



Alliant Energy
4902 North Biltmore Lane
P.O. Box 77007
Madison, WI 53707-1007

1-800-ALLIANT (800-255-4268)
alliantenergy.com

May 22, 2023

Ms. Ann Bekta
Wisconsin Department of Natural Resources
2514 Morse Street
Janesville, WI 53545

**Subject: Phase 2, Modules 10 and 11 Liner Construction Documentation Report
Addendum #1
Dry Ash Disposal Facility (WDNR License #3025)
Wisconsin Power and Light Company – Columbia Energy Center
Portage, Wisconsin**

Dear Ms. Bekta,

On behalf of Wisconsin Power and Light Company (WPL), Alliant Energy is submitting one hard copy of Addendum #1 to the Phase 2, Modules 10 and 11 Liner Construction Documentation Report, prepared by SCS Engineers.

We appreciate your review of the enclosed report. Please call me at (608) 458-3853 if you have any questions or need additional information prior to approval.

Sincerely,

A handwritten signature in black ink, appearing to read "Jeff Maxted".

Jeff Maxted
Manager – Environmental Services
Alliant Energy

Enclosures

Cc: Tyler Sullivan – Wisconsin Department of Natural Resources
Brian Clepper – Columbia Energy Center
Phil Gearing – SCS Engineers

Construction Documentation Report Addendum No.1

Phase 2, Modules 10 and 11 Liner Construction
Columbia Dry Ash Disposal Facility
Pardeeville, Wisconsin

Prepared for:

Wisconsin Power and Light Company
Columbia Energy Center
W8375 Murray Road
Pardeeville, Wisconsin 53954

SCS ENGINEERS

25222157.00 | May 2023

2830 Dairy Drive
Madison, WI 53718-6751
608-224-2830

Table of Contents

Section	Page
Certification Page	iii
1.0 Introduction	1
1.1 Purpose and Scope	1
2.0 Summary of Work Performed	1
2.1 North Perimeter Berm and Southwest Corner Berm.....	1
2.2 Leachate Collection Pipe Connections.....	2
2.3 Leachate Collection Pipe Jetting and Televising	2
2.4 Module 3 and Module 4 Abandonments	2
2.4.1 Removal of Geomembrane Flap.....	2
2.4.2 Leachate Headwell Abandonments	3
2.4.3 Leachate Header Trench Plug	3
2.5 Geomembrane Installation	3
2.5.1 Geomembrane Deployment.....	3
2.5.2 Geomembrane Seaming.....	3
2.5.3 Non-destructive Seam Testing.....	4
2.5.4 Destructive Seam Testing.....	4
2.5.4.1 Destructive Seam Test DS-28	4
2.5.4.2 Destructive Seam Test DS-30	4
2.5.5 Geomembrane Repair.....	5
2.6 Drainage Layer Placement.....	5
3.0 Additional 2023 Construction Activities	5
3.1 Landfill Modules	5
3.2 Perimeter Work.....	6

Tables

Table 1.	Leachate Collection System Updates Grade Table
Table 2.	Berm Field Moisture and Density Test Results Summary

Figures

Figure 1.	Berm General Fill Density Test Locations (1 st Alternate Lift)
Figure 2.	Berm General Fill Density Test Locations (2 nd Alternate Lift)

Appendices

Appendix A	Construction Photographs
Appendix B	General Fill Sample Results
Appendix C	Drainage Layer Sample Result
Appendix D	Geosynthetic Personnel Resumes
Appendix E	Tensiometer Calibration Certifications
Appendix F	Subgrade Acceptance Forms
Appendix G	Geosynthetics Installation Daily Field Reports
Appendix H	Geomembrane Destructive Testing Results
Appendix I	Geomembrane Installation Forms
Appendix J	Jetting and Televising of Leachate Collection Pipe

Plan Sheets (Folded)

1	Leachate Collection System Update
2	Temporary Geomembrane Installation and Repairs
3	Details

I:\25222157.00\Deliverables\Modules 10 and 11 Construction Documentation Report_Addendum No.1\230517_Construction Documentation Report_Modules 10&11_Add No.1_DRAFT.docx

CERTIFICATION PAGE

- A. The following certification statements are provided for all registered professional engineers who performed quality assurance work on the project or supervised qualified technicians who did so (NR 500.05(4) and NR 516.04(3)(a)).

I, Phillip E. Gearing, hereby certify that I am a licensed professional engineer in the State of Wisconsin in accordance with the requirements of ch. A-E4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E8, Wis. Adm. Code; and that to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 500 to 538, Wis. Adm. Code.



Signature

Project Manager / E-45115

Title and PE Number

May 22, 2023

Date



- B. The following construction certification statements are provided for the professional engineers responsible for quality assurance on the project (NR 516.04(3)(d)).

I, Phillip E. Gearing, certify to the best of my knowledge, information, and belief that construction activities completed as part of this report at the Wisconsin Power and Light Company Columbia Energy Center Dry Ash Disposal Facility have been completed in substantial conformance with the applicable portions of the Wisconsin Administrative Code, Chapters NR 500 through 520; the 2010 Plan of Operation; and the corresponding WDNR approvals. The construction of each item identified in the following subdivisions of NR 516.04 (3)(d), was accomplished in conformance with the above requirements:

NR 516.04(3)(d) 2. Geosynthetics and appurtenances:

- a. Connections with all previously placed geosynthetics.

NR 516.04(3)(d) 3. Elements of leachate or storm water routing, collection, storage, and transportation:

- a. Construction of the leachate collection and transfer lines.
- b. Leachate headwell construction.

This certification is based on my personal observations during the construction activities and my review/discussion of field observation and reports prepared by SCS Engineers personnel during construction, record survey data, and the results of material testing.



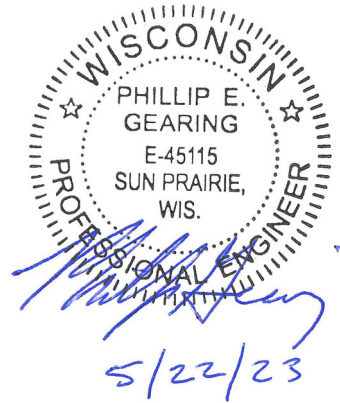
Signature

Project Manager / E-45115

Title and PE Number

May 22, 2023

Date



1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

On behalf of Wisconsin Power and Light Company (WPL), SCS Engineers (SCS) is providing this addendum to the Modules 10 and 11 liner construction documentation report for the Dry Ash Disposal Facility at the Columbia Energy Center. The Construction Documentation Report for the construction of Phase 1, Module 10 and Module 11 was submitted on February 8, 2023. This addendum has been prepared to record observations, test results, and documentation survey data relating to additional construction activities performed.

2.0 SUMMARY OF WORK PERFORMED

A summary of construction activities that have occurred since the February 2023 construction documentation report submission are listed below:

- North and southwest perimeter berm construction.
- Leachate collection pipe connections to existing modules.
- Leachate collection pipe jetting and televising.
- Module 3 and Module 4 geomembrane flap removal, leachate headwell abandonments, and leachate header trench plugs.
- Temporary geomembrane installation and placement of drainage material.

Several parties were involved with the construction activities. Company information and work performed are described below:

- **Ames Construction (Ames) of Burnsville, Minnesota:** General contractor for Module 10 and Module 11 construction. Performed temporary berm installation, connection of leachate collection piping, removal of the existing temporary berm geomembrane, abandonment of the Module 3 and Module 4 leachate head wells and cleanout pipe, and installation of plugs in the Module 3 and 4 header trenches to direct leachate into Modules 10 and 11.
- **Geo-Synthetics Systems (GSI), of Waukesha, Wisconsin:** Installation of the Module 10 and Module 11 temporary 60-mil HDPE geomembrane flaps.
- **Northern Pipe, of Green Bay, Wisconsin:** Jetting and televising the leachate collection pipes in Modules 10 and 11.

SCS was the primary party responsible for providing construction documentation, including field testing of soils, surveying, photographic documentation, and on-site observation during construction activities. Construction documentation was performed by Joe Stone, Zana Bajalan, and Phillip Gearing of SCS. Photographs of the construction activities are included in **Attachment A**.

2.1 NORTH PERIMETER BERM AND SOUTHWEST CORNER BERM

A perimeter berm was constructed with general fill on the north side of Module 11 and the southwest corner of Module 10 from April 13, 2023 through April 14, 2023. The location of the perimeter berms are shown on **Plan Sheet 2** by the location of the temporary geomembrane placed. Pressure

treated plywood wrapped in geotextile was installed along the northern limit of the existing geomembrane anchor trench prior to the installation of the general fill as shown on Detail 4, Plan Sheet 3.

Samples of the general fill were collected before placement and tested for grain size distribution and Modified Proctor. Test results are included in **Appendix B**. General fill was placed and graded in 1-foot lifts and compacted with a smooth drum roller. The general fill was field tested using a nuclear density gauge (NDG) to document that specified compaction was achieved. NDG test results are provided in **Table 1**. All the NDG testing meets CQA Plan requirements for general fill.

2.2 LEACHATE COLLECTION PIPE CONNECTIONS

The existing Module 3 and 4 leachate collection pipes were located and the caps were removed. On April 28, 2023, and May 2, 2023, the leachate collection pipes from Module 3 to Module 10 and Module 4 to Module 11 were welded together using electrofusion couplers, respectively. The leachate pipe tie-in detail is shown on **Detail 1, Plan Sheet 3**. Documentation points were surveyed at each pipe connection by SCS and are provided in the grade table (**Table 2**). The location of the documentation points are shown on **Plan Sheet 1**.

On May 2 and 3, 2023, 6 inches of coarse aggregate bedding was placed under the connected leachate collection pipe. Geotextile cushion was previously installed in the leachate collection trench and connected to the existing material. One foot of coarse aggregate bedding was placed above the pipe followed by 1 foot of filter material and 1 foot of drainage material. The material placed was connected to existing materials. One foot of drainage material was placed in remaining exposed geomembrane areas. Coarse aggregate bedding and filter material placed was the same material used in the initial installation of Module 10 and 11 leachate collection piping. Additional drainage layer material was imported from the same material source used to construct the Module 10 and 11 drainage layer, however, the material was pre-screened at the source for ¼ inch minus and not screened on-site. One sample of imported leachate drainage layer material was collected due to the prescreening for grain-size distribution (ASTM D422) and analyzed for remolded hydraulic conductivity (ASTM 2434). The sample result met the project specifications and is contained in **Appendix C**.

2.3 LEACHATE COLLECTION PIPE JETTING AND TELEVISIONING

The leachate collection pipe was jetted and video inspected after installation and connection to the previous modules was performed. The initial work was performed on May 4, 2023, by Northern Pipe, Inc. of Green Bay, WI. The full length of the pipes was inspected through the connection to the previous modules. The original video of Module 11 piping had water collected in the leachate pipe and the Module 10 piping was hard to see in the video inspection, therefore Northern Pipe, Inc. returned on May 17 to re-televise the piping. Pipe jetting and video inspections indicate that the pipes are clean and free of defects. Pipe cleaning and video inspection records are provided in **Appendix J**. Pipe cleaning and inspection records include digital video recordings of the video camera inspections.

2.4 MODULE 3 AND MODULE 4 ABANDONMENTS

2.4.1 Removal of Geomembrane Flap

The geomembrane flap between Modules 3 and 4; and Modules 10 and 11 was removed between the dates of April 28, 2023, and May 4, 2023. During removal, there was one portion of existing

geomembrane that was damaged and needed repair. The repair is shown as R295 and R310 on the temporary geomembrane installation and repairs drawing (**Plan Sheet 2**). **Detail 1, Plan Sheet 3** also shows the tie-in detail location where the temporary geomembrane was removed.

2.4.2 Leachate Headwell Abandonments

Leachate headwells LH-3 and LH-4 were abandoned on May 3, 2023. The existing transducer, wiring, and control panels were removed. The pipe transition elbow and the headwell riser were also removed. See **Detail 2, Plan Sheet 3** for the detail drawing. The location of the leachate headwell abandonments are shown on **Plan Sheet 1**.

2.4.3 Leachate Header Trench Plug

Leachate header trench plugs were installed on May 2, 2023. See **Detail 3, Plan Sheet 3** for the detail drawing of the plugs. An approximate 5-foot section of leachate drainage blanket, drainage filter, and coarse aggregate bedding were removed south of the leachate collection trench “T”s in Module 3 and Module 4. A 3-foot section of the existing 6-inch diameter HDPE leachate collection pipe was removed and capped on both ends. The removed drainage materials were replaced with an approximate 20 percent bentonite to sand mixture. Due to the exposure of drainage materials at the northern capped location near the “T” in each module, the coarse aggregate bedding, filter material, and drainage material were replaced and documented. The documented placement of the drainage materials are shown in **Table 2**. The location of the documentation points are shown on **Plan Sheet 1**.

2.5 GEOMEMBRANE INSTALLATION

Installation of the temporary geomembrane flaps in Module 10 and Module 11 was performed in accordance with the manufacturer’s recommendations and the CQA Plan. A Solmax HDPE 60 mil textured geomembrane was installed by GSI. Conformance data for the geomembrane material used for the temporary flaps was previously submitted with the February 8, 2023 documentation report. Installation occurred on May 4, 5, and 6, and additional repair and destruct tracking occurred on May 11, 12, and 20, 2023. The geosynthetic crew resumes are located in **Appendix D**. Prior to installation of the geomembrane the subgrade surface was observed. The subgrade was inspected by GSI and SCS prior to geomembrane deployment. Subgrade acceptance forms for the installation are included in **Appendix F**.

2.5.1 Geomembrane Deployment

Geomembrane panels were placed in the numerical order shown on the panel layout diagram located on **Plan Sheet 2**. The geomembrane was deployed by hand and using a CAT-299C skid steer with rubber tracks. The roll to be deployed was picked up with the equipment and moved to the deployment area for placement. Final adjustments to the position of geomembrane panels were made manually. The geomembrane was anchored at the outer limits using an anchor trench and ballasted with sand bags. Geomembrane was placed in perimeter anchor trenches as shown on **Plan Sheet 2**. Daily field reports prepared by SCS discussing geomembrane placement, seaming, testing, and repair are contained in **Appendix G**. Panel placement information is included in **Appendix I**.

2.5.2 Geomembrane Seaming

GSI exclusively utilized extrusion welding equipment for panel seaming and repairs. Geomembrane panel and seam locations were surveyed by SCS. Field seaming information is contained in **Appendix I**.

SCS observed all trial weld testing performed before seaming began. Trial weld test results are contained in **Appendix I**. Two sets of load cells were used during the geomembrane installation, and all GSI field tensiometer calibration certifications were within 90 days of calibration when each tensiometer was used. The calibration certifications are presented in **Appendix E**.

2.5.3 Non-destructive Seam Testing

GSI conducted non-destructive tests on each geomembrane seam in the field. SCS documented all non-destructive seam testing, and test data are contained in **Appendix I**. A description of the non-destructive testing methods used by GSI is provided in the following discussion.

Extrusion welded seams and repairs were tested by GSI with a vacuum box. Vacuum box testing involved wetting the seam area with a soapy water solution and placing the vacuum box over a portion of the seam. A vacuum was applied to the box to verify the integrity of the area. The geomembrane surface within the vacuum box was monitored for the formation of air bubbles, which indicate that air was moving through the membrane or the seam and that a hole was present.

2.5.4 Destructive Seam Testing

GSI collected end of seam samples for field testing from seams over 100 feet in length. One sample was tested in shear and one in peel. SCS observed end of seam field testing, and test results are provided on panel seaming summary forms in **Appendix I**. All end of seam testing met the project requirements.

Destructive samples were taken for laboratory testing every 500 feet of seaming in accordance with the requirements of the CQA Plan. Destructive seam lab test locations are shown on **Plan Sheet 2**.

After confirmation of passing seam tests, the destructive test locations were repaired and non-destructively tested by GSI. Field destructive test logs and seam repair logs prepared by SCS are contained in **Appendix I**. Laboratory destructive test results provided by TRI are also contained in **Appendix H**. Testing methodology included ASTM D 6392 and GRI GM19 for shear and peel laboratory analysis. Two of the extrusion destructive seam samples failed to meet the minimum project requirements and are described in the sections below.

2.5.4.1 Destructive Seam Test DS-28

DS-28 was collected on May 4, 2023, from the repair R295 performed by welder BR with the extrusion machine #97. DS-28 failed during field testing. To track the failing destructive sample DS-28, all of the repairs performed by BR were capped with another welder, as well as tracked into seam P85/P86 until the passing destructive test DS-29A was performed. DS-29 had been collected previously, however, DS-29A was also collected to shorten the repair length necessary. DS-29 and DS-29A both passed field and laboratory testing.

The failure of DS-28 was due to a low peel strength in the field sample possibly caused by insufficient cleaning or grinding of the weld location due to the fine sand present. Continued installer diligence in the cleaning and welding technique was discussed with GSI following destructive sample failures.

2.5.4.2 Destructive Seam Test DS-30

DS-30 was collected on May 5, 2023, from seam welding performed by welder FR with the extrusion machine #115. DS-30 failed during field testing in shear, which is not common. To track the failing

destructive sample DS-30 the welding performed by FR was tracked through the repairs and seaming performed by testing DS-30A and DS-30B, DS-30B1, DS-30B2, DS-30B3, and DS-30B4. DS-30B, DS-30B1, and DS-30B2 all failed in the field due to low peel strength. DS-26B3 passed in the field, however, failed in the lab. DS-30A and DS-30B4 each passed both in the field and in the lab. All seaming and repairs performed between DS-30A and DS-30B4 were capped.

The failures of DS-30 series of destructs were possibly caused by insufficient cleaning or grinding of the weld location due to the fine sand present. Continued installer diligence in the cleaning and welding technique was discussed with GSI following destructive sample failures.

2.5.5 Geomembrane Repair

SCS observed the geomembrane for defects immediately following placement of the panels during seaming, and periodically after seaming until the geomembrane installation was completed. Geomembrane material was damaged in a few locations during the removal of materials to expose the geomembrane flap tie-in location. SCS marked areas on the panels and seams that required repair, and GSI completed and retested all repairs. Repair and test documentation is contained in **Appendix I**.

Repair of the geomembrane was completed by tack welding a piece of geomembrane to the repair area with a leister. The geomembrane patch was ground using a grinder and then welded with an extrusion welder. Trial welds were tested before extrusion welding was performed. The repairs were non-destructively tested by vacuum box testing.

2.6 DRAINAGE LAYER PLACEMENT

After deployment of the temporary geomembrane in Module 10 and Module 11, 1-foot of drainage layer material was installed above the temporary geomembrane flaps. Placement of the drainage layer material on the temporary geomembrane flaps started on May 16, 2023, and was completed on May 19, 2023. Additionally, on May 22, 2023, 1-foot of sand drainage layer material was placed on additional geomembrane repairs performed on May 20, 2023.

3.0 ADDITIONAL 2023 CONSTRUCTION ACTIVITIES

Additional construction activities in conjunction with the Modules 10 and 11 construction that will need to be completed in 2023 are as follows:

3.1 LANDFILL MODULES

The following activities are yet to be completed within the landfill modules:

- Installation of an electrical transformer and underground utility east of Module 10 to power the leachate collection pumps.
- Installation of the leachate collection pump system, including force main piping, vaults, and electrical components. Temporary pumps are currently installed in the riser piping and leachate is pumped to the leachate/surface water pond.
- Install telemetry and transducers to leachate headwells for Modules 10 and 11. Existing leachate headwells will need to be hand measured until the transducers are installed.

3.2 PERIMETER WORK

The following activities are yet to be completed outside the liner limits:

- Place the remaining breaker run and dense aggregate base for perimeter roads.
- Finish grade swales and installation of remaining culverts.
- Install all final erosion control features (ditch checks, filter socks, riprap, etc.).
- Complete remaining restoration activities (Seed, mulch, fertilizer, etc.) in restoration areas.

Tables

- 1 Leachate Collection System Updates Grade Table
- 2 Berm Field Moisture and Density Test Results Summary

**Table 1. Leachate Collection System Updates Grade Table
Modules 10 and 11 Liner Construction
Columbia Dry Ash Disposal Facility**

Documentation Point No.	Location		Leachate Collection Pipe Top of Pipe Elevation Actual (ft)	Top of Coarse Aggregate Elevation Actual (ft)	Coarse Aggregate Above Pipe Thickness		Drainage Filter Layer Elevation Actual (ft)	Drainage Filter Thickness		Top of Leachate Drainage Layer Elevation Actual (ft)	Leachate Drainage Layer Thickness		Comments
	Northing	Easting			Design (ft)	Actual (ft)		Design (ft)	Actual (ft)		Design (ft)	Actual (ft)	
Mod 10 Leachate Collection Line East-West (South)													
2100	542,494.4	2,124,541.5	803.05	804.18	1.00	1.13	805.20	1.00	1.01	806.20	1.00	1.00	Pipe Connection
Mod 11 Leachate Collection Line East-West (North)													
2101	542,751.6	2,124,518.4	804.42	805.55	1.00	1.13	806.61	1.00	1.05	807.62	1.00	1.01	Pipe Connection
Mod 3 Leachate Collection North Pipe Cap													
2200	542,490.9	2,124,502.1	802.83	804.48	1.00	1.65	805.59	1.00	1.11	806.61	1.00	1.02	Pipe Cap
Mod 4 Leachate Collection North Pipe Cap													
2201	542,749.5	2,124,482.7	804.19	805.21	1.00	1.01	806.22	1.00	1.01	807.24	1.00	1.02	Pipe Cap

Updated by: JTS, 5/5/23
Checked /Revised by: PEG, 5/10/23

Table 2. Berm Field Moisture and Density Test Results Summary
Modules 10 and 11 Liner Construction
Columbia Dry Ash Disposal Facility / SCS Engineers Project #25222157.01

