Haley Griffith (adpce.ad)

Subject: RE: CCSWDA Legacy LF Cell 5 CQA Report

From: Paul Crawford <pcrawford@olsson.com>
Sent: Thursday, January 15, 2026 12:23 PM
To: Richard Bennett (adpce.ad) <richard.bennett@arkansas.gov>
Cc: Greg Banic (adpce.ad) <greg.banic@arkansas.gov>; Angela Sparks <angela@ccswda.com>; Robert Hendrix <rhendrix@ccswda.com>; David Passmore <david@ccswda.com>
Subject: CCSWDA Legacy LF Cell 5 CQA Report
Importance: High

Richard,

On behalf of Craighead County Solid Waste Disposal Authority, Olsson, Inc. has prepared the construction quality assurance report for waste Cell 5 at the Legacy Landfill site. This is the first disposal cell developed under their new permit issued in 2025. The report can be downloaded at this Sharefile link: https://oaconsulting.sharefile.com/i/ief0b74121314a13b

The facility respectfully requests an expeditious review of the report as they have less than one month of available space for disposal (see attached image).

If you have any questions regarding the report, please contact me.

Thanks,
Paul

Paul Crawford, P.E., P.G.
Senior Team Leader / Environmental

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LEGACY LANDFILL CELL 5 BOTTOM LINER SYSTEM CONSTRUCTION QUALITY ASSURANCE CERTIFICATION REPORT

Prepared for:

Craighead County

Solid Waste Disposal Authority

(Signed and Dated Seal)

January 2026

Olsson Project No. 025-04399

Project Address/Location:

Legacy Landfill

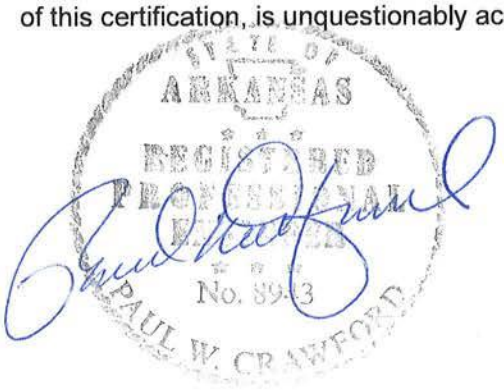
238 County Road 476

Jonesboro, AR 72404

olsson®

PROFESSIONAL ENGINEERING CERTIFICATION

"I certify that, to the best of my professional engineering judgement, Cell 5 of the Legacy Class 1 Landfill (Permit No. 0254-S1-R5) was constructed in accordance with the project plans and specifications, the facility permit documents, and the Arkansas Pollution Control and Ecology Commission 8 CAR §60. This Construction Quality Assurance (CQA) Report has been prepared based upon my (or my designated representative's) observations of construction and the constructed facility, survey data provided by Ridge Surveying and Consulting, PLLC , field soil testing data provided by MTA Engineers, and materials testing data provided by WSP Global, Inc. This certification is contingent on the fact that all information supplied, up to the date of this certification, is unquestionably accurate and was provided in good faith."



01-14-2026

Date

Paul Crawford, PE, PG

Arkansas PE License #8943

ACRONYMS AND ABBREVIATIONS

APCEC ..... Arkansas Pollution Control and Ecology Commission
CCSWDA..... Craighead County Solid Waste Disposal Authority
CQA..... Construction Quality Assurance
DEQ..... Division of Environmental Quality
E&E ..... Arkansas Department of Energy and Environment
MCY..... Million Cubic Yards

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1. INTRODUCTION

This Construction Quality Assurance (CQA) report documents the activities and results associated with the construction of a new waste disposal cell within the Class 1 Legacy Landfill. This report details construction procedures and quality assurance measures implemented during the installation of the bottom liner of the new Cell 5. Supporting documentation, including correspondence, quality control testing results, and certifications associated with the construction are provided in the attached appendices. This document is intended to satisfy the requirements of Arkansas Pollution Control and Ecology Commission (APCEC) 8 CAR §60-428.

1.1 General

The Craighead County Solid Waste Disposal Authority (CCSWDA) owns and operates the Legacy Landfill near Jonesboro, Arkansas. The facility encompasses approximately 525 acres, with 297 acres currently permitted for waste disposal, and is located approximately 5 miles south of Jonesboro along Highway 1. Figure 1 (located in Appendix A) shows the landfill's location on an Arkansas Department of Transportation highway map. The landfill operates under Solid Waste Permit No. 0254-S1-R5 (November 2025), issued by the Arkansas Department of Energy and Environment, Division of Environmental Quality (DEQ), and is authorized for disposal of Class 1 wastes.

Since beginning operations in the early 1990s, the landfill has expanded from a single cell to five cells, increasing its capacity from approximately 7 million cubic yards (MCY) in 2012 to 13 MCY in 2025 with the recent permit modification. Olsson was contracted by CCSWDA to provide Construction Quality Assurance (CQA) services associated with the construction of the bottom liner system for Cell 5.

1.2 Site Description

The Legacy Landfill is organized into multiple disposal cells within the permitted Class 1 waste area as seen in Sheet 2 of the Construction Plans (Appendix B). The site layout includes eight disposal cells, with Cells 1 through 4 located on the east side of the property and Cells 5 through 8 west of Cells 1 through 4. Cell 5 is approximately 15 acres in size and is the first cell constructed in the newly permitted 55-acre area.

The facility has several soil borrow areas – one north of Cell 1 and several west of the newly permitted disposal area. Stormwater management features include four detention ponds arranged in series along the western and southwestern boundaries of the landfill. Leachate collection systems are installed within each cell, directing leachate to sumps and then to holding tanks positioned near the southern and western site boundaries for offsite disposal. Internal haul roads provide access between active disposal areas, the borrow area, and support facilities.

During the installation of the Cell 5's bottom liner, the active disposal area was located in portions of Cells 1 South, 2 and 3, which is almost filled to its permitted disposal capacity.

1.3 Project Description

This project involved the construction and CQA monitoring of the bottom liner system, leachate collection and transmission, and stormwater controls for Cell 5. As shown in Figure 3, the project included preparation of the new disposal area, construction of the leachate collection and transmission system for the new disposal area, and construction of stormwater control facilities.

The sequence of construction activities was as follows:

1. Survey of the construction area prior to excavation;
2. Excavation of the disposal area to the designed subgrade and general site preparation;
3. Preparation, installation, and testing of compacted clay liner;
4. Construction of drainage ways and earthen berms;
5. Installation and testing of smooth and textured 60-mil high density polyethylene (HDPE) geomembrane liner;
6. Installation of 12-inch thick soil protective cover layer;
7. Installation of leachate drainage pipe and trench;
8. Installation of leachate transmission system including side-slope riser pipe, pump, pump control system, and dual-contained leachate transmission piping;
9. Installation of new leachate storage area with two 20,000-gallon storage tanks; and
10. Installation of stormwater control facilities such as ditches and culverts.

Appendix C provides a photographic log of the construction project, and a daily field log of construction activities is included as Appendix D.

1.4 Project Personnel

Several individuals were involved in this project as highlighted below:

Owner: CCSWDA
Executive Director: Ms. Angela Sparks

Design Engineer: Olsson
Project Manager/Engineer: Mr. Paul Crawford, PE, PG

Construction Quality Assurance Consultant: Olsson
Project Manager/Engineer: Mr. Paul Crawford, PE, PG

CQA Monitors:
Mr. James McKeever
Mr. Wes Allen

Survey Control: Ridge Surveying and Consulting, PLLC (Ridge)
Mr. Jason Beard, PLS

Field Soil Testing: MTA Engineers

Mr. Brad Johnson

Geotechnical Laboratory and Geomembrane Conformance Testing: WSP Global, Inc. (WSP)
Mr. Henry Mock

Earthwork Contractor: Dumey Contracting, Inc. (Dumey)
Project Manager: Mr. Tom Jansen, P.E.

Geomembrane Contractor: Patriot Environmental LLC (Patriot)
Project Manager: Mr. Ryan Bunch

Construction Foreman:
Mr. Bounthanh (Billy) Xaysana

HDPE Piping Contractor: Plastic Fusion Fabricators

1.5 Project Documents

The construction of the new disposal area and associated facilities was conducted in accordance with the following documents:

1. "Craighead County Solid Waste Disposal Authority, Legacy Landfill, Cell 5 Construction Project" (Specifications and Contract Documents), Olsson, June 2025.
2. "Craighead County Solid Waste Disposal Authority, Legacy Landfill 5 Construction" (Drawings), Olsson, July 2025.
3. "Construction Quality Assurance and Quality Control Plan," Olsson, November 2024.
4. 8 CAR §60, Solid Waste Management Rules, APCEC, April 26, 2008.

2. SUBGRADE PREPARATION

This section highlights the preparation required to establish a stable and uniform foundation for the new Cell 5 bottom liner.

2.1 Clearing and Grubbing

This subsection addresses the removal of vegetation and topsoil to ensure a clean, stable surface for subsequent grading and compaction activities.

2.1.1 Project Specifications

The project specifications required that the construction area be cleared and stripped of topsoil. This included stripping topsoil from the proposed Cell 5 area and the borrow areas, and stockpiling excavated material adjacent to the construction area. Figure 3 shows the proposed construction plan for Cell 5.

2.1.2 Construction Procedures

From August 28, 2025 to August 29, 2025, the existing topsoil in the proposed Cell 5 area was removed and stockpiled, as stated in the specifications.

2.2 Excavation and Subgrade Preparation

2.2.1 Project Specifications

Project specifications required that overburden soils and areas of unsatisfactory materials within the project limits be excavated. Unsatisfactory materials include soft or compressible soils or materials judged by the CQA Consultant to be unsuitable for foundations or the placement of compacted soils.

Suitable soils for construction were to be stockpiled separately from the unsuitable soils. Specifications required the subgrade to have a smooth surface free from irregular surface changes and slope grades to prevent surface water from ponding. Subgrade elevations were to be verified through an independent survey. In addition, the subgrade surface was required to be scarified and compacted to 90% of the Standard Proctor density.

2.2.2 Subgrade Construction Procedures

The subgrade excavation and preparation for compacted clay liner occurred from August 29, 2025 to September 3, 2025. During this period, the construction activities consisted of excavating or filling to the proposed subgrade surface for the entire disposal area and preparation of the subgrade surface for installation of the clay liner. The subgrade elevations were verified by an independent survey conducted by Ridge on September 3, 2025.

Figure 4 shows final subgrade grid elevations of the disposal area. In general, the subsurface was prepared in accordance with the Permit, CQA Plan, and construction plans. Photos 1 through 5 in Appendix C present subgrade preparation activities.

2.2.3 Subgrade Testing

The subgrade surface was tested for its conformance with project specifications for compaction using the “proof-roll” test method on September 3, 2025. According to the proof-roll testing, the subgrade surface met the project specifications.

3. COMPACTED CLAY LINER INSTALLATION

Dumey Contracting, Inc. installed the clay liner for the Cell 5 construction project. Dumey met the requirement of more than 500,000 square feet of clay liner construction in the past 3 years. Their previous clay liner construction experience is presented in Appendix E.

3.1 Project Specifications

The project specifications required that a 24-inch-thick compacted clay liner be constructed within the disposal area limits. The compacted clay liner was specified to be constructed in four uniform, loose lifts of 9 inches (or 6 inches compacted).

The clay liner material and completed clay liner had to meet the following requirements:

1. Unified Soil Classification System (USCS) classification of CL, CH, or SC;
2. A minimum of 30% passing the #200 U.S. Standard Sieve;
3. A Plasticity Index (PI) greater than or equal to 10;
4. Each lift compacted to a minimum 95% of the maximum dry density with a corresponding moisture content above the OMC, as determined by the Standard Proctor test (ASTM D 698);
5. The in-place permeability of 1 x 10-7 cm/sec or less for each lift; and
6. The final surface graded to the top of liner elevations shown on the project drawings (Appendix B).

3.2 Clay Liner Material Conformance Testing

Prior to construction of the disposal cell, three soil samples (PC-1, PC-2, and PC-3) of the clay liner material were obtained from the borrow area. These samples were submitted to WSP for analysis. The samples met the requirements for the clay liner material and the clay material from the sampled borrow areas was used for the project. In addition, to meet the requirement for one construction sample per 5,000 cy of clay liner material used in construction, ten construction samples (C-1 through C-10) were obtained from the borrow soils as they were excavated.

Table 1 presents a summary of the test results of the pre-construction samples, and Table 2 presents a summary of the test results of the construction samples. Based on the pre-construction and construction test results, the soils from the borrow area excavation met the project specifications with the exception of PC-9 which did not meet the Plasticity Index requirement, and therefore, soil from this part of the borrow area was not used in clay liner construction. Laboratory test summaries of the pre-construction and construction soil samples are included as Appendices F and G, respectively.

3.3 Compacted Clay Liner Construction Procedures

In accordance with the project specifications, the soils were placed and compacted in four uniform 6-inch-thick compact lifts to the top of liner elevations. Photos 6 through 10 in Appendix C present construction activities of the compacted clay liner.

3.4 Compacted Clay Liner Testing

Construction testing was conducted at the rate of one test per 10,000 square feet of completed clay liner lift according to project specifications and 8 CAR §60 requirements.

A total of 63 construction tests (density and moisture using densitometer) were taken per lift. Table 3 presents a summary range of field test measurements of each of the four compacted lifts of the clay liner and the results of the tests. Summaries of the field test results are included as Appendix H.

Table 1 Clay liner material pre-construction test summary.

Sample ID	USCS Classification	% Passing #200 Sieve	Atterberg Limits			Dry Density (lbs/ft^3)	OMC (%)	Coefficient of Permeability (cm/sec)
			Liquid Limit	Plastic Limit	Plasticity Index			
Specification	**CL or CH**	**>30%**	**N/A**	**N/A**	**>=10**	**N/A**	**N/A**	**<=1.0 x 10^{-7}**
PC-1	CL	97.6	49	15	34	103.1	20.0	5.6 x 10^{-9}
PC-2	CL	95.3	38	14	24	106.2	16.8	9.2 x 10^{-9}
PC-3	CL	96.8	37	16	21	103.8	18.2	1.0 x 10^{-8}

Table 2 Clay liner material construction test summary.

Sample ID	USCS Classification	% Passing #200 Sieve	Atterberg Limits			Dry Density (lbs/ft^3)	OMC (%)	Coefficient of Permeability (cm/sec)
			Liquid Limit	**Plastic Limit**	**Plasticity Index**			
Specification	CL or CH	>30%	N/A	N/A	>=10	N/A	N/A	<=1.0 x 10^{-7}
C-1	CL	96.3	44	14	30	103.9	18.6	6.9 x 10^{-9}
C-2	CH	97.6	50	13	37	103.7	19.5	1.2 x 10^{-8}
C-3	CL	97.1	49	14	35	102.8	18.0	2.4 x 10^{-8}
C-4	CH	98.1	50	14	36	102.4	18.7	6.4 x 10^{-9}
C-5	CL	98.5	47	14	33	102.2	18.3	6.7 x 10^{-9}
C-6	CL	97.4	46	15	31	103.4	17.9	1.7 x 10^{-8}
C-7	CL	95.8	40	15	25	103.4	16.5	1.8 x 10^{-8}
C-8	CL	96.0	43	16	27	102.8	17.7	5.5 x 10^{-8}
C-9	CL-ML	84.5	23	19	4	109.4	12.8	4.0 x 10^{-8}
C-10	CL	94.5	44	16	28	102.8	18.4	1.3 x 10^{-8}

Table 3 Summary of compacted clay liner field tests.

