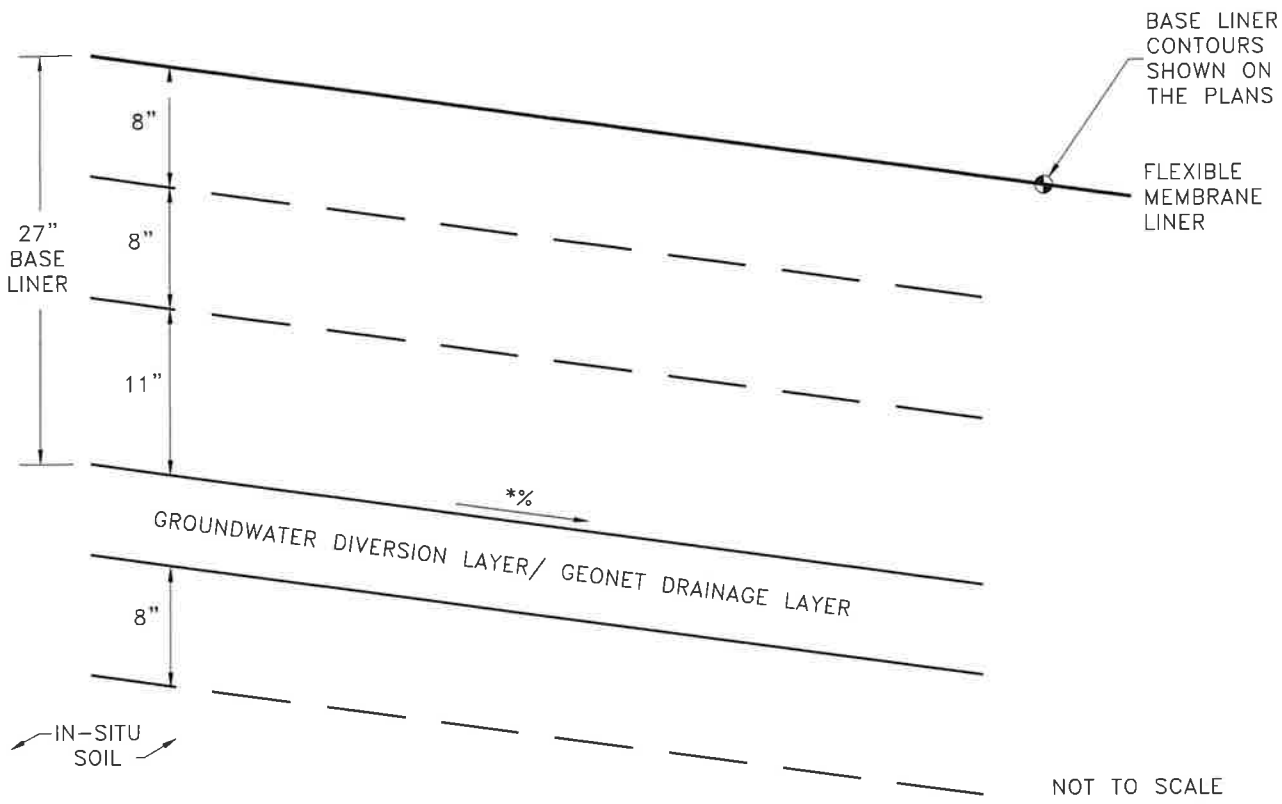
TYPICAL MANHOLE BACKFILL

LEACHATE STORAGE LAGOON

BENTON COUNTY SANITARY LANDFILL
BLAIRSTOWN, IOWA

FIGURE: 13

REVISION	NO.	DATE
DRAWN JGH	PROJECT NO. 6043-23B	DATE 01/12/25



BASE LINER CONSTRUCTION AND MATERIAL NOTES:

- The top 8" of subgrade shall be scarified and recompacted to a minimum of 95% Standard Proctor (ASTM D698) or proof rolled.
- The base liner shall be constructed in accordance with Iowa Administrative Code 567, Subrule 113.7(5)"A".
- The base liner soil shall have a lab tested hydraulic conductivity ≤ 1 x 10E−7 cm/sec, the Engineer shall determine the suitability of the soil for use as the base liner material based on the results of lab hydraulic conductivity tests performed by the Engineer.
- The base liner shall be constructed in 2 – 8 inch compacted lifts and 1 – 11" compacted lift to a total depth of 2.25 feet (27 inches). The base liner material shall be placed with moisture and density control. Unless specified otherwise in the plans and specifications, the soil shall be compacted to a minimum of 95% standard proctor density (ASTM D698) with moisture 0−5% above optimum.
- The bottom lift shall be placed in a single 11 inch (compacted depth) lift to meet designed base liner thickness. The entire lift shall meet the compaction and moisture requirements for base liner construction.
- The Engineer shall test for density and moisture (as per the specifications), certify and pass each 8 inch lift prior to placement of the next lift. Tests are required at the rate of five per lift per acre of base liner.
- A minimum of 5 Shelby Tube tests shall be taken from the base liner. Test results meeting or exceeding the IDNR minimum hydraulic conductivity requirement (≤ 1x10E−7 cm/sec) must be obtained before FML installation can begin.
- The flexible membrane liner shall be placed in direct and uniform contact with the base liner. For details of flexible membrane liner see specifications.
- Leachate collection pipes, groundwater diversion pipes, etc., shall be placed as shown on the details, plans, and specifications.

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BASE LINER CONSTRUCTION

LEACHATE STORAGE LAGOON

BENTON COUNTY SANITARY LANDFILL
BLAIRSTOWN, IOWA

FIGURE: 14

REVISION	NO.	DATE
DRAWN JGH	PROJECT NO. 6043−23B	DATE 5/21/24

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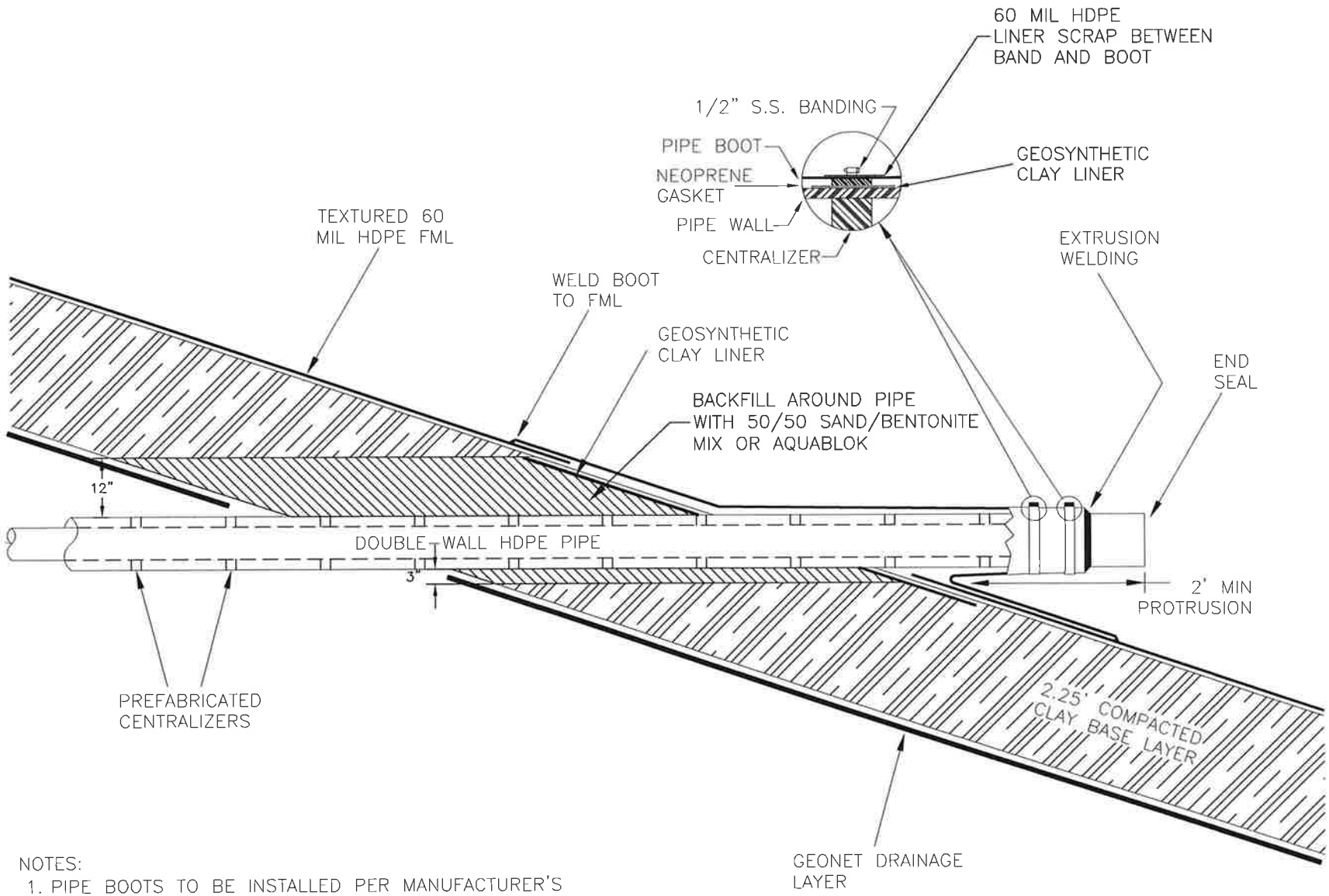
LAGOON PIPE PENETRATION