Field Sample ID	Lift	Date	Northing	Easting	Wet Density from NDG (lb/ft ³)	Water Weight (pcf)	Moisture Content	Dry Density of Sample (lb/ft ³)	Modified Proctor Density (lb/ft ³)	% Compaction	Optimum Moisture Content	Pass/Fail
North Berm (North of Module 11)												
BERM A (1)	1	04/13/23	542,900	2,124,550	126.2	7.0	5.9%	119.2	128.9	92.5%	8.0%	PASS
BERM B (1)	1	04/13/23	542,900	2,124,650	128.0	7.1	5.9%	120.9	128.9	93.8%	8.0%	PASS
BERM C (1)	1	04/13/23	542,900	2,124,750	130.0	8.4	6.9%	121.6	128.9	94.3%	8.0%	PASS
BERM D (1)	1	04/13/23	542,900	2,124,850	132.4	6.9	5.5%	125.5	128.9	97.4%	8.0%	PASS
BERM E (1)	1	04/13/23	542,900	2,124,950	128.3	5.9	4.8%	122.4	128.9	95.0%	8.0%	PASS
BERM F (1)	1	04/13/23	542,900	2,125,050	132.7	5.1	4.0%	127.6	128.9	99.0%	8.0%	PASS
BERM G (2)	2	04/13/23	542,900	2,124,600	131.7	6.0	4.8%	125.7	128.9	97.5%	8.0%	PASS
BERM H (2)	2	04/13/23	542,900	2,124,700	127.8	7.3	6.1%	120.5	128.9	93.5%	8.0%	PASS
BERM I (2)	2	04/13/23	542,900	2,124,800	132.0	5.7	4.5%	126.3	128.9	98.0%	8.0%	PASS
BERM J (2)	2	04/13/23	542,900	2,124,900	130.7	6.1	4.9%	124.6	128.9	96.7%	8.0%	PASS
BERM K (2)	2	04/13/23	542,900	2,125,000	132.6	6.7	5.3%	125.9	128.9	97.7%	8.0%	PASS
BERM A (3)	3	04/13/23	542,900	2,124,550	123.5	4.9	4.1%	118.6	128.9	92.0%	8.0%	PASS
BERM B (3)	3	04/13/23	542,900	2,124,650	130.2	5.9	4.7%	124.3	128.9	96.4%	8.0%	PASS
BERM C (3)	3	04/13/23	542,900	2,124,750	128.0	7.0	5.8%	121.0	128.9	93.9%	8.0%	PASS
BERM D (3)	3	04/13/23	542,900	2,124,850	124.0	5.7	4.8%	118.3	128.9	91.8%	8.0%	PASS
BERM E (3)	3	04/13/23	542,900	2,124,950	132.5	6.2	4.9%	126.3	128.9	98.0%	8.0%	PASS
BERM F (3)	3	04/13/23	542,900	2,125,050	125.1	7.8	6.6%	117.3	128.9	91.0%	8.0%	PASS
BERM G (4)	4	04/13/23	542,900	2,124,600	122.9	5.1	4.3%	117.8	128.9	91.4%	8.0%	PASS
BERM H (4)	4	04/13/23	542,900	2,124,700	121.9	5.8	5.0%	116.1	128.9	90.1%	8.0%	PASS
BERM I (4)	4	04/13/23	542,900	2,124,800	126.2	6.6	5.5%	119.6	128.9	92.8%	8.0%	PASS
BERM J (4)	4	04/13/23	542,900	2,124,900	129.9	6.9	5.6%	123.0	128.9	95.4%	8.0%	PASS
BERM K (4)	4	04/13/23	542,900	2,125,000	130.1	5.5	4.4%	124.6	128.9	96.7%	8.0%	PASS
BERM A (5)	5	04/14/23	542,900	2,124,550	129.0	6.3	5.1%	122.7	128.9	95.2%	8.0%	PASS
BERM B (5)	5	04/14/23	542,900	2,124,650	130.2	6.8	5.5%	123.4	128.9	95.7%	8.0%	PASS
BERM C (5)	5	04/14/23	542,900	2,124,750	130.3	7.9	6.5%	122.4	128.9	95.0%	8.0%	PASS
BERM D (5)	5	04/14/23	542,900	2,124,850	126.3	5.1	4.2%	121.2	128.9	94.0%	8.0%	PASS
BERM E (5)	5	04/14/23	542,900	2,124,950	121.9	5.6	4.8%	116.3	128.9	90.2%	8.0%	PASS
BERM F (5)	5	04/14/23	542,900	2,125,050	134.7	7.4	5.8%	127.3	128.9	98.8%	8.0%	PASS
BERM G (6)	6	04/14/23	542,900	2,124,600	125.6	6.3	5.3%	119.3	128.9	92.6%	8.0%	PASS
BERM H (6)	6	04/14/23	542,900	2,124,700	123.7	5.6	4.7%	118.1	128.9	91.6%	8.0%	PASS
BERM I (6)	6	04/14/23	542,900	2,124,800	124.0	5.7	4.8%	118.3	128.9	91.8%	8.0%	PASS
BERM J (6)	6	04/14/23	542,900	2,124,900	128.9	8.6	7.1%	120.3	128.9	93.3%	8.0%	PASS
BERM K (6)	6	04/14/23	542,900	2,125,000	127.8	8.2	6.9%	119.6	128.9	92.8%	8.0%	PASS
Southwest Corner Berm (Module 10)												
SEC 1	1	04/13/23	542,450	2,124,550	127.8	6.3	5.2%	121.5	128.9	94.3%	8.0%	PASS
SEC 2	2	04/13/23	542,450	2,124,550	134.4	11.1	9.0%	123.3	128.9	95.7%	8.0%	PASS
SEC 3	3	04/13/23	542,450	2,124,550	135.7	12.8	10.4%	122.9	128.9	95.3%	8.0%	PASS

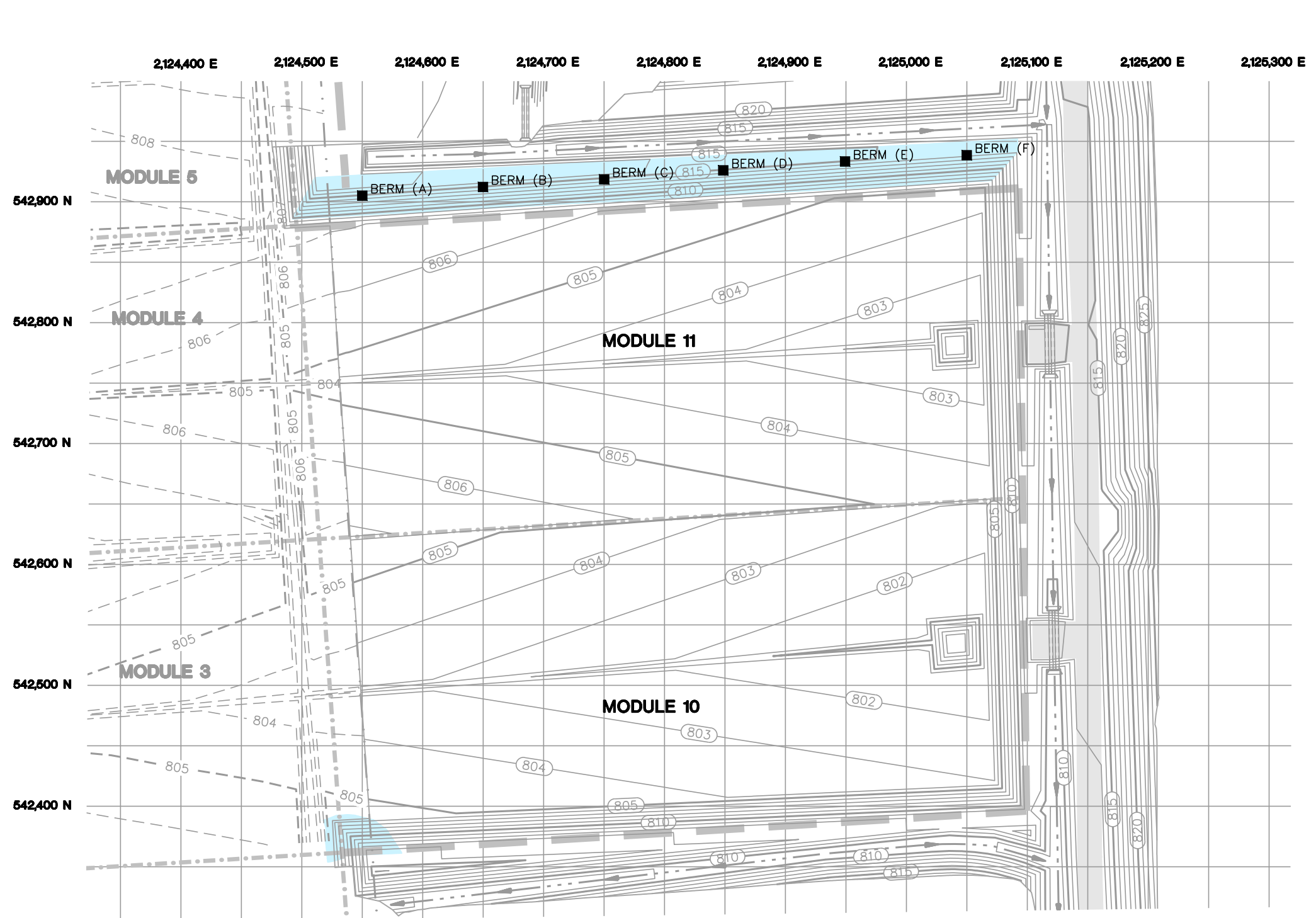
Updated By: JTS, 4/14/23

Checked By: ZB, 4/17/23

I:\25222157.00\Deliverables\Modules 10 and 11 Construction Documentation Report_Addendum No.1\Tables\Table 2_Berm Density Tests_North (Mod 11) and Southeast Corner (Mod 10).xls]FieldSheet

Figures

- 1 Berm General Fill Density Test Locations (1st Alternate Lift)
- 2 Berm General Fill Density Test Locations (2nd Alternate Lift)

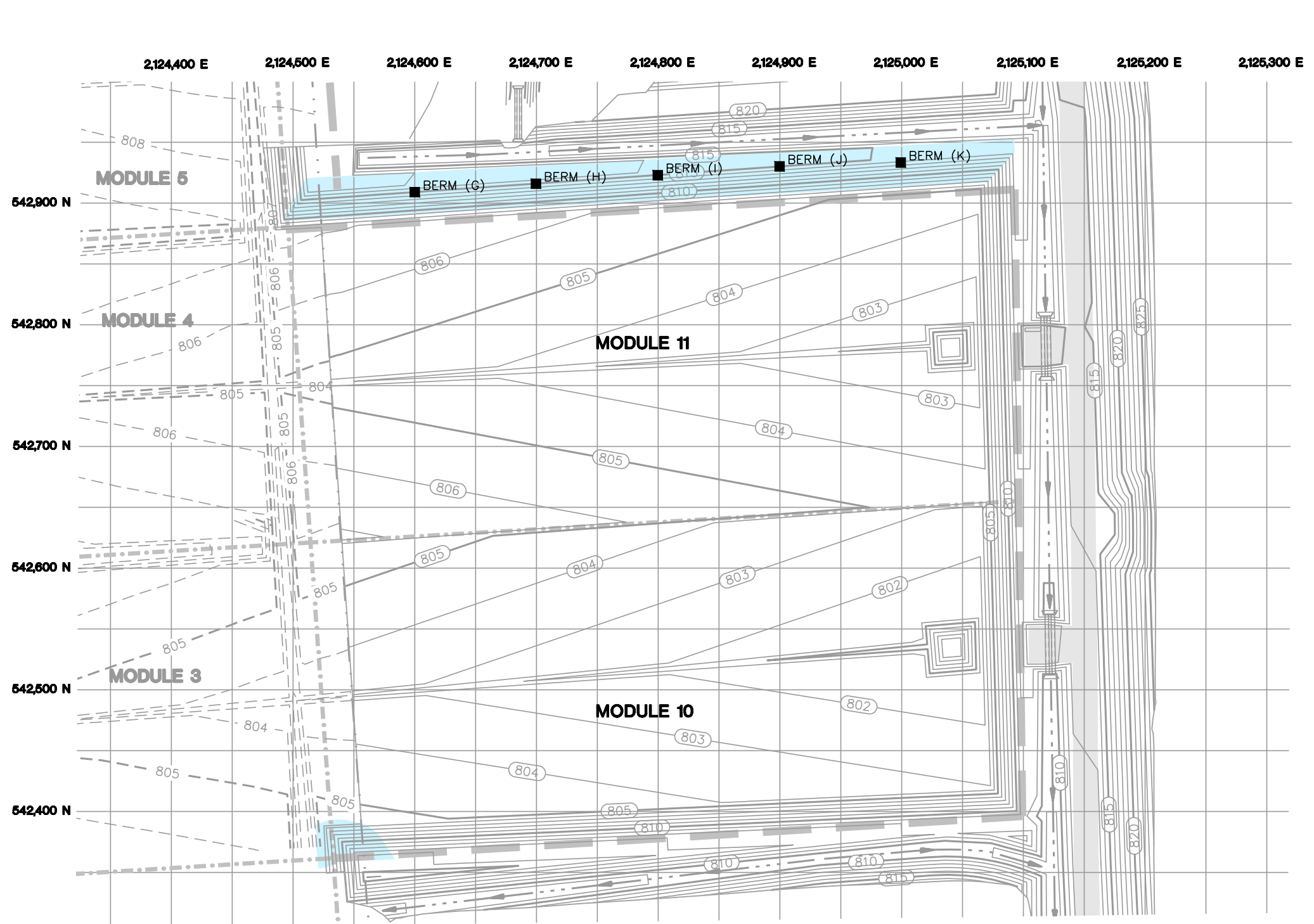


LEGEND

	MODULE LIMIT
	ASH FILL LIMIT
	CLAY LIMIT
	BERM (A)
	APPROXIMATE BERM LOCATION

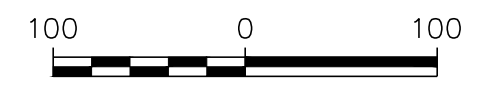
- NOTES:**
1. CONTOURS REPRESENT PROPOSED MODULE 10/11 BASE GRADES AND PERIMETER GRADES.
 2. DASHED CONTOURS REPRESENT DOCUMENTED BASE GRADES IN MODULES 3, 4, AND 5.
 3. DENSITY TESTING IN THE SOUTHWEST CORNER OF MODULE 10 ARE PROVIDED AS SEC LOCATIONS IN TABLE 2.

PROJECT NO. 25222157.01	DRAWN BY: KP	 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	CLIENT WISCONSIN POWER AND LIGHT COLUMBIA ENERGY CENTER W8375 MURRAY ROAD PARDEEVILLE, WISCONSIN 53954	SITE MODULES 10 AND 11 LINER CONSTRUCTION COLUMBIA DRY ASH DISPOSAL FACILITY TOWN OF PACIFIC, WISCONSIN	BERM GENERAL FILL DENSITY TEST LOCATIONS (1ST ALTERNATE LIST)	FIGURE
DRAWN: 04/11/2023	CHECKED BY: PEG					1
REVISED: 05/17/2023	APPROVED BY: PEG 05/22/2023					



LEGEND	
	MODULE LIMIT
	ASH FILL LIMIT
	CLAY LIMIT
	BERM (G)
	APPROXIMATE BERM LOCATION


- NOTES:
1. CONTOURS REPRESENT PROPOSED MODULE 10/11 BASE GRADES AND PERIMETER GRADES.
 2. DASHED CONTOURS REPRESENT DOCUMENTED BASE GRADES IN MODULES 3, 4, AND 5.
 3. DENSITY TESTING IN THE SOUTHWEST CORNER OF MODULE 10 ARE PROVIDED AS SEC LOCATIONS IN TABLE 2.



SCALE: 1" = 100'

PROJECT NO. 25222157.01	DRAWN BY: KP	 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	CLIENT WISCONSIN POWER AND LIGHT COLUMBIA ENERGY CENTER W8375 MURRAY ROAD PARDEEVILLE, WISCONSIN 53954	SITE MODULES 10 AND 11 LINER CONSTRUCTION COLUMBIA DRY ASH DISPOSAL FACILITY TOWN OF PACIFIC, WISCONSIN	BERM GENERAL FILL DENSITY TEST LOCATIONS (2ND ALTERNATE LIFT)	FIGURE
DRAWN: 04/11/2023	CHECKED BY: PEG					2
REVISED: 05/17/2023	APPROVED BY: PEG 05/22/2023					

I:\25222157.00\Drawings\Modules 10 and 11 Con Doc_Addendum No. 1\ICQA Berm Testing Figures.dwg, 5/17/2023 12:49:33 PM



Appendix A
Construction Photographs

Appendix A – Construction Photographs
Modules 10 and 11 Liner Construction – Addendum No.1
W8375 Murray Road, Pardeeville, WI 53954
SCS Engineers Project #25222157.00



Photo 1: Plywood (2'x8'x0.5" sections wrapped in geotextile) placed at the northern edge of the existing geomembrane of Module 11 berm. (Looking west) (4/12/2023)



Photo 2: Compacting the general fill material for Module 11 northern berm. (Looking northwest) (4/13/2023)

Appendix A – Construction Photographs
Modules 10 and 11 Liner Construction – Addendum No.1
W8375 Murray Road, Pardeeville, WI 53954
SCS Engineers Project #25222157.00



Photo 3: SCS NDG testing the general fill lifts for compaction. (Looking down)
(4/13/2023)



Photo 4: Exposing the east-west leachate collection pipes in preparation for pipe connections. (Looking east)
(4/27/2023)

Appendix A – Construction Photographs
Modules 10 and 11 Liner Construction – Addendum No.1
W8375 Murray Road, Pardeeville, WI 53954
SCS Engineers Project #25222157.00



Photo 5: Removing and capping the leachate cleanout risers in Modules 3 and 4.
(Looking west)
(4/27/2023)



Photo 6: Electrofusion welding of east-west leachate collection pipe from Module 4 to Module 11.
(Looking down)
(4/28/2023)

Appendix A – Construction Photographs
Modules 10 and 11 Liner Construction – Addendum No.1
W8375 Murray Road, Pardeeville, WI 53954
SCS Engineers Project #25222157.00



Photo 7: Removing an approximate 3-foot section of the leachate collection piping south of the “T” in Module 4.
(Looking down)
(4/28/2023)



Photo 8: Fusion welding of the caps on the leachate collection pipe and cleanout in Module 4.
(Looking west)
(4/28/2023)

Appendix A – Construction Photographs
Modules 10 and 11 Liner Construction – Addendum No.1
W8375 Murray Road, Pardeeville, WI 53954
SCS Engineers Project #25222157.00



Photo 9: Removing an approximate 3-foot section of the leachate collection piping south of the Module 3 “T”.
(Looking southwest)
(5/2/2023)



Photo 10: Fusion welding of the leachate collection pipe from Module 3 to Module 10.
(Looking northeast)
(5/2/2023)

Appendix A – Construction Photographs
Modules 10 and 11 Liner Construction – Addendum No.1
W8375 Murray Road, Pardeeville, WI 53954
SCS Engineers Project #25222157.00



Photo 11: Placing layers of coarse aggregate bedding and filter material (1-foot-thick) on top of the leachate pipe connection in Module 11. (Looking south) (5/2/2023)



Photo 12: Fusion welding the caps on the leachate collection pipes and cleanout risers in Module 3 at leachate header plug location. (Looking northwest) (5/2/2023).

Appendix A – Construction Photographs
Modules 10 and 11 Liner Construction – Addendum No.1
W8375 Murray Road, Pardeeville, WI 53954
SCS Engineers Project #25222157.00



Photo 13: Mixing bentonite and sand mix for leachate header trench plugs. (5/2/2023)



Photo 14: Placement of bentonite mixed sand for the leachate header plug. (Looking northwest) (5/2/2023)

Appendix A – Construction Photographs
Modules 10 and 11 Liner Construction – Addendum No.1
W8375 Murray Road, Pardeeville, WI 53954
SCS Engineers Project #25222157.00



Photo 15: Placing layers of filter and drainage layer material (1-foot-thick) on top of the leachate pipe connection in Module 10. (Looking northwest) (5/3/2023)



Photo 16: Removing the geomembrane flap on the berm between Modules 3/4 and 10/11. (Looking west) (5/3/2023)

Appendix A – Construction Photographs
Modules 10 and 11 Liner Construction – Addendum No.1
W8375 Murray Road, Pardeeville, WI 53954
SCS Engineers Project #25222157.00



Photo 17: Removing the leachate headwell risers in both Modules 3 and 4. (Looking south) (5/3/2023)



Photo 18: Cleaning surface of geomembrane at the north berm in preparation for the temporary geomembrane flap installation. (Looking southeast) (5/4/2023)

Appendix A – Construction Photographs
Modules 10 and 11 Liner Construction – Addendum No.1
W8375 Murray Road, Pardeeville, WI 53954
SCS Engineers Project #25222157.00



Photo 19: Jetting and televising the leachate collection pipes in Modules 10 and 11. (Looking north) (5/4/2023)



Photo 20: Performing geomembrane trial welds before seaming temporary geomembrane flap. (Looking southwest) (5/4/2023)

Appendix A – Construction Photographs
Modules 10 and 11 Liner Construction – Addendum No.1
W8375 Murray Road, Pardeeville, WI 53954
SCS Engineers Project #25222157.00



Photo 21: Field testing of the geomembrane trial welds.
(Looking west)
(5/4/2023)



Photo 22: Repairing existing damage of the existing geomembrane.
(Looking south)
(5/4/2023)

Appendix A – Construction Photographs
Modules 10 and 11 Liner Construction – Addendum No.1
W8375 Murray Road, Pardeeville, WI 53954
SCS Engineers Project #25222157.00



Photo 23: Installing geomembrane panels on the north berm of Module 11.
(Looking east)
(5/4/2023)



Photo 24: Placing geomembrane panels in the southwest corner of Module 10.
(Looking south)
(5/4/2023)

Appendix A – Construction Photographs
Modules 10 and 11 Liner Construction – Addendum No.1
W8375 Murray Road, Pardeeville, WI 53954
SCS Engineers Project #25222157.00



Photo 25: Marking and collecting destruct geomembrane samples. (Looking down) (5/4/2023)



Photo 26: Vacuum box testing of extrusion seams. (Looking east) (5/4/2023)

Appendix A – Construction Photographs
Modules 10 and 11 Liner Construction – Addendum No.1
W8375 Murray Road, Pardeeville, WI 53954
SCS Engineers Project #25222157.00



Photo 27: Placing geomembrane panels on the north berm of Module 11. (Looking east) (5/5/2023)



Photo 28: Collecting geomembrane destruct samples. (Looking west) (5/5/2023)

Appendix A – Construction Photographs
Modules 10 and 11 Liner Construction – Addendum No.1
W8375 Murray Road, Pardeeville, WI 53954
SCS Engineers Project #25222157.00



Photo 29: Extrusion welding of the geomembrane repairs on Module 11 north berm. (Looking northeast) (5/5/2023)



Photo 30: Surveying the geomembrane panels and repairs. (Looking west) (5/5/2023)

Appendix A – Construction Photographs
Modules 10 and 11 Liner Construction – Addendum No.1
W8375 Murray Road, Pardeeville, WI 53954
SCS Engineers Project #25222157.00



Photo 31: Repaired damaged section on the existing geomembrane of Module 4.
(Looking south)
(5/6/2023).