Lift Number	Number of Tests	Range of Measured Compaction (%)	Range of Measured Moisture above OMC (%)	Results of Tests
Lift 1	63	98.4 – 100+	0.2 – 7.6	All tests passed.
Lift 2	63	99.0 – 100+	0.0 – 3.7	All tests passed.
Lift 3	63	98.8 – 100+	0.0 – 5.6	All tests passed.
Lift 4	63	98.7 – 100+	0.0 – 5.0	All tests passed.
Lift 1	63	98.4 – 100+	0.2 – 7.6	All tests passed.
Lift 2	63	99.0 – 100+	0.0 – 3.7	All tests passed.
Lift 3	63	98.8 – 100+	0.0 – 5.6	All tests passed.
Lift 4	63	98.7 – 100+	0.0 – 5.0	All tests passed.

Performance testing was conducted at the rate of one test per 40,000 square feet of completed clay liner lift in accordance with the project specifications and 8 CAR §60. Sixteen Shelby tube samples were collected for each of the four lifts, for a total of 64 samples. Two samples were collected at each sample location and labeled “A” or “B.” The “B” samples were only analyzed if the “A” samples were damaged during the sampling event or shipment. The samples were submitted to WSP for permeability analysis. Table 4 presents a summary of the permeability test results for each of the four lifts of the compacted clay liner. Summaries of the in-place permeability test results are included as Appendix I.

Table 4. Summary of compacted clay liner in-place permeability results.

Sample ID	Lift Number	Measured Permeability (cm/s)	Comment
P-1-1A	1	5.2×10^{-8}	Pass
P-1-2B	1	2.9×10^{-8}	Pass
P-1-3A	1	3.4×10^{-8}	Pass
P-1-4A	1	6.4×10^{-9}	Pass
P-1-5A	1	1.1×10^{-8}	Pass
P-1-6B	1	1.5×10^{-8}	Pass
P-1-7A	1	1.3×10^{-8}	Pass
P-1-8A	1	7.0×10^{-9}	Pass
P-1-9A	1	9.0×10^{-9}	Pass
P-1-10B	1	3.4×10^{-9}	Pass
P-1-11A	1	7.6×10^{-8}	Pass
P-1-12A	1	3.6×10^{-9}	Pass
P-1-13A	1	1.4×10^{-8}	Pass
P-1-14A	1	1.0×10^{-8}	Pass
P-1-15A	1	2.6×10^{-8}	Pass
P-1-16A	1	2.3×10^{-8}	Pass
P-2-1A	2	1.8×10^{-8}	Pass
P-2-2A	2	5.4×10^{-8}	Pass
P-2-3A	2	2.9×10^{-8}	Pass
P-2-4A	2	2.0×10^{-8}	Pass
P-2-5A	2	5.6×10^{-8}	Pass
P-2-6A	2	4.4×10^{-8}	Pass
P-2-7A	2	4.8×10^{-8}	Pass
P-2-8A	2	4.8×10^{-8}	Pass
P-2-9A	2	1.8×10^{-8}	Pass
P-2-10A	2	1.6×10^{-8}	Pass
P-2-11A	2	2.5×10^{-8}	Pass

Table 4. Summary of compacted clay liner in-place permeability results (continued).

Sample ID	Lift Number	Measured Permeability (cm/s)	Comment
P-2-12A	2	1.6×10^{-8}	Pass
P-2-13A	2	2.8×10^{-8}	Pass
P-2-14A	2	2.1×10^{-8}	Pass
P-2-15A	2	4.8×10^{-8}	Pass
P-2-16A	2	4.4×10^{-9}	Pass
P-3-1A	3	3.3×10^{-8}	Pass
P-3-2A	3	1.4×10^{-8}	Pass
P-3-3A	3	2.4×10^{-8}	Pass
P-3-4A	3	2.0×10^{-8}	Pass
P-3-5A	3	6.0×10^{-9}	Pass
P-3-6A	3	1.8×10^{-8}	Pass
P-3-7A	3	8.3×10^{-9}	Pass
P-3-8A	3	5.7×10^{-8}	Pass
P-3-9A	3	2.2×10^{-8}	Pass
P-3-10A	3	4.5×10^{-8}	Pass
P-3-11A	3	6.0×10^{-8}	Pass
P-3-12A	3	3.5×10^{-8}	Pass
P-3-13A	3	2.1×10^{-8}	Pass
P-3-14A	3	7.9×10^{-9}	Pass
P-3-15A	3	1.5×10^{-8}	Pass
P-3-16A	3	3.3×10^{-8}	Pass
P-4-1A	4	2.9×10^{-8}	Pass
P-4-2A	4	2.1×10^{-8}	Pass
P-4-3A	4	2.3×10^{-8}	Pass
P-4-4A	4	1.6×10^{-8}	Pass
P-4-5A	4	2.5×10^{-8}	Pass
P-4-6A	4	1.1×10^{-8}	Pass
P-4-7A	4	3.8×10^{-8}	Pass
P-4-8A	4	8.9×10^{-9}	Pass
P-4-9A	4	2.2×10^{-8}	Pass
P-4-10A	4	3.7×10^{-8}	Pass
P-4-11A	4	5.2×10^{-9}	Pass
P-4-12A	4	1.4×10^{-8}	Pass
P-4-13A	4	1.8×10^{-8}	Pass
P-4-14A	4	2.9×10^{-8}	Pass
P-4-15A	4	3.9×10^{-8}	Pass
P-4-16A	4	1.4×10^{-8}	Pass

Figures 5 through 8 present the field testing locations during the construction of the clay liner for each lift. Figure 9 presents the survey certification grid and elevations for the clay liner and is a record drawing of the final grades of the clay liner verified through an independent survey conducted by Ridge on September 17, 2025. Based on the survey, the top of the clay liner was constructed to meet the required minimum two-foot thickness. Geomembrane Liner Installation This section of the report summarizes the construction activities associated with the installation and testing of the geomembrane liner. Geomembrane construction activities consisted of the installation and testing of 548,850 square feet of smooth 60-mil HDPE liner material and 89,250 square feet of textured 60-mil HDPE liner material. Installation of the geomembrane liner began on September 26, 2025, and was completed on October 13, 2025. Photos 11 through 17 in Appendix C present geomembrane installation activities.

3.5 Project Specifications

The project specifications required that a 60-mil smooth HDPE geomembrane liner be installed on the bottom of the disposal area and textured HDPE geomembrane liner be installed the side-slopes. The geomembrane was to be installed as shown on the project drawings and in accordance with the project specifications.

3.6 Submittals

3.6.1 Manufacturer's Quality Control Certificates

In accordance with the project specifications, the geomembrane installation company, Patriot Environmental LLC (Patriot), submitted their company's qualifications for review by Olsson. This included the company's experience, representative projects, experience of the field superintendent and master seamer, installation procedures, and approval by the geomembrane manufacturer to install their materials. The information provided by Patriot demonstrated their qualifications to perform the work, and they were approved by Olsson. A copy of Patriot's submittal information is included as Appendix J.

Manufacturer's quality control certificates (roll certification reports) were submitted by Patriot for comparison of the materials to be installed with the project specifications. Copies of the manufacturer's certificates for the geomembrane material supplied for the project are included as Appendix K, and an inventory of the geomembrane rolls sent to the project site are included as Appendix L. Based on the information supplied by Patriot, the material was approved for shipment to the project.

3.6.2 Material Conformance Testing

After acceptance of the roll certification reports, conformance test samples of the smooth and textured geomembrane material were sent directly from the manufacturing facility (SKAPS Industries) to WSP laboratory in Atlanta, Georgia, for compliance testing. and the conformance samples were tested per the project specifications and all samples passed conformance testing. A copy of the laboratory test results is included as Appendix M. Based on the conformance test results, the geomembrane materials were approved for installation.

3.7 Construction Procedures

3.7.1 Deployment of Geomembrane

Prior to installation of the geomembrane liner, the Patriot field superintendent and the Olsson CQA Monitor reviewed the clay liner surface. Any defects in the surface were repaired prior to installation. Once the surface was reviewed and approved, both parties accepted the subgrade. A copy of the subgrade acceptance form is included as Appendix N.

Deployment of the geomembrane was accomplished using a front-end loader and manual labor to transport each geomembrane panel into place. An Olsson CQA Monitor observed and documented the deployment of the geomembrane panels. The panels were reviewed, and any defects were noted for repair. All panels were temporarily anchored with sandbags to prevent wind damage. The panels were seamed and then permanently anchored on the south, east, and west sides of the disposal cell. The daily deployment logs for the geomembrane installation are included as Appendix O. Figure 10 is a panel layout of the disposal cell.

3.7.2 Trial Seam Testing

In accordance with the project specifications, the fusion and extrusion welder operators were required to prepare trial seams before the startup of each seaming period. Coupons were cut from the trial seam and were tested in the field on a gauged tensiometer to check for seaming machine failures or operator errors. The trial seams were tested for peel and shear strength, and had to exhibit a film tear bond (FTB) and meet the project requirements for strength to be deemed acceptable. If the trial seam met the peel and shear strength requirements, the operator was allowed to begin seaming. A summary of the trial seam logs is included in Appendix P.

3.7.3 Geomembrane Seaming

The principal method for joining the geomembrane panels was through the use of an automated double-track fusion welder. Extrusion welders were used for seaming patches, repairs, intersections of seams, and seam reconstruction.

An Olsson CQA Monitor observed and documented the seaming activities. Duties included visual observation of the seaming process, visual examination of the completed seam, and verification and documentation that the seam was welded for its entire length. Any seaming imperfections were marked by the Olsson CQA Monitor or the Patriot field superintendent and were repaired in accordance with the project specifications. The geomembrane production seaming log, which includes information on the geomembrane panel, seam number, seam length, and welding information, is included as Appendix Q.

3.8 Testing Procedures

3.8.1 Non-Destructive Seam Testing and Repairing

All seams, seam repairs, and patches were non-destructively tested for continuity by the installer, using an air pressure test for fusion welds or vacuum box techniques for extrusion welds. An Olsson CQA Monitor observed and documented all field testing of the geomembrane seams to ensure that the tests were performed in accordance with the project specifications. The seaming continuity test log is presented with the production seaming log in Appendix Q. The location, size, and testing results of all seam repairs, patches, and defects were documented by an Olsson CQA Monitor. Information on the repairs made to the liner is included in the geomembrane liner defect and repair log which is included as Appendix R. Locations of liner repairs and patches are shown on Figure 10.

3.8.2 Destructive Seam Strength Testing

In accordance with the project specifications, destructive samples were obtained at a minimum frequency of one sample per 500 linear feet of completed seam. Each destructive sample was divided into three equal-sized sections: one for field testing, one for laboratory testing, and one to be archived. Prior to shipment of the laboratory samples to WSP, the field test sample was tested by Patriot on their tensiometer for peel and shear strength to determine the seam's conformance with the project specifications.

All the field samples and laboratory samples passed. Summaries of the field and laboratory destructive seam strength testing are included as Appendix S. Locations of destructive seam samples are shown on Figure 10.

4. LEACHATE COLLECTION SYSTEM INSTALLATION

4.1 Geocomposite Drainage Layer

4.1.1 Project Specifications

The project construction documents required the installation of a single-sided geocomposite above the geomembrane liner within the disposal cell area. The geocomposite was to be installed in accordance with the construction documents.

4.1.2 Geocomposite Material Submittals

4.1.3 Manufacturer's Quality Control Certificates

Manufacturer's quality control certificates (roll certification reports) were submitted by Patriot for comparison of the materials to be installed with the project specifications. Copies of the manufacturer's certificates for the geocomposite material supplied for the project are included as Appendix T.

4.1.4 Material Conformance Testing

After acceptance of the roll certification reports, conformance test samples of the geonet, geotextile, and the completed geocomposite materials were sent directly from the manufacturing facility (SKAPS Industries) to WSP laboratory in Atlanta, Georgia, for compliance testing. Based on the results of the conformance testing of the geocomposite materials, the material was approved to be shipped to the project. Copies of the geocomposite conformance testing results are included in Appendix U.

4.1.5 Construction Procedures

The geocomposite was installed over the entire bottom and side slopes of Cell 5 in accordance with the project construction documents. Patriot installed the geocomposite from October 4 to October 14, 2025. Photos of the geocomposite installation are included in photos 18 through 21 in the Photo Log included in Appendix C.

4.2 Protective Cover Layer

4.2.1 Project Specifications

The project construction documents required the installation of a 12-inch thick protective cover layer over the entire waste cell. The protective cover material was specified to be a sand/gravel material (GW or GP), with a minimum of 95% passing the 1-inch sieve, a maximum calcium carbonate content of 15% and a minimum permeability of 1×10^{-3} cm/sec.

Placement of the protective cover layer was specified to be done with low ground pressure equipment to minimize pressure on the underlying geosynthetic materials. Equipment was not to be operated over the geosynthetic materials with less than 12 inches of protective cover. The completed surface was to be surveyed for verification of the thickness of the material.

4.2.2 Construction Procedures

Prior to installation of the protective cover, one soil sample (PCL) of the protective cover material was obtained from an offsite borrow source. The sample was submitted to WSP for analysis. Table 5 presents a summary of the test results of the pre-construction sample. The laboratory test summary of the pre-construction soil sample is included in Appendix V.

Table 5: Protective cover material pre-construction test summary.

Sample ID	% Passing 1-inch Sieve	Carbonate Content	Coefficient of Permeability (cm/sec)
Specification	> 95%	<15%	>1.0 x 10^{-3}
PCL	81.7	0.1%	1.3 x 10^{-3}

The protective cover layer met all the criteria except having 95% passing the 1-inch sieve (results were 81.7% passing) as the material had a higher gravel content. However, the material was accepted as it was primarily gravel and sand and still met the permeability requirement of greater than 1 x 10^{-3} cm/sec. The material was installed in accordance with the project drawings and specifications. Dumey installed the protective layer starting October 15, 2025, and completed the installation on November 16, 2025. Dumey spread the protective cover material across the disposal cell except in the leachate trench, sump areas, and the two intercell rainflap/berms. Dumey then installed the leachate piping and sump materials followed by the installation of the soil protective cover layer on the side slopes of the disposal cell.

The two rain flaps/berms perpendicular to the leachate collection trench subdivided the disposal area into three subareas. A blind flange was installed in the leachate collection pipe upgradient of the berms to prevent stormwater from entering the leachate collection system in the downgradient areas that contain waste. Future trapped stormwater in the unused subarea of Cell 5will be pumped to the stormwater ponds. This will allow the landfill facility to minimize leachate production.

The final elevations of the completed protective cover layer were verified through an independent survey conducted by Ridge on November 17, 2025. Figure 11 presents the protective cover layer certification grid and recorded elevations and is a record drawing of the

final grades of the protective cover layer. Based on the survey, the top of the protective cover layer was constructed with a minimum thickness of 1 ft. Photos 22 through 27 in Appendix C present the protective cover layer construction activities.

4.3 Leachate Collection Trench and Sump

4.3.1 Project Specifications

The project specifications required the leachate collection trench to consist of a 6-inch diameter SDR 17 HDPE perforated pipe to be placed in a washed gravel bed and wrapped in an 8-ounce non-woven geotextile fabric. The perforated pipe was specified to have 3/8-inch diameter holes spaced on 6-inch centers. The washed gravel was specified to be less than 3 inches in diameter, with a calcium carbonate content of less than 15%, and a maximum of 5% passing the No. 8 Standard Sieve.

On each end (east and west) of the disposal cell, a 6-inch diameter solid wall SDR 17 HDPE leachate collection cleanout riser pipe was to be connected to the perforated collection pipe. The cleanout riser pipes were specified to be installed into concrete headwalls to be constructed at the top of the waste cell slopes.

An 18-inch diameter SDR 11 HDPE leachate pump riser pipe was specified to be installed on the eastern slope of the landfill and to rest in the base of the leachate collection sump. The lower 3 feet of the riser pipe was specified to be perforated with 3/4-inch diameter holes on 12-inch centers. The leachate pump riser pipe was to be installed into the concrete headwall along with the cleanout riser pipe.