LEACHATE STORAGE LAGOON

BENTON COUNTY SANITARY LANDFILL
BLAIRSTOWN, IOWA

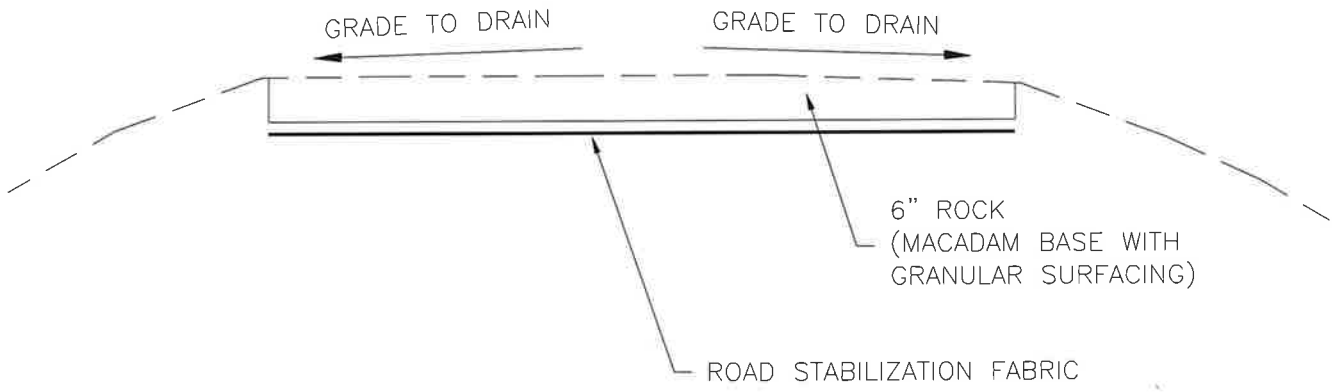
FIGURE: 15

REVISION	NO.	DATE
DRAWN JGH	PROJECT NO. 6043-23B	DATE 5/21/24



NOTES:

1. PIPE BOOTS TO BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS. IF CONFLICTS EXIST WITH THIS DRAWING, MANUFACTURER'S INSTRUCTIONS PREVAIL.
2. GEOSYNTHETIC CLAY LINER (GCL) TO BE INSTALLED UNDER PIPE BOOT. GCL TO EXTEND A MINIMUM OF 1' PAST EDGE OF HOLE IN FML.



ROCK WIDTH: VARIES

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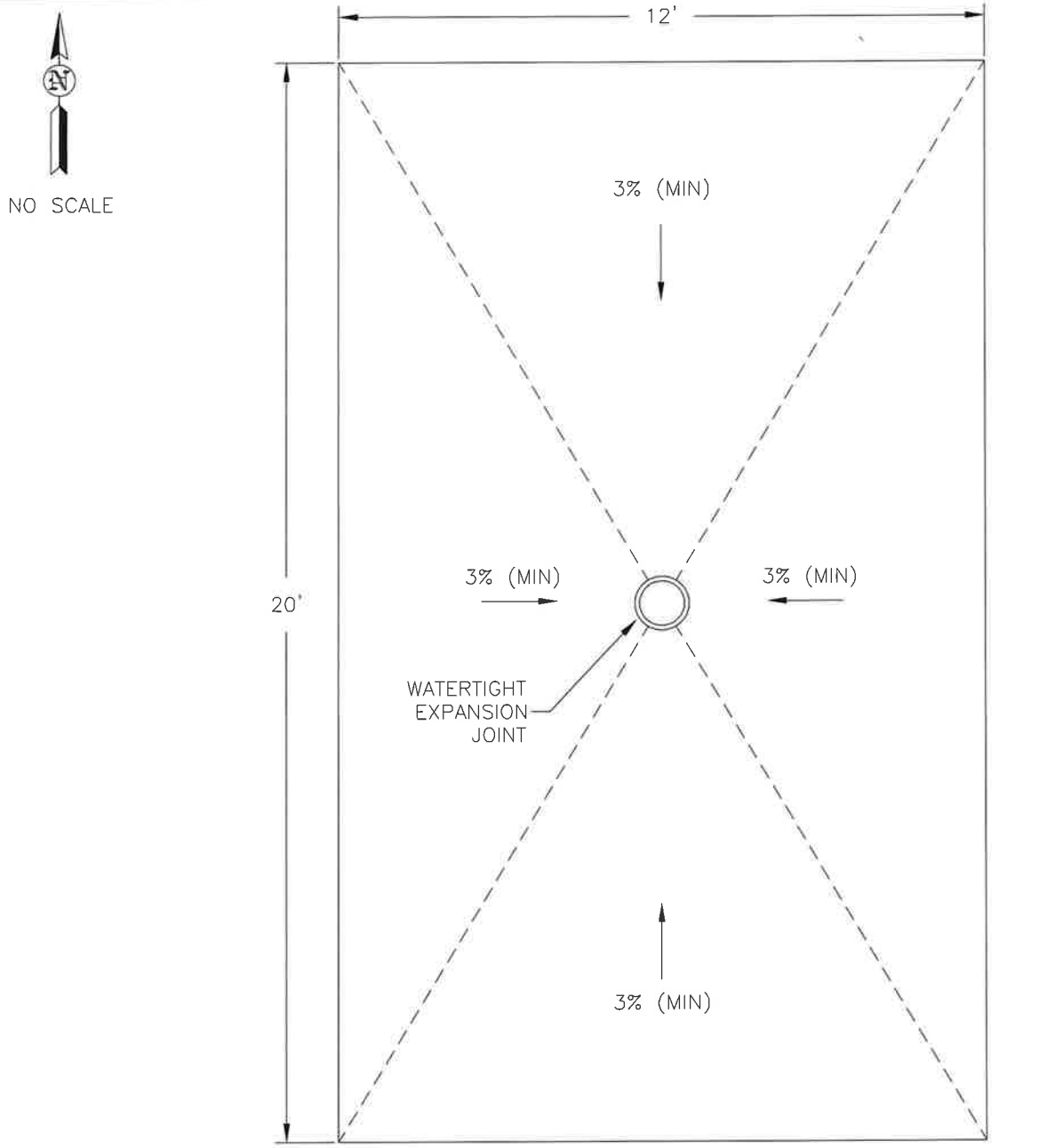
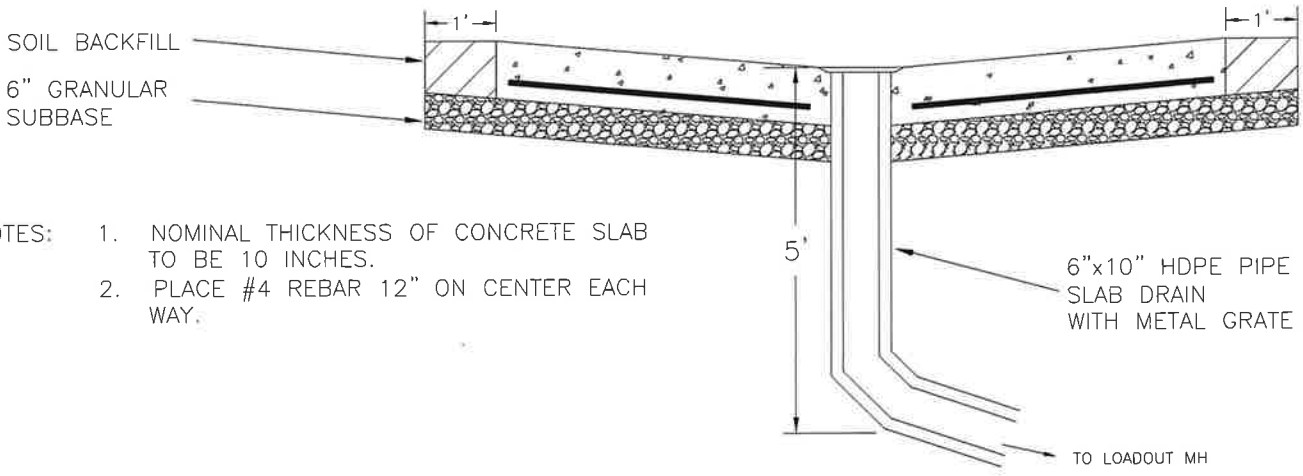
TYPICAL ROAD CROSS SECTION
LEACHATE STORAGE LAGOON

BENTON COUNTY SANITARY LANDFILL
BLAIRSTOWN, IOWA

FIGURE: 16

REVISION	NO.	DATE
DRAWN JGH	PROJECT NO. 6043-23B	DATE 2/11/25





NOTES:
1. NOMINAL THICKNESS OF CONCRETE SLAB TO BE 10 INCHES.
2. PLACE #4 REBAR 12" ON CENTER EACH WAY.