Photo 32: Northwest corner of Module 11 berm welded to existing flap of Module 5.
(Looking northeast)
(5/6/2023)

Appendix A – Construction Photographs
Modules 10 and 11 Liner Construction – Addendum No.1
W8375 Murray Road, Pardeeville, WI 53954
SCS Engineers Project #25222157.00



Photo 33: Southwest corner of Module 10 berm welded to existing flap of Module 2.
(Looking southeast)
(5/6/2023)



Photo 34: Collecting an additional destruct and performing repairs.
(Looking southwest)
(5/11/2023)

Appendix A – Construction Photographs
Modules 10 and 11 Liner Construction – Addendum No.1
W8375 Murray Road, Pardeeville, WI 53954
SCS Engineers Project #25222157.00



Photo 35: Collecting an additional destruct and performing repairs and vacuum box testing. (Looking southeast) (5/12/2023)



Photo 36: Drainage material placement on top of the geomembrane on the southwest temporary berm. (Looking southwest) (5/16/2023)

Appendix A – Construction Photographs
Modules 10 and 11 Liner Construction – Addendum No.1
W8375 Murray Road, Pardeeville, WI 53954
SCS Engineers Project #25222157.00



Photo 37: Drainage material placement on top of the geomembrane on the temporary north berm. (Looking northwest) (5/16/2023)



Photo 38: Drainage material placement on top of the geomembrane on the temporary north berm. (Looking northwest) (5/17/2023)

Appendix A – Construction Photographs
Modules 10 and 11 Liner Construction – Addendum No.1
W8375 Murray Road, Pardeeville, WI 53954
SCS Engineers Project #25222157.00



Photo 39: Re-televising the leachate collection pipes in Modules 10 and 11.
(Looking northwest)
(5/18/2023)



Photo 40: Finalizing the drainage material placement on the north berm.
(Looking northeast)
(5/19/2023)


Appendix A – Construction Photographs
Modules 10 and 11 Liner Construction – Addendum No.1
W8375 Murray Road, Pardeeville, WI 53954
SCS Engineers Project #25222157.00



Photo 41: Geomembrane repairs between Modules 4 and 11. (Looking north) (5/20/2023)

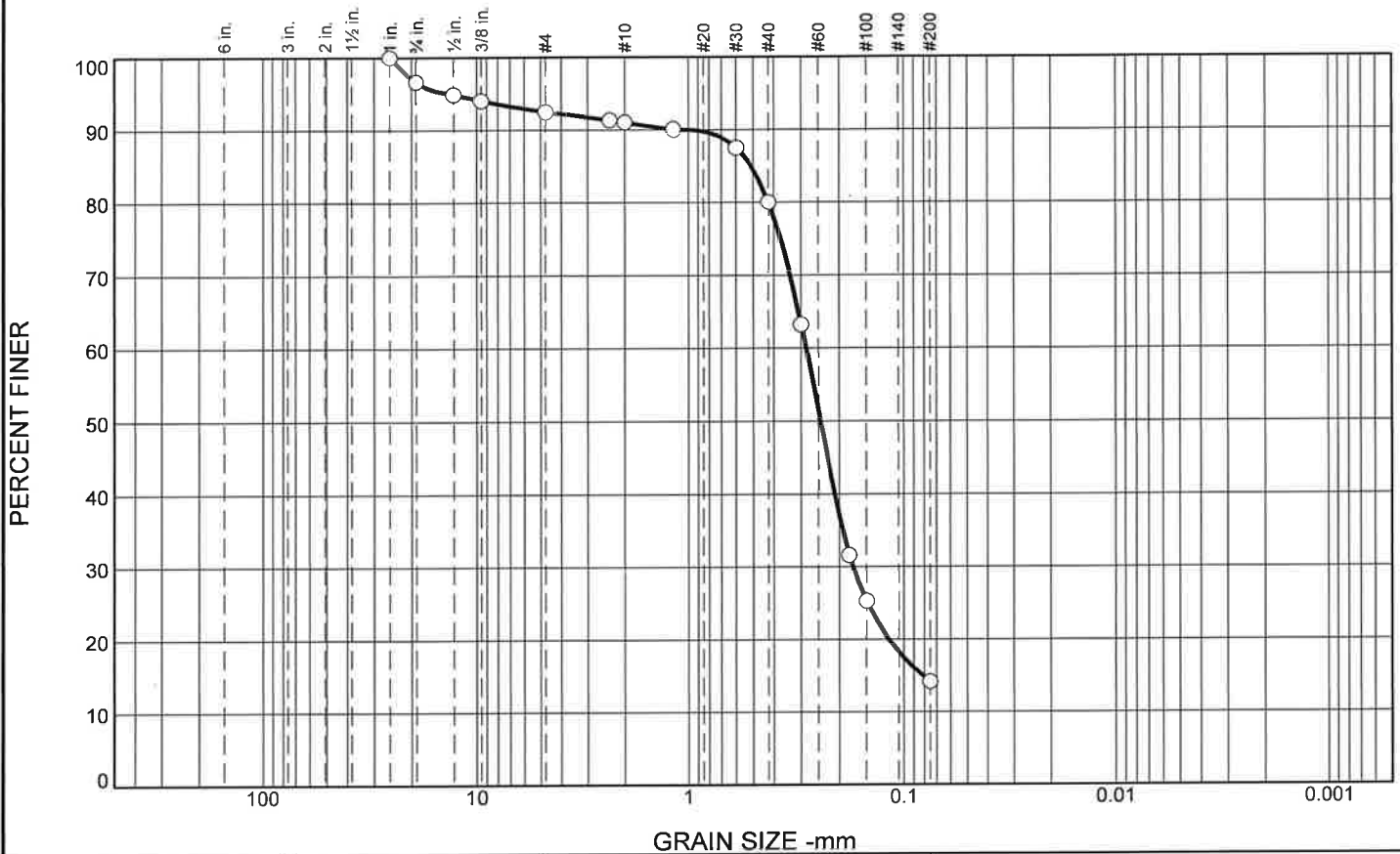


Photo 42: Vacuum box testing of the geomembrane repairs. (Looking south) (5/20/2023)



Appendix B
General Fill Sample Results

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	3.4	4.1	1.5	11.0	65.8	14.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
3/4	96.6		
1/2	94.8		
3/8	94.0		
#4	92.5		
#8	91.3		
#10	91.0		
#16	90.1		
#30	87.5		
#40	80.0		
#50	63.3		
#80	31.6		
#100	25.3		
#200	14.2		

Material Description

Brown Fine to Medium Sand, Some Silt, Little Gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.9879 D₈₅= 0.5127 D₆₀= 0.2849
D₅₀= 0.2454 D₃₀= 0.1733 D₁₅= 0.0812
D₁₀= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

* (no specification provided)

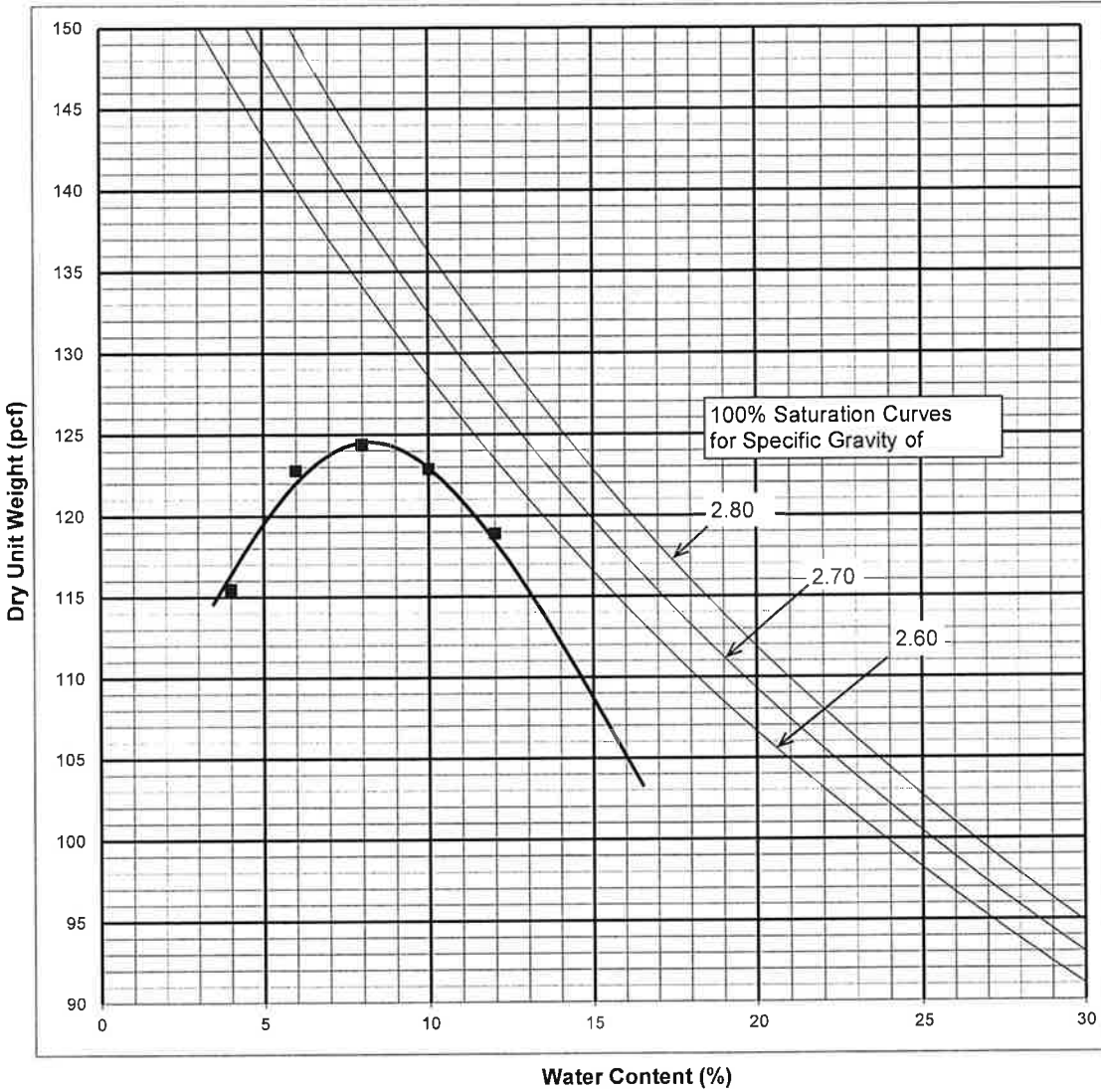
Sample Number: COL-GF-B1

Date: 4/13/23

	Client: SCS Engineers Project: Modules 10 and 11 Liner Construction SCS #25222157.00 Project No: C22011-2	Figure
--	--	---------------

Tested By: JFS **Checked By:** KJS

TEST REPORT



Specimen No.	Maximum Dry Unit Weight, pcf	Optimum Water Content, %
COL - GF - B1	124.4	8.0
Specimen Description		
Brown Fine to Medium Sand, Some Silt, Little Gravel		
Corrected Maximum Dry Unit Weight, pcf	Corrected Optimum Water Content, %	
See Above	See Above	
Test Method	Liquid Limit	Plastic Limit
ASTM D1557, Method A	-	-
Preparation Method	% Gravel	% Sand
Dry	7.5	78.3
		Plasticity Index
		14.2
		Specific Gravity
		2.7 (est.)
		% Fines
		-
		% Oversize

PROJECT: Columbia Modules 10 and 11 Liner Construction

PROJECT NUMBER: C22011-2

TEST NUMBER: 10801

**LABORATORY
COMPACTION TEST**

CGC, Inc.

CHECKED BY:

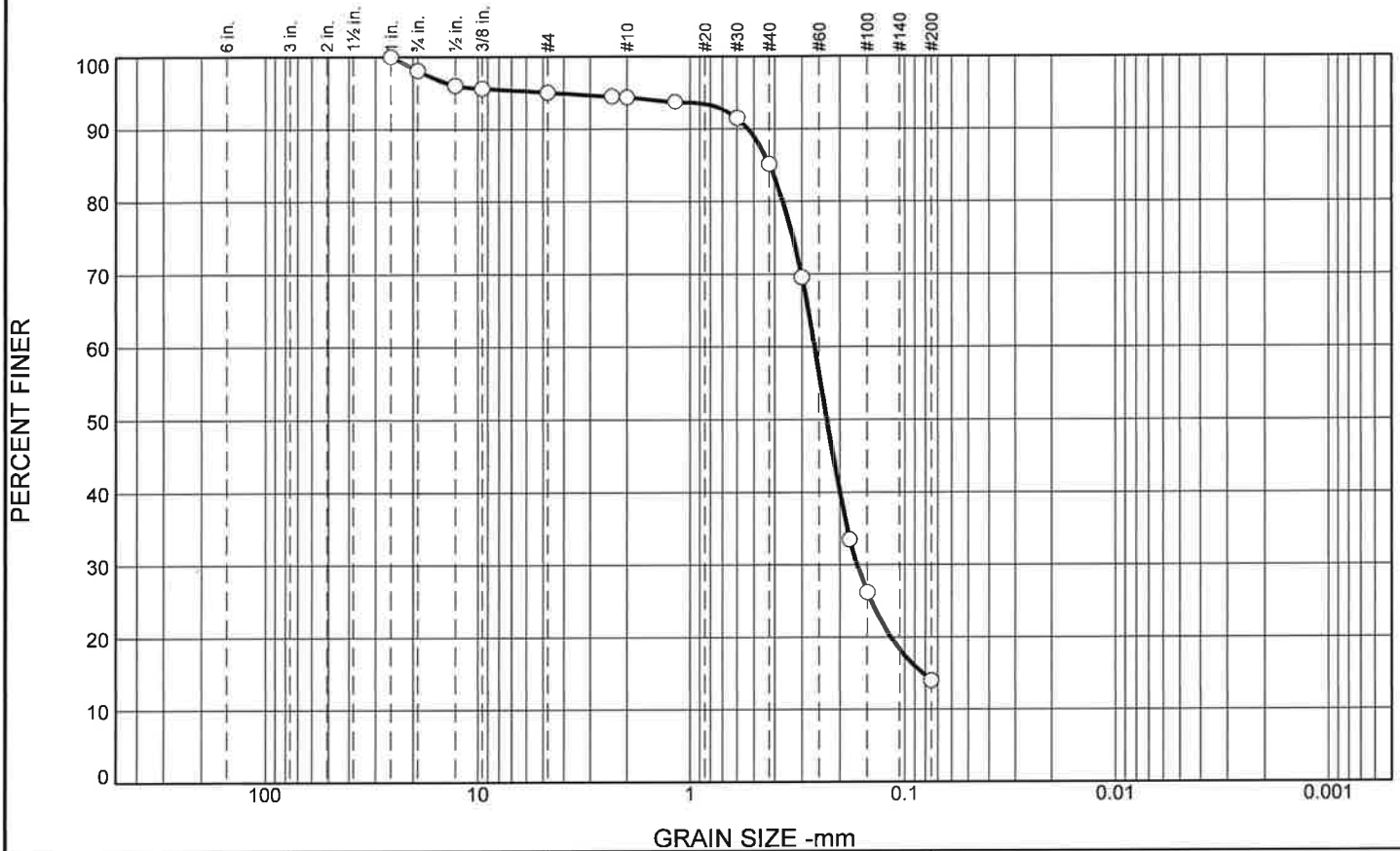
KJS

REVIEWED BY:

KJS

6-Apr-23

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	1.9	3.0	0.7	9.3	71.1	14.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
3/4	98.1		
1/2	96.1		
3/8	95.6		
#4	95.1		
#8	94.5		
#10	94.4		
#16	93.7		
#30	91.5		
#40	85.1		
#50	69.5		
#80	33.5		
#100	26.2		
#200	14.0		

Material Description

Brown Fine to Medium Sand, Some Silt, Little Gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.5331 D₈₅= 0.4229 D₆₀= 0.2620
D₅₀= 0.2300 D₃₀= 0.1670 D₁₅= 0.0824
D₁₀= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

* (no specification provided)

Sample Number: COL-GF-B2

Date: 4/13/23



Client: SCS Engineers
Project: Modules 10 and 11 Liner Construction SCS #25222157.00

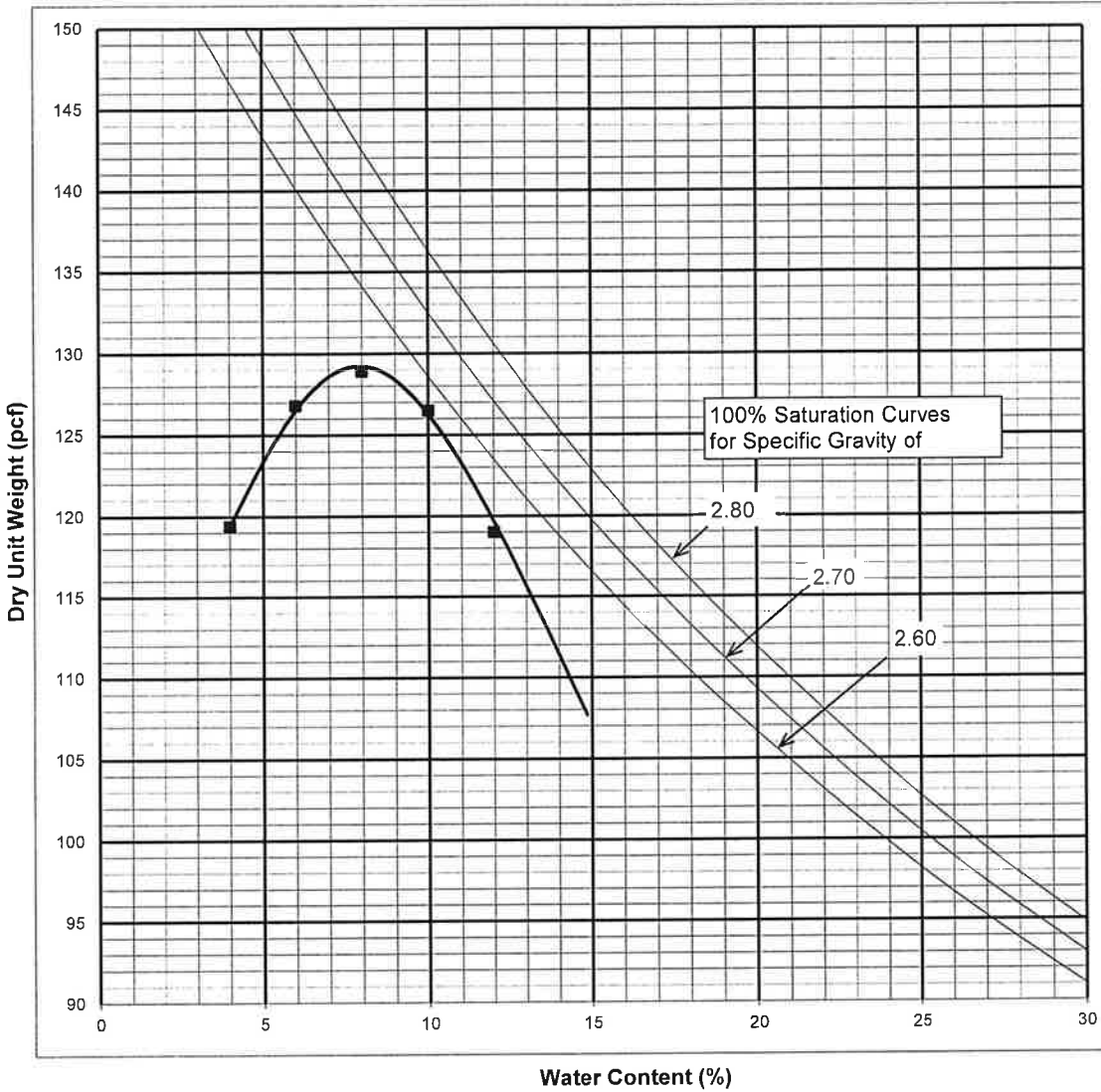
Project No: C22011-2

Figure

Tested By: JFS

Checked By: KJS

TEST REPORT



Specimen No.	Maximum Dry Unit Weight, pcf	Optimum Water Content, %
COL - GF - B2	128.9	8.0
Specimen Description		
Brown Fine to Medium Sand, Some Silt, Little Gravel		
Corrected Maximum Dry Unit Weight, pcf	Corrected Optimum Water Content, %	
See Above	See Above	
Test Method	Liquid Limit	Plastic Limit
ASTM D1557, Method A	-	-
Preparation Method	% Gravel	% Sand
Dry	4.9	81.1
		Plasticity Index
		14.0
		Specific Gravity
		2.7 (est.)
		% Fines
		-
		% Oversize

PROJECT: Columbia Modules 10 and 11 Liner Construction

PROJECT NUMBER: C22011-2

TEST NUMBER: 10802

**LABORATORY
COMPACTION TEST**

CGC, Inc.

CHECKED BY:

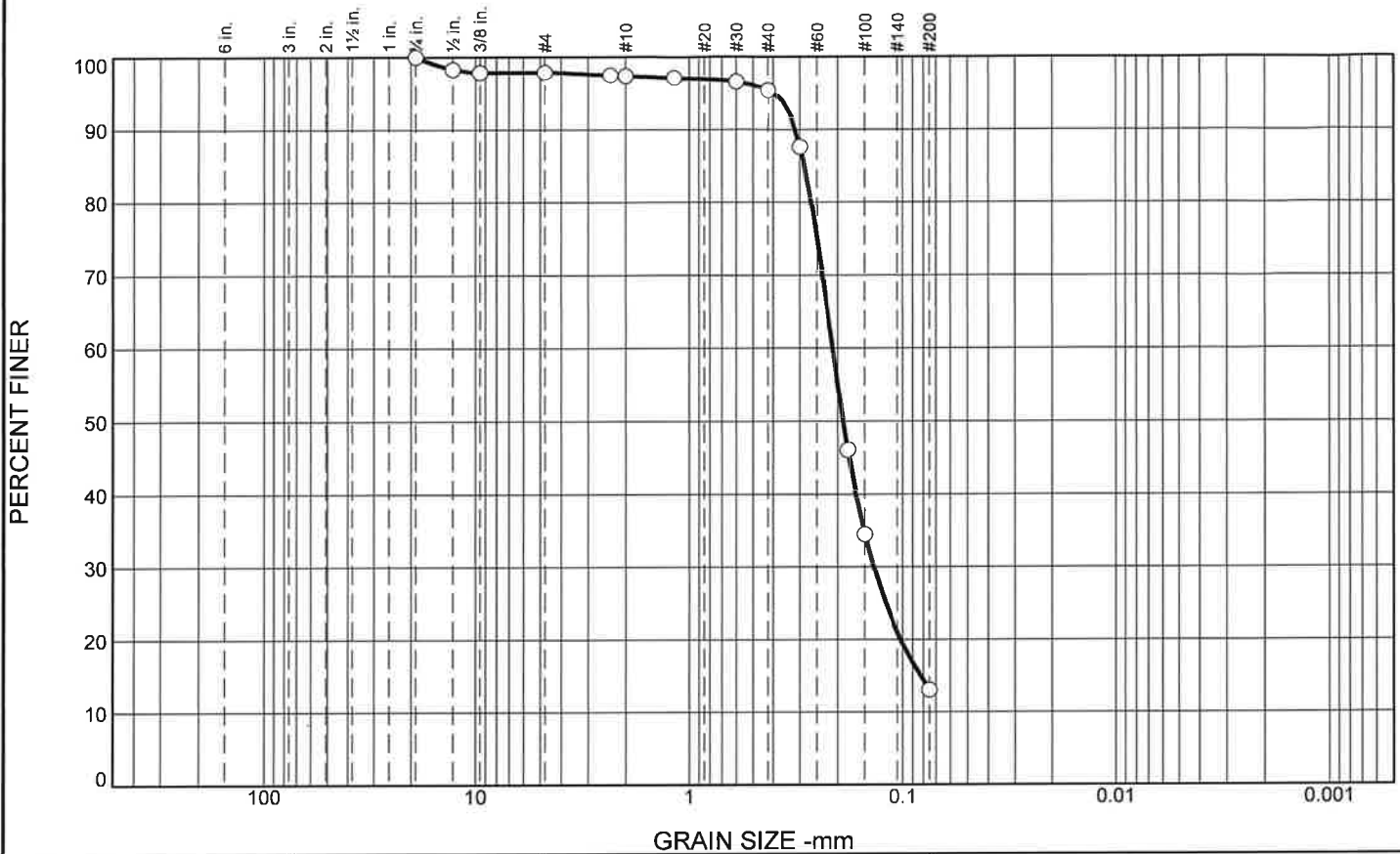
KJS

REVIEWED BY:

KJS

6-Apr-23

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.1	0.5	2.0	82.3	13.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4	100.0		
1/2	98.3		
3/8	97.9		
#4	97.9		
#8	97.5		
#10	97.4		
#16	97.1		
#30	96.6		
#40	95.4		
#50	87.6		
#80	46.1		
#100	34.5		
#200	13.1		

Material Description

Brown Fine Sand, Some Silt, Trace Gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.3157 D₈₅= 0.2866 D₆₀= 0.2120
D₅₀= 0.1891 D₃₀= 0.1369 D₁₅= 0.0826
D₁₀= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

* (no specification provided)