4.3.2 Construction Procedures

Dumey submitted information on the leachate collection piping and based on this information; Olsson approved the piping material for shipment to the project site.

Prior to installation of the collection trench, samples of the washed gravel for the leachate collection trench and the leachate collection sump and geotextile fabric were submitted for conformance testing. Both the gravel materials and the geotextile met the requirements of the project specifications and were approved for shipment to the project site. Results of the washed gravel analyses are included as Appendix V and the results of the geotextile fabric material testing are included as Appendix W.

Construction of the leachate collection trench was conducted from November 11, 2025, through November 16, 2025. The leachate collection trench was constructed in accordance with the project drawings and specifications. Initially, Dumey placed the geotextile fabric in the base of the collection trench and the collection sump over the geomembrane liner, and then placed

approximately 6 inches of gravel on top of the geotextile. Dumey then welded the leachate collection pipe together (including the solid wall cleanout pipes at the ends of the pipeline) and Dumey placed the pipe in the trench. Dumey then installed the 18-inch diameter HDPE leachate pump riser pipe in the collection sump and covered the collection pipe and sump with gravel up to the required depth. The geotextile was then wrapped over the top of the gravel in both the sump and the trench. A final layer of gravel was installed over the trench and sump.
Photos 28 through 34 in Appendix C present the construction of the leachate collection trench and sump.

4.4 Leachate Pump System

4.4.1 Project Specifications

The project specifications required the installation of a side-slope riser pumping system for the leachate collection sump. The pumping system was to be installed in the 18-inch diameter HDPE side-slope riser pipe in the sump on the eastern perimeter berm of the waste disposal area. The pump was designed to discharge into a dual-contained pipeline that was to be installed along the gravel access road east of Cell 5 and future Cell 6 to the existing leachate storage system located between future Cell 6 and Cell 7.

4.4.2 Construction Procedures

The approved leachate pumping system was manufactured by EPG Companies Inc. (EPG). The submittal information for the pumping system can be found in Appendix X. Installation of the leachate pumping system was performed in accordance with the project drawings and specifications. Dumey installed the dual-contained HDPE pipeline from the concrete headwall to the new leachate storage tank pad between November 18 and 20, 2025. In accordance with the project specifications, the dual-contained pipeline was air-tested for potential leaks, and the pipeline met the project requirements. Photos 35 through 38 in Appendix C present the installation of the leachate transmission pipeline and the riser pipe headwall.
C2R, LLC installed the pumping system starting December 16, 2025 and completed the installation on December 22, 2025. The system was successfully tested and performs as specified. Figure 12 in Appendix A illustrates the leachate sump pump control settings for Cell 5.

4.5 Leachate Storage Tanks

4.5.1 Project Specifications

The project specifications required the installation of two 20,000-gallon plastic storage tanks placed within a concrete storage tank area.

4.5.2 Submittals

Dumey submitted shop drawings for the construction of the concrete storage area and product information for the two 20,000-gallon storage tanks. Based on the information provided the tanks and the concrete storage area design were approved.

4.5.3 Construction Procedures

Dumey constructed the concrete leachate storage tank area per the construction documents between October 20 and 23, 2025. Dumey installed the leachate storage tanks in accordance with the project documents on December 10, 2025. The HDPE piping for the tanks was installed on December 11, 2025.

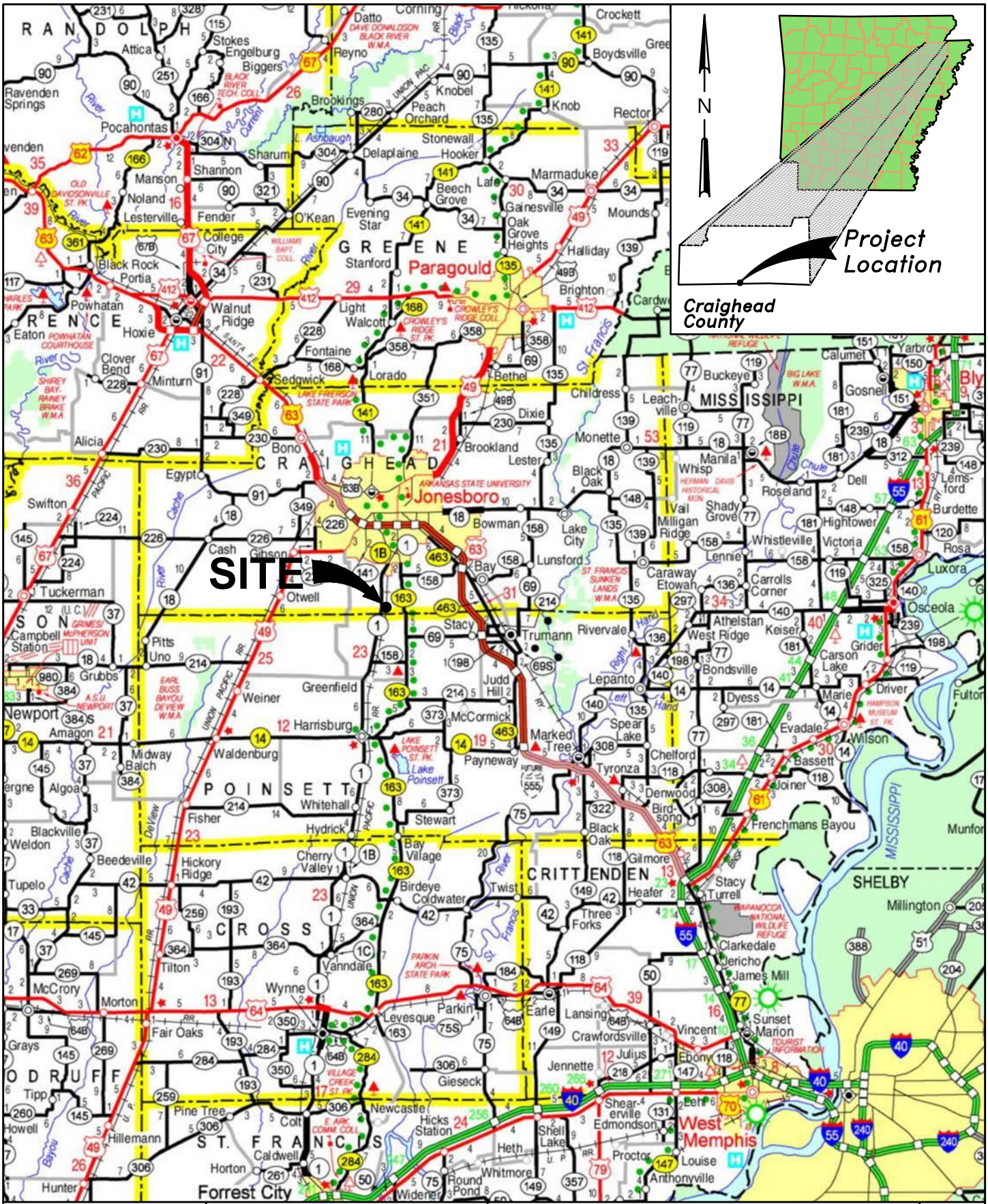
Photos of the concrete storage area, the leachate storage tanks, and the leachate transmission piping from Cell 5 are shown in photos 37 and 38 of the Photo Log in Appendix C.

5. CONCLUSIONS

Construction of Cell 5 of the CCSWDA Legacy Landfill began in September 2025 and was substantially complete on December 22, 2025. The disposal area was constructed according to the project specifications, the facility CQA Plan, and APCEC Rule No. 22. Required field and laboratory testing was performed and successfully completed as detailed in this report. Elevations of respective components of the cell liner system were within the project specifications as indicated on the Record Drawings.

The Professional Engineering certification for the construction of Cell 5 of the landfill is included at the beginning of this report.

APPENDIX A
FIGURES



F:\2025\04001-04500\025-04399\60-Construction\08-Construction Reports\ENV\CQA Report\Draft Figures\Figure 1 - Site Location Map.dwg
DATE: Jan 14, 2026 8:46am USER: jtorres

PROJECT NO:	025-04399
DRAWN BY:	JT
DATE:	01.14.2026

Figure 1.
Legacy Landfill site location map.

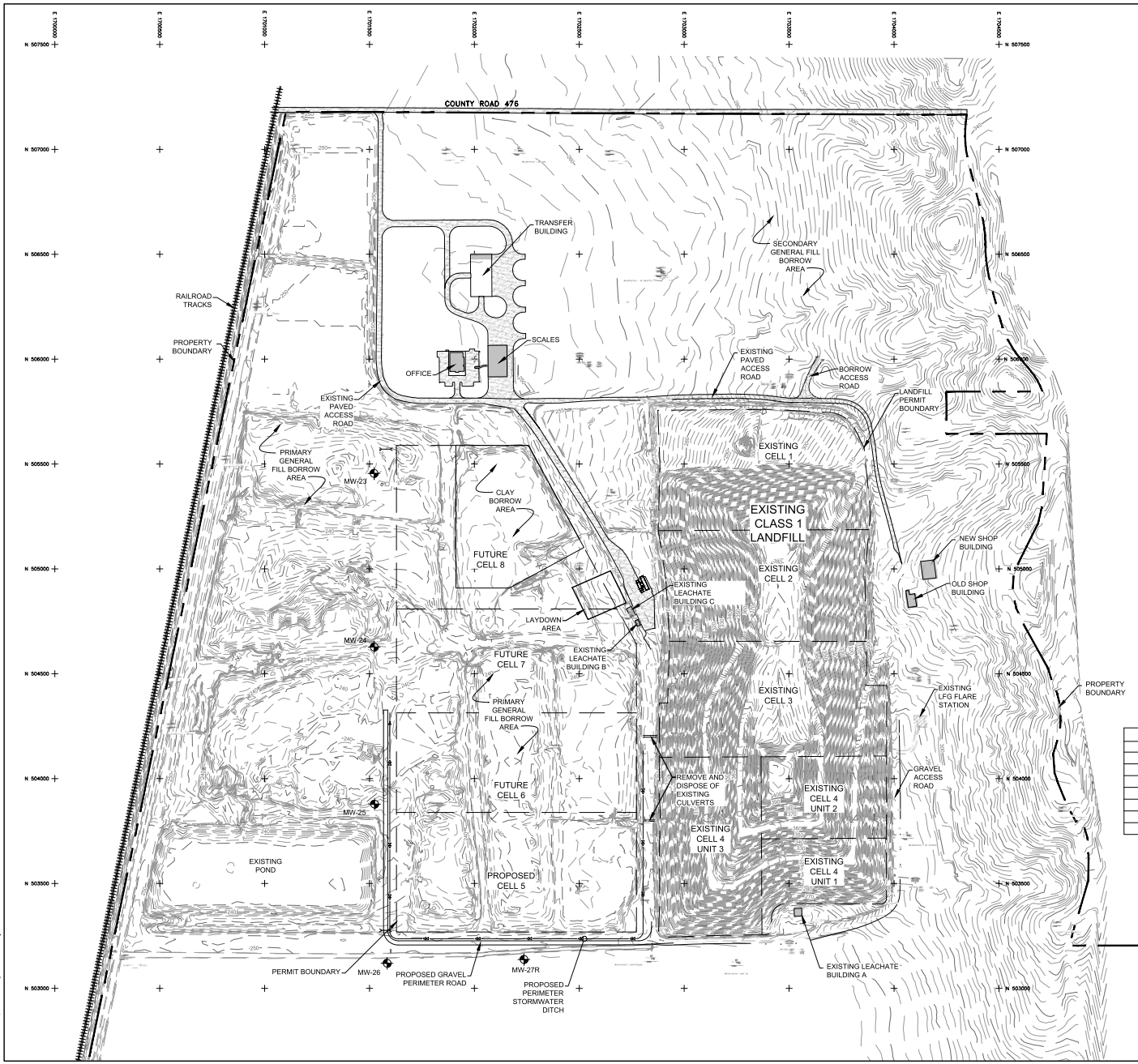
olsson

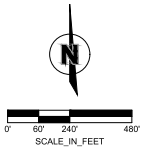
3 Innwood Circle
Suite 220
Little Rock, AR 72211

olsson.com
TEL 501.225.7779
Olsson - Engineering
Arkansas COA #1010

FIGURE

1





LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERIOR CONTOUR
- EXISTING BUILDING
- SITE GRID
- PROPERTY BOUNDARY
- LANDFILL PERMIT BOUNDARY
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING MONITORING WELL
- EXISTING GAS PROBE
- EXISTING SURVEY CONTOUR POINT
- PROPOSED UNPAVED ROAD
- PROPOSED STORMWATER DITCH
- PROPOSED STORMWATER POND LIMITS
- NEW MONITORING WELL
- PROPOSED CULVERT

SURVEY CONTROL POINTS

POINT	NORTHING	EASTING	ELEVATION
SC #1	504500	1704100	302.10
SC #2	503500	1704100	279.83
SC #3	503200	1703500	256.50
SC #4	505000	1702500	253.93
SC #5	506000	1702500	257.86
SC #6	505900	1703500	288.88
SC #7	505400	1704000	311.11

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Arkansas COA #1010

CERTIFICATE OF AUTHORIZATION OLSSON, INC. No. 1010 ARKANSAS

ARKANSAS REGISTERED PROFESSIONAL ENGINEER 01-13-2026

REV NO.	DATE	DESCRIPTION	BY

REVISIONS

FIGURE 2
EXISTING SITE PLAN

CRAIGHEAD COUNTY LANDFILL
CELL 5 CONSTRUCTION PROJECT

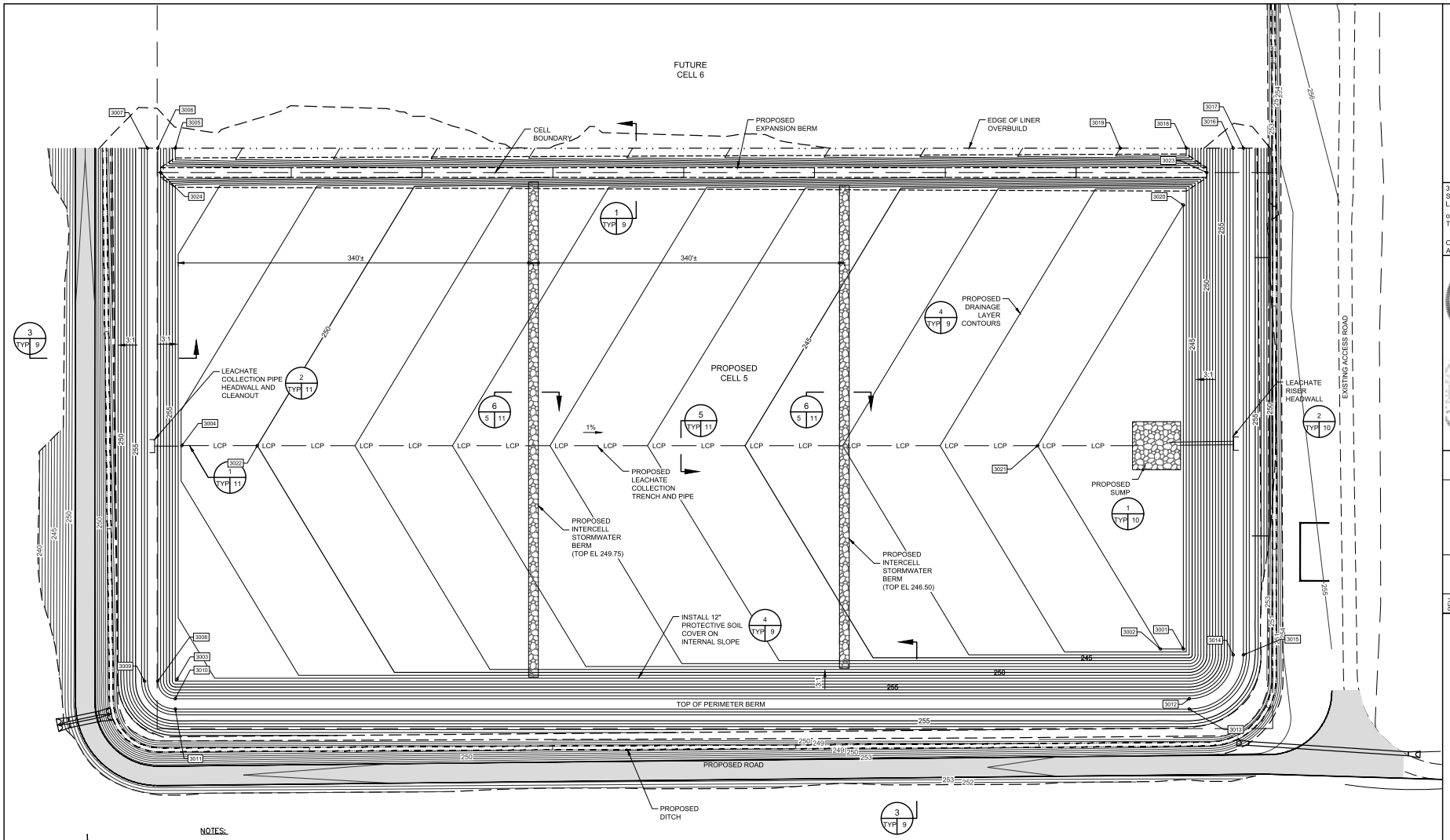
JONESBORO, ARKANSAS

2025

drawn by: JJG
designed by: JJG
project no.: 025-02434
date: 08/15/2025

SHEET
02 of 15

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NOTES:

1. SURVEY DATA IS BASED UPON ARKANSAS NORTH STATE PLANE COORDINATE SYSTEM. ELEVATIONS ARE BASED UPON THE NORTH AMERICAN VERTICAL DATUM OF 1988.
2. LANDFILL COORDINATE SYSTEM IS BASED UPON SITE COORDINATE SYSTEM, WHICH IS TIED INTO ARKANSAS STATE PLANE COORDINATE SYSTEM.
3. CONSTRUCTION OF PROPOSED FACILITIES SHOWN ON THESE DRAWINGS SHALL BE DONE IN ACCORDANCE WITH THE FACILITY PERMIT, CONSTRUCTION DOCUMENTS, AND THE FACILITY CQA PLAN.
4. EXISTING FACILITIES AND FEATURES ARE SHOWN LIGHT-LINED AND/OR SCREENED. NEW FACILITIES AND FEATURES ARE SHOWN SOLID AND HEAVY-LINED.

0' 25' 50' 100'
SCALE IN FEET

PROTECTIVE COVER/DRAINAGE LAYER CONSTRUCTION POINTS

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
3001	503350.36	1702680.58	242.00	PC/DL	3013	503288.78	1702686.58	259.00	PC/DL
3002	503350.36	1702656.96	242.00	PC/DL	3014	503344.36	1702731.58	259.00	PC/DL
3003	503319.16	1701648.71	252.40	PC/DL	3015	503344.36	1702742.16	259.00	PC/DL
3004	503558.81	1701653.70	249.77	PC/DL	3016	503863.82	1702731.58	259.00	PC/DL
3005	503863.82	1701647.02	253.00	PC/DL	3017	503863.82	1702742.16	259.00	PC/DL
3006	503863.82	1701629.02	259.00	PC/DL	3018	503863.82	1702683.58	243.00	PC/DL
3007	503863.82	1701618.44	259.00	PC/DL	3019	503863.82	1702615.89	243.00	PC/DL
3008	503317.36	1701629.02	259.00	PC/DL	3020	503805.53	1702680.58	242.00	PC/DL
3009	503317.36	1701615.44	258.00	PC/DL	3021	503558.81	1702531.15	242.00	PC/DL
3010	503299.36	1701647.02	259.00	PC/DL	3022	503558.81	1701731.15	250.00	PC/DL
3011	503288.78	1701647.02	259.00	PC/DL	3023	503838.82	1702704.58	250.00	PC/DL
3012	503299.36	1702686.58	259.00	PC/DL	3024	503838.82	1701632.02	258.00	PC/DL

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REVISIONS

REV NO.	DATE	DESCRIPTION	BY

FIGURE 3 - CONSTRUCTION PLAN
DRAINAGE LAYER / PROTECTIVE COVER PLAN

CRAIGHEAD COUNTY LANDFILL
CELL 5 CONSTRUCTION PROJECT

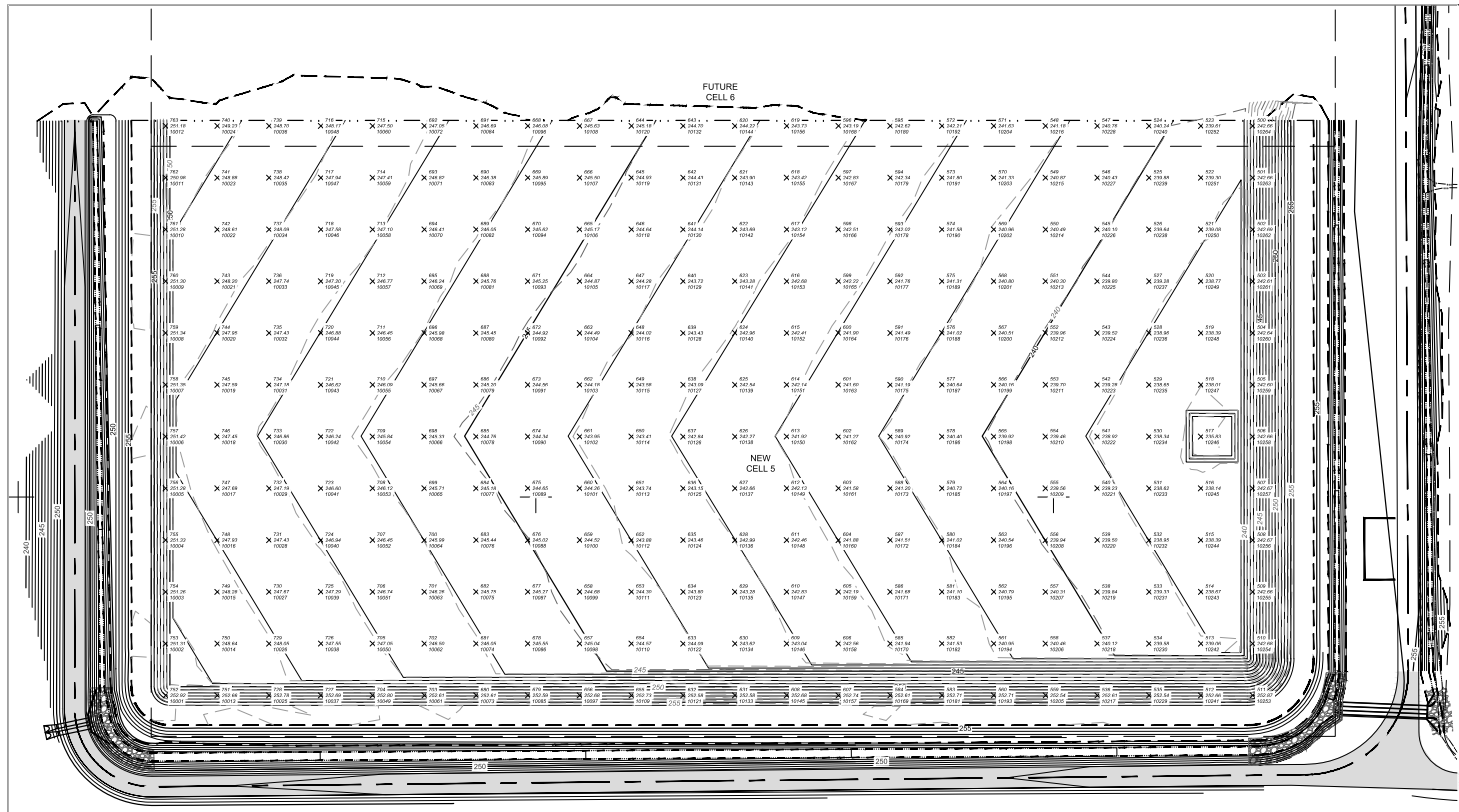
JONESBORO, ARKANSAS

2025

drawn by: JJG
designed by: JJG
project no.: 025-02434
date: 08/15/2025

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05 of 15

F:\2025\04001-04500\025-04369\03-Construction\08-Construction Reports\ENV\CQA Report\Draft Figures\Figure 3 - Construction Plan.dwg
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LEGEND

- 240 — MAJOR CONTOUR - DESIGN (5')
- MINOR CONTOUR - DESIGN (1')
- 240 — MAJOR CONTOUR - SURVEY (5')
- MINOR CONTOUR - SURVEY (1')
- CELL BOUNDARY

NOTES:

1. SUBGRADE CQA SURVEY PROVIDED BY RIDGE SURVEYING & CONSULTING, PLLC, ON SEPTEMBER 2, 2025. CONTOURS GENERATED BY OLSSON USING BREAKLINES GENERATED FROM SURVEY POINT CODES.

SUBGRADE CQA SURVEY POINTS

PT	N	E	EL. (FT)	PT	N	E	EL. (FT)	PT	N	E	EL. (FT)
10001	503308.44	1701642.40	252.92	10059	503508.46	1701992.38	244.65	10177	503708.44	1702342.40	241.76
10002	503358.41	1701642.37	251.31	10060	503558.41	1701992.34	244.35	10178	503758.40	1702342.39	242.02
10003	503408.41	1701642.38	251.36	10061	503608.42	1701992.32	244.52	10179	503808.40	1702342.41	242.34
10004	503458.41	1701642.36	251.33	10062	503658.39	1701992.37	244.93	10180	503858.45	1702342.37	242.62
10005	503508.45	1701642.38	251.28	10063	503708.43	1701992.25	245.25	10181	503308.46	1702392.36	252.71
10006	503558.41	1701642.36	251.43	10064	503758.48	1701992.35	245.62	10182	503358.47	1702392.36	241.53
10007	503608.45	1701642.36	251.35	10065	503808.44	1701992.36	245.89	10183	503408.43	1702392.33	241.10
10008	503658.45	1701642.35	251.35	10066	503858.45	1701992.36	246.08	10184	503458.47	1702392.37	241.02
10009	503708.47	1701642.42	251.31	10067	503308.46	1702042.39	252.68	10185	503508.47	1702392.39	240.72
10010	503758.45	1701642.34	251.26	10068	503358.42	1702042.40	244.68	10186	503558.39	1702392.36	240.40
10011	503808.45	1701642.39	250.96	10069	503408.42	1702042.40	244.68	10187	503608.47	1702392.41	240.64
10012	503858.43	1701642.42	251.18	10100	503458.43	1702042.40	244.52	10188	503658.45	1702392.39	241.02
10013	503308.42	1701692.40	252.90	10101	503508.44	1702042.37	244.26	10189	503708.42	1702392.33	241.31
10014	503358.43	1701692.40	248.64	10102	503558.45	1702042.40	243.95	10190	503758.42	1702392.37	241.58
10015	503408.40	1701692.38	248.28	10103	503608.45	1702042.37	244.18	10191	503808.45	1702392.39	241.80
10016	503458.43	1701692.38	247.93	10104	503658.42	1702042.40	244.40	10192	503858.46	1702392.37	242.2
10017	503508.43	1701692.39	247.63	10105	503708.43	1702042.43	244.65	10193	503308.47	1702442.36	252.71
10018	503558.42	1701692.39	247.45	10106	503758.46	1702042.38	245.17	10194	503358.46	1702442.39	240.95
10019	503608.42	1701692.37	247.59	10107	503808.41	1702042.41	245.50	10195	503408.44	1702442.39	240.79
10020	503658.42	1701692.38	247.95	10108	503858.46	1702042.42	245.63	10196	503458.45	1702442.41	240.54
10021	503708.46	1701692.38	248.35	10109	503308.47	1702092.36	252.78	10197	503508.42	1702442.44	240.16
10022	503758.44	1701692.37	248.61	10110	503358.46	1702092.36	243.86	10198	503558.44	1702442.37	239.92
10023	503808.43	1701692.39	248.88	10111	503408.47	1702092.36	244.30	10199	503608.45	1702442.41	240.17
10024	503858.44	1701692.40	249.23	10112	503458.43	1702092.36	243.89	10200	503658.46	1702442.41	240.51
10025	503308.46	1701742.38	252.78	10113	503508.41	1702092.32	243.74	10201	503708.46	1702442.39	240.80
10026	503358.42	1701742.36	248.05	10114	503558.46	1702092.39	243.41	10202	503758.46	1702442.37	240.96
10027	503408.50	1701742.37	247.67	10115	503608.45	1702092.41	243.56	10203	503808.48	1702442.36	241.33
10028	503458.44	1701742.43	247.43	10116	503658.46	1702092.39	244.02	10204	503858.45	1702442.37	241.63
10029	503508.44	1701742.40	247.19	10117	503708.45	1702092.37	244.28	10205	503308.48	1702492.39	252.54
10030	503558.43	1701742.36	246.86	10118	503758.48	1702092.40	244.64	10206	503358.46	1702492.35	240.46
10031	503608.47	1701742.37	247.19	10119	503808.46	1702092.37	244.94	10207	503408.41	1702492.35	240.67
10032	503658.47	1701742.39	247.43	10120	503858.44	1702092.42	245.18	10208	503458.42	1702492.37	239.94
10033	503708.46	1701742.33	247.74	10121	503308.39	1702142.36	252.58	10209	503508.44	1702492.35	239.56
10034	503758.45	1701742.38	248.09	10122	503358.39	1702142.35	244.09	10210	503558.44	1702492.34	239.49
10035	503808.45	1701742.36	248.42	10123	503408.43	1702142.41	243.80	10211	503608.47	1702492.40	239.73
10036	503858.44	1701742.43	248.71	10124	503458.47	1702142.41	243.46	10212	503658.46	1702492.35	239.96
10037	503308.47	1701792.37	252.69	10125	503508.42	1702142.39	243.15	10213	503708.45	1702492.35	240.30
10038	503358.48	1701792.41	247.55	10126	503558.35	1702142.36	242.94	10214	503758.47	1702492.41	240.48
10039	503408.45	1701792.39	247.29	10127	503608.43	1702142.46	243.09	10215	503808.44	1702492.37	240.67
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10041	503508.43	1701792.38	246.61	10129	503708.41	1702142.38	243.72	10217	503308.39	1702542.42	252.61
10042	503558.46	1701792.37	246.25	10130	503758.44	1702142.37	244.14	10218	503358.48	1702542.37	240.13
10043	503608.38	1701792.40	246.62	10131	503808.43	1702142.41	244.43	10219	503408.41	1702542.38	239.84
10044	503658.49	1701792.42	246.86	10132	503858.45	1702142.38	244.70	10220	503458.47	1702542.38	239.50
10045	503708.44	1701792.37	247.20	10133	503308.50	1702192.35	252.56	10221	503508.46	1702542.37	239.22
10046	503758.46	1701792.36	247.59	10134	503358.46	1702192.36	244.04	10222	503558.45	1702542.42	238.93
10047	503808.43	1701792.36	247.94	10135	503408.42	1702192.39	243.28	10223	503608.46	1702542.38	239.28
10048	503858.44	1701792.36	248.17	10136	503458.41	1702192.40	242.96	10224	503658.44	1702542.42	239.52
10049	503308.47	1701842.36	252.80	10137	503508.45	1702192.41	242.66	10225	503708.42	1702542.37	239.82
10050	503358.48	1701842.38	247.05	10138	503558.45	1702192.40	242.27	10226	503758.44	1702542.36	240.10
10051	503408.43	1701842.37	246.74	10139	503608.44	1702192.42	242.55	10227	503808.43	1702542.40	240.43
10052	503458.42	1701842.36	246.45	10140	503658.44	1702192.36	242.96	10228	503858.47	1702542.40	240.78
10053	503508.46	1701842.36	246.12	10141	503708.46	1702192.43	243.29	10229	503308.46	1702592.36	252.54
10054	503558.42	1701842.39	245.84	10142	503758.47	1702192.40	243.68	10230	503358.43	1702592.38	239.58
10055	503608.44	1701842.35	246.09	10143	503808.40	1702192.38	243.90	10231	503408.44	1702592.41	239.30
10056	503658.46	1701842.39	246.45	10144	503858.42	1702192.38	244.25	10232	503458.46	1702592.36	238.99
10057	503708.43	1701842.36	246.77	10145	503308.52	1702242.35	252.68	10233	503508.42	1702592.36	238.62
10058	503758.47	1701842.38	247.10	10146	503358.46	1702242.36	243.04	10234	503558.42	1702592.35	238.34
10059	503808.45	1701842.36	247.41	10147	503408.45	1702242.36	242.83	10235	503608.41	1702592.37	238.65
10060	503858.46	1701842.36	247.51	10148	503458.46	1702242.37	242.46	10236	503658.44	1702592.36	238.98
10061	503308.43	1701892.40	252.61	10149	503508.51	1702242.39	242.13	10237	503708.43	1702592.36	239.28
10062	503358.44	1701892.40	246.52	10150	503558.46	1702242.37	241.92	10238	503758.42	1702592.37	239.64
10063	503408.50	1701892.40	246.20	10151	503608.47	1702242.38	242.14	10239	503808.43	1702592.36	239.88
10064	503458.42	1701892.38	245.96	10152	503658.46	1702242.41	242.41	10240	503858.42	1702592.37	240.28
10065	503508.42	1701892.37	245.71	10153	503708.43	1702242.42	242.68	10241	503308.42	1702642.40	252.66
10066	503558.38	1701892.32	245.33	10154	503758.47	1702242.39	243.13	10242	503358.46	1702642.36	239.09
10067	503608.42	1701892.34	245.67	10155	503808.47	1702242.38	243.42	10243	503408.44	1702642.36	238.67
10068	503658.39	1701892.41	245.96	10156	503858.46	1702242.39	243.73	10244	503458.44	1702642.37	238.39
10069	503708.44	1701892.34	246.24	10157	503308.42	1702292.36	252.75	10245	503508.43	1702642.37	238.14
10070	503758.48	1701892.41	246.41	10158	503358.44	1702292.34	242.96	10246	503558.44	1702642.37	238.63
10071	503808.46	1701892.37	246.62	10159	503408.46	1702292.36	242.78	10247	503608.46	1702642.36	238.91
10072	503858.47	1701892.38	247.05	10160	503458.44	1702292.33	241.88	10248	503658.43	1702642.38	238.39
10073	503308.39	1701942.40	252.61	10161	503508.49	1702292.37	241.58	10249	503708.47	1702642.40	238.77
10074	503358.42	1701942.37	246.05	10162	503558.36	1702292.36	241.27	10250	503758.42	1702642.36	239.08
10075	503408.49	1701942.33	245.75	10163	503608.47	1702292.37	241.60	10251	503808.45	1702642.36	239.31
10076	503458.46	1701942.42	245.44	10164	503658.50	1702292.33	241.90	10252	503858.41	1702642.40	239.61
10077	503508.43	1701942.32	245.18	10165	503708.46	1702292.32	242.23	10253	503308.47	1702692.39	252.61
10078	503558.43	1701942.34	244.76	10166	503758.44	1702292.36	242.53	10254	503358.43	1702692.36	242.88
10079	503608.45	1701942.42	245.20	10167	503808.43	1702292.36	242.83	10255	503408.42	1702692.36	242.66
10080	503658.43	1701942.39	245.45	10168	503858.43	1702292.37	243.19	10256	503458.43	1702692.37	242.67
10081	503708.47	1701942.43	245.76	10169	503308.43	1702342.42	252.61	10257	503508.43	1702692.36	242.47
10082	503758.47	1701942.36	246.05	10170	503358.42	1702342.37	241.94	10258	503558.44	1702692.36	242.66
10083	503808.47	1701942.41	246.38	10171	503408.42	1702342.38	242.24	10259	503608.42	1702692.34	242.60
10084	503858.47	1701942.43	246.69	10172	503458.42	1702342.40	241.51	10260	503658.47	1702692.39	242.64
10085	503308.46	1701992.39	252.58	10173	503508.41	1702342.43	241.20	10261	503708.43	1702692.37	242.66
10086	503358.42	1701992.38	245.55	10174	503558.39	1702342.42	240.92	10262	503758.45	1702692.36	242.69
10087	503408.46	1701992.39	245.27	10175	503608.40	1702342.38	241.19	10263	503808.46	1702692.39	242.66
10088	503458.49	1701992.37	245.02	10176	503658.47	1702342.43	241.46	10264	503858.46	1702692.37	242.64