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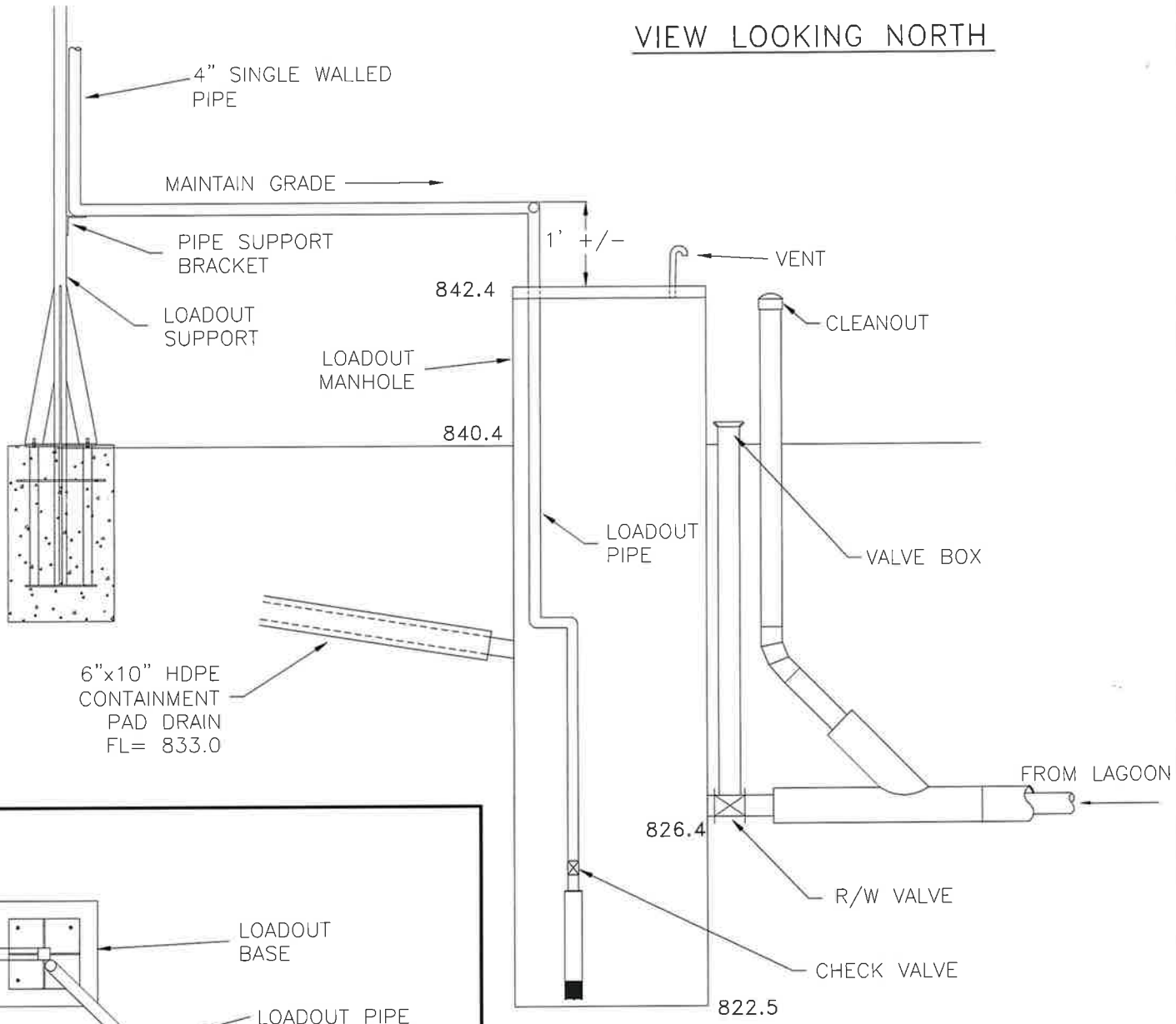
LOADOUT CONTAINMENT PAD
LEACHATE STORAGE LAGOON

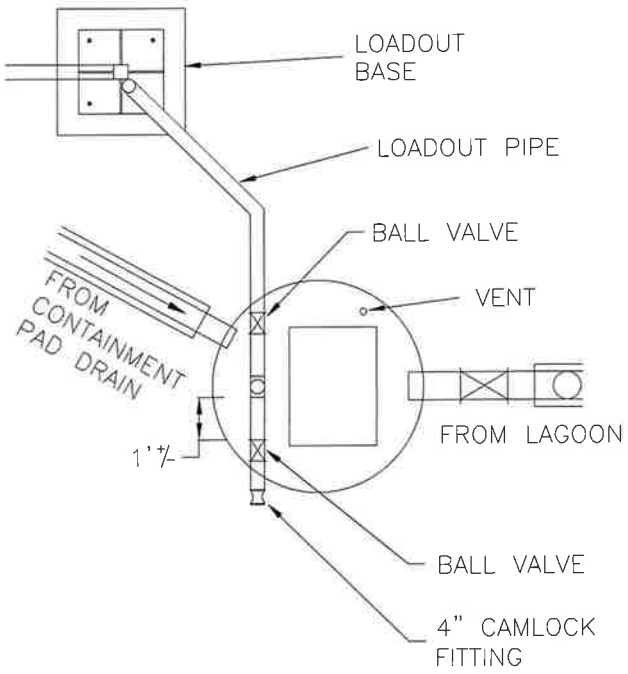
BENTON COUNTY SANITARY LANDFILL
BLAIRSTOWN, IOWA

FIGURE: 17

REVISION	NO.	DATE
DRAWN JGH	PROJECT NO. 6043-23B	DATE 01/14/25

VIEW LOOKING NORTH





NOTES:

1. INTERNAL COMPONENTS OF LOADOUT MANHOLE (PUMP, RAIL SYSTEM, DISCONNECT, PULLOUT, DISCHARGE PIPE, ETC.) NOT SHOWN IN DETAIL AND TO BE BASED ON MANUFACTURER'S RECOMMENDATIONS.
2. BLOCK/SUPPORT PUMP SO PUMP BASE SITS APPROXIMATELY 1 FT ABOVE BASE OF MANHOLE.
3. LOADOUT PIPE SHALL BE ORIENTED TO NOT CONFLICT WITH ACCESS HATCH OPERATION, PUMP REMOVAL, USE OF CLEANOUT, OR VALVE OPERATION.
4. WELD A PIPE SUPPORT BRACKET TO LOADOUT SUPPORT

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PUMP STATION
LEACHATE STORAGE LAGOON

BENTON COUNTY SANITARY LANDFILL
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FIGURE: 18