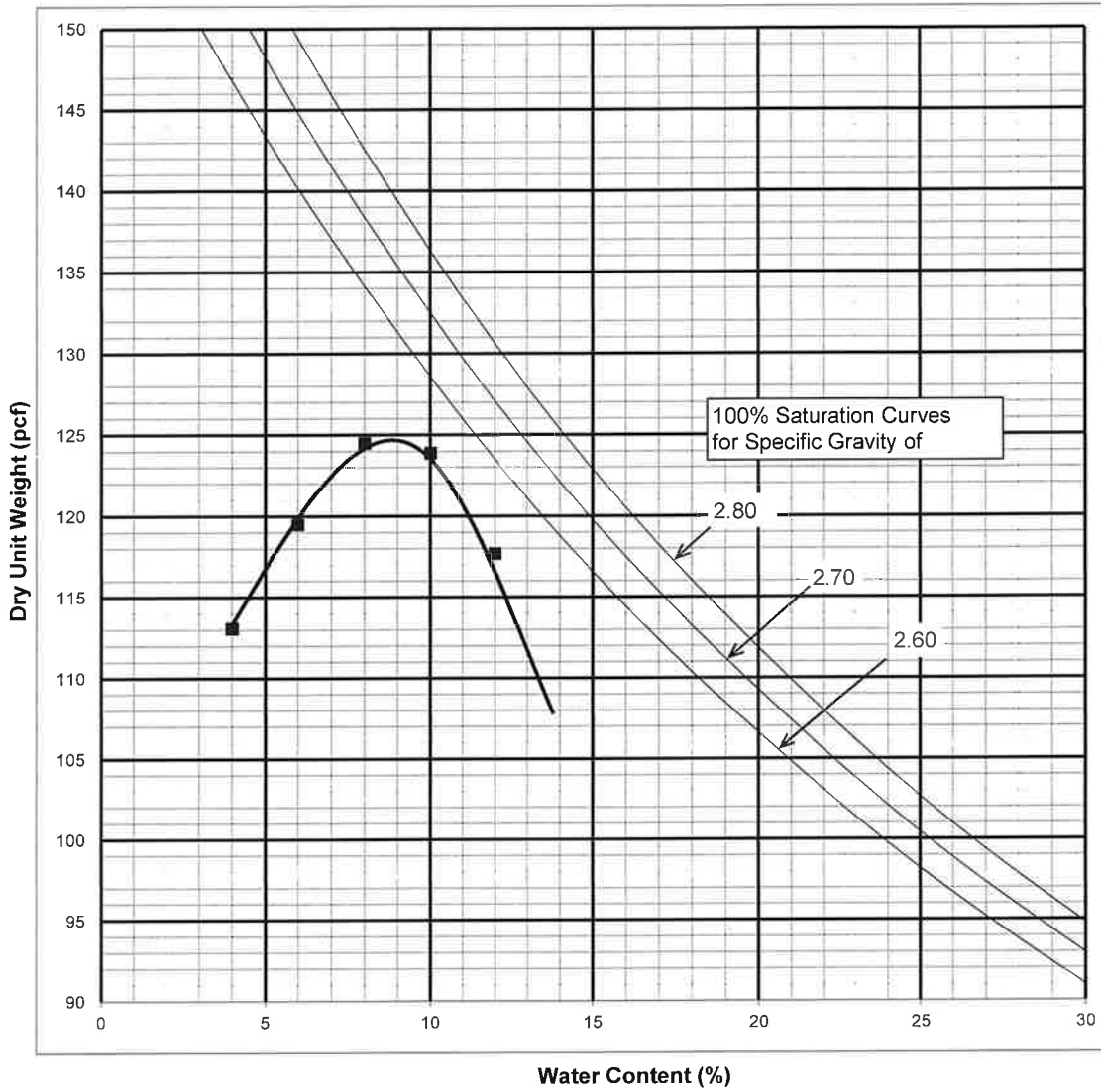
Sample Number: COL-GF-B3

Date: 4/14/23

	<p>Client: SCS Engineers</p> <p>Project: Modules 10 and 11 Liner Construction SCS #25222157.00</p> <p>Project No: C22011-2</p>	<p>Figure</p>
--	---	----------------------

Tested By: JFS **Checked By:** KJS

TEST REPORT



Specimen No.	Maximum Dry Unit Weight, pcf	Optimum Water Content, %			
COL - GF - B3	124.7	8.5			
Specimen Description					
Brown Fine Sand, Some Silt, Trace Gravel					
Corrected Maximum Dry Unit Weight, pcf	Corrected Optimum Water Content, %				
See Above	See Above				
Test Method	Liquid Limit	Plastic Limit	Plasticity Index	Specific Gravity	
ASTM D1557, Method A	-	-	-	2.7 (est.)	
Preparation Method	USCS	% Gravel	% Sand	% Fines	% Oversize
Dry	SM	13.1	84.8	2.1	-

PROJECT: Columbia Modules 10 and 11 Liner Construction

PROJECT NUMBER: C22011-2
 TEST NUMBER: 10910

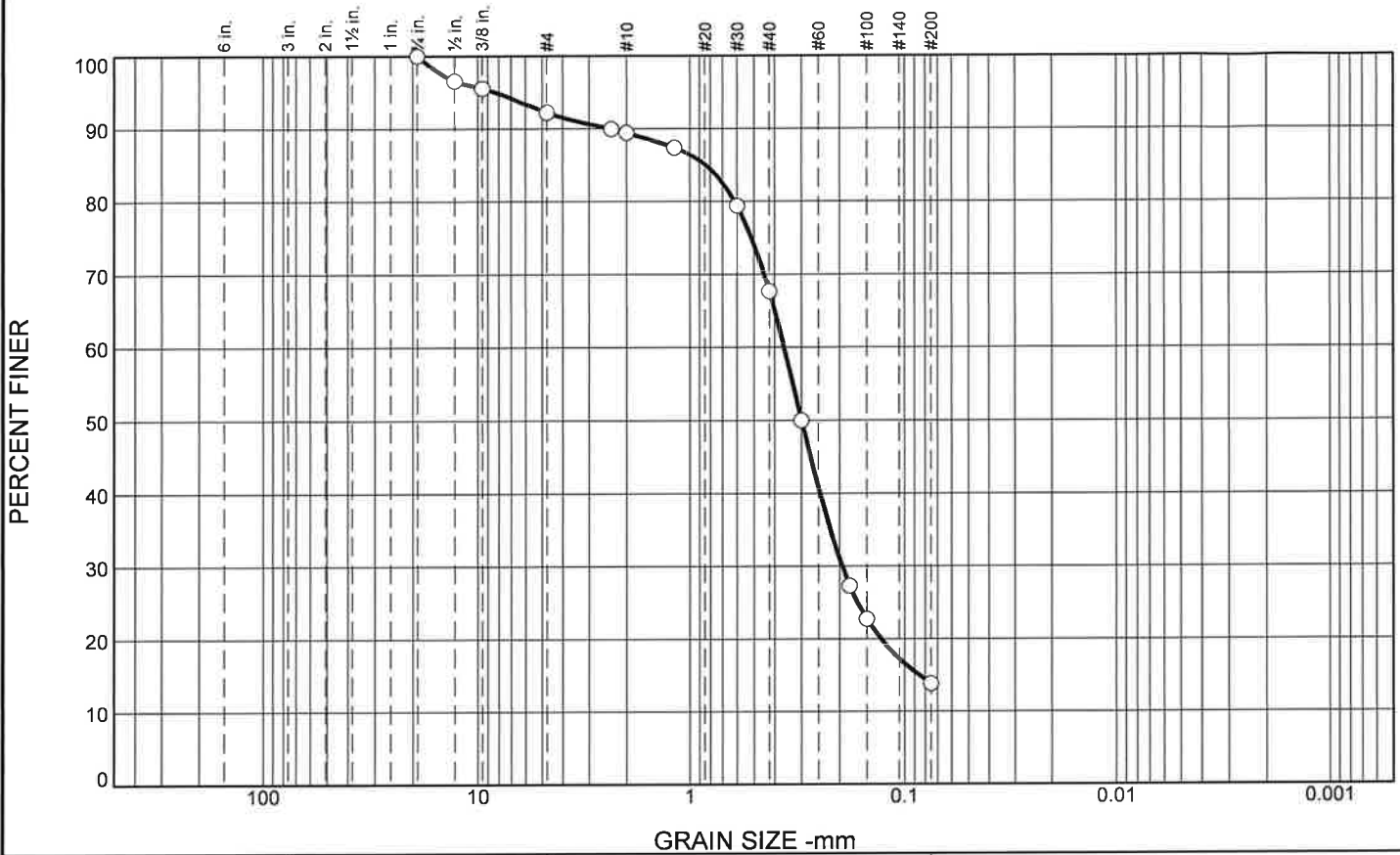
**LABORATORY
COMPACTION TEST**

CGC, Inc.

CHECKED BY: KJS REVIEWED BY: KJS

12-Apr-23

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	7.8	2.8	21.7	53.9	13.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4	100.0		
1/2	96.5		
3/8	95.5		
#4	92.2		
#8	90.0		
#10	89.4		
#16	87.3		
#30	79.4		
#40	67.7		
#50	50.0		
#80	27.3		
#100	22.7		
#200	13.8		

Material Description

Brown Fine to Medium Sand, Some Silt, Little Gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 2.3920 D₈₅= 0.8425 D₆₀= 0.3626
D₅₀= 0.3001 D₃₀= 0.1952 D₁₅= 0.0854
D₁₀= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

* (no specification provided)

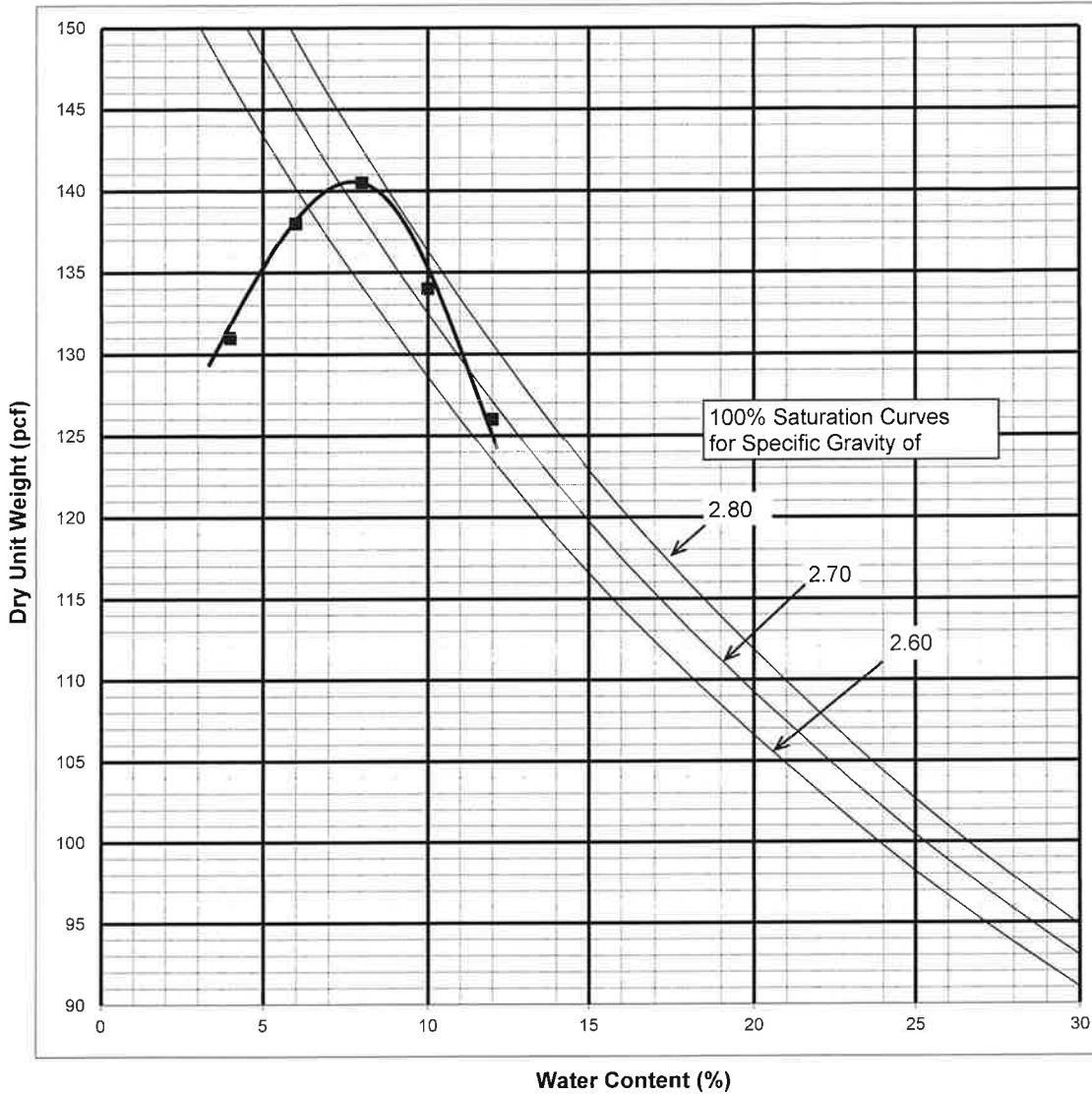
Sample Number: COL-GF-B4

Date: 4/14/232

	Client: SCS Engineers Project: Modules 10 and 11 Liner Construction SCS #25222157.00 Project No: C22011-2	Figure
--	--	---------------

Tested By: JFS **Checked By:** KJS

TEST REPORT



Specimen No.	Maximum Dry Unit Weight, pcf	Optimum Water Content, %
COL - GF - B4	140.5	8.0
Specimen Description		
Brown Fine to Medium Sand, Some Silt, Little Gravel		
Corrected Maximum Dry Unit Weight, pcf	Corrected Optimum Water Content, %	
See Above	See Above	
Test Method	Liquid Limit	Plastic Limit
ASTM D1557, Method A	-	-
Preparation Method	% Gravel	% Sand
Dry	13.8	78.4
USCS	% Fines	% Oversize
SM	7.8	-
	Plasticity Index	Specific Gravity
	-	2.7 (est.)

PROJECT: Columbia Modules 10 and 11 Liner Construction

PROJECT NUMBER: C22011-2


TEST NUMBER: 10901

**LABORATORY
COMPACTION TEST**

CGC, Inc.

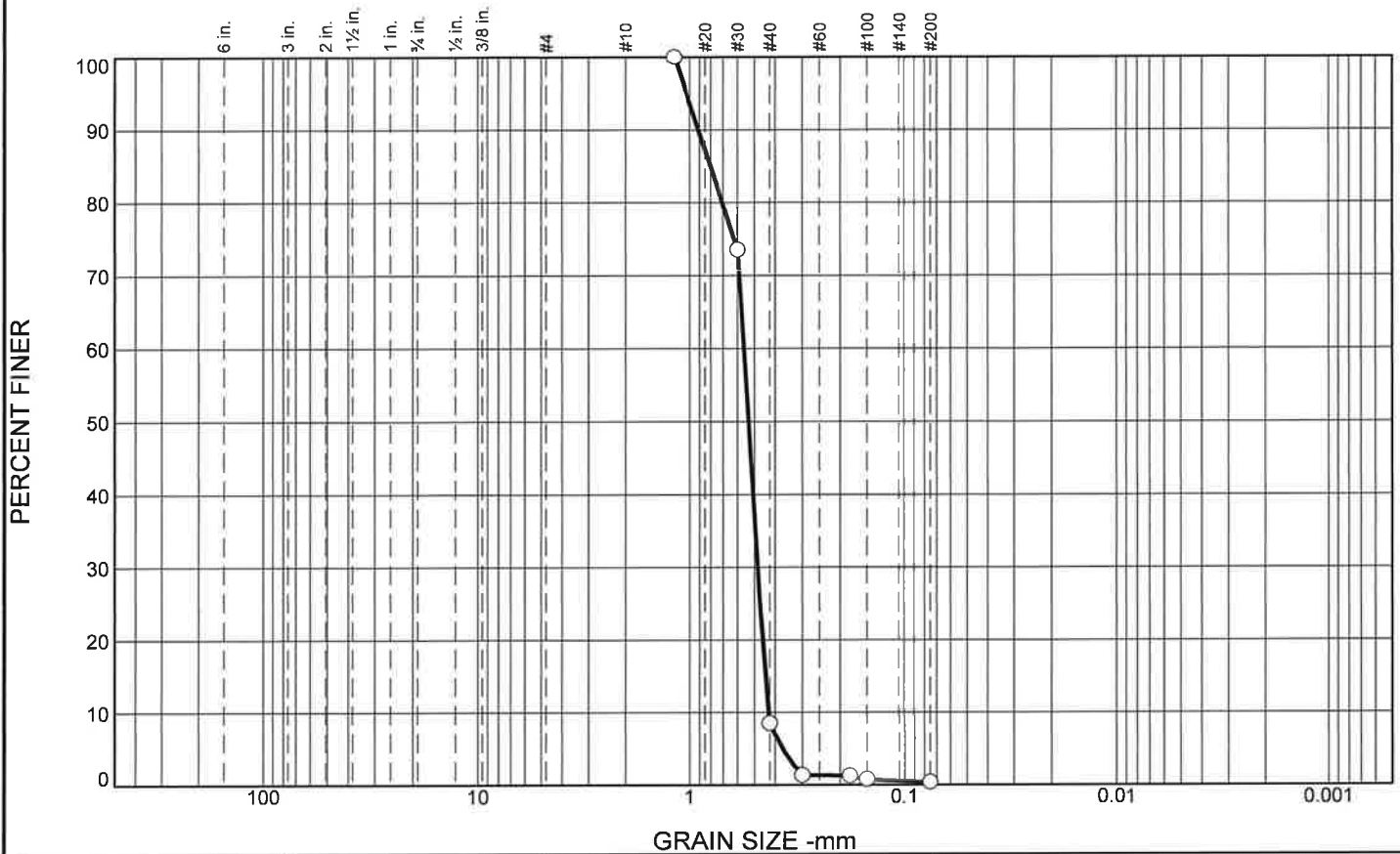
CHECKED BY: KJS REVIEWED BY: KJS

12-Apr-23



Appendix C
Drainage Layer Sample Result

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	91.5	8.1	0.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#16	100.0		
#30	73.5		
#40	8.5		
#50	1.4		
#80	1.3		
#100	0.8		
#200	0.4		

Material Description

Tan Fine to Medium Sand, Trace Silt

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 0.9143 D₈₅= 0.8049 D₆₀= 0.5588
D₅₀= 0.5327 D₃₀= 0.4841 D₁₅= 0.4454
D₁₀= 0.4301 C_u= 1.30 C_c= 0.97

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Sample Number: COL-DL-B13 (K)

Date: 5/10/23

	Client: SCS Engineers Project: Modules 10 and 11 Liner Construction SCS #25222157.00 Project No: C22011-2	Figure
--	--	---------------

Tested By: JFS **Checked By:** KJS



Job No. C22011-2
 Date: 5/8/2023

CONSTANT HEAD PERMEABILITY TEST (ASTM D2434-94)

CGC, Inc., 2921 Perry Street, Madison, WI (608) 288-4100; Fax: (608) 288-7887

PROJECT: Columbia Module 10 and 11 Liner Construction
 LOCATION: _____
 SAMPLE: COL-DL-B13(K)
 DEPTH (ft): -
 SOIL DESCRIPTION: Tan Fine to Medium Sand, Trace Silt


	<u>INITIAL</u>	<u>FINAL</u>
SAMPLE DIAMETER (cm)	10.16	10.16
SAMPLE LENGTH (cm)	11.65	11.65
MOISTURE CONTENT (%)	1.5	15.3
DRY DENSITY (lb/ft ³)	103.4	105.4
COMPACTION (%)	-	-

RUN	COEFFICIENT OF PERMEABILITY, k (cm/sec)
1	4.88E-02
2	5.08E-02
3	4.56E-02
4	4.01E-02
5	5.75E-02
6	4.05E-02
7	3.77E-02
8	3.18E-02

AVERAGE COEFFICIENT OF PERMEABILITY = 4.41E-02 cm/sec
 (Based on run numbers 1 through 8)

FORMULA:
$$k = \frac{Q \cdot L \cdot R_T}{h \cdot A \cdot t}$$

REMARKS: Sample lightly tamped into 4"-diameter permeameter in three lifts.



Appendix D
Geosynthetic Personnel Resumes

FIELD RESUME FOR: Jose Vargas

Jose started with Geo-Synthetics Systems, LLC. on September 11th, 2008. Jose's main duty for Geo-Synthetics Systems, LLC. is as a Superintendent and has been in the Flexible Membrane Liner industry for 21 years.

EXPERIENCE: Combined Square Footage: 105 million

LININGS INSTALLED: HDPE, LLPE, GCL, Geocomposite, PVC, RPP, XR-5, EPDEM and Geotextile

TYPES OF PROJECTS: Landfills, Landfill Caps, Ponds, Wastewater Lagoons, Containment Structures and Methane Barriers

EQUIPMENT KNOWLEDGE: Has extensive knowledge in maintaining and/or operating the following equipment:

- Grinder
- Generator
- ATV
- Wedge Welder
- Extrusion Welder
- Sewing Machine
- Liester
- V-Box
- Telescopic Lifts
- Tracked Skidsters
- Tensiometer
- Wheel & Track Loaders

TRAINING:

- In-Field Training
- 40hr. OSHA
- MSHA
- CPR/First Aid Certification
- IAGI Certification

FIELD RESUME FOR: Pedro Garcia

Pedro started with Geo-Synthetics Systems, LLC. on May 2nd, 2016. Pedro's main duty for Geo-Synthetics Systems, LLC. is as a Foreman and has been in the Flexible Membrane Liner industry for 12 years.

EXPERIENCE: Combined Square Footage: 60 million

LININGS INSTALLED: HDPE, LLPE, GCL, Geocomposite, PVC and Geotextile

TYPES OF PROJECTS: Landfills, Landfill Caps, Ponds, Lagoons, Secondary Containment Structures

EQUIPMENT KNOWLEDGE: Has extensive knowledge in maintaining and/or operating the following equipment:

- Grinder
- Generator
- ATV
- Wedge Welder
- Extrusion Welder
- Sewing Machine

TRAINING:

- In-Field Training
- 10hr OSHA
- MSHA
- 8hr HazWop

FIELD RESUME FOR: Saul Rivas

Saul started with Geo-Synthetics Systems, LLC. on April 4th, 2012. Saul's main duty for Geo-Synthetics Systems, LLC. is as a Quality Controller and has been in the Flexible Membrane Liner industry for 14 years.

EXPERIENCE: Combined Square Footage: 70 million

LININGS INSTALLED: HDPE, LLPE, GCL, PVC, RPP, RPE, XR-5, Geocomposite and Geotextile

TYPES OF PROJECTS: Landfills, Landfill Caps, Ponds, Wastewater Treatment Plants and Containment Structures

EQUIPMENT KNOWLEDGE: Has extensive knowledge in maintaining and/or operating the following equipment:

- Grinder
- Generator
- ATV
- Sewing Machine
- Leister
- V-Box
- Tensiometer
- Wedge Welder
- Extrusion Weld

TRAINING:

- In-Field Training
- CPR/First Aid Certification
- 10hr OSHA
- Part 46 MSHA

FIELD RESUME FOR: Blas Rivas

Blas started with Geo-Synthetics Systems, LLC. on May 5th, 2014. Blas' main duty for Geo-Synthetics Systems, LLC. is as a Master Seamer and has been in the Flexible Membrane Liner industry for 22 years.

EXPERIENCE: Combined Square Footage: 110,000 million

LININGS INSTALLED: HDPE, LLPE, PVC, RPP, RPE, GCL, Geocomposite and Geotextile

TYPES OF PROJECTS: Landfills, Landfill Caps, Wastewater Lagoons, Ponds, and Containment Structures

EQUIPMENT KNOWLEDGE: Has extensive knowledge in maintaining and/or operating the following equipment:

- Tensiometer
- Wedge Welder
- Extrusion Welder
- Sewing Machine
- V-Box
- Leister
- Generator
- Grinder
- ATV
- Telescopic Lifts
- Tracked Skidsters
- Wheel & Track Loaders

TRAINING:

- In-Field Training
- 40HR. OSHA
- CPR/First Aid Certified
- Part 48 MSHA

FIELD RESUME FOR: Esequiel Rivas

Esequiel started with Geo-Synthetics Systems, LLC. on May 14th, 2019. Esequiel's main duty for Geo-Synthetics Systems, LLC. is as a Technician and has been in the Flexible Membrane Liner industry for 2 years.

EXPERIENCE: Combined Square Footage: 10 million

LININGS INSTALLED: HDPE, LLPE, GCL, Geocomposite and Geotextile

TYPES OF PROJECTS: Landfills, Landfill Caps

EQUIPMENT KNOWLEDGE: Has extensive knowledge in maintaining and/or operating the following equipment:

- Grinder
- Generator
- ATV

TRAINING:

- In-Field Training

FIELD RESUME FOR: Jose Martinez Jr.

Jose started with Geo-Synthetics Systems, LLC. on May 11th, 2020. Jose's main duty for Geo-Synthetics Systems, LLC. is as a Technician and has been in the Flexible Membrane Liner industry for 4 years.

EXPERIENCE: Combined Square Footage: 20 million

LININGS INSTALLED: HDPE, LLPE, GCL, Geocomposite and Geotextile

TYPES OF PROJECTS: Landfills, Landfill Caps, Ponds and Containment Structures

EQUIPMENT KNOWLEDGE: Has extensive knowledge in maintaining and/or operating the following equipment:

- Sewing Machine
- Wedge Welder
- Generator
- Grinder
- ATV

TRAINING:

- In-Field Training

FIELD RESUME FOR: Jose Salazar-Martinez Sr.

Jose started with Geo-Synthetics Systems, LLC. on May 14th, 2016. Jose' main duty for Geo-Synthetics Systems, LLC. is as a Technician and has been in the Flexible Membrane Liner industry for 9 years.