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FIGURE 4 - SUBGRADE AS-BUILT CRAIGHEAD COUNTY LANDFILL CELL 5 CONSTRUCTION REPORT

CRAIGHEAD COUNTY SOLID WASTE DISPOSAL AUTHORITY
LEGACY LANDFILL CELL 5 CONSTRUCTION

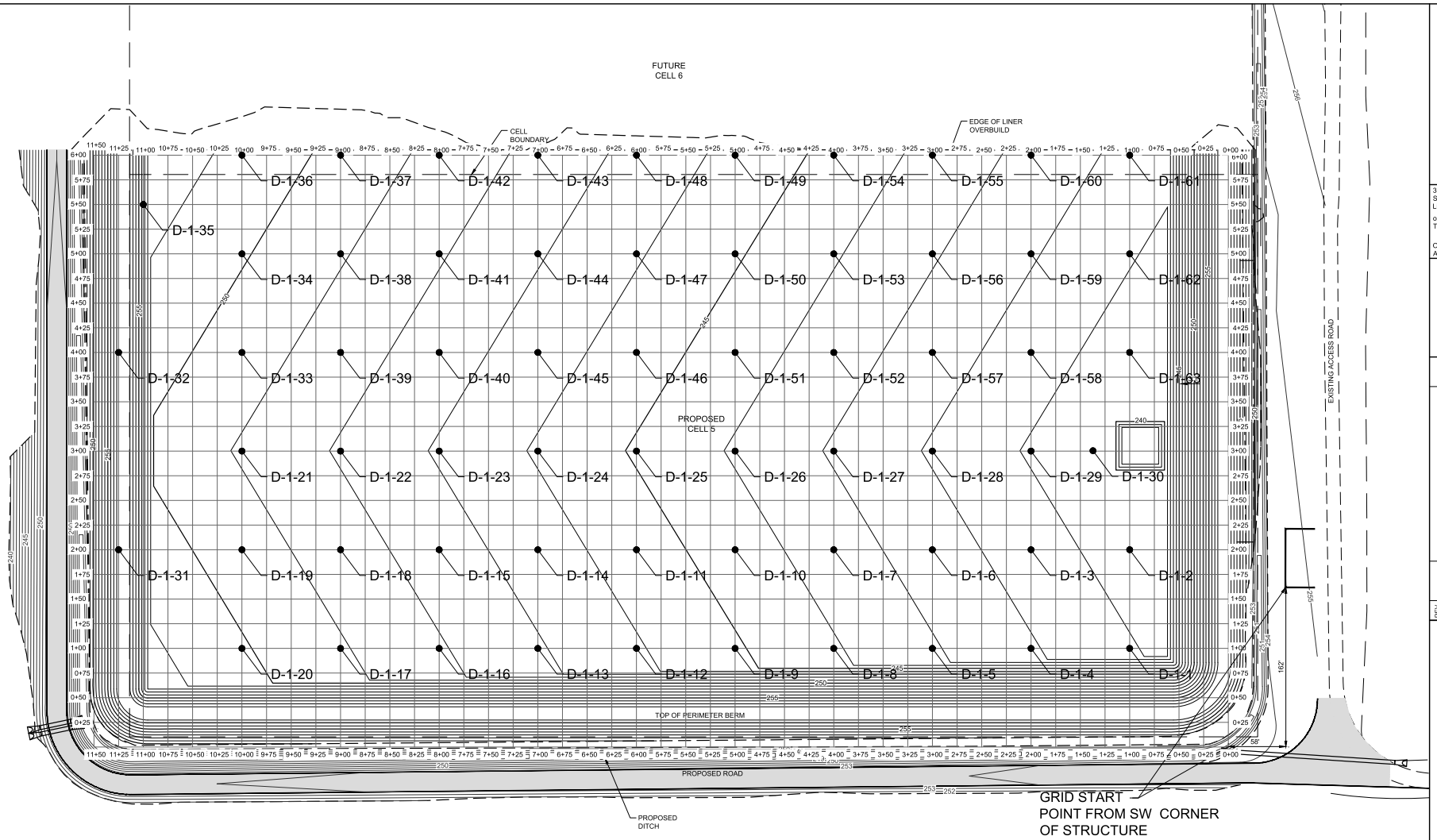
JONESBORO, AR

2025

drawn by: JJG
designed by: JJG
project no.: 025-04399
date: 12/23/2025

SHEET
04 of 12

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DATE: Jan 14, 2026 2:50pm USER: jlorres



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DATE: Jan 13, 2026 1:35pm USER: jmckeever

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DENSITY TEST LOCATIONS
LIFT 1

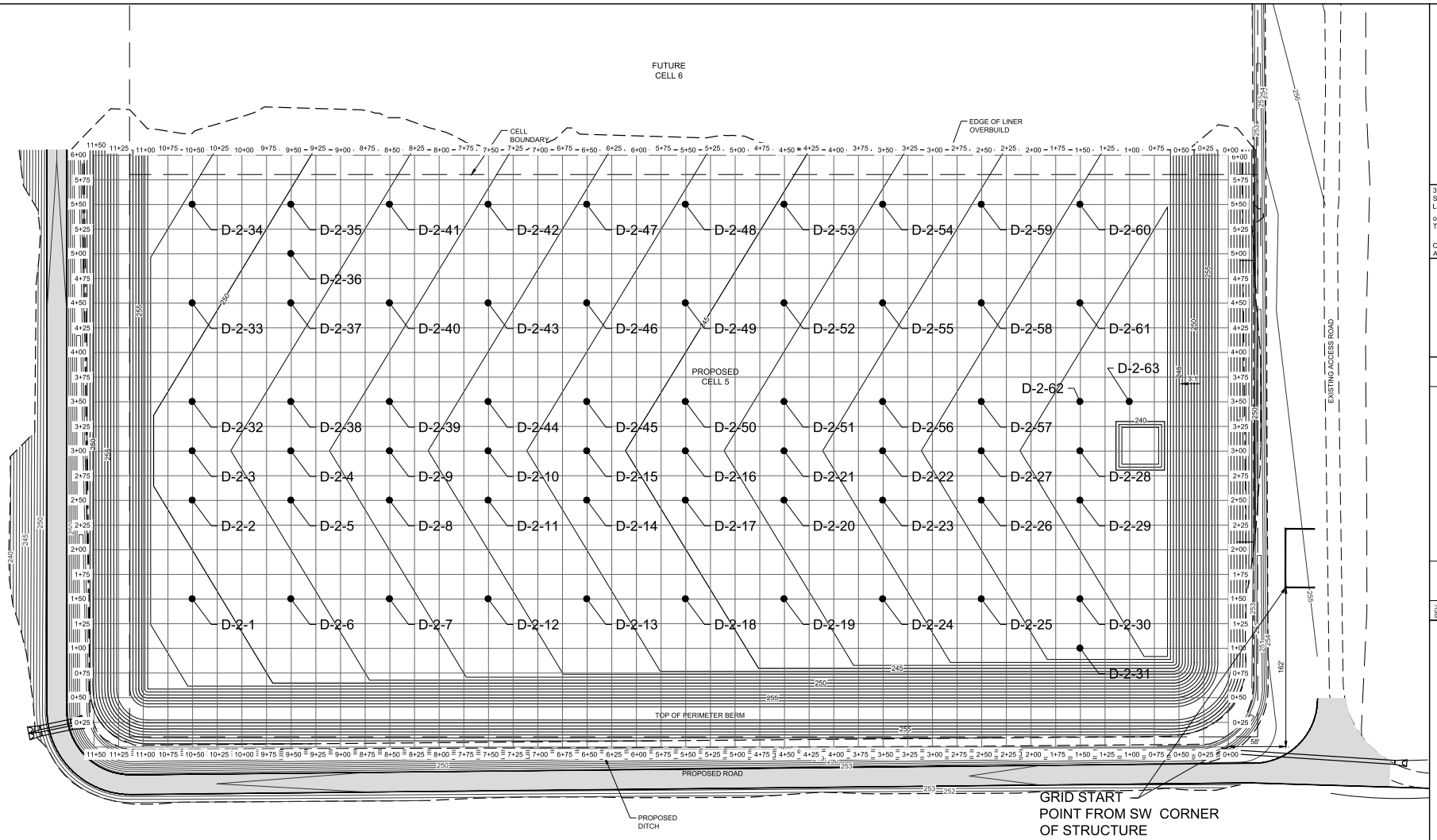
CRAIGHEAD COUNTY LANDFILL
CELL 5 CONSTRUCTION REPORT

JONESBORO, ARKANSAS

2026

drawn by: JM
designed by: JJG
project no.: 025-04389
date: 01/13/2026

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05 of 12



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DENSITY TEST LOCATIONS
LIFT 2

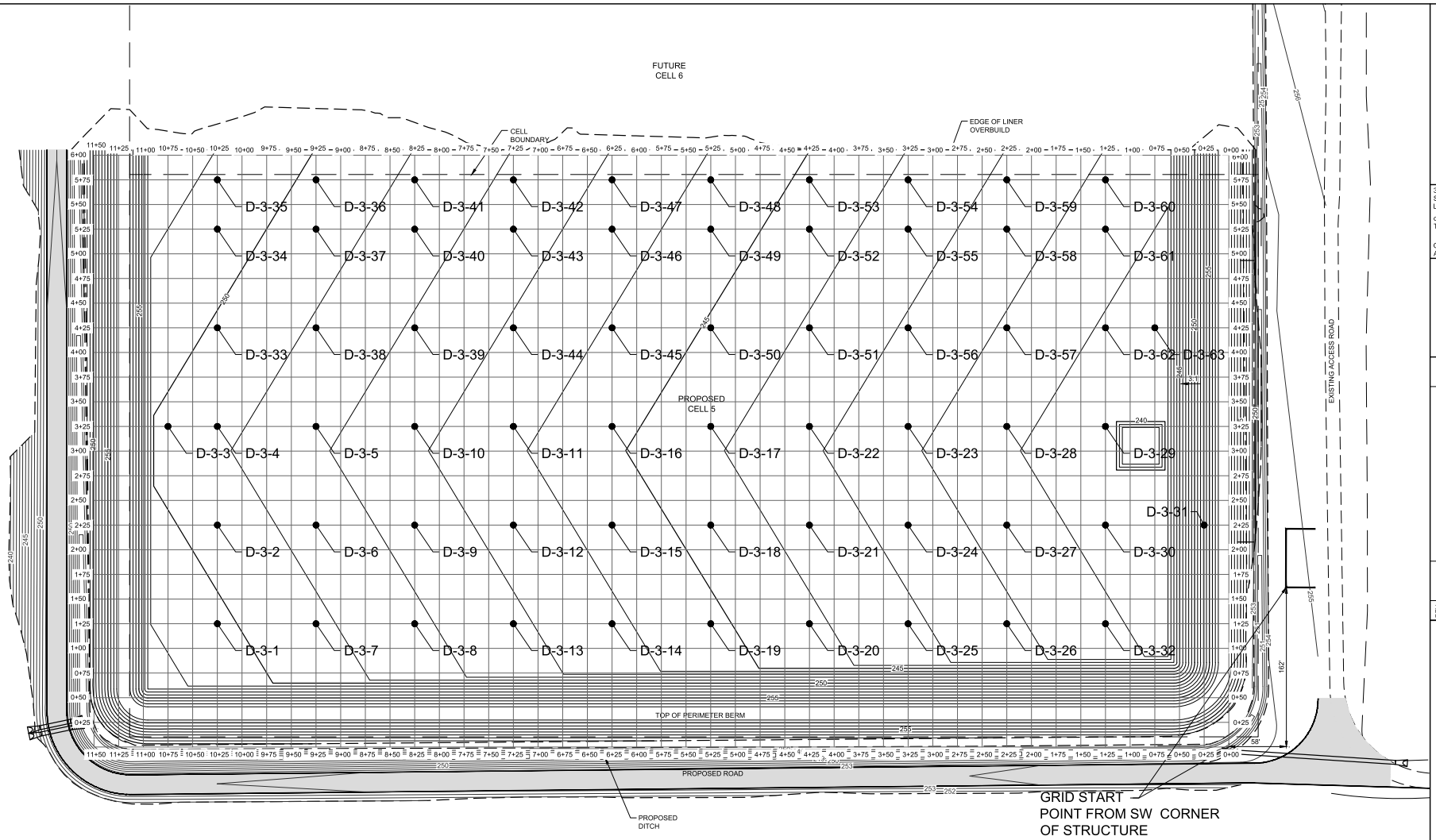
CRAIGHEAD COUNTY LANDFILL
CELL 5 CONSTRUCTION REPORT

JONESBORO, ARKANSAS

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designed by: JJG
project no.: 025-04389
date: 01/13/2026