REVISION	NO.	DATE

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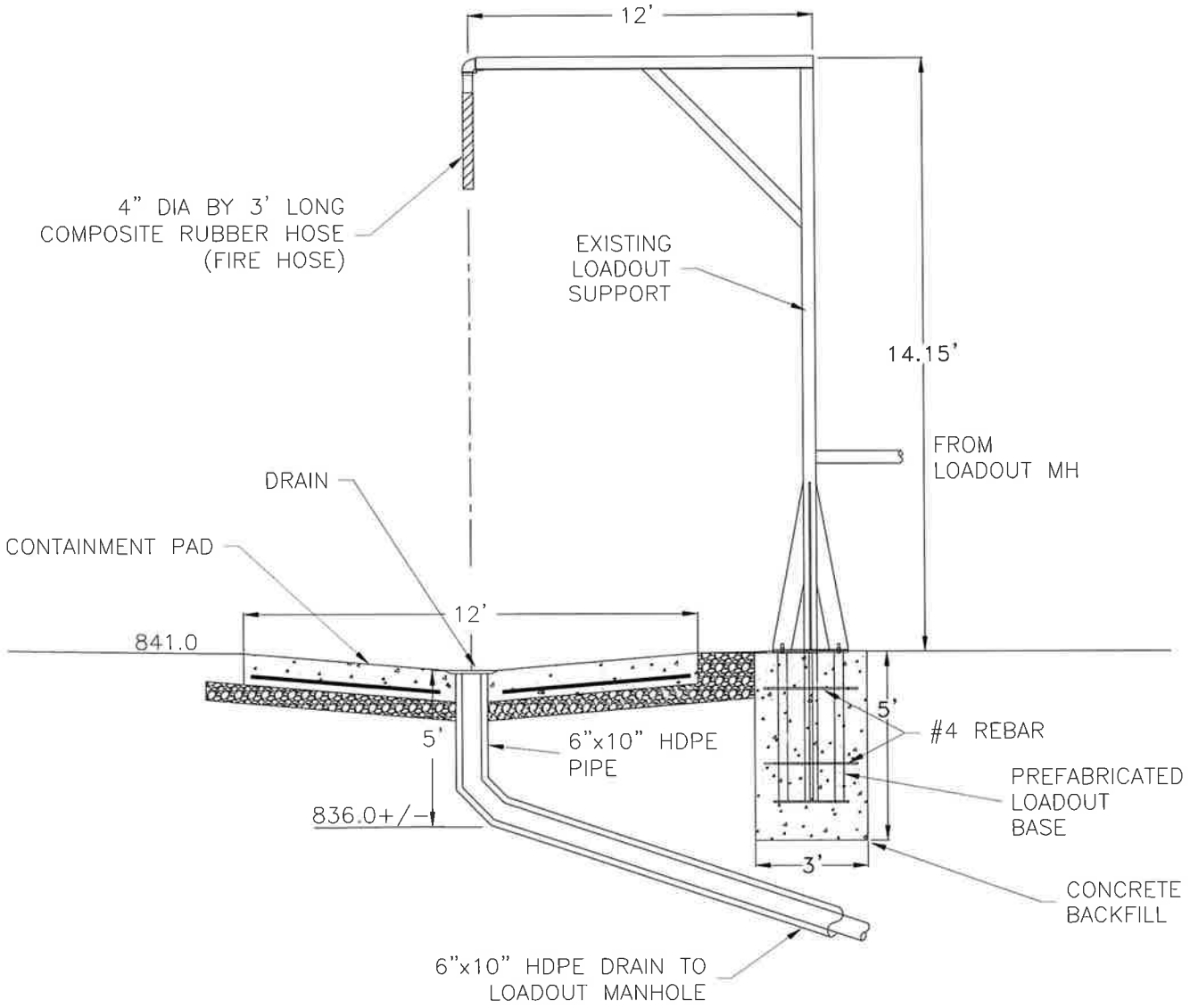
JGH	6043-23B	02/18/25



NOTES:

1. HOSE TO BE ALIGNED OVER CENTER OF PAD.
2. INSERT 4 - #4 BARS THROUGH CLEAR SPACE IN LOADOUT BASE, 2 BARS RUNNING N-S AND 2 BARS RUNNING E-W AT 2 LOCATIONS (8 BARS TOTAL). LENGTH OF EACH BAR = 30". BARS TO BE PLACED APPROXIMATELY 1' BELOW TOP PLATE AND APPROXIMATELY 1' ABOVE BOTTOM PLATE.
3. EXISTING LOADOUT SUPPORT CONSTRUCTED FROM 4"x4" SQUARE STEEL STOCK.
4. PIPE TO FOLLOW 45 ANGLE BRACE ON LOADOUT SUPPORT. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
5. EXISTING LOADOUT SUPPORT TO BE RELOCATED TO THIS LOCATION (SEE FIGURE 3).

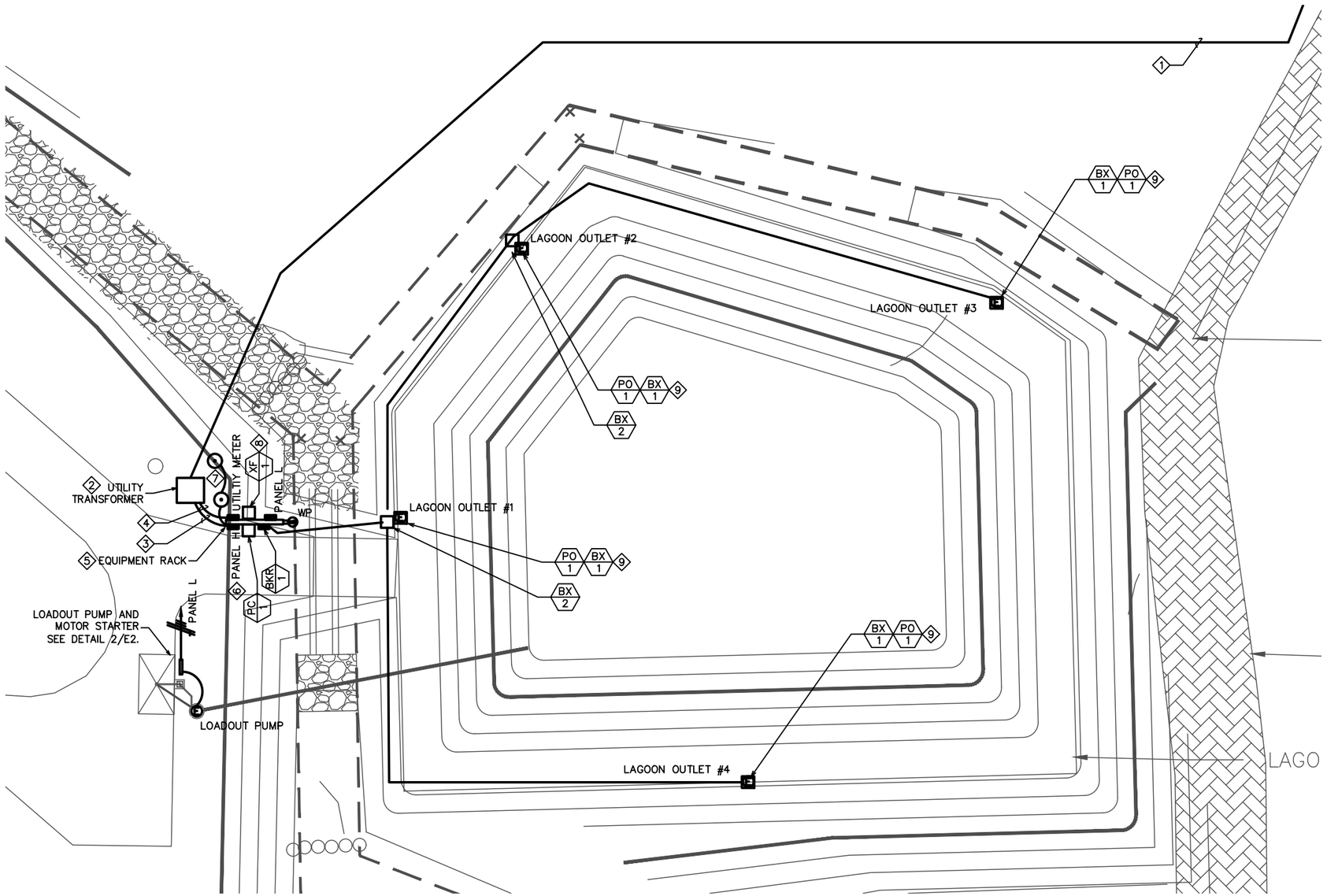
FIGURE: 19

REVISION	NO.	DATE
DRAWN JGH	PROJECT NO. 6043-23B	DATE 2/11/25

LEACHATE LOADOUT STATION
LEACHATE STORAGE LAGOON

BENTON COUNTY SANITARY LANDFILL
BLAIRSTOWN, IOWA

HLW Engineering Group



GENERAL NOTES:

1. ALL CONDUITS BURIED 36" MINIMUM, UNLESS OTHERWISE NOTED.

2. CONDUITS NOTED AS PVC TYPE, SHALL TRANSITION TO RGS, AT BURIED DEPTH, PROVIDE RGS ELBOWS TO TURN UP. ALL ABOVE-GRADE EXTERIOR CONDUIT SHALL BE TYPE RGS.

TAGGED NOTES

1. UTILITY PRIMARY CABLES BY UTILITY.
2. UTILITY TRANSFORMER AND FIBERGLASS BASE BY UTILITY.
3. UTILITY SECONDARY CABLES AND CONDUIT BY CONTRACTOR.
4. UTILITY METER CIRCUIT. 1" CONDUIT WITH PULL ROPE BY CONTRACTOR. WIRING AND TERMINATIONS BY UTILITY.
5. CONSTRUCT ELECTRICAL EQUIPMENT RACK. ALL EQUIPMENT MOUNTED TO RACK. SEE DETAILS.
6. SERVICE DISTRIBUTION PANEL. PROVIDE N-G BONDING LINK AND GROUND ROD CONNECTIONS IN THIS EQUIPMENT.
7. ELECTRICAL SERVICE GROUND RODS, WIRING. SEE DETAILS.
8. MOUNT TRANSFORMER TO ELECTRICAL RACK. PROVIDE ADDITIONAL POST FOR EQUIPMENT RACK NEAR TRANSFORMER TO CARRY 225LB WEIGHT.
9. PROVIDE 3" RGC STEEL CONDUIT 5FT LONG. AUGER 6" HOLE IN GROUND 24" BELOW GRADE AT NOT MORE THAN 9" FROM FENCE LINE, AND FILL WITH CONCRETE. PROVIDE THREADED STEEL CAP AT TOP. USE UNISTRUT AND CONDUIT CLAMPS FOR SUPPORTS TO MOUNT POWER OUTLET AND SPLICE BOXES.