EXPERIENCE: Combined Square Footage: 45 million

LININGS INSTALLED: HDPE, LLPE, GCL, Geocomposite, PVC and Geotextile

TYPES OF PROJECTS: Landfills, Landfill Caps, Lagoons, Secondary Containment

EQUIPMENT KNOWLEDGE: Has extensive knowledge in maintaining and/or operating the following equipment:

- Grinder
- Generator
- ATV
- Wedge Welder
- Extrusion Welder
- Sewing Machine
- Leister

TRAINING:

- In-Field Training
- 10hr OSHA
- MSHA
- 8hr HazWop

FIELD RESUME FOR: Franco Rivas

Franco started with Geo-Synthetics Systems, LLC. on May 8th, 2013. Franco's main duty for Geo-Synthetics Systems, LLC. is as a Technician and has been in the Flexible Membrane Liner industry for 15 years.

EXPERIENCE: Combined Square Footage: 75,000 million

LININGS INSTALLED: HDPE, LLPE, GCL, RPP, RPE, XR-5 Geocomposite and Geotextile

TYPES OF PROJECTS: Landfills, Landfill Caps, Wastewater Lagoons, Wastewater Treatment Plants, Ponds and Containment Structures

EQUIPMENT KNOWLEDGE: Has extensive knowledge in maintaining and/or operating the following equipment:

- Extrusion Welder
- Sewing Machine
- Tensiometer
- Wedge Welder
- V-Box
- Leister
- Generator
- Grinder
- ATV
- Telescopic Lifts
- Tracked Skidster
- Wheel & Track Loaders

TRAINING:

- In-Field Training
- 40HR. OSHA
- Part 48 MSHA

FIELD RESUME FOR: Jose Hernandez

Jose started with Geo-Synthetics Systems, LLC. on May 27th, 2002. Jose's main duty for Geo-Synthetics Systems, LLC. is as a Technician and has been in the Flexible Membrane Liner industry for 17 years.

EXPERIENCE: Combined Square Footage: 85 million

LININGS INSTALLED: HDPE, LLPE, GCL, RPP, RPE, XR-5, PVC, Geocomposite and Geotextile

TYPES OF PROJECTS: Landfills, Landfill Caps, Ponds, Lagoons, Wastewater Treatment Plant and Sancondary Containment Structures

EQUIPMENT KNOWLEDGE: Has extensive knowledge in maintaining and/or operating the following equipment:

- Sewing Machine
- Wedge Welder
- Extrusion Weld
- Lesiter
- V-Box
- Grinder
- Generator
- Grinder
- ATV
- Telescopic Lifts
- Tracked Skidsters
- Wheel & Track Loaders

TRAINING:

- In-Field Training
- CPR/First Aid Certification
- 40HR. OSHA
- Part 48 MSHA

FIELD RESUME FOR: Francisco Perez

Francisco started with Geo-Synthetics Systems, LLC. on March 20th, 2015. Francisco's main duty for Geo-Synthetics Systems, LLC. is as a Technician and has been in the Flexible Membrane Liner industry for 6 years.

EXPERIENCE: Combined Square Footage: 30 million

LININGS INSTALLED: HDPE, LLPE, GCL, Geocomposite, PVC and Geotextile

TYPES OF PROJECTS: Landfills, Landfill Caps, Secondary Containment

EQUIPMENT KNOWLEDGE: Has extensive knowledge in maintaining and/or operating the following equipment:

- ◆ Grinder
- ◆ Generator
- ◆ ATV
- ◆ Wedge Welder
- ◆ Extrusion Welder
- ◆ Sewing Machine
- ◆ Leister

TRAINING:

- ◆ In-Field Training
- ◆ 10hr OSHA
- ◆ MSHA
- ◆ 8hr HazWop

FIELD RESUME FOR: Dionicio Ledesma Martinez

Dionicio started with Geo-Synthetics Systems, LLC. on April 17th, 2023. Dionicio main duty for Geo-Synthetics Systems, LLC. is as a Technician and has been in the Flexible Membrane Liner industry for 18 years.

EXPERIENCE: Combined Square Footage: 90 million

LININGS INSTALLED: HDPE, LLPE, GCL, Geocomposite and Geotextile


TYPES OF PROJECTS: Landfills, Landfill Caps

EQUIPMENT KNOWLEDGE: Has extensive knowledge in maintaining and/or operating the following equipment:

- Grinder
- Extrusion Welder
- Sewing Machine
- Tensiometer
- Generator
- ATV

TRAINING:

- In-Field Training
- 10hr OSHA



Appendix E
Tensiometer Calibration Certifications

Demtech Services, Inc.
Placerville, California, USA

CALIBRATION CERTIFICATE

Tensiometer Model:	Pro-Tester T-0100		
Device Calibrated:	S-Type load cell	Calibration Apparatus:	
Range:	0 - 750 lbs. Tension	Pro-Cal unit, model TC-0100/A	
Model No:	M2405-750A-00		
Serial No:	240716	Dead Weight:	Reference Cell:
A/D Module Model No:	T-029	W1	R1
A/D Module Serial No:	4309240716	W2	R2
Channel No:	N/A	W3	R3

Indicator reading with no load:

Offset: Scale:

Applied Force lbs

2
52
102
152
202
252
302

Cell Response:

2
52
102
152
202
252
302

Deviation Error:

0.00
0.00
0.00
0.00
0.00
0.00
0.00

Total Deviation Error (%):

Temperature at time of calibration: 73 degrees F
Excitation Voltage: V DC

This calibration conforms to the standards set by ASTM E4 and is traceable to NIST standards

Note: A/D Module and load cell above have been systems calibrated and are considered a matched pair. In general, calibrated A/D Modules and load cells are not interchangeable.

Frank Kawa


Date: 05/02/23



CALIBRATION CERTIFICATE

Tensiometer Model: Pro-Tester [T-0100/A or T-0100SE/A]
 Device Calibrated: S-Type load cell Calibration Apparatus:
 Range: 0 - 750 lbs. Tension
 Model No: XTS2-750 Pro-Cal unit, model TC-0100/A
 Serial No: 65862

A/D Module Model No: T-029 Dead Weight: Reference Cell:
 A/D Module Serial No: 1219065862 W1 2 R1 2
 Channel No: N/A W2 152 R2 152
 W3 302 R3 302

Indicator reading with no load: 0

Offset: 2.395871 Scale: 3.327546

Applied Force lbs.
2
52
102
152
202
252
302

Cell Response:
2
52
102
152
202
252
302


Deviation Error:
0.00
0.00
0.00
0.00
0.00
0.00
0.00

Total Deviation Error (%): 0.00%

Temperature at time of calibration: 73 degrees F
 Excitation Voltage: 5 V DC

This calibration conforms to the standards set by ASTM E4 and is traceable to NIST standards

Note: A/D Module and load cell above have been systems calibrated and are considered a matched pair. In general, calibrated A/D Modules and load cells are not interchangeable.

Calibration Technician: Frank Kawa Date: 05/02/23
 Signature: 

CALIBRATION CERTIFICATE

Tensiometer Model:

Pro-Tester [T-0100/A or T-0100SE/A]

Device Calibrated:

S-Type load cell

Range:

0 - 750 lbs. Tension

Calibration Apparatus:

Model No:

M2405-750#

Pro-Cal unit, model TC-0100/A

Serial No:

79000

A/D Module Model No:

T-029

Dead Weight:

W1

2

Reference Cell:

R1

2

A/D Module Serial No:

119079000

W2

152

R2

152

Channel No:

N/A

W3

302

R3

302

Indicator reading with no load:

0

Offset:

-4.305823

Scale:

3.329036

Applied Force lbs.

2
52
102
152
202
252
302

Cell Response:

2
52
102
152
202
252
302

Deviation Error:

0.00
0.00
0.00
0.00
0.00
0.00
0.00
0.00

Total Deviation Error (%):

0.00%

Temperature at time of calibration:

73 degrees F

Excitation Voltage:

5

V DC

This calibration conforms to the standards set by ASTM E4 and is traceable to NIST standards

Note: A/D Module and load cell above have been systems calibrated and are considered a matched pair. In general, calibrated A/D Modules and load cells are not interchangeable.

Calibration Technician:

Marc Scott

Date:

05/05/23

Signature:

Marc Scott

DEMTECH[®] Services Inc.

CALIBRATION CERTIFICATE

Tensiometer Model: Pro-Tester [T-0100/A or T-0100SE/A]

Device Calibrated: S-Type load cell
 Range: 0 - 750 lbs. Tension
 Model No:

M2405-750#

 Serial No:

80492

Calibration Apparatus:

Pro-Cal unit, model TC-0100/A

A/D Module Model No:

T-029

 A/D Module Serial No:

4117080492

 Channel No:

N/A

Dead Weight:	Reference Cell:		
W1 <table border="1" style="display: inline-table;"><tr><td>2</td></tr></table>	2	R1 <table border="1" style="display: inline-table;"><tr><td>2</td></tr></table>	2
2			
2			
W2 <table border="1" style="display: inline-table;"><tr><td>152</td></tr></table>	152	R2 <table border="1" style="display: inline-table;"><tr><td>152</td></tr></table>	152
152			
152			
W3 <table border="1" style="display: inline-table;"><tr><td>302</td></tr></table>	302	R3 <table border="1" style="display: inline-table;"><tr><td>302</td></tr></table>	302
302			
302			

Indicator reading with no load:

0

Offset:

-3.632739

 Scale:

3.320428

Applied Force lbs.

Cell Response:

Deviation Error:

2
52
102
152
202
252
302

2
52
102
152
202
252
302

0.00
0.00
0.00
0.00
0.00
0.00
0.00

Total Deviation Error (%):

0.00%

Temperature at time of calibration: 73 degrees F

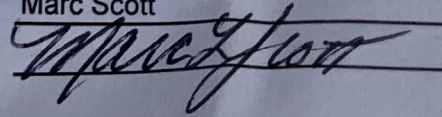
Excitation Voltage:

5


 V DC

This calibration conforms to the standards set by ASTM E4 and is traceable to NIST standards

Note: A/D Module and load cell above have been systems calibrated and are considered a matched pair. In general, calibrated A/D Modules and load cells are not interchangeable.

Calibration Technician: Marc Scott
 Signature: 

Date: 05/05/23



Appendix F
Subgrade Acceptance Forms

WORK ACCEPTANCE REPORT

PROJECT NAME: Alliant Columbia Mod10&11

LOCATION: Alliant Energy Pardeeville, WI JOB NO.: 722011

PROJECT OWNER: Alliant Energy PRIME CONTRACTOR: _____
(If GSI is not contracted with the Owner)

MATERIALS REPORT:

MATERIALS INSTALLED

QUANTITY INSTALLED

QUANTITY LEFT ON SITE

60Mill Textured (Solmax) SW corner

2,471'

Flap

W:33' L:630 SF 21,288'

ADDITIONAL WORK & NOTES (Location of material left on site, repairs, boots, batten, polylock or tie-in seaming, etc.)

*SW Corner Material is installed, Total Panels 3, Total SqFt 2471.

* Flap is made on the north side. Flap dimensions width 32'length 630', welded feet 1386 (Flap). *Total repairs 21

EQUIPMENT	Make/Model	Condition	Fuel Level	Hours
GSI Arrival: _____				
Demobilization: _____				

Demobilization: _____

Were quantities surveyed during or immediately after installation, prior to cover placement? _____

ACCEPTANCE:

All work, material, and equipment as referenced above has been jointly inspected by Geo-Synthetics, LLC and the Owner / Contractor, or his representative, and has found to be described in full accurately, and satisfactorily completed in accordance with the applicable project documents.

[Signature] 5/6/2023
Owner / Contractor Representative Signature Date

[Signature] 5/6/2023
Geo-Synthetics, LLC Representative Signature Date

Foreman Jason Brantler
Representative Name and Title

Jose Vargas Supervisor
Representative Name and Title

WORK ACCEPTANCE REPORT

PROJECT NAME: Alliant Columbia Mod10&11

LOCATION: Alliant Energy Pardeeville, WI JOB NO.: 722011

PROJECT OWNER: Alliant Energy PRIME CONTRACTOR: _____
(If GSI is not contracted with the Owner)

MATERIALS REPORT:

<u>MATERIALS INSTALLED</u>	<u>QUANTITY INSTALLED</u>	<u>QUANTITY LEFT ON SITE</u>
60Mill Textured (Solmax)	23,759SF	
Flap	W:33' L:630	

ADDITIONAL WORK & NOTES (Location of material left on site, repairs, boots, batten, polylock or tie-in seaming, etc.)

*SW Corner Material is installed, Total Panels 3, Total SqFt 2471.

* Flap is made on the north side. Flap dimensions width 32'length 630', welded feet 1386 (Flap). *Total repairs 21

<u>EQUIPMENT</u>	<u>Make/Model</u>	<u>Condition</u>	<u>Fuel Level</u>	<u>Hours</u>
GSI Arrival: _____				
Demobilization: _____				

Were quantities surveyed during or immediately after installation, prior to cover placement? _____

ACCEPTANCE:


All work, material, and equipment as referenced above has been jointly inspected by Geo-Synthetics, LLC and the Owner / Contractor, or his representative, and has found to be described in full accurately, and satisfactorily completed in accordance with the applicable project documents.

Jason Brantaw 5/6/2023
Owner / Contractor Representative Signature Date

Geo-Synthetics, LLC Representative Signature Date

Jason Brantaw Foreman
Representative Name and Title

Jose Vargas Supervisor
Representative Name and Title



Appendix G
Geosynthetics Installation Daily Field Reports

Owner Name: Wisconsin Power and Light Company
Project Name: Ash Ponds Closure and Modules 10 and 11 Liner Construction
Design Engineer: SCS Engineers
SCS Project Number: 25222157.00
Installation Contractor: Ames Construction, Inc.
Project Location: W8375 Murray Road, Pardeeville, WI 53954
Today's Task(s): Geomembrane of Module 11 north berm and southwest corner of Module 10

Report No. 42
Date: May 4, 2023
Work Start Time: 7:00
Work Stop Time: 19:00
SCS Arrival Time: 7:00
SCS Departure Time: 19:00

Weather Conditions:
a.m. 50 °F, Wind: 6 mph/S, Partly Cloudy
p.m. 68 °F, Wind: 15 mph/SW, Partly Cloudy

Contractors and Personnel On Site:

<u>Eric Altman - Superintendent (Ames)</u>	<u>Jason Brantner - Foreman (Ames)</u>
<u>Conor O'Dea - Project Safety Manager (Ames)</u>	<u>4 Laborers (Ames)</u>
<u>11 Operators (Ames)</u>	<u>9 Laborer (GSI)</u>
<u>2 Mechanics (Ames)</u>	<u>Zana Bajalan - Project Engineer (SCS Engineers)</u>
<u>Clinton Berning - Project Engineer (Ames)</u>	<u>3 Laborers (Northern Pipe, Inc.)</u>
<u>Joe Stone - Field Engineer (SCS Engineers)</u>	

Equipment On Site

<u>(3) Bulldozers - CAT - (1) D6T LGP, (2) D6</u>	<u>RTV - Kubota - X1140</u>	<u>(2) Excavator - CAT - 352</u>
<u>Wheel Loader - DEERE - 744L</u>	<u>Mini Excavator (CAT-308E2CR)</u>	<u>Komatsu long reach excavator - EX-21 (Dirt Works)</u>
<u>Water Truck - Freightliner - FL70</u>	<u>Sheep foot soil compactor - CAT - 815</u>	<u>Off-road haul truck (DEERE-410E-11)</u>
<u>(2) Off road haul truck - CAT - 745</u>	<u>Road Reclaimer (CAT-RM500B)</u>	<u>Off road haul truck - CAT - 740</u>
<u>Vibratory Smooth Drum Roller - CAT - CS56B</u>	<u>Cement Pig</u>	<u>Roughneck MO2855EL boat</u>
<u>Motor Grader - CAT-160M2 AWD</u>	<u>Fuel Truck - Mack - 5991002</u>	<u>Skid Steer - CAT - 299C (GSI)</u>
<u>(2) Skid Steer - CAT - 299D3(XE)</u>	<u>Excavator - CAT - 349F(L)</u>	
<u>(2) Off-road haul truck (DEERE-410E)</u>	<u>(2) Off-road haul truck (CAT-740)</u>	

Work Performed/Boundaries (Landfill Area and Modules 10 and 11 Liner Construction)

- GSI crew started work at 8:00am. The crew placed three geomembrane panels (P82-P84) at the southwest corner of Module 10. Trial welds were performed in the morning and again in the afternoon. The panels were extrusion welded. Seams and Repairs were Vacuum Box Tested.
- GSI repaired the geomembrane damage locations at north and west of Module 11. Geomembrane repairs were performed by tack welding a piece of geomembrane to the repair area by a leister. The patch was ground using a grinder before being welded with an extrusion weld machine. The repairs were tested using a vacuum box.
- 2 geomembrane destructs (DS-27 through DS-28) were collected and tested by GSI in the field. DS-27 field test results met the CQA requirements. Portion from the same destructs were sent to the lab for conformance testing. DS-28 did not meet the requirements. DS-28 was collected from repair #295. The entire repair and the other two repairs performed by the repairer will be capped.
- Ames added sand material to the north berm and continued excavating the anchor trench.
- GSI placed three geomembrane panels (P85-P87) at the north berm of Module 11. The panels were extrusion welded.

Testing Equipment Used/Observed and Calibration/Re-Calibration Documentation

N/A

Field Tests Completed/Observed and Samples Collected

- Seams and Repairs were Vacuum Box Tested

Lab Test Results

N/A

Material(s) Delivered to Site

N/A

Joe Stone/Zana Bajalan

Resident Project Representative

Phillip Gearing

Project Manager

Owner Name: Wisconsin Power and Light Company
Project Name: Ash Ponds Closure and Modules 10 and 11 Liner Construction
Design Engineer: SCS Engineers
SCS Project Number: 25222157.00
Installation Contractor: Ames Construction, Inc.
Project Location: W8375 Murray Road, Pardeeville, WI 53954
Today's Task(s): Geomembrane of Module 11 north berm and southwest corner of Module 10

Report No. 43
Date: May 5, 2023
Work Start Time: 7:00
Work Stop Time: 19:00
SCS Arrival Time: 7:00
SCS Departure Time: 19:00

Weather Conditions: a.m. 72 °F, Wind: 11 mph/S, Partly Cloudy
p.m. 75 °F, Wind: 14 mph/S, Partly Cloudy

Contractors and Personnel On Site:

<u>Eric Altman - Superintendent (Ames)</u>	<u>Jason Brantner - Foreman (Ames)</u>
<u>Conor O'Dea - Project Safety Manager (Ames)</u>	<u>4 Laborers (Ames)</u>
<u>11 Operators (Ames)</u>	<u>9 Laborer (GSI)</u>
<u>2 Mechanics (Ames)</u>	<u>Zana Bajalan - Project Engineer (SCS Engineers)</u>
<u>Clinton Berning - Project Engineer (Ames)</u>	<u>Ryan Matzuk - Geologist (SCS Engineers)</u>
<u>Joe Stone - Field Engineer (SCS Engineers)</u>	

Equipment On Site

<u>(3) Bulldozers - CAT - (1) D6T LGP, (2) D6</u>	<u>RTV - Kubota - X1140</u>	<u>(2) Excavator - CAT - 352</u>
<u>Wheel Loader - DEERE - 744L</u>	<u>Mini Excavator (CAT-308E2CR)</u>	<u>Komatsu long reach excavator - EX-21 (Dirt Works)</u>
<u>Water Truck - Freightliner - FL70</u>	<u>Sheep foot soil compactor - CAT - 815</u>	<u>Off-road haul truck (DEERE-410E-11)</u>
<u>(2) Off road haul truck - CAT - 745</u>	<u>Road Reclaimer (CAT-RM500B)</u>	<u>Off road haul truck - CAT - 740</u>
<u>Vibratory Smooth Drum Roller - CAT - CS56B</u>	<u>Cement Pig</u>	<u>Roughneck MO2855EL boat</u>
<u>Motor Grader - CAT-160M2 AWD</u>	<u>Fuel Truck - Mack - 5991002</u>	<u>Skid Steer - CAT - 299C (GSI)</u>
<u>(2) Skid Steer - CAT - 299D3(XE)</u>	<u>Excavator - CAT - 349F(L)</u>	
<u>(2) Off-road haul truck (DEERE-410E)</u>	<u>(2) Off-road haul truck (CAT-740)</u>	

Work Performed/Boundaries (Landfill Area and Modules 10 and 11 Liner Construction)

- GSI crew started work at 8:00am. The crew placed seven geomembrane panels (P85-P91) on the north berm of Module 11. Trial welds were performed in the morning and again in the afternoon. The panels were extrusion welded. Seams and Repairs were Vacuum Box Tested
- 3 geomembrane destructs (DS-29 through DS-31) were collected and tested by GSI in the field. DS-29 and DS-31 field test results met the CQA requirements. DS-30 field testing did not meet the requirements. Destruct DS-30A was collected 5 feet before the original destruct. The area from DS-30A to the end of the seam was capped. DS-30A field test results met CQA requirements. Portion from the same destructs were sent to the lab for conformance testing.
- The anchor trench north of Module 11 berm was backfilled with general fill.

Testing Equipment Used/Observed and Calibration/Re-Calibration Documentation

N/A

Field Tests Completed/Observed and Samples Collected

- DS-29 (passed), DS-30(failed), DS-30A (passed) and DS-31(passed).

Lab Test Results

- DS-27 (passed)

Material(s) Delivered to Site

N/A

Joe Stone/Zana Bajalan

Resident Project Representative

Phillip Gearing

Project Manager

Owner Name:	<u>Wisconsin Power and Light Company</u>	Report No.	<u>44</u>
Project Name:	<u>Ash Ponds Closure and Modules 10 and 11 Liner Construction</u>	Date:	<u>May 6, 2023</u>
Design Engineer:	<u>SCS Engineers</u>	Work Start Time	<u>6:00</u>
SCS Project Number:	<u>25222157.00</u>	Work Stop Time:	<u>13:30</u>
Installation Contractor:	<u>Ames Construction, Inc.</u>	SCS Arrival Time:	<u>7:00</u>
Project Location:	<u>W8375 Murray Road, Pardeeville, WI 53954</u>	SCS Departure Time:	<u>12:00</u>
Today's Task(s):	<u>Dewatering, geomembrane of Module 11 north berm and southwest corner of Module 10, abandonment of 3 dewatering wells</u>		

Weather Conditions:	<u>a.m. 59 °F, Wind: 11 mph/SE, Cloudy</u>
	<u>p.m. 64 °F, Wind: 16 mph/S, Cloudy</u>

Contractors and Personnel On Site:

<u>Eric Altman - Superintendent (Ames)</u>	<u>Zana Bajalan - Project Engineer (SCS Engineers)</u>	
<u>Jason Brantner - Foreman (Ames)</u>	<u>Meghan Blodgett - Hydrogeologist (SCS Engineers)</u>	
<u>6 Operators (Ames)</u>		
<u>9 Laborer (GSI)</u>		
<u>2 Laborers (Ames)</u>		
<u>Joe Stone - Field Engineer (SCS Engineers)</u>		

Equipment On Site

<u>(3) Bulldozers - CAT - (1) D6T LGP, (2) D6</u>	<u>RTV - Kubota - X1140</u>	<u>(2) Excavator - CAT - 352</u>
<u>Wheel Loader - DEERE - 744L</u>	<u>Mini Excavator (CAT-308E2CR)</u>	<u>Komatsu long reach excavator - EX-21 (Dirt Works)</u>
<u>Water Truck - Freightliner - FL70</u>	<u>Sheep foot soil compactor - CAT - 815</u>	<u>Off-road haul truck (DEERE-410E-11)</u>
<u>(2) Off road haul truck - CAT - 745</u>	<u>Road Reclaimer (CAT-RM500B)</u>	<u>Off road haul truck - CAT - 740</u>
<u>Vibratory Smooth Drum Roller - CAT - CS56B</u>	<u>Cement Pig</u>	<u>Roughneck MO2855EL boat</u>
<u>Motor Grader - CAT-160M2 AWD</u>	<u>Fuel Truck - Mack - 5991002</u>	<u>Skid Steer - CAT - 299C (GSI)</u>
<u>(2) Skid Steer - CAT - 299D3(XE)</u>	<u>Excavator - CAT - 349F(L)</u>	
<u>(2) Off-road haul truck (DEERE-410E)</u>	<u>(2) Off-road haul truck (CAT-740)</u>	

Work Performed/Boundaries (Landfill Area and Modules 10 and 11 Liner Construction)

- GSI crew started work at 8:00am. The crew completed the vacuum box testing for the remainder of the geomembrane seams. In addition, the new flap was connected and welded to the existing geomembrane flap at the southwest corner of Module 10. A trial welds were performed in the morning. The panels were extrusion welded.
- SCS surveyed repairs and panel placements.