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DENSITY TEST LOCATIONS
LIFT 3

CRAIGHEAD COUNTY LANDFILL
CELL 5 CONSTRUCTION REPORT

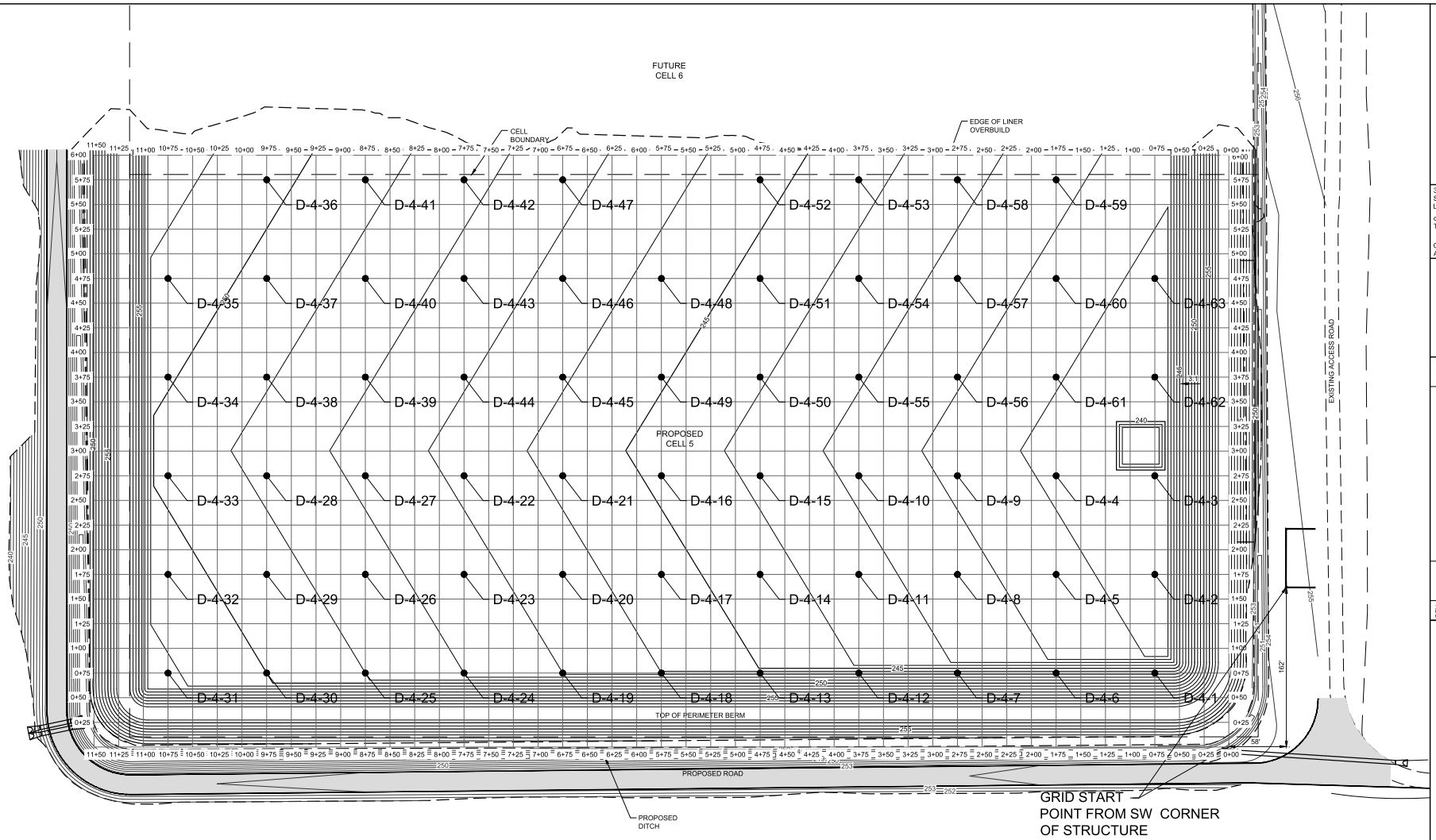
JONESBORO, ARKANSAS

2026

drawn by: JM
designed by: JJG
project no.: 025-04389
date: 01/13/2026

SHEET
07 of 12

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DENSITY TEST LOCATIONS
LIFT 4

CRAIGHEAD COUNTY LANDFILL
CELL 5 CONSTRUCTION REPORT

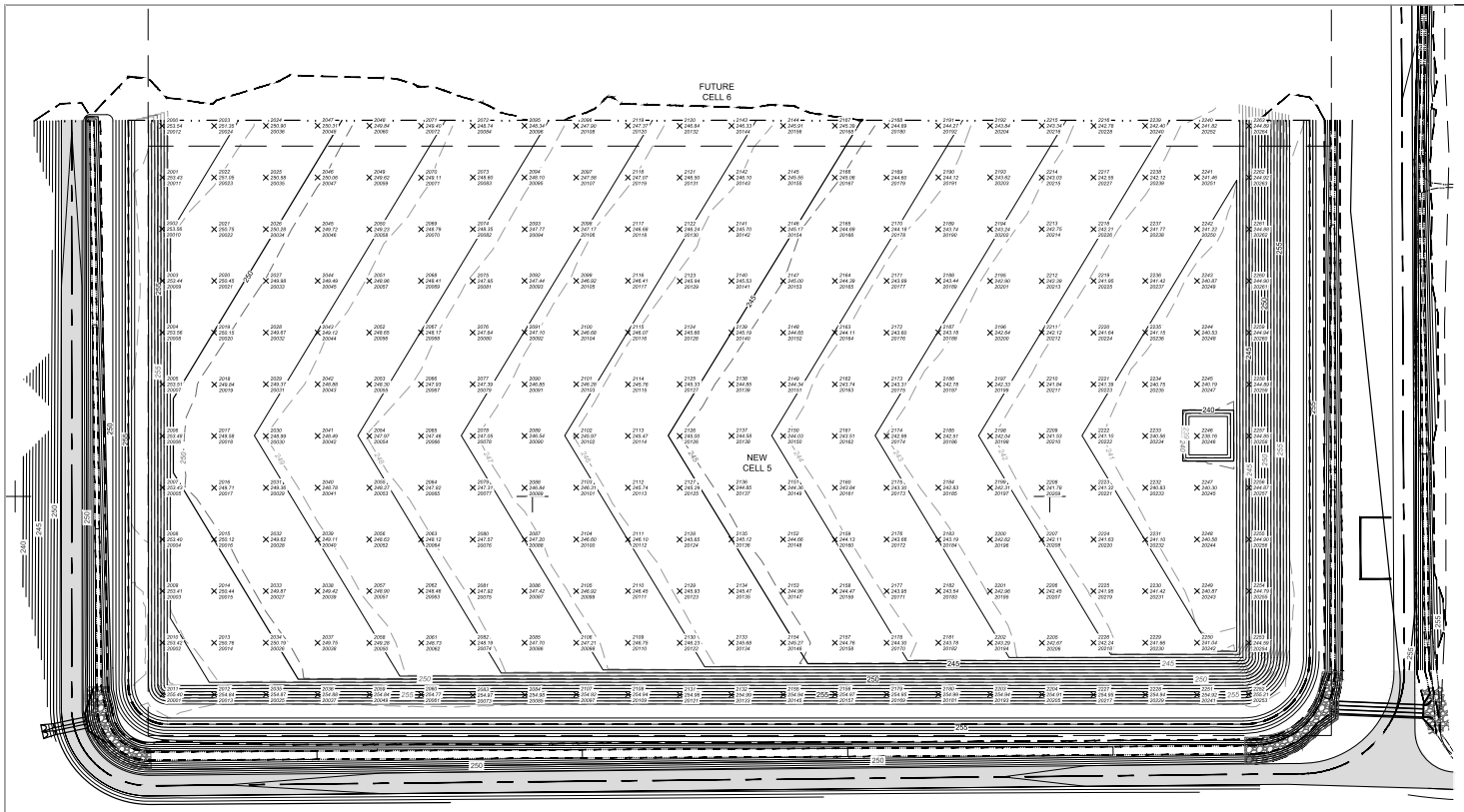
JONESBORO, ARKANSAS

2026

drawn by: JM
designed by: JJG
project no.: 025-04389
date: 01/13/2026

SHEET
08 of 12

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CLAY LINER CQA POINTS

PT	SURVEYED EL (FT)	DIFF (FT)	PT	SURVEYED EL (FT)	DIFF (FT)	PT	SURVEYED EL (FT)	DIFF (FT)
20001	255.40	2.5	20089	246.84	2.2	20177	243.89	2.1
20002	253.42	2.1	20090	246.54	2.2	20178	244.18	2.2
20003	253.41	2.1	20091	246.85	2.3	20179	244.60	2.3
20004	253.41	2.1	20092	247.10	2.2	20180	244.89	2.3
20005	253.43	2.1	20093	247.45	2.2	20181	254.99	2.3
20006	253.48	2.1	20094	247.77	2.2	20182	243.78	2.2
20007	253.51	2.2	20095	248.10	2.2	20183	243.54	2.4
20008	253.56	2.2	20096	248.34	2.3	20184	243.19	2.2
20009	253.44	2.1	20097	254.92	2.2	20185	242.83	2.1
20010	253.56	2.3	20098	247.21	2.2	20186	242.51	2.1
20011	253.43	2.5	20099	246.92	2.2	20187	242.79	2.1
20012	253.54	2.4	20100	246.60	2.1	20188	243.18	2.2
20013	254.84	2.2	20101	246.31	2.1	20189	243.44	2.1
20014	250.77	2.1	20102	245.97	2.0	20190	243.74	2.2
20015	250.44	2.2	20103	246.28	2.1	20191	244.12	2.3
20016	250.12	2.2	20104	246.68	2.2	20192	244.27	2.1
20017	249.71	2.0	20105	246.92	2.1	20193	254.94	2.2
20018	249.58	2.1	20106	247.17	2.0	20194	243.29	2.3
20019	249.84	2.2	20107	247.58	2.1	20195	242.96	2.2
20020	250.15	2.2	20108	247.90	2.3	20196	242.62	2.1
20021	250.45	2.3	20109	254.94	2.2	20197	242.31	2.2
20022	250.75	2.1	20110	246.75	2.2	20198	242.04	2.1
20023	251.05	2.2	20111	246.45	2.1	20199	242.33	2.2
20024	251.35	2.1	20112	246.10	2.2	20200	242.64	2.1
20025	254.87	2.1	20113	245.74	2.0	20201	242.90	2.1
20026	250.19	2.1	20114	245.47	2.1	20202	243.24	2.3
20027	249.87	2.2	20115	245.76	2.2	20203	243.62	2.3
20028	249.62	2.2	20116	246.07	2.0	20204	243.84	2.2
20029	249.37	2.2	20117	246.41	2.1	20205	254.91	2.4
20030	248.99	2.1	20118	246.68	2.0	20206	242.67	2.2
20031	249.37	2.2	20119	247.07	2.1	20207	242.45	2.1
20032	249.67	2.2	20120	247.37	2.2	20208	242.11	2.2
20033	249.99	2.2	20121	254.96	2.4	20209	241.78	2.2
20034	250.28	2.2	20122	246.23	2.1	20210	241.53	2.1
20035	250.58	2.2	20123	245.93	2.1	20211	241.84	2.1
20036	250.90	2.2	20124	245.65	2.2	20212	242.12	2.2
20037	254.88	2.2	20125	245.29	2.1	20213	242.39	2.1
20038	249.75	2.2	20126	245.00	2.2	20214	242.75	2.3
20039	249.42	2.1	20127	245.33	2.2	20215	243.03	2.2
20040	249.11	2.2	20128	245.66	2.2	20216	243.34	2.2
20041	248.78	2.2	20129	245.94	2.2	20217	254.95	2.3
20042	248.49	2.2	20130	246.24	2.1	20218	242.25	2.1
20043	248.88	2.3	20131	246.50	2.1	20219	241.95	2.1
20044	249.12	2.2	20132	246.84	2.1	20220	241.63	2.1
20045	249.49	2.3	20133	254.99	2.4	20221	241.32	2.1
20046	249.72	2.1	20134	245.68	2.1	20222	241.10	2.2
20047	250.06	2.1	20135	245.47	2.2	20223	241.39	2.1
20048	250.31	2.1	20136	245.12	2.1	20224	241.64	2.1
20049	254.84	2.0	20137	244.85	2.2	20225	241.95	2.2
20050	249.28	2.2	20138	244.58	2.3	20226	242.21	2.1
20051	248.90	2.2	20139	244.85	2.3	20227	242.55	2.1
20052	248.63	2.2	20140	245.19	2.2	20228	242.78	2.0
20053	248.27	2.1	20141	245.53	2.3	20229	254.94	2.4
20054	247.97	2.1	20142	245.70	2.0	20230	241.66	2.1
20055	248.30	2.2	20143	246.10	2.2	20231	241.42	2.1
20056	248.65	2.2	20144	246.33	2.1	20232	241.10	2.2
20057	248.96	2.2	20145	254.94	2.3	20233	240.83	2.2
20058	249.23	2.1	20146	245.27	2.2	20234	240.56	2.2
20059	249.62	2.2	20147	244.96	2.1	20235	240.75	2.1
20060	249.84	2.3	20148	244.66	2.2	20236	241.15	2.2
20061	254.77	2.2	20149	244.36	2.2	20237	241.42	2.1
20062	248.73	2.2	20150	244.03	2.1	20238	241.77	2.1
20063	248.46	2.2	20151	244.34	2.2	20239	242.12	2.2
20064	248.12	2.1	20152	244.65	2.2	20240	242.40	2.2
20065	247.82	2.1	20153	245.01	2.3	20241	254.92	2.3
20066	247.46	2.1	20154	245.17	2.0	20242	241.05	2.0
20067	247.93	2.3	20155	245.55	2.1	20243	240.87	2.2
20068	248.17	2.2	20156	245.91	2.2	20244	240.58	2.2
20069	248.41	2.2	20157	254.97	2.2	20245	240.31	2.2
20070	248.79	2.4	20158	244.76	2.2	20246	238.16	2.3
20071	249.11	2.3	20159	244.47	2.3	20247	240.19	2.2
20072	249.40	2.3	20160	244.13	2.3	20248	240.53	2.1
20073	254.97	2.4	20161	243.84	2.3	20249	240.87	2.1
20074	248.19	2.1	20162	243.51	2.2	20250	241.22	2.1
20075	247.92	2.2	20163	243.74	2.1	20251	241.46	2.2
20076	247.57	2.1	20164	244.11	2.2	20252	241.82	2.2
20077	247.31	2.1	20165	244.39	2.2	20253	255.21	2.3
20078	247.05	2.3	20166	244.69	2.2	20254	244.59	2.0
20079	247.39	2.2	20167	245.06	2.2	20255	244.79	2.1
20080	247.64	2.2	20168	245.39	2.2	20256	244.90	2.2
20081	247.95	2.2	20169	254.95	2.3	20257	244.87	2.2
20082	248.35	2.3	20170	244.30	2.4	20258	244.85	2.2
20083	248.60	2.2	20171	243.95	2.3	20259	244.89	2.3
20084	248.74	2.1	20172	243.66	2.2	20260	244.94	2.3
20085	254.98	2.4	20173	243.30	2.1	20261	244.90	2.3
20086	247.70	2.1	20174	242.99	2.1	20262	244.88	2.2
20087	247.42	2.1	20175	243.31	2.1	20263	244.92	2.3
20088	247.20	2.2	20176	243.60	2.1	20264	244.89	2.2

LEGEND

- 240 — MAJOR CONTOUR - DESIGN (5')
- MINOR CONTOUR - DESIGN (1')
- 240 — MAJOR CONTOUR - SURVEY (5')
- MINOR CONTOUR - SURVEY (1')
- CELL BOUNDARY

NOTES:

1. SUBGRADE CQA SURVEY PROVIDED BY RIDGE SURVEYING & CONSULTING, PLLC, ON SEPTEMBER 17, 2025. CONTOURS GENERATED BY OLSSON USING BREAKLINES GENERATED FROM SURVEY POINT CODES.