N

1 / E1 **LAGOON AREA PLAN** 1"=40'-0"

SCALE 0 20'-0" 40'-0"

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FIGURE: E1

REVISION	NO.	DATE

DRAWN BDR
PROJECT NO. 6043-23B
DATE 08FEB2025

ELECTRICAL LAGOON PLANS
LEACHATE STORAGE LAGOON
BENTON COUNTY SANITARY LANDFILL
BLAIRSTOWN, IOWA

HLW Engineering Group
204 West Broad Street, P.O. Box 314
Story City, Iowa 50248
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FAX: (515) 733-4146

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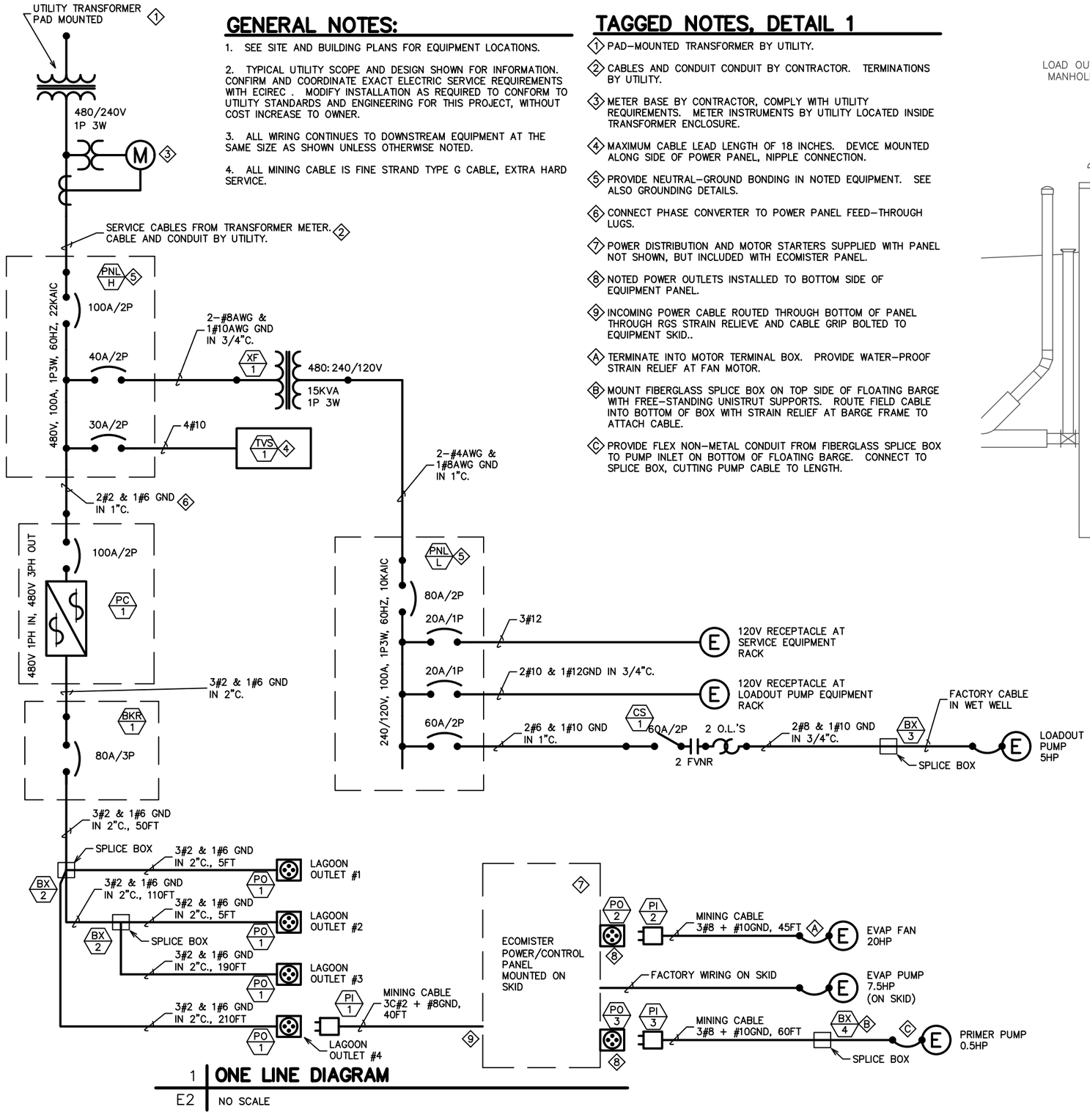


1 ONE LINE DIAGRAM
E2 NO SCALE

GENERAL NOTES:

1. SEE SITE AND BUILDING PLANS FOR EQUIPMENT LOCATIONS.

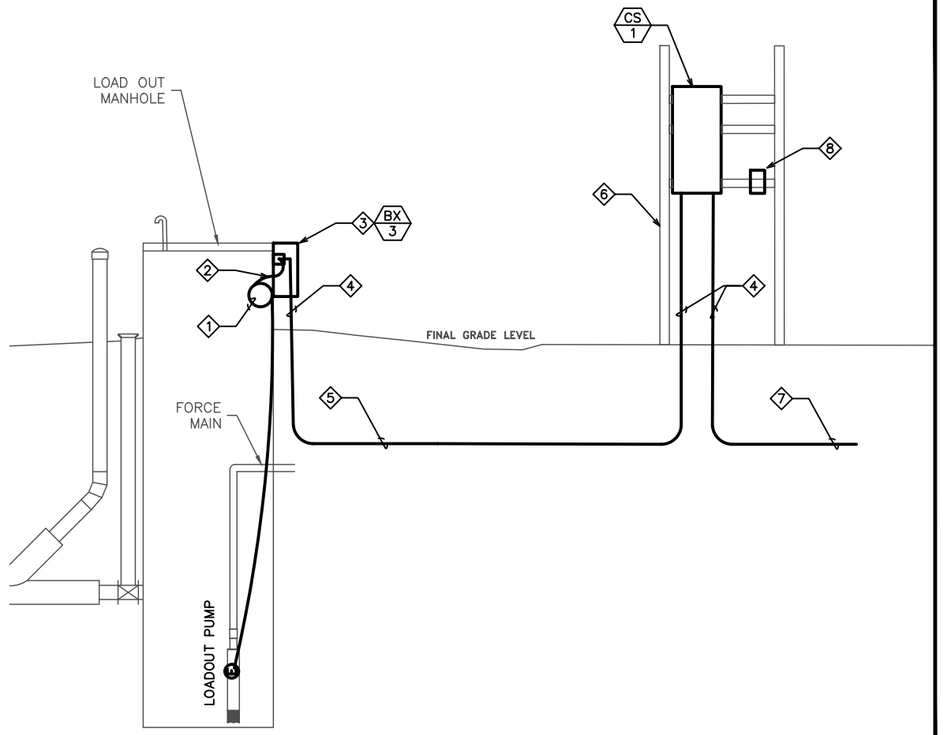
2. TYPICAL UTILITY SCOPE AND DESIGN SHOWN FOR INFORMATION. CONFIRM AND COORDINATE EXACT ELECTRIC SERVICE REQUIREMENTS WITH ECIREC . MODIFY INSTALLATION AS REQUIRED TO CONFORM TO UTILITY STANDARDS AND ENGINEERING FOR THIS PROJECT, WITHOUT COST INCREASE TO OWNER.