Testing Equipment Used/Observed and Calibration/Re-Calibration Documentation

N/A

Field Tests Completed/Observed and Samples Collected

- DS-29 (passed), DS-30(failed), and DS-31 (passed)

Lab Test Results

N/A

Material(s) Delivered to Site

N/A

Joe Stone/Zana Bajalan

Resident Project Representative

Phillip Gearing

Project Manager

Owner Name:	<u>Wisconsin Power and Light Company</u>	Report No.	<u>48</u>
Project Name:	<u>Ash Ponds Closure and Modules 10 and 11 Liner Construction</u>	Date:	<u>May 11, 2023</u>
Design Engineer:	<u>SCS Engineers</u>	Work Start Time	<u>7:00</u>
SCS Project Number:	<u>25222157.00</u>	Work Stop Time:	<u>20:00</u>
Installation Contractor:	<u>Ames Construction, Inc.</u>	SCS Arrival Time:	<u>7:00</u>
Project Location:	<u>W8375 Murray Road, Pardeeville, WI 53954</u>	SCS Departure Time:	<u>20:00</u>
Today's Task(s):	<u>Dewatering, hauling CCR material, re-handling, primary ash pond slope stripping, GSI additional destructs and repairs</u>		

Weather Conditions:
 a.m. 77 °F, Wind: 6 mph/S, Partly Cloudy
 p.m. 81 °F, Wind: 9 mph/S, Partly Cloudy

Contractors and Personnel On Site:

<u>Eric Altman - Superintendent (Ames)</u>	<u>Conor O'Dea - Project Safety Manager (Ames)</u>
<u>Jason Brantner - Foreman (Ames)</u>	<u>Phil Gearing - Project Manager (SCS Engineers)</u>
<u>16 Operators (Ames)</u>	
<u>Joe Stone - Field Engineer (SCS Engineers)</u>	
<u>2 Laborers (Ames)</u>	
<u>Clinton Berning - Project Engineer (Ames)</u>	

Equipment On Site

<u>(3) Bulldozers - CAT - (1) D6T LGP, (2) D6</u>	<u>RTV - Kubota - X1140</u>	<u>(2) Excavator - CAT - 352</u>
<u>Wheel Loader - DEERE - 744L</u>	<u>Mini Excavator (CAT-308E2CR)</u>	<u>Komatsu long reach excavator - EX-21 (Dirt Works)</u>
<u>Water Truck - Freightliner - FL70</u>	<u>Sheep foot soil compactor - CAT - 815</u>	<u>Off-road haul truck (DEERE-410E-11)</u>
<u>(2) Off road haul truck - CAT - 745</u>	<u>Road Reclaimer (CAT-RM500B)</u>	<u>Off road haul truck - CAT - 740</u>
<u>Vibratory Smooth Drum Roller - CAT - CS56B</u>	<u>Cement Pig</u>	<u>Roughneck MO2855EL boat</u>
<u>Motor Grader - CAT-160M2 AWD</u>	<u>Fuel Truck - Mack - 5991002</u>	<u>Off-road haul truck (Volvo A45G)</u>
<u>(2) Skid Steer - CAT - 299D3(XE)</u>	<u>Excavator - CAT - 349F(L)</u>	
<u>(2) Off-road haul truck (DEERE-410E)</u>	<u>(2) Off-road haul truck (CAT-740)</u>	

Work Performed/Boundaries (Landfill Area and Modules 10 and 11 Liner Construction)

- GSI returned to collect additional destructs to track failed destruct DS-30 and further track failed destruct DS-28 to passing destruct DS-29. and repair areas where failure occurred. Repaired areas were vacuum box tested. Trial welds were performed. Sample of destruct sent to lab for testing.

CCR Material Tracking**Testing Equipment Used/Observed and Calibration/Re-Calibration Documentation**

N/A

Field Tests Completed/Observed and Samples Collected

- DS-29A, DS-30B/B1/B2(failed), DS-30B3 (passed), and DS-32(passed)

Lab Test Results

N/A

Material(s) Delivered to Site

N/A

Joe Stone/Phil Gearing

Resident Project Representative

Phillip Gearing

Project Manager

Owner Name:	<u>Wisconsin Power and Light Company</u>	Report No.	<u>49</u>
Project Name:	<u>Ash Ponds Closure and Modules 10 and 11 Liner Construction</u>	Date:	<u>May 12, 2023</u>
Design Engineer:	<u>SCS Engineers</u>	Work Start Time	<u>7:00</u>
SCS Project Number:	<u>25222157.00</u>	Work Stop Time:	<u>18:30</u>
Installation Contractor:	<u>Ames Construction, Inc.</u>	SCS Arrival Time:	<u>7:30</u>
Project Location:	<u>W8375 Murray Road, Pardeeville, WI 53954</u>	SCS Departure Time:	<u>18:30</u>
Today's Task(s):	<u>Dewatering, hauling CCR material, primary ash pond slope stripping, GSI additional destructs and repairs</u>		

Weather Conditions:	<u>a.m. 72 °F, Wind: 1 mph, Cloudy</u>
	<u>p.m. 73 °F, Wind: 10 mph/NE, Partly Cloudy</u>

Contractors and Personnel On Site:

<u>Eric Altman - Superintendent (Ames)</u>	<u>Conor O'Dea - Project Safety Manager (Ames)</u>
<u>Jason Brantner - Foreman (Ames)</u>	<u>Phil Gearing - Project Manager (SCS Engineers)</u>
<u>16 Operators (Ames)</u>	<u>Brad Folczyk - Project Manager (Ames)</u>
<u>Joe Stone - Field Engineer (SCS Engineers)</u>	
<u>2 Laborers (Ames)</u>	
<u>Clinton Berning - Project Engineer (Ames)</u>	

Equipment On Site

<u>(3) Bulldozers - CAT - (1) D6T LGP, (2) D6</u>	<u>RTV - Kubota - X1140</u>	<u>(2) Excavator - CAT - 352</u>
<u>Wheel Loader - DEERE - 744L</u>	<u>Mini Excavator (CAT-308E2CR)</u>	<u>Komatsu long reach excavator - EX-21 (Dirt Works)</u>
<u>Water Truck - Freightliner - FL70</u>	<u>Sheep foot soil compactor - CAT - 815</u>	<u>Off-road haul truck (DEERE-410E-11)</u>
<u>(2) Off road haul truck - CAT - 745</u>	<u>Road Reclaimer (CAT-RM500B)</u>	<u>Off road haul truck - CAT - 740</u>
<u>Vibratory Smooth Drum Roller - CAT - CS56B</u>	<u>Cement Pig</u>	<u>Roughneck MO2855EL boat</u>
<u>Motor Grader - CAT-160M2 AWD</u>	<u>Fuel Truck - Mack - 5991002</u>	<u>Off-road haul truck (Volvo A45G)</u>
<u>(2) Skid Steer - CAT - 299D3(XE)</u>	<u>Excavator - CAT - 349F(L)</u>	
<u>(2) Off-road haul truck (DEERE-410E)</u>	<u>(2) Off-road haul truck (CAT-740)</u>	

Work Performed/Boundaries (Landfill Area and Modules 10 and 11 Liner Construction)

- GSI returned to collect a destruct to track failed destruct DS-30 and repair the area where failure occurred. Repaired areas were vacuum box tested.
- A trial weld was performed. Sample of destruct DS-30B4 sent to the lab for testing.

Testing Equipment Used/Observed and Calibration/Re-Calibration Documentation

N/A

Field Tests Completed/Observed and Samples Collected

- DS-30B4 (passed)

Lab Test Results

- DS-29A (passed), DS-30B3 (failed), and DS-32(passed)

Material(s) Delivered to Site

N/A

Joe Stone/Phil Gearing

Resident Project Representative

Phillip Gearing

Project Manager

Owner Name: Wisconsin Power and Light Company
Project Name: Ash Ponds Closure and Modules 10 and 11 Liner Construction
Design Engineer: SCS Engineers
SCS Project Number: 25222157.00
Installation Contractor: Ames Construction, Inc.
Project Location: W8375 Murray Road, Pardeeville, WI 53954
Today's Task(s): Geomembrane repairs

Report No. 56
Date: May 20, 2023
Work Start Time 7:55
Work Stop Time: 10:25
SCS Arrival Time: 7:20
SCS Departure Time: 10:25

Weather Conditions: a.m. 50 °F, Wind: 8 mph/NW, Clear
p.m. 70 °F, Wind: 6 mph/N, Clear

Contractors and Personnel On Site:

Eric Altman - Superintendent (Ames)
Zana Bajalan - Project Engineer (SCS Engineers)
1 Superintendent and 2 labors (GSI crew)

Equipment On Site

<u>(4) Bulldozers - CAT - (2) D6T LGP, (2) D6</u>	<u>RTV - Kubota - X1140</u>	<u>(2) Excavator - CAT - 352</u>
<u>Wheel Loader - DEERE - 744L</u>	<u>Mini Excavator (CAT-308E2CR)</u>	<u>Komatsu long reach excavator - EX-21 (Dirt Works)</u>
<u>Water Truck - Freightliner - FL70</u>	<u>Sheep foot soil compactor - CAT - 815</u>	<u>Off-road haul truck (DEERE-410E-11)</u>
<u>(2) Off road haul truck - CAT - 745</u>	<u>Road Reclaimer (CAT-RM500B)</u>	<u>Off road haul truck - CAT - 740</u>
<u>Vibratory Smooth Drum Roller - CAT - CS56B</u>	<u>Cement Pig</u>	<u>Roughneck MO2855EL boat</u>
<u>Motor Grader - CAT-160M2 AWD</u>	<u>Fuel Truck - Mack - 5991002</u>	<u>Off-road haul truck (Volvo A45G)</u>
<u>(2) Skid Steer - CAT - 299D3(XE)</u>	<u>Excavator - CAT - 349F(L)</u>	
<u>(2) Off-road haul truck (DEERE-410E)</u>	<u>(2) Off-road haul truck (CAT-740)</u>	

Work Performed/Boundaries (Landfill Area and Modules 10 and 11 Liner Construction)

- GSI crew (1 superintendent and 2 labors) was onsite at 7:50 am to perform geomembrane repairs at the north side of Module 11 north berm, and at the northwest side of Module 11 (the spots that were identified on Friday, 5/19).
- Geomembrane trial weld (#67) was performed before the repairs. The trial weld was tested onsite using a tensiometer. Five specimens (out of 5) passed.
- GSI repaired the geomembrane damage locations at north side of Module 11 berm and at the northwest side of Module 11. Geomembrane repairs were performed by tack welding a piece of geomembrane to the repair area by a leister. The patch was ground using a grinder before being welded with an extrusion weld machine. The repairs were tested using a vacuum box.

Testing Equipment Used/Observed and Calibration/Re-Calibration Documentation

Tensiometer. Calibrated within the last 90 days.

Field Tests Completed/Observed and Samples Collected

N/A

Lab Test Results

N/A

Material(s) Delivered to Site


N/A

Zana Bajalan

Resident Project Representative

Phillip Gearing

Project Manager



Appendix H

Geomembrane Destructive Testing Results



Date: 2023-05-05

Mail To:
Phil Gearing
SCS Engineers
2830 Dairy Dr.
Madison , WI , 53718

Bill To:
SCS Engineers
25222157.01

e-mail:
pgearing@scsengineers.com zbajalan@scsengineers.com jstone@scsengineers.com dnelson@scsengineers.com

Dear Mr. Gearing,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project: **Columbia Dry Ash Disposal Facility Mod 10 and 11 Liner Const.**

TRI Job Reference Number: **77915**

Material(s) Tested: (1) Single Extrusion Weld Seam(s)

Test(s) Requested: SAME DAY Peel and Shear
(ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

Codes:

AD	Adhesion Failure (100% Peel)
BRK	Break in sheeting away from Seam edge.
SE	Break in sheeting at edge of seam.
AD-BRK	Break in sheeting after some adhesion failure - partial peel.
SIP	Separation in the plane of the sheet (leaving the bond intact).
FTB	Film tearing bond (all non "AD" failures).
NON-FTB	100% peel.

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Nicole Saucedo

Geosynthetic Services Division
<http://www.geosyntheticstestinc.com>

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.



DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS - SINGLE TRACK

TRI Client: SCS Engineers

Project: Columbia Dry Ash Disposal Facility Mod 10 and 11 Liner Const.

Material: 60 mil. HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

TRI Log#: 77915

PARAMETER	TEST REPLICATE NUMBER					MEAN
	1	2	3	4	5	
Sample ID: DS-27 Weld: Single Extrusion						
Side: Peel						Peel
Peel Strength (ppi)	148	122	133	136	146	137
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						Shear
Shear Strength (ppi)	153	156	155	157	151	154
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.



Date: 2023-05-08

Mail To:
Phil Gearing
SCS Engineers
2830 Dairy Dr.
Madison , WI , 53718

Bill To:
SCS Engineers
25222157.01

e-mail:
pgearing@scsengineers.com zbajalan@scsengineers.com jstone@scsengineers.com dnelson@scsengineers.com

Dear Mr. Gearing,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project: **Columbia Dry Ash Disposal Facility Mod 10 and 11 Liner Const.**

TRI Job Reference Number: **77923**

Material(s) Tested: (3) Single Extrusion Weld Seam(s)

Test(s) Requested: SAME DAY Peel and Shear
(ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

Codes:

AD	Adhesion Failure (100% Peel)
BRK	Break in sheeting away from Seam edge.
SE	Break in sheeting at edge of seam.
AD-BRK	Break in sheeting after some adhesion failure - partial peel.
SIP	Separation in the plane of the sheet (leaving the bond intact).
FTB	Film tearing bond (all non "AD" failures).
NON-FTB	100% peel.

If you have any questions or require any additional information, please call us at 1-800-880-8378.
Sincerely,

Nicole Saucedo

Geosynthetic Services Division
<http://www.geosyntheticstestinc.com>

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.



DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS - SINGLE TRACK

TRI Client: SCS Engineers

Project: Columbia Dry Ash Disposal Facility Mod 10 and 11 Liner Const.

Material: 60 mil. HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

TRI Log#: 77923

PARAMETER	TEST REPLICATE NUMBER					MEAN
	1	2	3	4	5	
Sample ID: DS-29 Weld: Single Extrusion						
Side: Peel						Peel
Peel Strength (ppi)	112	117	103	114	115	112
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						Shear
Shear Strength (ppi)	170	164	162	163	161	164
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-31 Weld: Single Extrusion						
Side: Peel						Peel
Peel Strength (ppi)	137	139	133	127	129	133
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						Shear
Shear Strength (ppi)	165	160	161	160	160	161
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-30A Weld: Single Extrusion						
Side: Peel						Peel
Peel Strength (ppi)	131	123	122	107	121	121
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						Shear
Shear Strength (ppi)	149	151	150	153	154	151
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.



Date: 2023-05-12

Mail To:
Phil Gearing
SCS Engineers
2830 Dairy Dr.
Madison , WI , 53718

Bill To:
SCS Engineers
25222157.01

e-mail:
pgearing@scsengineers.com zbajalan@scsengineers.com jstone@scsengineers.com dnelson@scsengineers.com

Dear Mr. Gearing,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project: Columbia Dry Ash Disposal Facility Mod 10 and 11 Liner Const.

TRI Job Reference Number: **77962**

Material(s) Tested: (3) Single Extrusion Weld Seam(s)

Test(s) Requested: SAME DAY Peel and Shear
(ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

Codes:

AD	Adhesion Failure (100% Peel)
BRK	Break in sheeting away from Seam edge.
SE	Break in sheeting at edge of seam.
AD-BRK	Break in sheeting after some adhesion failure - partial peel.
SIP	Separation in the plane of the sheet (leaving the bond intact).
FTB	Film tearing bond (all non "AD" failures).
NON-FTB	100% peel.

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Nicole Saucedo

Geosynthetic Services Division
<http://www.geosyntheticstestinc.com>

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.



DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS - SINGLE TRACK

TRI Client: SCS Engineers

Project: Columbia Dry Ash Disposal Facility Mod 10 and 11 Liner Const.

Material: 60 mil. HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

TRI Log#: 77962

PARAMETER	TEST REPLICATE NUMBER					MEAN
	1	2	3	4	5	
Sample ID: DS-29A Weld: Single Extrusion						
Side: Peel						Peel
Peel Strength (ppi)	122	130	114	116	133	123
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						Shear
Shear Strength (ppi)	160	163	162	163	168	163
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-30B3 Weld: Single Extrusion						
Side: Peel						Peel
Peel Strength (ppi)	99	125	48	104	124	100
Peel Incursion (%)	100	<5	100	100	<5	
Peel Locus Of Failure Code	AD	SE	AD	AD	SE	
Peel NSF Failure Code	NON-FTB	FTB	NON-FTB	NON-FTB	FTB	
Shear						Shear
Shear Strength (ppi)	155	149	151	155	151	152
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-32 Weld: Single Extrusion						
Side: Peel						Peel
Peel Strength (ppi)	145	154	144	148	152	149
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						Shear
Shear Strength (ppi)	155	158	159	157	159	158
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.



Date: 2023-05-15

Mail To:
Phil Gearing
SCS Engineers
2830 Dairy Dr.
Madison , WI , 53718

Bill To:
SCS Engineers
25222157.01

e-mail:
pgearing@scsengineers.com zbajalan@scsengineers.com jstone@scsengineers.com dnelson@scsengineers.com

Dear Mr. Gearing,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project: **Columbia Dry Ash Disposal Facility Mod 10 and 11 Liner Const.**

TRI Job Reference Number: **77975**

Material(s) Tested: (1) Single Extrusion Weld Seam(s)

Test(s) Requested: SAME DAY Peel and Shear
(ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

Codes:	
AD	Adhesion Failure (100% Peel)
BRK	Break in sheeting away from Seam edge.
SE	Break in sheeting at edge of seam.
AD-BRK	Break in sheeting after some adhesion failure - partial peel.
SIP	Separation in the plane of the sheet (leaving the bond intact).
FTB	Film tearing bond (all non "AD" failures).
NON-FTB	100% peel.

If you have any questions or require any additional information, please call us at 1-800-880-8378.
Sincerely,

Nicole Saucedo

Geosynthetic Services Division
<http://www.geosyntheticstestinc.com>

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.



DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS - SINGLE TRACK

TRI Client: SCS Engineers

Project: Columbia Dry Ash Disposal Facility Mod 10 and 11 Liner Const.


Material: 60 mil. HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

TRI Log#: 77975

PARAMETER	TEST REPLICATE NUMBER					MEAN
	1	2	3	4	5	
Sample ID: DS-30-B4 Weld: Single Extrusion						
Side: Peel						Peel
Peel Strength (ppi)	116	129	108	116	111	116
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						Shear
Shear Strength (ppi)	151	153	156	156	152	154
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.



Appendix I
Geomembrane Installation Forms

SEAM/NON-DESTRUCTIVE TEST RECORD and END OF SEAM FIELD DESTRUCT TEST RECORD

100 ft. See 'Project Information' Worksheet Cell 'G45'

Client Name: Wisconsin Power and Light (WPL)
 Project Location: Columbia Dry Ash Disposal Facility
Town of Pacific, Wisconsin 53954

SCS Engineers CQA Technician: Zana Bajalan
Joe Stone, et al.

SCS Engineers Project Name: Modules 10 and 11 Liner Construction

SCS Engineers Project Number: 25222157.01

Specifications: 60 mil
 Material Type: HDPE
 Fusion
 Peel (P) \geq 91
 Shear (S) \geq 120

4 = No of Passed Tests
0 = No of Failed Tests

Max Pressure Drop = 3.00 psi
 Elapsed Test Interval = 5.0 min

Date dd-mmm-yy	Time hhmm (24)	Seaming Information										End of Seam Field DESTRUCT TESTS Req'd (Wisconsin Only)			Non-Destructive Testing Information									
		Seam Numbers		Seam Length	Seamer Initials	Machine Number	Trial Weld #	Direction Seamed	Destruct Number	Material (Top 1st)	Minimum Seam Length > 100 ft.			Date Tested	Addn'l Test #'s	Tester Initials	Pressure			Time [hhmm (24)]		P/F	Vacuum Box P/F	Location/Comments
		Start	End	ft						Shear	Peel	P/F	dd-mmm-yy			Start	End	+/-	Start	End	P/F			
04-May-23	1107	Ex	P-82	61 ft	FR	115	54	NW		T/T				4-May-23									Pass	
04-May-23	1130	P-82	P-83	42 ft	FR	115	54	NW	DS-27	T/T				4-May-23									Pass	
04-May-23	1310	P-83	P-84	30 ft	FR	115	54	NW		T/T				4-May-23									Pass	
04-May-23	1330	P-84	Ex	28 ft	FR	115	54	SOUTH		T/T				4-May-23									Pass	
04-May-23	1603	P-85	P-86	92 ft	BR	97	56	WEST	DS-29	T/T				5-May-23									Pass	DS-29A
04-May-23	1610	P-85	P-87	77 ft	FR	115	57	WEST	DS-30A	S/T				5-May-23									Pass	
05-May-23	1028	P-85	P-87	26 ft	FR	115	59	WEST	DS-30B	S/T				5-May-23									Pass	DS-30B1
05-May-23	1040	P-86	Ex	93 ft	FR	115	59	EAST	DS-30B2	S/T				5-May-23									Pass	
05-May-23	1051	P-86	P-87	11 ft	BR	116	60	SOUTH		T/T				5-May-23									Pass	
05-May-23	1101	P-87	Ex	99 ft	BR	116	60	WEST		T/T				5-May-23									Pass	
05-May-23	1301	P-89	Ex	203 ft	FR	115	59	EAST	DS-30B3	S/T	133 ppi	108 ppi	105 ppi	Pass	5-May-23								Pass	DS-30B4
05-May-23	1308	P-87	P-89	11 ft	BR	116	60	NORTH		T/T				5-May-23									Pass	
05-May-23	1510	P-85	P-90	3 ft	FR	115	63	WEST		T/T				6-May-23									Pass	
05-May-23	1516	P-89	P-90	11 ft	FR	115	63	SOUTH		T/T				5-May-23									Pass	
05-May-23	1516	P-88	P-90	175 ft	FR	115	63	WEST		T/T	126 ppi	101 ppi	93 ppi	Pass	6-May-23								Pass	
05-May-23	1546	P-85	P-89	198 ft	BR	116	62	WEST	DS-31	T/T	125 ppi	132 ppi	115 ppi	Pass	5-May-23								Pass	
05-May-23	1639	P-88	P-91	52 ft	FR	115	63	WEST		T/T				6-May-23									Pass	
05-May-23	1655	P-85	P-88	18 ft	BR	116	62	WEST		T/T				6-May-23									Pass	
05-May-23	1706	P-88	FLAP	25 ft	FR	115	63	SOUTH		T/T				6-May-23									Pass	
05-May-23	1707	P-90	Ex	175 ft	BR	116	62	WEST		T/T	153 ppi	139 ppi	146 ppi	Pass	6-May-23								Pass	
05-May-23	1735	P-91	FLAP	15 ft	FR	115	63	SOUTH		T/T				6-May-23									Pass	
05-May-23	1749	P-91	Ex	53 ft	FR	115	63	EAST		T/T				6-May-23									Pass	
05-May-23	1827	P-90	P-91	11 ft	BR	116	62	NORTH		T/T				6-May-23									Pass	
06-May-23	0906	P-84	FLAP	9 ft	FR	115	64	EAST		T/T				6-May-23									Pass	

GEOSYNTHETIC PANEL PLACEMENT RECORD

SCS Engineers CQA Technician: Zana Bajalan
Joe Stone, et al.