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CERTIFICATE OF AUTHORIZATION
OLSSON, INC.
No. 1010
ARKANSAS

REGISTERED PROFESSIONAL ENGINEER
PAUL H. GRAHAM
01-14-2026

REV. NO.	DATE	DESCRIPTION
		REVISIONS

FIGURE 9 - CLAY LINER AS-BUILT CRAIGHEAD COUNTY LANDFILL CELL 5 CONSTRUCTION REPORT

CRAIGHEAD COUNTY SOLID WASTE DISPOSAL AUTHORITY
LEGACY LANDFILL CELL 5 CONSTRUCTION

JONESBORO, AR

2025

drawn by: JJG
designed by: JJG
project no.: 025-04399
date: 12/23/2025

SHEET
09 of 12

F:\2025\04001-04500\025-04399\60-Construction\08-Construction Reports\ENV\CQA Report\Autocad Figures\C_FIG_02504399-CL LINER FIGURE.dwg
DATE: Jan 14, 2026 5:36pm USER: jburres

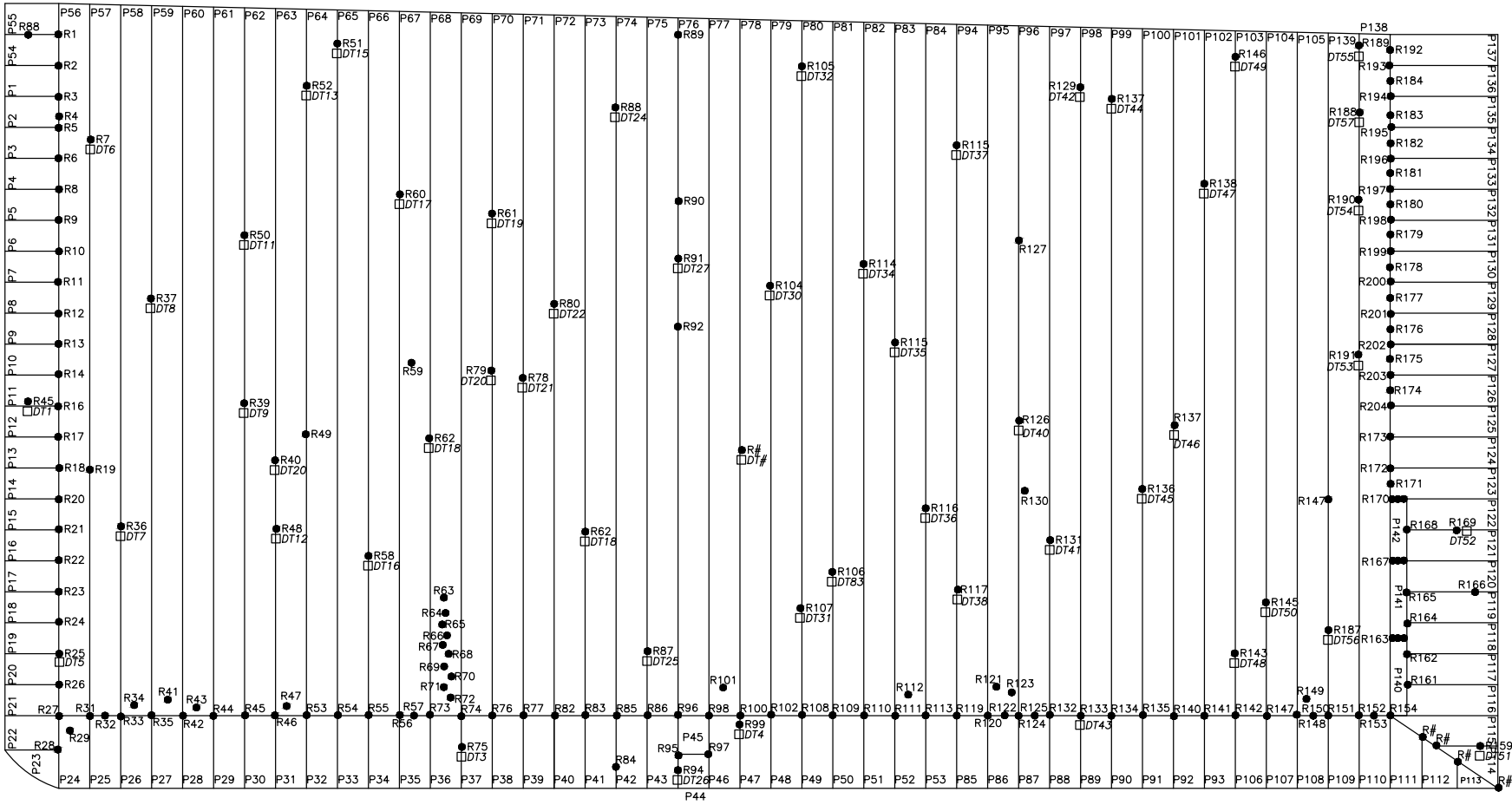
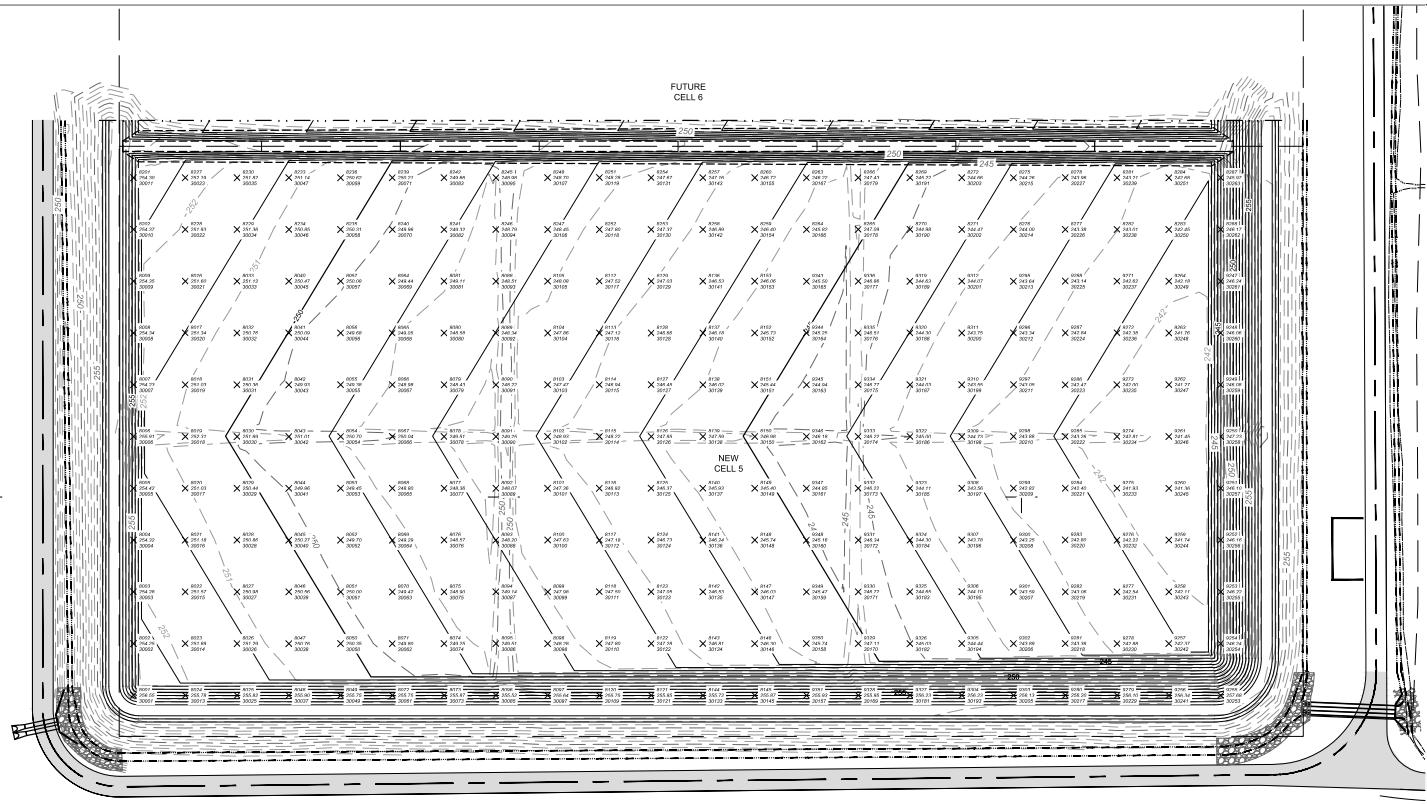
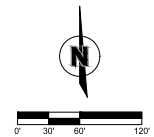


FIGURE 10

DRAWN BY: Barrett S DATE: 10/24/25					PATRIOT ENVIRONMENTAL, LLC. 317 S DAWSON STREET MEEKER, OK 74855 www.PELiners.com
CHKD BY: DATE:					PROJECT INFORMATION: PRIMARY 60-MIL HDPE AS-BUILT / RECORD DRAWING CRAIGHEAD COUNTY SWDA - LEGACY LANDFILL CELL 5
SCALE: NTS					DWG# 1 of 1
JOB #: 0 EST #: 0	NO.	REVISION DESCRIPTION	DATE	BY	





LEGEND

- 240 — MAJOR CONTOUR - DESIGN (5')
- MINOR CONTOUR - DESIGN (1')
- 240 — MAJOR CONTOUR - SURVEY (5')
- MINOR CONTOUR - SURVEY (1')
- CELL BOUNDARY

NOTES:

1. PROTECTIVE COVER CQA SURVEY PROVIDED BY RIDGE SURVEYING & CONSULTING, PLLC. ON JANUARY 6, 2026.

PROTECTIVE COVER/DRAINAGE LAYER CQA COMPARISON

GRID PT	SURVEYED EL (FT)	DIFF (FT)	GRID PT	SURVEYED EL (FT)	DIFF (FT)	GRID PT	SURVEYED EL (FT)	DIFF (FT)
30001	256.55	1.64	30089	248.07	1.42	30177	246.86	3.11
30002	254.25	1.00	30090	249.25	2.91	30178	247.09	3.07
30003	254.28	1.01	30091	248.22	1.66	30179	247.43	3.09
30004	254.33	1.00	30092	248.34	1.41	30181	256.23	1.52
30005	254.42	1.13	30093	248.51	1.25	30182	245.03	1.51
30006	255.91	2.49	30094	248.79	1.17	30183	244.65	1.55
30007	254.23	1.00	30095	248.98	1.09	30184	244.30	1.27
30008	254.34	1.00	30097	255.64	0.97	30185	244.11	1.38
30009	254.35	1.05	30098	248.28	1.24	30186	245.00	2.60
30010	254.37	1.09	30099	247.98	1.30	30187	244.03	1.38
30011	254.30	1.33	30100	247.63	1.12	30188	244.31	1.29
30013	255.78	1.12	30101	247.36	1.11	30189	244.63	1.32
30014	251.89	1.25	30102	248.93	2.98	30190	244.98	1.40
30015	251.57	1.29	30103	247.47	1.29	30191	245.22	1.42
30016	251.18	1.25	30104	247.87	1.38	30193	256.23	1.52
30017	251.03	1.33	30105	248.09	1.22	30194	244.45	1.50
30018	252.31	2.86	30106	248.45	1.28	30195	244.10	1.31
30019	251.03	1.44	30107	248.70	1.20	30196	243.78	1.24
30020	251.34	1.40	30109	255.75	1.02	30197	243.56	1.40
30021	251.60	1.40	30110	247.81	1.23	30198	244.73	2.82
30022	251.93	1.32	30111	247.51	1.20	30199	243.55	1.39
30023	252.19	1.31	30112	247.18	1.31	30200	243.75	1.23
30025	255.82	1.04	30113	246.92	1.18	30201	244.07	1.27
30026	251.29	1.24	30114	248.22	2.82	30202	244.47	1.51
30027	250.98	1.31	30115	246.94	1.35	30203	244.66	1.33
30028	250.86	1.43	30116	247.12	1.10	30205	256.13	1.59
30029	250.44	1.25	30117	247.52	1.24	30206	243.89	1.43
30030	251.69	2.83	30118	247.80	1.16	30207	243.59	1.28
30031	250.36	1.17	30119	248.28	1.35	30208	243.25	1.31
30032	250.76	1.33	30121	255.85	1.28	30209	242.82	1.26
30033	251.12	1.38	30122	247.29	1.20	30210	243.88	2.42
30034	251.36	1.26	30123	247.05	1.24	30211	243.05	1.35
30035	251.82	1.40	30124	246.73	1.28	30212	243.34	1.38
30037	255.90	1.21	30125	246.37	1.22	30213	243.64	1.34
30038	250.76	1.21	30126	247.85	3.01	30214	244.00	1.50
30039	250.56	1.26	30127	246.45	1.36	30215	244.26	1.39
30040	250.27	1.34	30128	246.66	1.22	30217	256.20	1.59
30041	249.96	1.35	30129	247.03	1.32	30218	243.36	1.24
30042	251.01	2.76	30130	247.37	1.23	30219	243.06	1.23
30043	249.93	1.31	30131	247.67	1.24	30220	242.80	1.30
30044	250.09	1.20	30133	255.72	1.14	30221	242.40	1.17
30045	250.47	1.27	30134	246.81	1.19	30222	243.26	2.35
30046	250.85	1.27	30135	246.53	1.24	30223	242.47	1.19
30047	251.14	1.20	30136	246.24	1.25	30224	242.84	1.32
30049	255.75	0.95	30137	245.93	1.27	30225	243.14	1.33
30050	250.35	1.30	30138	247.59	3.31	30226	243.39	1.28
30051	250.00	1.26	30139	246.02	1.47	30227	243.96	1.53
30052	249.70	1.25	30140	246.18	1.22	30229	256.10	1.56
30053	249.45	1.33	30141	246.53	1.25	30230	242.88	1.31
30054	250.70	2.86	30142	246.89	1.19	30231	242.54	1.21
30055	249.38	1.29	30143	247.16	1.26	30232	242.22	1.27
30056	249.68	1.23	30145	255.87	1.19	30233	241.93	1.31
30057	250.08	1.31	30146	246.30	1.27	30234	242.81	2.48
30058	250.31	1.21	30147	246.03	1.19	30235	242.00	1.35
30059	250.62	1.21	30148	245.74	1.28	30236	242.38	1.43
30061	255.75	1.14	30149	245.41	1.28	30237	242.62	1.34
30062	249.80	1.30	30150	246.98	3.06	30238	243.01	1.37
30063	249.42	1.16	30151	245.44	1.30	30239	243.21	1.33
30064	249.29	1.29	30152	245.73	1.32	30241	256.34	1.68
30065	248.80	1.09	30153	246.06	1.38	30242	242.37	1.31
30066	250.04	2.71	30154	246.40	1.27	30243	242.11	1.44
30067	248.98	1.31	30155	246.72	1.29	30244	241.74	1.35
30068	249.05	1.07	30157	255.93	1.19	30245	241.36	1.22
30069	249.44	1.20	30158	245.75	1.18	30246	241.45	3.62
30070	249.96	1.55	30159	245.47	1.28	30247	241.27	1.26
30071	250.21	1.40	30160	245.16	1.29	30248	241.76	1.37
30073	255.87	1.26	30161	244.85	1.27	30249	242.18	1.41
30074	249.25	1.20	30162	246.18	2.91	30250	242.45	1.36
30075	248.91	1.16	30163	244.94	1.34	30251	242.68	1.38
30076	248.57	1.13	30164	245.25	1.35	30253	257.68	2.81
30077	248.36	1.18	30165	245.50	1.28	30254	246.25	1.57
30078	249.51	2.75	30166	245.82	1.31	30255	246.22	1.56
30079	248.43	1.23	30167	246.23	1.39	30256	246.16	1.49
30080	248.58	1.13	30169	255.95	1.34	30257	246.11	1.43
30081	249.11	1.34	30170	247.11	3.16	30258	247.23	2.57
30082	249.32	1.28	30171	246.72	3.04	30259	246.08	1.48
30083	249.66	1.28	30172	246.34	2.83	30260	246.06	1.43
30085	255.53	0.93	30173	246.22	3.03	30261	246.24	1.63
30086	249.51	1.97	30174	246.22	3.30	30262	246.17	1.48
30087	249.14	1.87	30175	246.77	3.59	30263	245.97	1.30
30088	248.20	1.18	30176	246.51	3.02			