3. ALL WIRING CONTINUES TO DOWNSTREAM EQUIPMENT AT THE SAME SIZE AS SHOWN UNLESS OTHERWISE NOTED.

4. ALL MINING CABLE IS FINE STRAND TYPE G CABLE, EXTRA HARD SERVICE.

TAGGED NOTES, DETAIL 1

1. PAD-MOUNTED TRANSFORMER BY UTILITY.
2. CABLES AND CONDUIT CONDUIT BY CONTRACTOR. TERMINATIONS BY UTILITY.
3. METER BASE BY CONTRACTOR, COMPLY WITH UTILITY REQUIREMENTS. METER INSTRUMENTS BY UTILITY LOCATED INSIDE TRANSFORMER ENCLOSURE.
4. MAXIMUM CABLE LEAD LENGTH OF 18 INCHES. DEVICE MOUNTED ALONG SIDE OF POWER PANEL, NIPPLE CONNECTION.
5. PROVIDE NEUTRAL-GROUND BONDING IN NOTED EQUIPMENT. SEE ALSO GROUNDING DETAILS.
6. CONNECT PHASE CONVERTER TO POWER PANEL FEED-THROUGH LUGS.
7. POWER DISTRIBUTION AND MOTOR STARTERS SUPPLIED WITH PANEL NOT SHOWN, BUT INCLUDED WITH ECOMISTER PANEL.
8. NOTED POWER OUTLETS INSTALLED TO BOTTOM SIDE OF EQUIPMENT PANEL.
9. INCOMING POWER CABLE ROUTED THROUGH BOTTOM OF PANEL THROUGH RGS STRAIN RELIEVE AND CABLE GRIP BOLTED TO EQUIPMENT SKID..
- A. TERMINATE INTO MOTOR TERMINAL BOX. PROVIDE WATER-PROOF STRAIN RELIEF AT FAN MOTOR.
- B. MOUNT FIBERGLASS SPLICE BOX ON TOP SIDE OF FLOATING BARGE WITH FREE-STANDING UNISTRUT SUPPORTS. ROUTE FIELD CABLE INTO BOTTOM OF BOX WITH STRAIN RELIEF AT BARGE FRAME TO ATTACH CABLE.
- C. PROVIDE FLEX NON-METAL CONDUIT FROM FIBERGLASS SPLICE BOX TO PUMP INLET ON BOTTOM OF FLOATING BARGE. CONNECT TO SPLICE BOX, CUTTING PUMP CABLE TO LENGTH.



2 WET WELL INSTALLATION DETAILS
E2 NO SCALE

TAGGED NOTES, DETAIL 2

1. SUBMERSIBLE CABLE SUPPLIED WITH PUMP. COIL SPARE CABLE.
2. CORE DRILL WITH CONDUIT NIPPLE AND BUSHINGS. SEAL CONDUIT VOIDS WITH GROUT. SEAL CABLE VOIDS WITH DUX SEAL. HOLE AND SLEEVE POSITIONED TO ALLOW TOP OF BOX FLUSH WITH TOP OF MANHOLE COVER.
3. MOUNT SPLICE BOX TO SIDE OF WET WELL. PERMANENT FIELD WIRING AND SUBMERSIBLE CABLES JOINED AT POWER TERMINAL BLOCK.
4. RGS CONDUIT EXTENDS BELOW GRADE WITH RGS ELBOW.
5. PVC CONDUIT AND WIRING TO MOTOR STARTER. SEE ONE-LINE DIAGRAM FOR SIZE.
6. CONSTRUCT ELECTRICAL EQUIPMENT RACK. SEE DETAILS.
7. PVC CONDUIT AND FIELD WIRING CONTINUES TO PANEL L. SEE ONE LINE DIAGRAM FOR SIZE AND SITE PLAN FOR ROUTING.
8. WEATHER-PROOF WHILE-IN-USE RECEPTACLE MOUNTED TO RACK.

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FIGURE: E2

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WET WELL ELECTRICAL
LEACHATE STORAGE LAGOON
BENTON COUNTY SANITARY LANDFILL
BLIARSTOWN, IOWA

HLW Engineering Group
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Story City, Iowa 50248
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HLW Engineering Group

PANEL H

RATING 480/277V, 3P, 4W, 125A, 30KAIC — MAIN CONNECTION 100A/2P BKR

MOUNTING SURFACE — SUB-FEED CONNECTION LUGS/2P

CCT NO	ITEM FED	DISTRIBUTION WATTS	WIRE SIZE	CIRCUIT BREAKER AMP	CIRCUIT BREAKER POLES	N	CIRCUIT BREAKER POLES	CIRCUIT BREAKER AMP	WIRE SIZE	DISTRIBUTION WATTS	ITEM FED	CCT NO
1	XF-1	15KVA	++	++	2	L1	–	–	–	–	–	2
3	/	/	/	/	/	L2	–	–	–	–	–	4
5	–	–	–	–	–	L1	–	–	–	–	–	6
7	–	–	–	–	–	L2	–	–	–	–	–	8
9	–	–	–	–	–	L1	–	–	–	–	–	10
11	–	–	–	–	–	L2	–	–	–	–	–	12
13	–	–	–	–	–	L1	–	–	–	–	–	14
15	–	–	–	–	–	L2	–	–	–	–	–	16
17	–	–	–	–	–	L1	–	–	–	–	–	18
19	–	–	–	–	–	L2	–	–	–	–	–	20
21	–	–	–	–	–	L1	–	–	–	–	–	22
23	–	–	–	–	–	L2	–	–	–	–	–	24
25	–	–	–	–	–	L1	–	–	–	–	–	26
27	TVS-1	10	++	++	2	L2	–	–	–	–	–	28
29	/	/	/	/	/	L1	–	–	–	–	–	30

**G = GROUND FAULT BREAKER
**S = SHUNT TRIP BREAKER
**H = HANDLE LOCK BREAKER
++ = SEE PLAN DRAWINGS
[#] = VIA LIGHTING CONTACTOR #

NOTES:
1. NEMA 3R ENCLOSURE DOUBLE-ENTRY, COPPER BUS, BOLT-ON BREAKERS, SQ-D TYPE NF OR EQUAL.

PANEL L

RATING 240/120V, 1P, 3W, 100A, 10KAIC — MAIN CONNECTION 80A/2P BKR

MOUNTING SURFACE — SUB-FEED CONNECTION NONE

CCT NO	ITEM FED	DISTRIBUTION WATTS	WIRE SIZE	CIRCUIT BREAKER AMP	CIRCUIT BREAKER POLES	N	CIRCUIT BREAKER POLES	CIRCUIT BREAKER AMP	WIRE SIZE	DISTRIBUTION WATTS	ITEM FED	CCT NO
1	EQUIP RACK RECEP	200	12	20	1	L1	2	60	6	5HP	LOADOUT PUMP	2
3	LOADOUT RACK RECEP	200	10	20	1	L2	/	/	/	/	VIA CS-1	4
5	–	–	–	–	–	L1	–	–	–	–	–	6
7	–	–	–	–	–	L2	–	–	–	–	–	8
9	–	–	–	–	–	L1	–	–	–	–	–	10
11	–	–	–	–	–	L2	–	–	–	–	–	12
13	–	–	–	–	–	L1	–	–	–	–	–	14
15	–	–	–	–	–	L2	–	–	–	–	–	16
17	–	–	–	–	–	L1	–	–	–	–	–	18
19	–	–	–	–	–	L2	–	–	–	–	–	20
21	–	–	–	–	–	L1	–	–	–	–	–	22
23	–	–	–	–	–	L2	–	–	–	–	–	24
25	–	–	–	–	–	L1	–	–	–	–	–	26
27	–	–	–	–	–	L2	–	–	–	–	–	28
29	–	–	–	–	–	L1	–	–	–	–	–	30

**G = GROUND FAULT BREAKER
**S = SHUNT TRIP BREAKER
**H = HANDLE LOCK BREAKER
++ = SEE ONE-LINE DIAGRAM
[#] = VIA LIGHTING CONTACTOR #

NOTES:
1. NEMA 3R ENCLOSURE DOUBLE-ENTRY, COPPER BUS, BOLT-ON BREAKERS, SQ-D TYPE QO LOAD CENTER OR EQUAL.