Client Name: Wisconsin Power and Light (WPL)
 Project Location: Columbia Dry Ash Disposal Facility
Town of Pacific, Wisconsin 53954

SCS Engineers Project Name: Modules 10 and 11 Liner Construction

SCS Engineers Project Number: 25222157.01

Date dd-mmm-yy	Time hhmm (24)	Panel Number	Roll Number	Panel Length (feet)	Panel Width (feet)	Panel Location/Comments
04-May-23	0950	82	1005-063615	39	22	E of P-83W of Ex slope
04-May-23	0955	83	1005-063615	42	22	W of P-82, E of P-84
04-May-23	1300	84	1005-063615	28	10	W of P-83, E of Ex
04-May-23	1500	85	1005-063615	406	17	N of P-86 and P-87, anchored at North
04-May-23	1530	86	1005-063618	92	12	N of EX, S of P-85
04-May-23	1540	87	1005-063618	103	12	N of EX, S of P-85
05-May-23	0830	88	1005-063618	225	18	W of P-85
05-May-23	0902	89	1005-063618	202	12	S of P-85, W of P-87, E of P-90, N of P-74 (Ex)
05-May-23	0924	90	1005-063618	181	11	N of P-74 (Ex), E of P-91, S of P-88, W of P-89
05-May-23	0940	91	1005-063619	54	13	W of P-90, S of P-88, E of Ex

TRIAL WELD RECORD

Client Name: Wisconsin Power and Light (WPL)
 SCS Engineers Project Name: Modules 10 and 11 Liner Construction
 SCS Engineers Project Number: 25222157.01
 Project Location: Columbia Dry Ash Disposal Facility
Town of Pacific, Wisconsin 53954

Specifications: 60 mil
 Material Type: HDPE

SCS Engineers
 CQA Technician: Zana Bajalan
Joe Stone, et al.

	Fusion	Extrusion
Peel (P)	≥ 91 lb/in	≥ 78 lb/in
Shear (S)	≥ 120 lb/in	≥ 120 lb/in
Max # of Failing Tests Allowed per P/S Set: <u>0 ea</u>		

Trial Weld Number	Date dd-mmm-yy	Time hhmm (24)	Ambient Temp (F°)	Installer QC	Seamers Initials	Machine Number	Machine Properties	Weld Type	Test Values (lbs/in)					Pass/Fail	Material (Top 1st)	Comments	
									Coupon 1	Coupon 2	Coupon 3	Coupon 4	Coupon 5				
54	04-May-23	1025	60	SR	FR	115	550/550	Extrusion	P	114	80	105	93	104	Pass	T/T	
									S	129	120	132	126	122			
55	04-May-23	1030	61	SR	BR	97	550/550	Extrusion	P	130	121	97	131	109	Pass	T/T	
									S	147	139	148	140	142			
56	04-May-23	1543	73	SR	BR	97	550/550	Extrusion	P	95	79	100	93	107	Pass	T/T	
									S	155	138	150	137	138			
57	04-May-23	1540	73	SR	FR	115	545/545	Extrusion	P	142	120	140	105	113	Pass	S/T	
									S	146	129	145	131	130			
58	05-May-23	0830	60	SR	BR	97	550/550	Extrusion	P	101	84	91	102	97	Pass	T/T	
									S	165	152	164	154	151			
59	05-May-23	1000	63	SR	FR	115	550/550	Extrusion	P	89	79	92	83	102	Pass	S/T	
									S	152	135	151	141	143			
60	05-May-23	1000	63	SR	BR	116	550/550	Extrusion	P	118	119	112	116	103	Pass	T/T	
									S	143	168	149	162	151			
61	05-May-23	1330	73	SR	FR	115	550/550	Extrusion	P	132	121	135	120	111	Pass	S/T	
									S	139	127	140	127	127			
62	05-May-23	1330	73	SR	BR	116	550/550	Extrusion	P	88	118	127	116	114	Pass	T/T	
									S	154	140	154	140	143			
63	05-May-23	1630	74	SR	FR	115	550/550	Extrusion	P	125	110	127	92	112	Pass	T/T	
									S	142	134	146	134	129			
64	06-May-23	0810	56	SR	FR	115	550/550	Extrusion	P	110	102	133	113	123	Pass	T/T	
									S	160	141	167	157	155			
65	11-May-23	1458	72	SR	FR	116	550/550	Extrusion	P	149	129	124	130	114	Pass	T/T	
									S	148	138	151	138	146			
66	12-May-23	1240	70	SR	JM	105	550/550	Extrusion	P	135	112	135	121	141	Pass	T/T	
									S	158	160	162	160	160			
67	20-May-23	0811	50	JV	PP	93	550/550	Extrusion	P	114	112	112	139	136	Pass	T/T	
									S	168	172	188	242	175			

DESTRUCTIVE TEST RECORD

Client Name: Wisconsin Power and Light (WPL)
 SCS Engineers Project Name: Modules 10 and 11 Liner Construction
 SCS Engineers Project Number: 25222157.01
 Project Location: Columbia Dry Ash Disposal Facility
Town of Pacific, Wisconsin 53954

Specifications: 60 mil
 Material Type: HDPE

	Fusion	Extrusion	
Peel (P)	≥ 91	≥ 78	lb/in
Shear (S)	≥ 120	≥ 120	lb/in

SCS Engineers CQA Technician: Zana Bajalan
Joe Stone, et al.

NOTE: ALWAYS CHECK FAILURE CODES ON LAB TEST TOO

Sample ID	Date dd-mmm-yy	Time hhmm (24)	Installer's QC	Seam Number		Seamers Initials	Machine Number	Weld Type	Field Test Values (lbs/in)										Field Pass/Fail	Lab Pass/Fail	Repair Number	Location
									Coupon 1		Coupon 2		Coupon 3		Coupon 4		Coupon 5					
									P	S	P	S	P	S	P	S	P	S				
DS-27	04-May-23	1530	SR	P-82	P-83	FR	115	Extrusion	121		103		108		106		97		Pass	Pass	R-296	STA 0+24
										139		128		141		127		122				
DS-28	04-May-23	1536	SR	R-295	EX	BR	97	Extrusion	49		110		132		97		82		Fail		R-310	
										141		129		138		137		107				
DS-29	05-May-23	1415	SR	P-85	P-86	BR	97	Extrusion	130		117		135		111		97		Pass	Pass	R-301	STA 0+31
										157		144		158		142		144				
DS-30	05-May-23	1401	SR	P-85	P-87	FR	115	Extrusion	122		95								Fail		R-302	STA 0+64
										100												
DS-31	05-May-23	1355	SR	P-85	P-89	BR	116	Extrusion	103		92		106		125		88		Pass	Pass	R-303	STA 0+19
										149		137		151		139		135				
DS-30A	05-May-23	1437	SR	P-85	P-87	FR	115	Extrusion	129		109		117		101		120		Pass	Pass	R-304	STA 0+53
										141		130		136		130		126				
DS-30B	11-May-23	1430	SR	P-85	P-87	FR	115	Extrusion	93		84		73		90		79		Fail		R-314	STA 0+68
										120												
DS-29A	11-May-23	1455	SR	P-85	P-86	BR	97	Extrusion	98		108		91		92		102		Pass	Pass	R-315	STA 0+16
										140		138		142		135		131				
DS-30B1	11-May-23	1515	SR	P-85	P-87	FR	115	Extrusion	85		94		84		80		62		Fail		R-314	STA 0+83
										120												
DS-30B2	11-May-23	1545	SR	P-86	EX	FR	115	Extrusion	105		79		34		84				Fail		R-316	STA 0+06
										120												
DS-30B3	11-May-23	1608	SR	P-89	EX	FR	115	Extrusion	99		105		95		96		102		Pass	Fail	R-319	STA 0+08
										140		142		138		133		126				
DS-32	11-May-23	1805	SR	R-316	P-86	FR	116	Extrusion	103		107		135		103		110		Pass	Pass	R-317	
										148		144		148		152		141				
DS-30B4	12-May-23	1237	SR	P-89	EX	FR	115	Extrusion	108		108		92		120		114		Pass	Pass	R-320	STA 0+25
										157		157		160		158		120				

REPAIR RECORD

Client Name: Wisconsin Power and Light (WPL)
Project Location: Columbia Dry Ash Disposal Facility
Town of Pacific, Wisconsin 53954
SCS Engineers Project Name: Modules 10 and 11 Liner Construction
SCS Engineers Project Number: 25222157.01

SCS Engineers CQA Technician: Zana Bajalan
Joe Stone, et al.

Repair Number	Panel/Seam			Repairer Initials	Machine Number	Repair Type	Repair size			Trial Weld Number	Test Date dd-mm-yy	Tester Initials	Test P/F	Location/Comments
							Length (ft)		Width (ft)					
R-292				BR	97	Patch	2.0 ft	x	2.0 ft	55	4-May-23	JR	Pass	Capped by R-298
R-293				BR	97	Patch	2.0 ft	x	1.5 ft	55	4-May-23	JR	Pass	capped by R-299
R-294				BR	97	Patch	1.5 ft	x	1.0 ft	55	4-May-23	JR	Pass	Under plywood
R-295				BR	97	Patch	12.0 ft	x	1.5 ft	55	4-May-23	JR	Pass	Capped with R-310
R-296	P-82	P-83		FR	115	Patch	4.0 ft	x	2.0 ft	54	4-May-23	JR	Pass	Capping DS-27
R-297	P-83	Ex		FR	115	Patch	7.0 ft	x	4.0 ft	54	4-May-23	JR	Pass	Connectinf flap to existing
R-298				BR	116	Patch	2.5 ft	x	2.0 ft	60	5-May-23	JH	Pass	Capping R-292
R-299				BR	116	Patch	2.0 ft	x	2.0 ft	60	5-May-23	JH	Pass	Capping R-293
R-300	P-86			FR	115	Patch	1.5 ft	x	1.5 ft	59	5-May-23	JH	Pass	STA 0+1
R-301	P-85	P-86		BR	116	Patch	5.0 ft	x	2.0 ft	60	5-May-23	JH	Pass	Capping DS-29
R-302	P-85	P-87		BR	116	Patch	4.0 ft	x	1.5 ft	60	6-May-23	JR	Pass	Capping DS-30
R-303	P-85	P-89		BR	116	Patch	5.0 ft	x	1.5 ft	62	6-May-23	JR	Pass	Capping DS-31
R-304	P-85	P-87		BR	116	Patch	10.0 ft	x	2.0 ft	62	6-May-23	JR	Pass	Capping DS-30A
R-305	P-85	P-87		BR	116	Patch	9.0 ft	x	2.0 ft	62	6-May-23	JR	Pass	Capping remaining of seam P-85 P-87 to end
R-306	P-88	P-90		FR	115	Patch	1.5 ft	x	1.5 ft	63	6-May-23	JR	Pass	Capping end bone
R-307	P-89	P-90	Ex	BR	116	Patch	1.5 ft	x	1.5 ft	62	6-May-23	JR	Pass	Intersection
R-308	P-85	P-89		BR	116	Patch	1.0 ft	x	1.0 ft	63	5-May-23	JH	Pass	Close to end of seam
R-309	P-89			FR	115	Patch	1.0 ft	x	1.0 ft	63	6-May-23	JR	Pass	Burnout
R-310	Ex			FR	115	Patch	12.0 ft	x	2.0 ft	63	6-May-23	JR	Pass	Capping 12' tear and DS-28
R-311	P-90	Ex		BR	116	Patch	1.5 ft	x	1.5 ft	62	6-May-23	JR	Pass	Capping end bone
R-312	P-84	Ex		FR	115	Patch	6.0 ft	x	3.0 ft	64	6-May-23	JR	Pass	Connecting flap to flap
R-313	P-84	Ex		FR	115	Patch	3.0 ft	x	0.5 ft	64	6-May-23	JR	Pass	Connecting flap to flap
R-314	P-85	P-87		FR	116	Patch	22.0 ft	x	2.5 ft	65	11-May-23	JH	Pass	Capping DS-30B and DS-30B2
R-315	P-85	P-86		FR	116	Patch	20.0 ft	x	2.5 ft	65	11-May-23	JH	Pass	Capping DS-29A
R-316	P-86	EX		FR	116	Patch	84.0 ft	x	2.5 ft	65	11-May-23	JH	Pass	Capping DS-30B2
R-317	P-86	R-316		FR	116	Patch	4.5 ft	x	2.5 ft	65	11-May-23	JH	Pass	DS-32
R-318	P-86	EX		FR	116	Patch	5.0 ft	x	3.0 ft	65	11-May-23	JH	Pass	Capped R-300

REPAIR RECORD

Client Name: Wisconsin Power and Light (WPL)
Project Location: Columbia Dry Ash Disposal Facility
Town of Pacific, Wisconsin 53954

SCS Engineers CQA Technician: Zana Bajalan
Joe Stone, et al.

SCS Engineers Project Name: Modules 10 and 11 Liner Construction

SCS Engineers Project Number: 25222157.01

Repair Number	Panel/Seam			Repairer Initials	Machine Number	Repair Type	Repair size			Trial Weld Number	Test Date dd-mm-yy	Tester Initials	Test P/F	Location/Comments
							Length (ft)	x	Width (ft)					
R-319	P-89	EX		FR	116	Patch	6.0 ft	x	2.0 ft	65	11-May-23	JH	Pass	Capped DS-30B3
R-320	P-89	EX		JM	105	Patch	20.0 ft	x	2.5 ft	66	12-May-23	JH	Pass	Capped DS-30B4
R-321	P-89	EX		JM	105	Patch	2.5 ft	x	2.5 ft	66	12-May-23	JH	Pass	Capping remaining of seam P-89/EX
R-322	FLAP			PP	93	Patch	1.5 ft	x	1.0 ft	67	20-May-23	OA	Pass	North flap of Module 11
R-323	MOD4			PP	93	Patch	1.5 ft	x	1.5 ft	67	20-May-23	OA	Pass	Floor of Module 4. E of N-S leachate pipe
R-324	MOD4			PP	93	Patch	1.5 ft	x	1.0 ft	67	20-May-23	OA	Pass	Floor of Module 4 & previous flap weld. 7' SW of R-323
R-325	MOD4			PP	93	Patch	3.0 ft	x	1.5 ft	67	20-May-23	OA	Pass	Floor of Module 4 & previous flap weld. 2' South of R-324
R-326	MOD4			PP	93	Patch	1.0 ft	x	1.0 ft	67	20-May-23	OA	Pass	Floor of Module 4. 6' W of R-323

Appendix J

Jetting and Televising of Leachate Collection Pipe

2094 County Rd QQ
 GREEN BAY, WISCONSIN 54311
 920-468-7074 | INFO@NORTHERNPIPEINC.COM

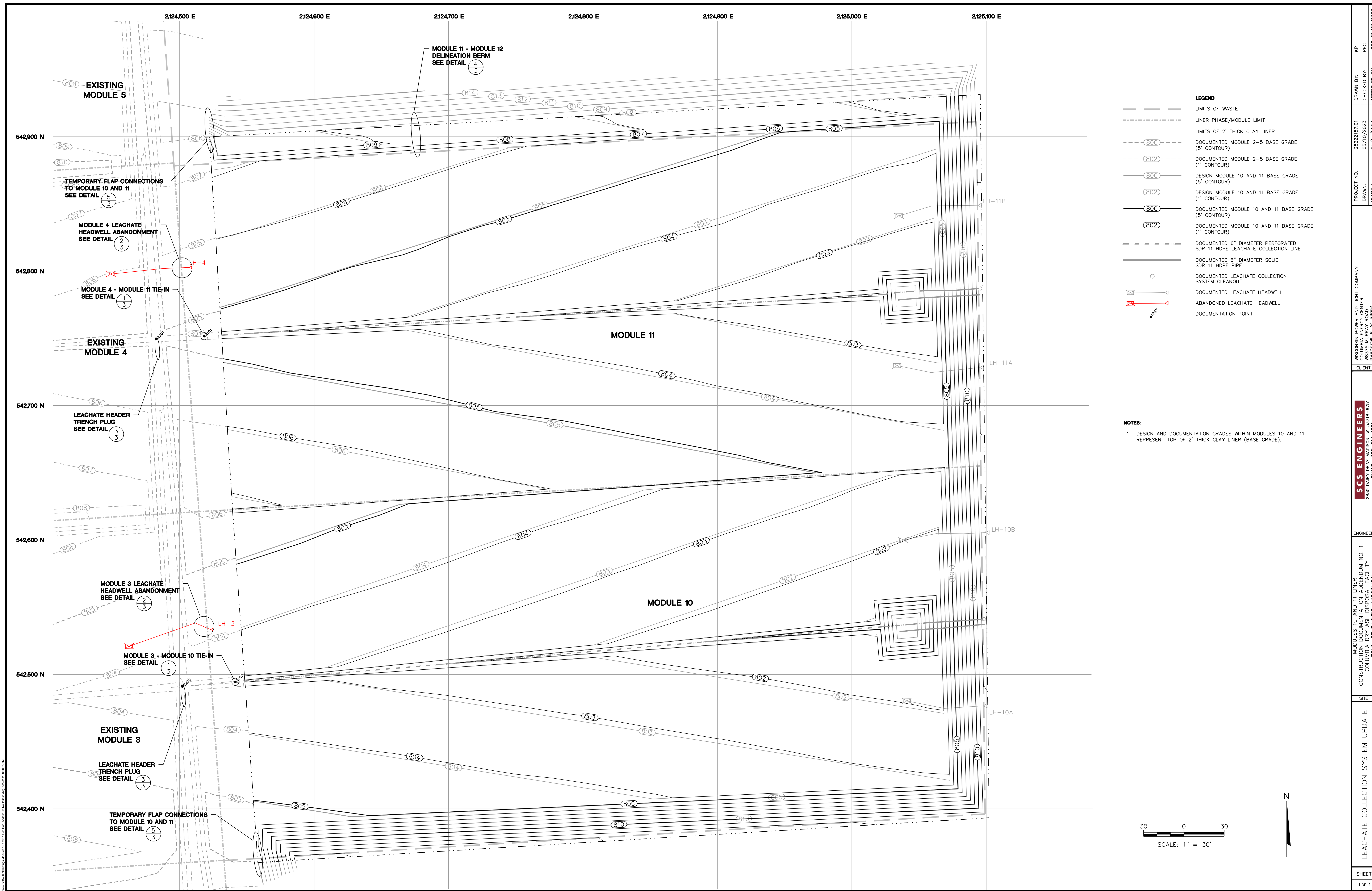
TV length in New Cell is as far as you can go
Document why unable to go further and techniques used to attempt to push further
(Ex. "Water and hand pushing has been attempted")

Phase	Line	Line Length	Length Cleaned	Date	Comments
New Cell	CO 1		581.7	05.04.2023	Line is in good condition
	EXISTING				
New Cell	CO 2		578.5	05.04.2023	Line is in good condition
	EXISTING				

Total Water Used: _____ Gallons

Plan Sheets (Folded)

- 1 Leachate Collection System Update
- 2 Temporary Geomembrane Installation and Repairs
- 3 Details

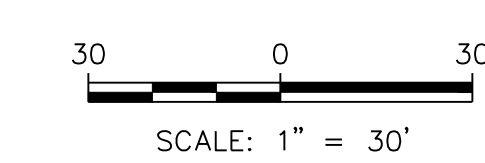


LEGEND

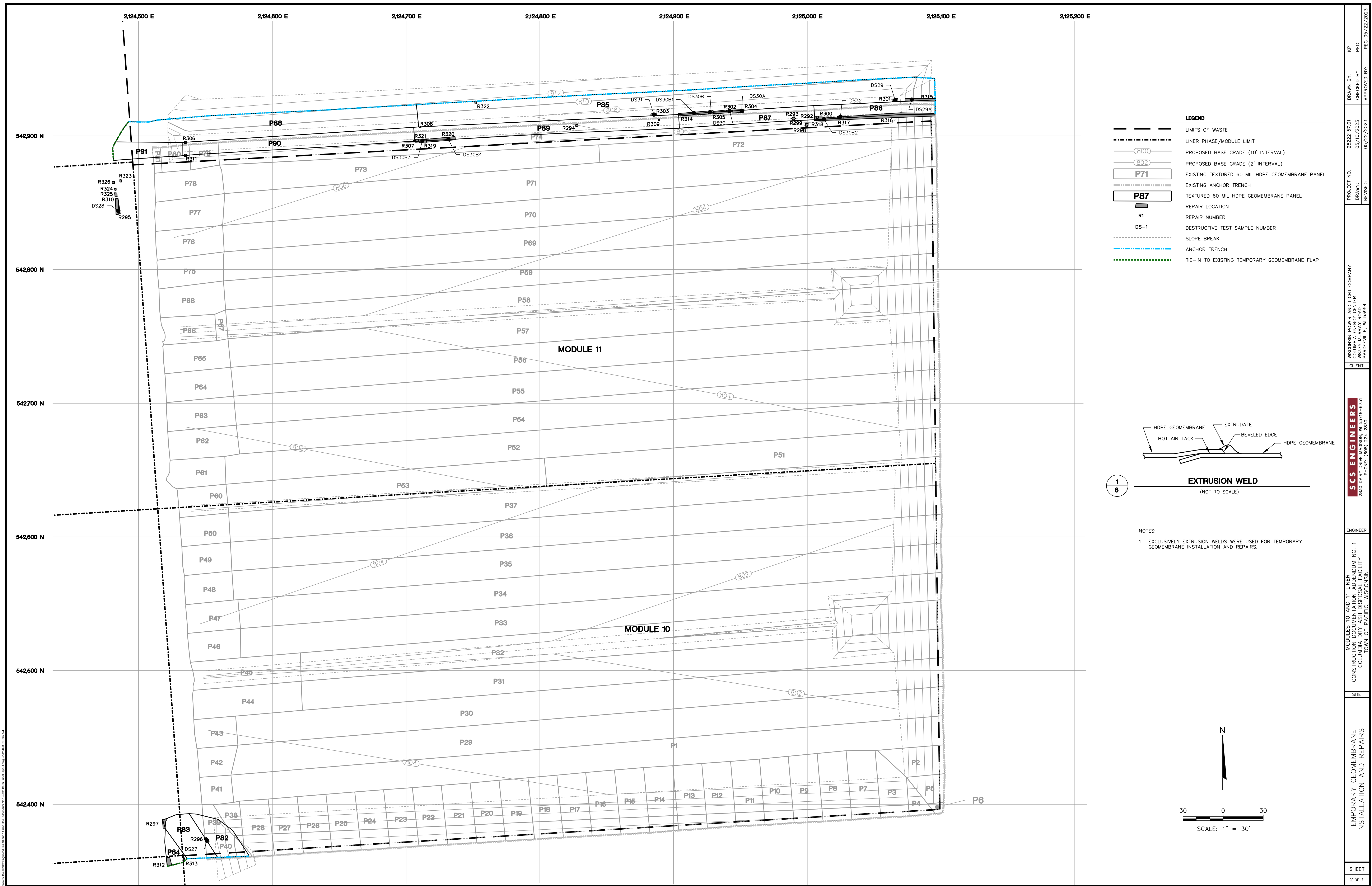
- LIMITS OF WASTE
- LINER PHASE/MODULE LIMIT
- LIMITS OF 2' THICK CLAY LINER
- - - (800) DOCUMENTED MODULE 2-5 BASE GRADE (5' CONTOUR)
- - - (802) DOCUMENTED MODULE 2-5 BASE GRADE (1' CONTOUR)
- - - (800) DESIGN MODULE 10 AND 11 BASE GRADE (5' CONTOUR)
- - - (802) DESIGN MODULE 10 AND 11 BASE GRADE (1' CONTOUR)
- - - (800) DOCUMENTED MODULE 10 AND 11 BASE GRADE (5' CONTOUR)
- - - (802) DOCUMENTED MODULE 10 AND 11 BASE GRADE (1' CONTOUR)
- - - DOCUMENTED 6" DIAMETER PERFORATED SDR 11 HDPE LEACHATE COLLECTION LINE
- - - DOCUMENTED 6" DIAMETER SOLID SDR 11 HDPE PIPE
- DOCUMENTED LEACHATE COLLECTION SYSTEM CLEANOUT
- ⊗ DOCUMENTED LEACHATE HEADWELL
- ⊗ ABANDONED LEACHATE HEADWELL
- DOCUMENTATION POINT

NOTES:

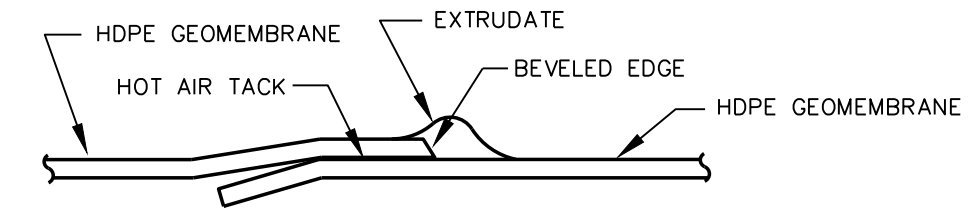
- DESIGN AND DOCUMENTATION GRADES WITHIN MODULES 10 AND 11 REPRESENT TOP OF 2' THICK CLAY LINER (BASE GRADE).



<p>SCS ENGINEERS 2830 DARY DRIVE MADISON, WI 53718-0751 PHONE: (608) 224-2830</p>	<p>ENGINEER</p>	<p>PROJECT NO. 2522197.01 DRAWN: 05/16/2023 CHECKED BY: PEG REVISION: 05/17/2023 APPROVED BY: KP</p>
<p>MODULES 10 AND 11 LINER CONSTRUCTION DOCUMENTATION ADDENDUM NO. 1 COLUMBIA DRY ASH DISPOSAL FACILITY TOWN OF PACIFIC, WISCONSIN</p>		
<p>LEACHATE COLLECTION SYSTEM UPDATE</p>		
<p>SHEET 1 of 3</p>		

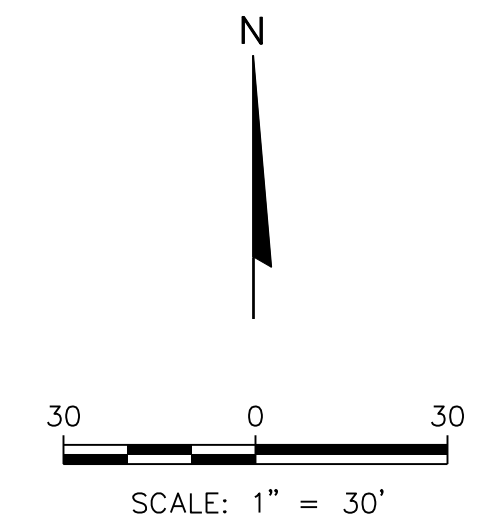


- LEGEND**
- LIMITS OF WASTE
 - - - LINER PHASE/MODULE LIMIT
 - (800) PROPOSED BASE GRADE (10' INTERVAL)
 - (802) PROPOSED BASE GRADE (2' INTERVAL)
 - P71 EXISTING TEXTURED 60 MIL HDPE GEOMEMBRANE PANEL
 - EXISTING ANCHOR TRENCH
 - P87 TEXTURED 60 MIL HDPE GEOMEMBRANE PANEL
 - R1 REPAIR LOCATION
 - DS-1 DESTRUCTIVE TEST SAMPLE NUMBER
 - - - SLOPE BREAK
 - ANCHOR TRENCH
 - TIE-IN TO EXISTING TEMPORARY GEOMEMBRANE FLAP



1
6
EXTRUSION WELD
(NOT TO SCALE)

NOTES:
1. EXCLUSIVELY EXTRUSION WELDS WERE USED FOR TEMPORARY GEOMEMBRANE INSTALLATION AND REPAIRS.



PROJECT NO. 2522157.01
 DRAWN BY: KP
 CHECKED BY: PEG
 APPROVED BY: PEG 05/22/2023

WISCONSIN POWER AND LIGHT COMPANY
 78375 MURRAY ROAD
 PARKEVILLE, WI 53854

SCS ENGINEERS
 2830 DARY DRIVE MADISON, WI 53718-6751
 PHONE: (608) 224-2830

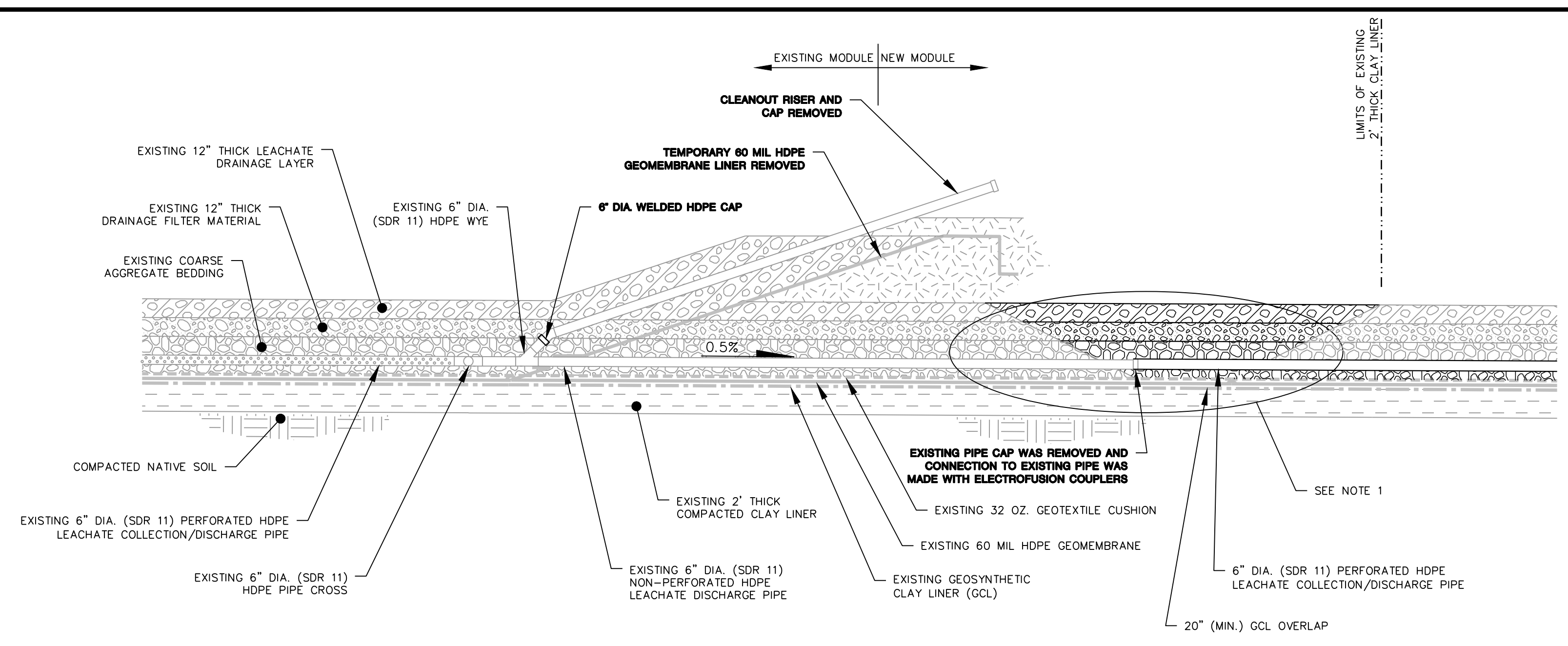
ENGINEER

MODULES 10 AND 11 LINER
 CONSTRUCTION DOCUMENTATION ADDENDUM NO. 1
 COLUMBIA DRY ASH DISPOSAL FACILITY
 TOWN OF PACIFIC, WISCONSIN

SITE

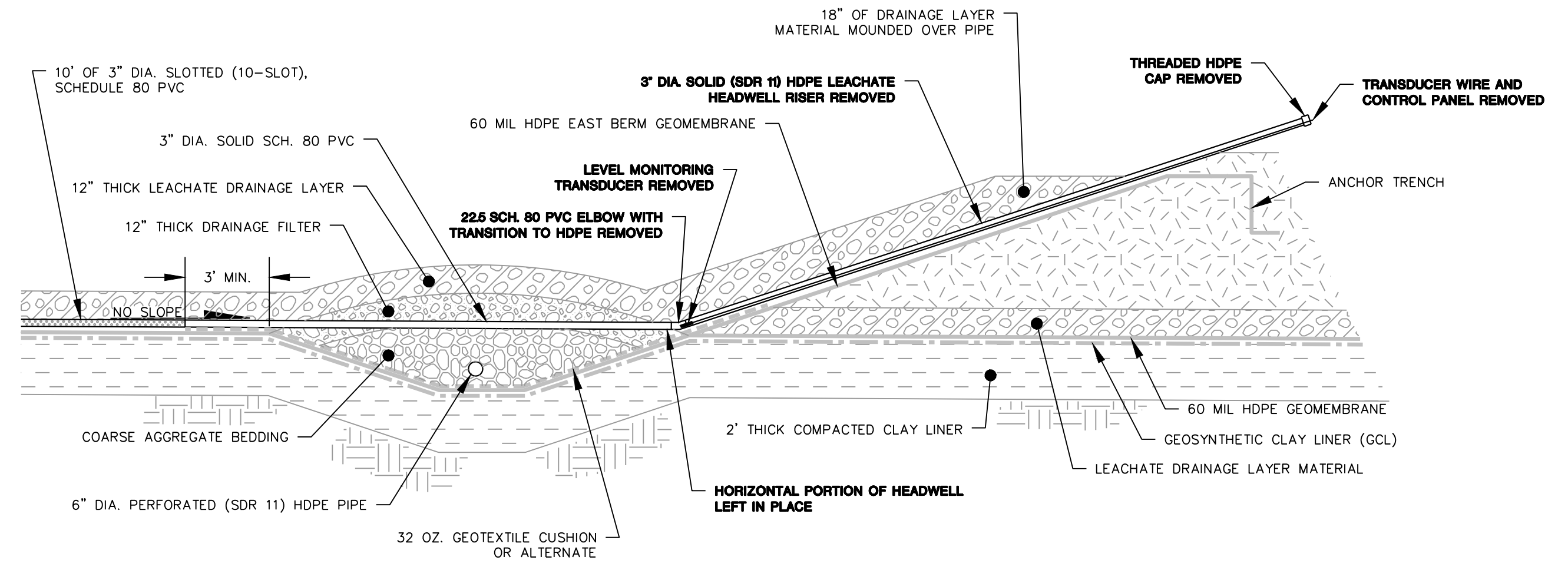
TEMPORARY GEOMEMBRANE
 INSTALLATION AND REPAIRS

SHEET
 2 of 3

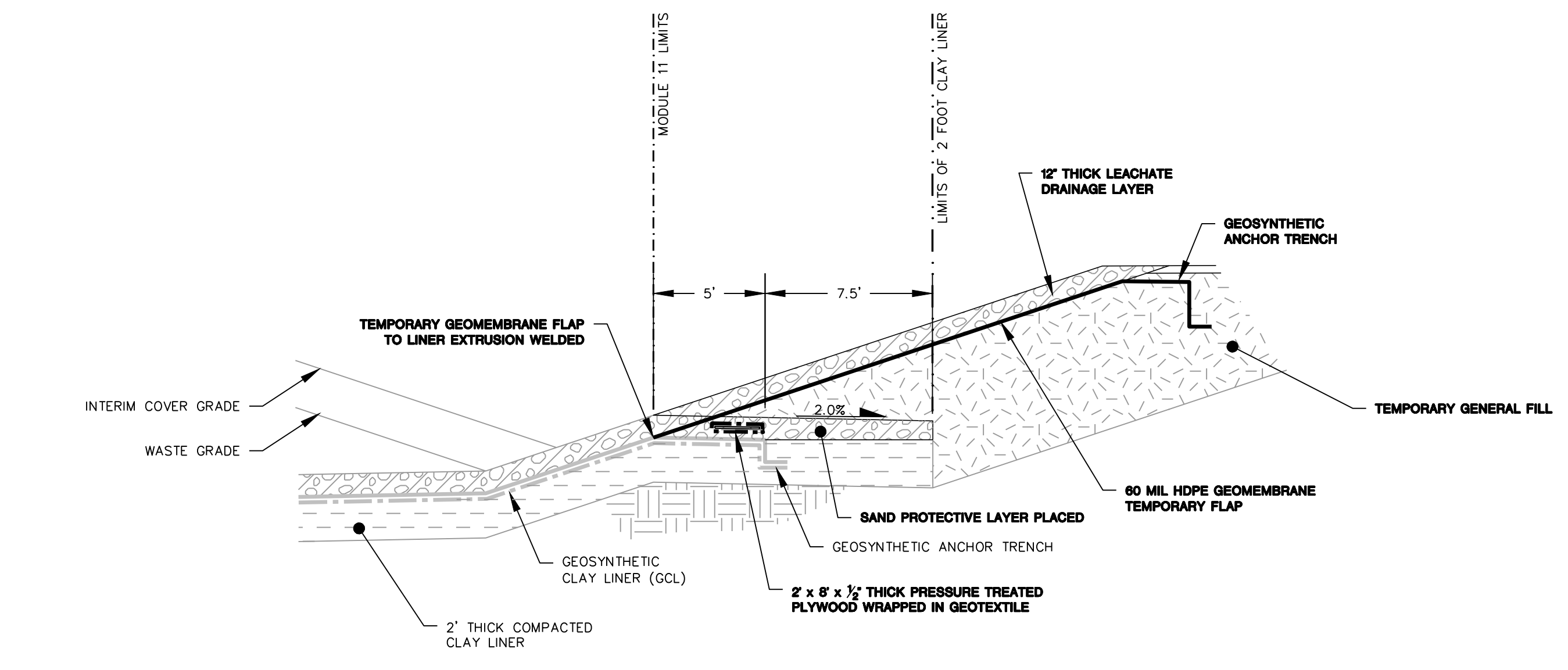


NOTES:
 1. LEACHATE DRAINAGE MATERIAL, DRAINAGE FILTER MATERIAL, AND COARSE AGGREGATE BEDDING WERE PLACED AFTER PIPE CONNECTION WAS MADE.

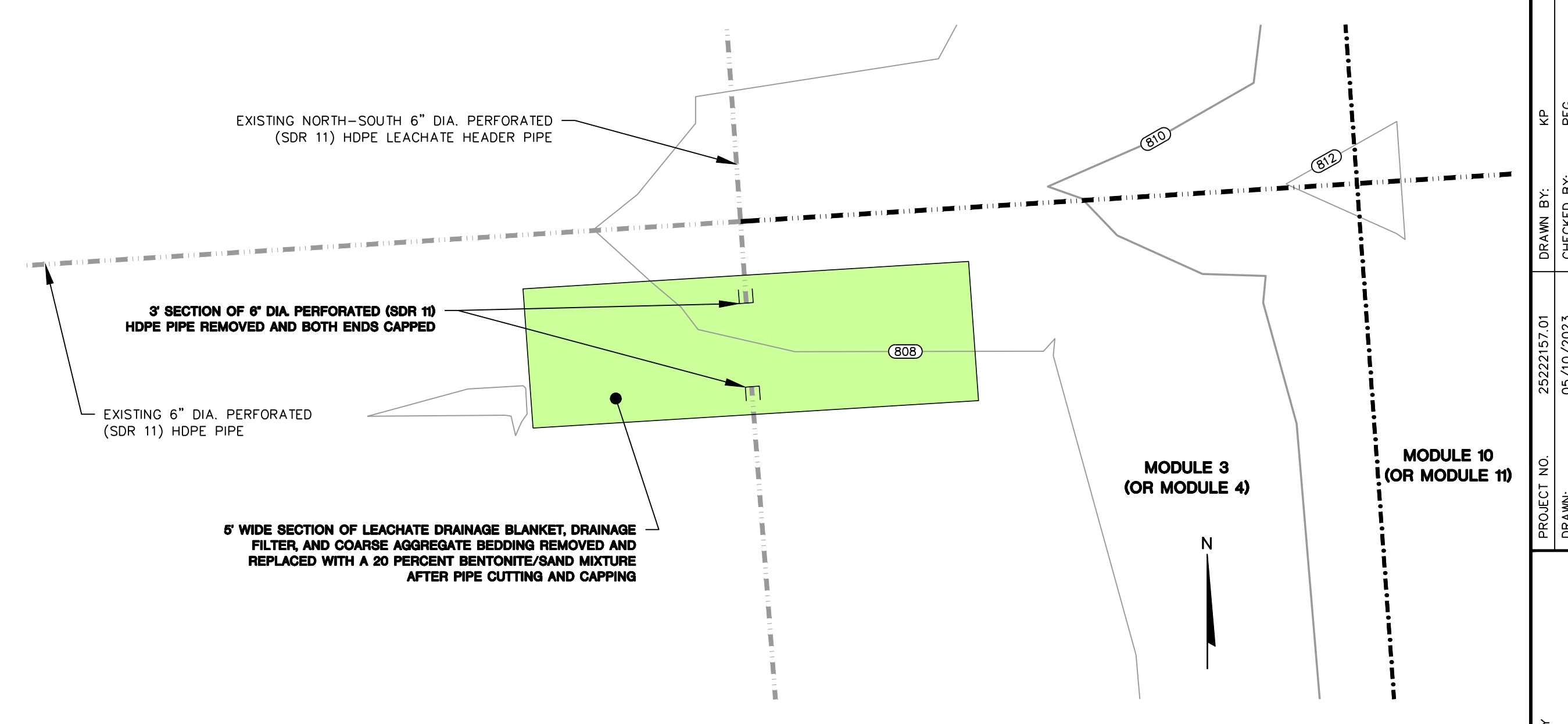
1
3 **MODULE 3-4 - MODULE 10-11 TIE-IN**
 SCALE: 1" = 5'



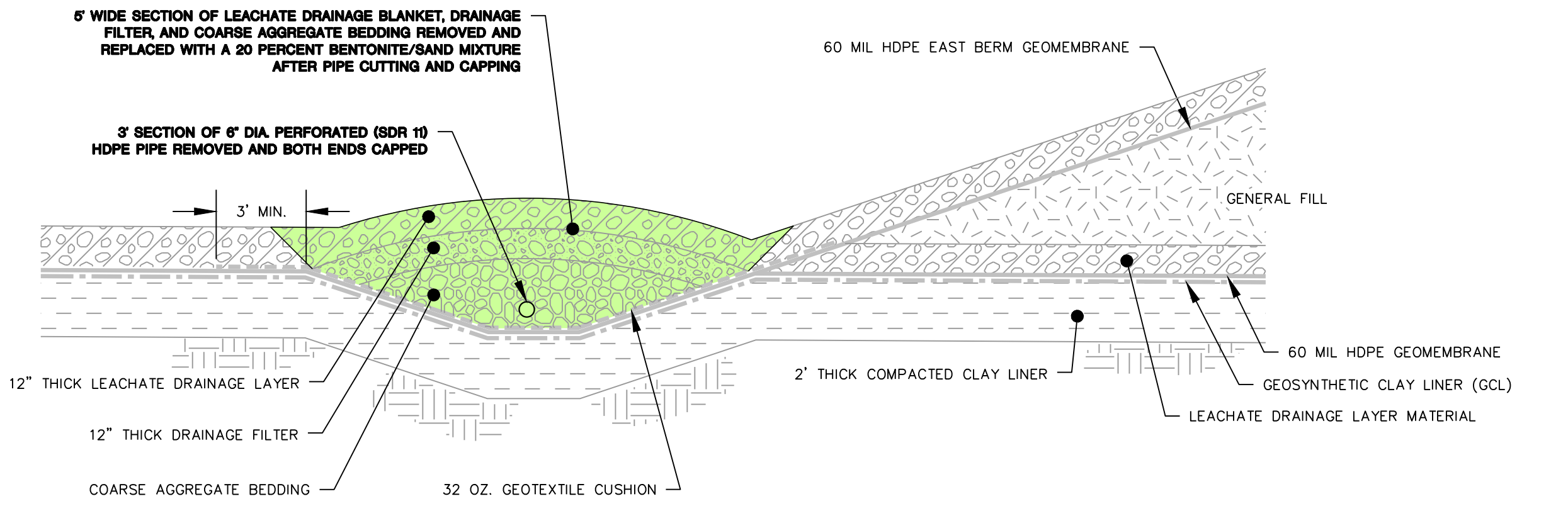
2
3 **MODULE 3 AND 4 LEACHATE HEADWELL ABANDONMENT**
 SCALE: 1" = 4'



4
3 **MODULE 11-MODULE 12 DELINEATION BERM**
 SCALE: 1" = 5'

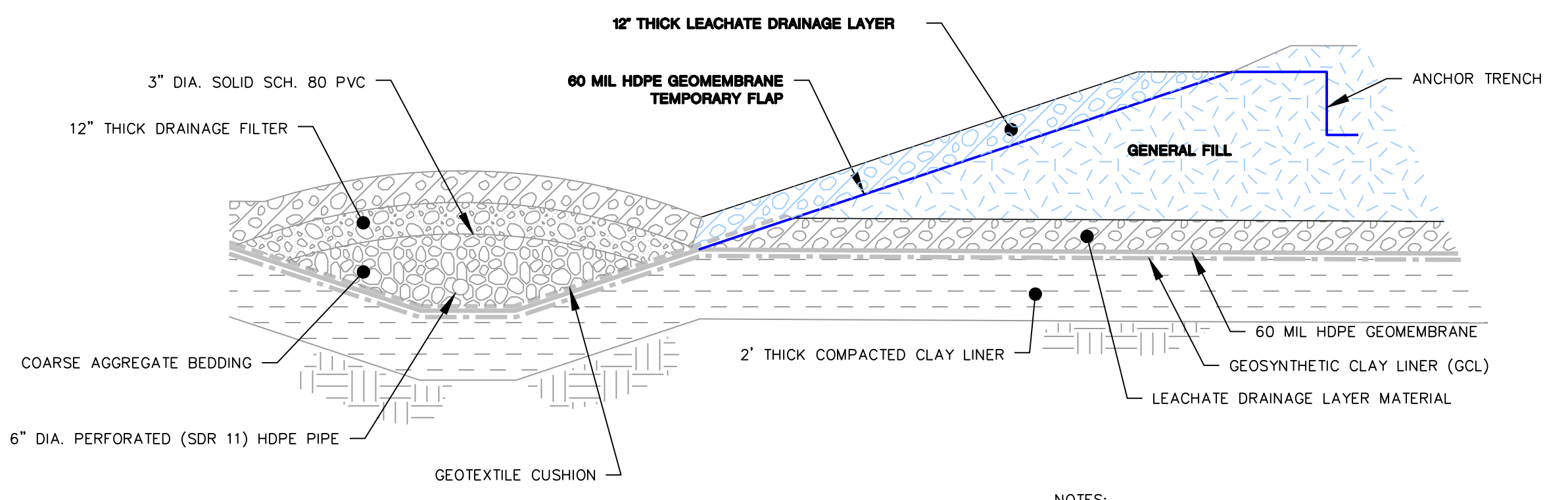


PLAN VIEW



SECTION VIEW

3
3 **LEACHATE HEADER TRENCH PLUG**
 SCALE: 1" = 4'



NOTES:
 1. SIDE SLOPE DRAINAGE LAYER, GEOMEMBRANE AND GENERAL FILL MATERIALS WERE REMOVED AND REPLACED, AS NECESSARY, IN ORDER TO TIE-IN TO MODULE 10 & 11 CONSTRUCTED MATERIALS.

5
3 **TEMPORARY FLAP CONNECTIONS TO MODULE 10 AND 11**
 SCALE: 1" = 4'

PROJECT NO. 2522197.01
 DRAWN BY: KP
 CHECKED BY: PEG
 APPROVED BY: PEG
 DATE: 05/10/2023
 REVISED: 05/17/2023
 WISCONSIN POWER AND LIGHT COMPANY
 8375 MURRAY ROAD
 PARKEVILLE, WI 53854
 CLIENT: WISCONSIN POWER AND LIGHT COMPANY
 ENGINEER: SC5 ENGINEERS
 2830 DARY DRIVE MADISON, WI 53718-6751
 PHONE: (608) 224-2830
 CONSTRUCTION DOCUMENTATION APPENDIX NO. 1
 COLUMBIA DRY ASH DISPOSAL FACILITY
 TOWN OF PACIFIC, WISCONSIN
 SHEET 3 of 3