ELECTRICAL MATERIALS

ITEM #	SYMBOL	TAG #	DESCRIPTION
1	WP		GROUND FAULT RECEPTACLE, 120V, 20A, WITH DIE-CAST WEATHER PROTECTED "WHILE IN USE" COVER, LEVITON 6899 WITH INTERMATIC WP1010MC OR EQUAL
2	⊙		GROUND ROD 3/4" X 10' LONG, COPPER-CLAD STEEL. DRIVE TOP OF ROD 12" BELOW GRADE. INSTALL AT 45 DEGREE ANGLE IF BURRIED OBSTRUCTION EXISTS.
3	E		ELECTRICAL CONNECTION TO EQUIPMENT. PROVIDE FLEXIBLE CONDUIT OR CORD AND COORDINATING TERMINATION TO EQUIPMENT. REFER TO SPECIFICATIONS.
4		GB 1	GROUND BOX 2'W X 3'L X 3'D, FIBERGLASS, LIGHT GREEN, STANDARD BOLT-ON COVER. QUAZITE PG STYLE WITH TYPE CA COVER OR EQUAL.
5	⊠	PC 1	DIGITAL PHASE CONVERTER 480V/1-PH IN, 480V/3-PH OUT, 38.2KVA, 98.7% EFFICIENT WITH 2% MAX PHASE VOLTAGE IMBALANCE, -10C TO 40C OPERATING TEMP, NEMA 3R OUTDOOR ENCLOSURE, 37H X 25W 19D, 141LBS, WITH 100A/2P INPUT BREAKER, ON/OFF CONTROL SWITCH AND INTERNAL SURGE SUPPRESSION. PHASE TECHNOLOGIES TYPE PT430R-BH3S1 OR ENGINEER PRE-APPROVED EQUAL.
6	⊠	CS 1	COMBINATION STARTER NEMA 12/3R ENCLOSURE WITH 60A 2 POLE NON-FUSED DISCONNECT, 250V 2 POLE SIZE 2 FVNR CONTACTOR, WIRED FOR 240V 1P, THERMAL OVERLOAD, HOA CONTROL SWITCH, AND OTHER CONTROL ACCESSORIES AS REQUIRED BY CONTROL SCHEMATICS, CPT WITH 120V SECONDARY AND COIL AND CTRL CIRCUIT, SQUARE D SDA61V03 OR EQUAL.
7		PO 1	PIN-AND-SLEEVE POWER OUTLET WITH MOUNTING BACK-BOX TYPE BX/1 BELOW. 480V 3P WITH GROUND, 100A, WATER-TIGHT LID, LEVITON 4100R7W OR EQUAL. TWO REQUIRED, EAST AND WEST LAGOON RECEPTACLE.
8		PI 1	PIN-AND-SLEEVE PLUG TO MATCH PO-1. 480V 3P WITH GROUND, 100A, WATER-TIGHT LID, LEVITON 4100P7WLEV OR EQUAL. ONE REQUIRED, POWER CORD FOR MISTER SKID.
9		PO 2	PIN-AND-SLEEVE POWER OUTLET MOUNTED TO EQUIPMENT CONTROL PANEL. 480V 3P WITH GROUND, 30A, WATER-TIGHT LID, LEVITON 430R7WLEV OR EQUAL. ONE REQUIRED, MISTER CONTROL PANEL.
10		PI 2	PIN-AND-SLEEVE PLUG TO MATCH PO-2. 480V 3P WITH GROUND, 30A, WATER-TIGHT LID, LEVITON 430P7WLEV OR EQUAL. ONE REQUIRED, POWER CORD FOR MISTER FAN.
11		PO 3	PIN-AND-SLEEVE POWER OUTLET MOUNTED TO EQUIPMENT CONTROL PANEL. 480V 3P WITH GROUND, 20A, WATER-TIGHT LID, LEVITON 420R7WLEV OR EQUAL. ONE REQUIRED, MISTER CONTROL PANEL.
12		PI 3	PIN-AND-SLEEVE PLUG TO MATCH PO-3. 480V 3P WITH GROUND, 20A, WATER-TIGHT LID, LEVITON 420P7WLEV OR EQUAL. ONE REQUIRED, POWER CORD FOR PRIMER PUMP.
13	▭	BKR 1	CIRCUIT BREAKER 80A/3P, 480/277V, 18KAIC, THERMAL-MAG TRIP, SQUARE D TYPE HDL BKR W/NEMA 12/3R SURFACE ENCL J250R OR EQUAL.
14	▭	TVS 1	TRANSIENT VOLTAGE SURGE SUPPRESSOR, WALL MOUNT, NIPPLE CONNECTED NEMA 12/4 ENCLOSURE, 4 MODE 80KA/MODE, 480/240V 1P3W WYE
15	▭	BX 1	PAINTED STEEL GASKETTED SPLICE BOX, CLAMP COVER, 12X12X6, HOFFMAN #A1212NF OR EQUAL. MOUNT POWER OUTLET PO/1 TO BOTTOM OF BOX.
16	▭	BX 2	PAINTED STEEL GASKETTED SPLICE BOX, CLAMP COVER, 12X12X6, HOFFMAN #A1212NF OR EQUAL. PROVIDE WITH POWER TERMINAL BLOCK SPLITTERS. 100A, 3P WITH GROUND. SEE ONE-LINE FOR CABLE SIZES AND QUANTITIES.
17	▭	BX 3	PAINTED STEEL GASKETTED SPLICE BOX, CLAMP COVER, 12X12X6, HOFFMAN #A1212NF OR EQUAL. PROVIDE WITH 60A 4-POLE POWER TERMINAL BLOCK AND 4P 30A CONTROL TERMINAL BLOCK FOR SEAL/THERMAL CONTROL WIRING.
18	▭	BX 4	PVC/FIBERGLASS GASKETTED SPLICE BOX, NEMA 4X, CLAMP COVER, 12X12X6 PROVIDE WITH 30A 4-POLE POWER TERMINAL BLOCK.

TRANSFORMER SCHEDULE

TAG#	kVA PHASE	MOUNT	SIZE INCHES	WEIGHT LBS	PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS PRIMARY	TEMP RISE (C)	NOTES	MANUFACTURER
XF 1	15 1	WALL	20H 15W 14D	225	480 1P2W	240/120 1P3W	NONE	115	1,2	SQUARE D 15S1F OR EQUAL

ALL WINDINGS ALUMINUM UNLESS NOTED
ALL TAPS FULL CAPACITY UNLESS NOTED

NOTES:
1) MEET FEDERAL ENERGY EFFICIENT REQUIREMENTS
2) RESIN ENCAPSULATED, NEMA 3R

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FIGURE: E3

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BDR	6043-23B	08FEB2025

ELECTRICAL SCHEDULES
LEACHATE STORAGE LAGOON
BENTON COUNTY SANITARY LANDFILL
BLAIRSTOWN, IOWA

HLW Engineering Group
204 West Broad Street, P.O. Box 314
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Phone: (515) 733-4144
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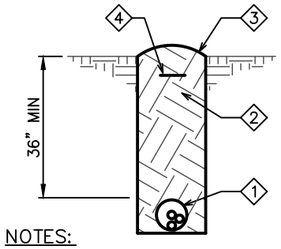
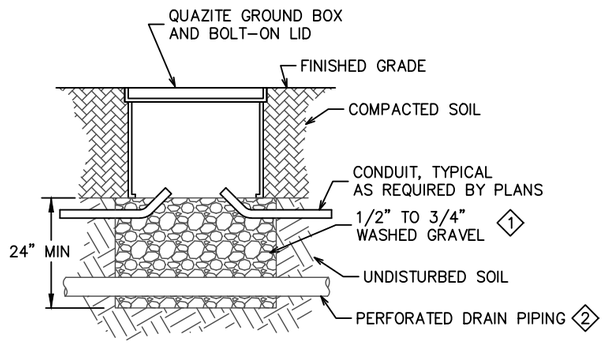


NOTES:

1. CONDUIT AND CABLES BY CONTRACTOR. CABLE AND INSTALLATION BY CONTRACTOR.
2. TRENCH AND BACKFILLING BY CONTRACTOR. BACKFILL AND COMPACT IN 6" LIFTS.
3. MOUND APPROXIMATELY 3" ABOVE SURROUNDING GRADE TO ALLOW FOR SETTLING.
4. WARNING TAPE 12" BELOW SURFACE.

1 CABLE TRENCHING DETAIL

E4 | NO SCALE

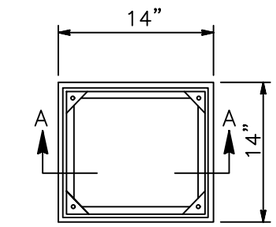


NOTES:

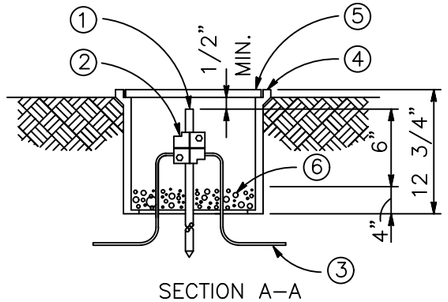
1. GRAVEL EXTENDS A MINIMUM OF 6" BEYOND ALL SIDES OF BOX, FOR BASE AND EASE OF ADDING FUTURE CONDUITS. FOR A 2'x3' BOX, A 3'X4' GRAVEL BASE IS REQUIRED.
2. PROVIDE DRAIN ONLY IF SHOWN ON SITE PLANS. ADJUST ELEVATION OF DRAIN PIPING AND PROVIDE ADDITIONAL EXCAVATION AND DEPTH OF GRAVEL TO ALLOW PROPER SLOPING OF DRAIN THROUGH SITE.

2 GROUND BOX INSTALLATION DETAIL

E4 | NO SCALE



TOP VIEW (COVER REMOVED)

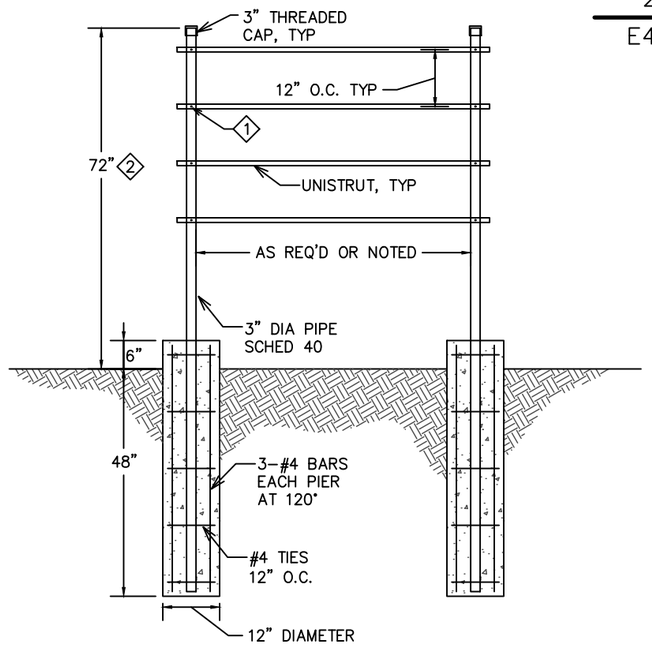


SECTION A–A

1. GROUND ROD
2. GROUND CLAMP
3. GROUNDING CONDUCTOR #1/0 COPPER
4. POLYMER CONCRETE FIBERGLASS REINFORCED BOX
5. COVER FOR ABOVE BOX
6. GRAVEL OR CRUSHED STONE

3 GROUND ROD INSTALLATION DETAIL

E4 | NO SCALE



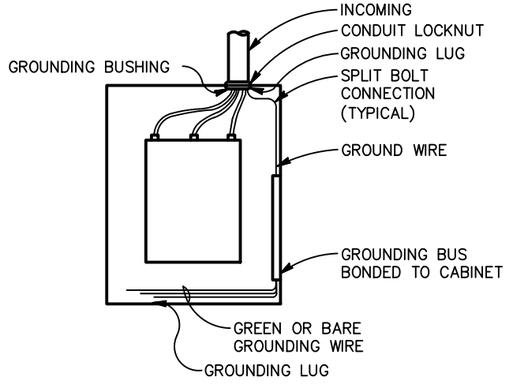
NOTES:

GENERAL:
1. ALL PIPE, STRUT, HARDWARE SHALL BE GALVANIZED STEEL UNLESS OTHERWISE NOTED.
2. SEE PLAN NOTES FOR ADDITIONAL REQUIREMENTS TO MATCH SPECIFIC INSTALLATION.

1. UNISTRUT ATTACHED TO PIPE WITH 3/8" BOLTS, NUTS AND LOCK WASHERS.
2. ADJUST DIMENSION AS NOTED ON PLANS.

4 ELECTRICAL EQUIPMENT RACK

E4 | NO SCALE

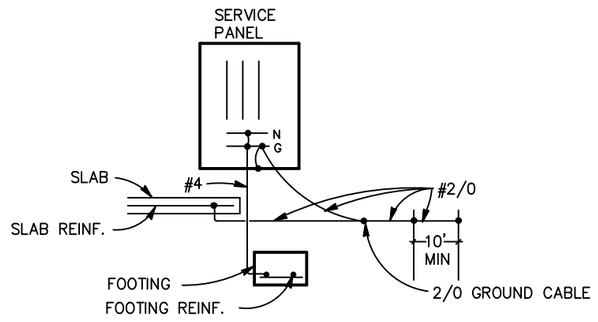


NOTES:

1. ALL WIRES TO BE NEATLY LACED.
2. AT THE POINT OF ATTACHMENT OF THE GROUNDING LUG TO THE CABINET, THE SURFACES SHALL BE SCRAPED FREE OF PAINT AND THOROUGHLY CLEANED TO INSURE PROPER BONDING.
3. NEUTRAL CONDUCTOR NOT SHOWN FOR CLARITY.

5 TYPICAL PANEL GROUNDING

E4 | NO SCALE



NOTES:

1. SERVICE ENTRANCE GROUND. 2–10' RODS SEPARATED BY 10' OF DISTANCE.

6 SYSTEM GROUNDING DETAIL

E4 | NO SCALE

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FIGURE: E4

REVISION	NO.	DATE

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BDR	6043-23B	08FEB2025

ELECTRICAL DETAILS

LEACHATE STORAGE LAGOON

BENTON COUNTY SANITARY LANDFILL
BLIARSTOWN, IOWA

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FAX: (515) 733-4146
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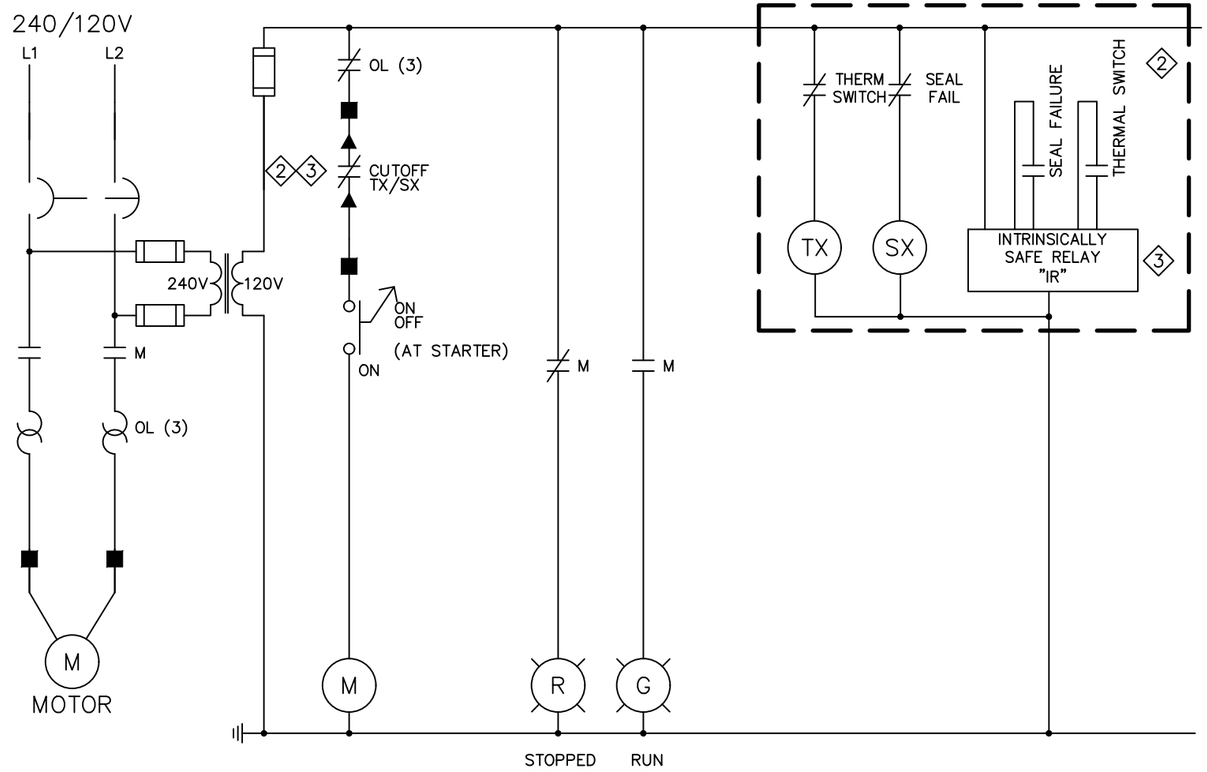

NOTES

1. SUGGESTED CONTROL SCHEMATICS DEPENDENT ON ACTUAL PROVIDED EQUIPMENT.
2. PROVIDE ADDITIONAL FIELD WIRING TO ACCOMMODATE ACTUAL EQUIPMENT, SECTION 26 05 00.
3. ALL DEVICES LOCATED IN THE MOTOR STARTER.

TAGGED NOTES

1. LOCKOUT PUMP IF SEAL OR THERMAL RELAY ACTIVATED.
2. SEAL FAIL RELAY LOCATED IN MOTOR STARTER, SUPPLIED WITH PUMP. PROVIDE AUX RELAYS TX AND SX IF NEEDED BY PUMP SUPPLIER RELAY.
3. IR RELAY APPLICABLE FOR HAZARDOUS LOCATION ONLY.

1 | LOADOUT PUMP MOTOR STARTER CONTROL WIRING

E5 | SCHEMATIC DIAGRAM

FIGURE: E5

REVISION	NO.	DATE
DRAWN BDR	PROJECT NO. 6043-23B	DATE 08FEB2025

ELECTRICAL SCHEMATIC WIRING

LEACHATE STORAGE LAGOON

BENTON COUNTY SANITARY LANDFILL
BLAIRSTOWN, IOWA

HLW Engineering Group
204 West Broad Street, P.O. Box 314
Story City, Iowa 50248
Phone: (515) 733-4144
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RIESBERG Engineering Company
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Internet http://www.riesberg-engr.com
REC PROJECT # 23-015

PART II - CONTRACT DOCUMENTS

F. Site Photos

Photo 1: Loadout support base

Photo 2: Existing loadout support