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OLSSON, INC.
No. 1010
ARKANSAS

01-14-2026

REV. NO.	DATE	DESCRIPTION
		REVISIONS

FIGURE 11 - PROTECTIVE COVER LAYER AS-BUILT CRAIGHEAD COUNTY LANDFILL CELL 5 CONSTRUCTION REPORT

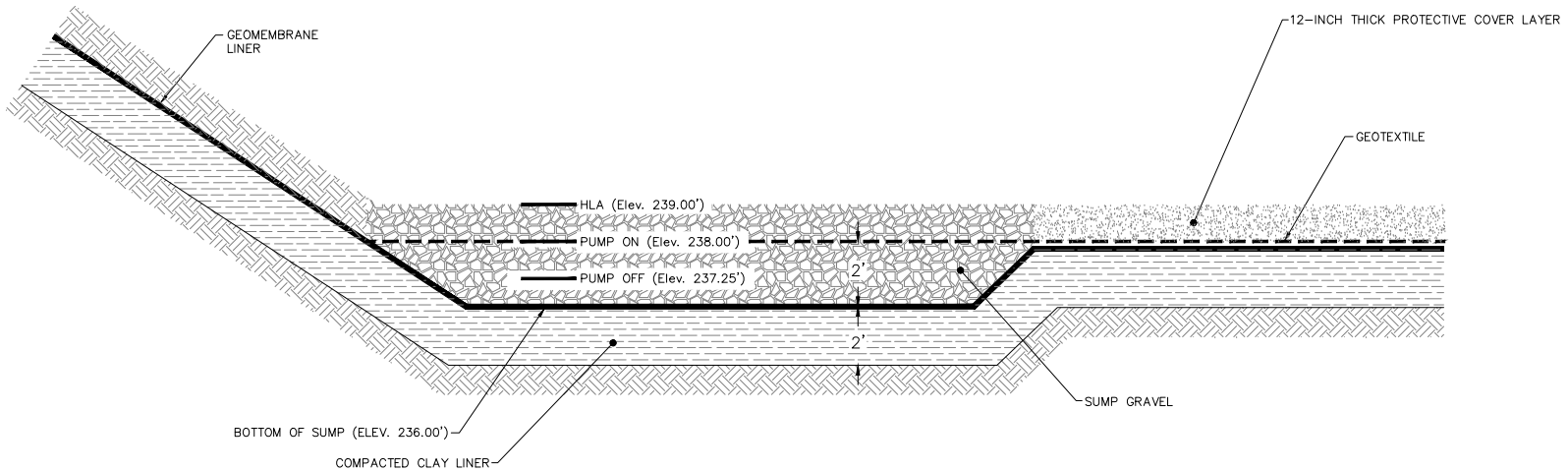
CRAIGHEAD COUNTY SOLID WASTE DISPOSAL AUTHORITY
LEGACY LANDFILL CELL 5 CONSTRUCTION

JONESBORO, AR

2025

drawn by: JJG
designed by: JJG
project no.: 025-04399
date: 12/23/2025

F:\2025\04001-04500\025-04399\60-Construction\08-Construction Reports\ENV\CQA Report\Autocad Figures\C_FIG_025l04399-PC-DL FIGURE.dwg
DATE: Jan 14, 2026 5:35pm USER: jtorres



LEACHATE SUMP PUMP CONTROL SETTINGS

NOTE:
HLA=HIGH LEVEL ALARM.

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ARKANSAS 01-13-2026

REV. NO.	DATE	DESCRIPTION	BY

REVISIONS

FIGURE 12
LEACHATE SUMP PUMP CONTROL SETTINGS

CRAIGHEAD COUNTY SOLID WASTE | DISPOSAL AUTHORITY
LEGACY LANDFILL CELL 1 NORTH CONSTRUCTION 2022

JONESBORO, ARKANSAS

2026

drawn by: CAM
designed by: PWC
project no.: 025-04399
date: 01.13.2026

SHEET
12 of 12

F:\2025\04001-04500\025-04399\60-Construction\08-Construction Reports\ENV\CQA Report\Draft Figures\Figure 12 - Sump Figure.dwg
DATE: Jan 14, 2026 1:24pm USER: jtorres

APPENDIX B
CONSTRUCTION PLANS

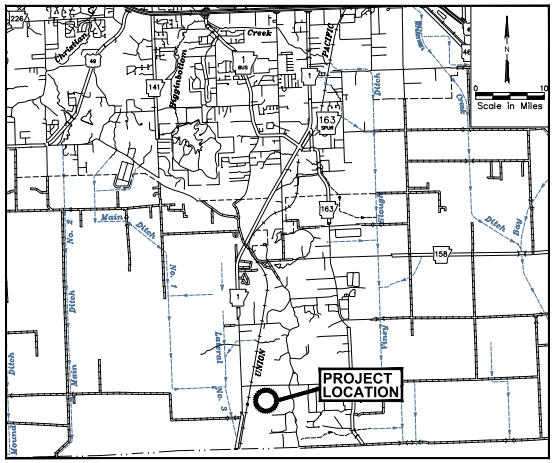
CRAIGHEAD COUNTY SOLID WASTE DISPOSAL AUTHORITY

LEGACY LANDFILL

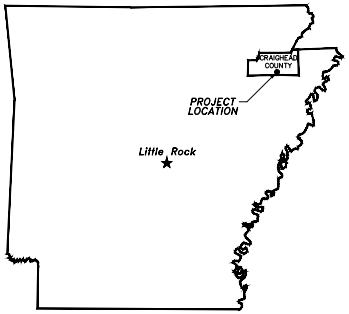
CELL 5 CONSTRUCTION PROJECT

JONESBORO, ARKANSAS

AUGUST 2025



VICINITY MAP



INDEX OF DRAWINGS	
SHEET No.	TITLE
1	GENERAL INFORMATION
2	EXISTING SITE PLAN
3	SUBGRADE PLAN
4	CLAY LINER PLAN
5	DRAINAGE LAYER / PROTECTIVE COVER PLAN
6	SITE UTILITY PLAN
7	CELL 5 SECTIONS
8	ROAD AND DRAINAGE PROFILES
9	LINER DETAILS
10	LEACHATE DETAILS (1 OF 2)
11	LEACHATE DETAILS (2 OF 2)
12	LEACHATE TRANSMISSION DETAILS
13	LEACHATE TANK DETAILS
14	STORMWATER AND EROSION CONTROL DETAILS
15	MISCELLANEOUS DETAILS



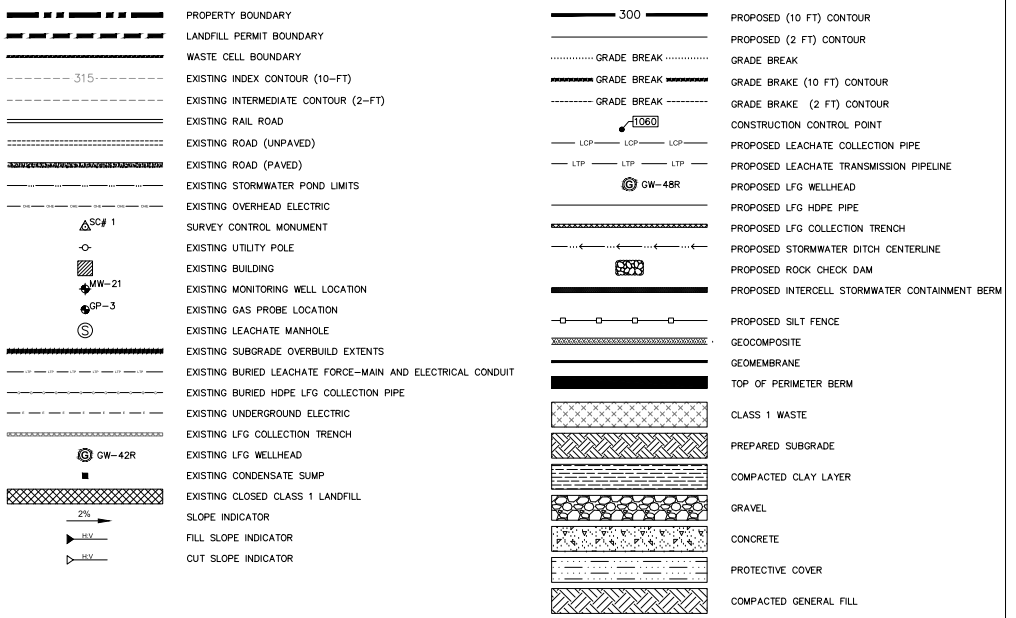
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DATE: Aug 15, 2025 9:24am USER: jghodotti

ABBREVIATIONS & SYMBOLS

ABBREVIATIONS

C/C	CENTER TO CENTER
CL	CENTERLINE
CXN	CONNECTION
DIA	DIAMETER
DIST	DISTANCE
DWG	DRAWING
E	EASTING
EL	ELEVATION
ELEV	ELEVATION
E.W.	EACH WAY
EXIST	EXISTING
FL	FLOW LINE
FT	FEET
GP	GAS PROBE
GW	GAS WELL
HDPE	HIGH DENSITY POLYETHYLENE
HT	HEIGHT
LCP	LEACHATE COLLECTION PIPE
LF	LINEAR FEET
LFG	LANDFILL GAS
LTP	LEACHATE TRANSMISSION PIPELINE
MAX	MAXIMUM
MH	MANHOLE
MIL	THOUSANDTH OF AN INCH
MIN	MINIMUM
MJ	MECHANICAL JOINT
N	NORTHING
O.C.	ON CENTER
O.D.	OUTSIDE DIAMETER
OZ	OUNCE
PSI	POUNDS PER SQUARE INCH
N.T.S.	NOT TO SCALE
R	RADIUS
RCP	REINFORCED CONCRETE PIPE
SC	SURVEY CONTROL
SCFM	STANDARD CUBIC FEET PER MINUTE
SDR	STANDARD DIMENSION RATIO
SQ	SQUARE
THK.	THICK
TYP	TYPICAL

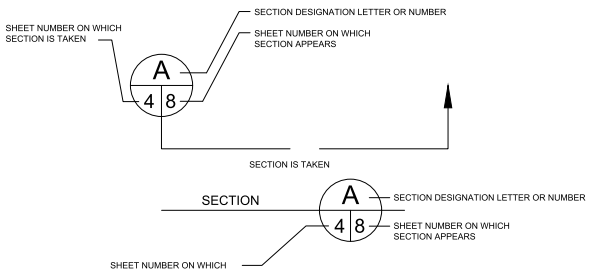
SYMBOLS



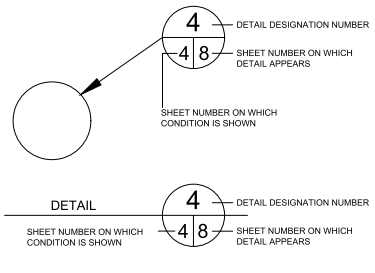
GENERAL NOTES

1. SURVEY DATA IS BASED UPON ARKANSAS NORTH STATE PLANE COORDINATE SYSTEM. ELEVATIONS ARE BASED UPON THE NORTH AMERICAN VERTICAL DATUM OF 1988.
2. LANDFILL COORDINATE SYSTEM IS BASED UPON SITE COORDINATE SYSTEM, WHICH IS TIED INTO ARKANSAS STATE PLANE COORDINATE SYSTEM.
3. SURVEY CONTROL POINTS ARE SHOWN ON SHEET 2.
4. THE LEGACY LANDFILL IS AN ACTIVE FACILITY. CONTRACTOR SHALL TAKE PRECAUTIONS NOT TO INTERRUPT THE DAILY OPERATIONS OF THE LANDFILL. CONTRACTOR SHALL COORDINATE WITH OWNER FOR STAGING AREA.
5. CONTRACTOR SHALL OBTAIN ALL REQUIRED ENVIRONMENTAL PERMITS FOR THE WORK SHOWN IN THESE DRAWINGS.
6. EXISTING FACILITIES AND FEATURES ARE SHOWN LIGHT-LINED AND/OR SCREENED. NEW FACILITIES AND FEATURES ARE SHOWN SOLID AND HEAVY-LINED.
7. SLOPES AND GRADES SHOWN ARE IN UNITS OF FT/FT UNLESS OTHERWISE NOTED.
8. EROSION CONTROL FACILITIES REQUIRED BY THESE PLANS AND/OR THE FACILITY PERMIT ARE THE MINIMUM REQUIRED. THE CONTRACTOR SHALL INSTALL ADDITIONAL EROSION CONTROL FACILITIES AS NECESSARY.
9. CONTRACTOR SHALL VERIFY ELEVATIONS PRIOR TO ANY EXCAVATION INCLUDING TOPSOIL STRIPPING.
10. ALL CONSTRUCTION OF LANDFILL LINER AND PROTECTIVE COVER LAYER SHALL BE CONDUCTED IN ACCORDANCE WITH THE CONSTRUCTION SPECIFICATIONS.
11. ALL EXISTING SUBSURFACE UTILITIES TO BE FIELD VERIFIED BY CONTRACTOR PRIOR TO EXCAVATION.

SECTIONS



DETAILS



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STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 19031
AARON GHIDOTTI

REV. NO.	DATE	DESCRIPTION	BY
0	07/11/25	ISSUED FOR BID	JJG
1	08/15/25	ISSUED FOR CONSTRUCTION.	JJG

REVISIONS

GENERAL INFORMATION

CRAIGHEAD COUNTY LANDFILL
CELL 5 CONSTRUCTION PROJECT

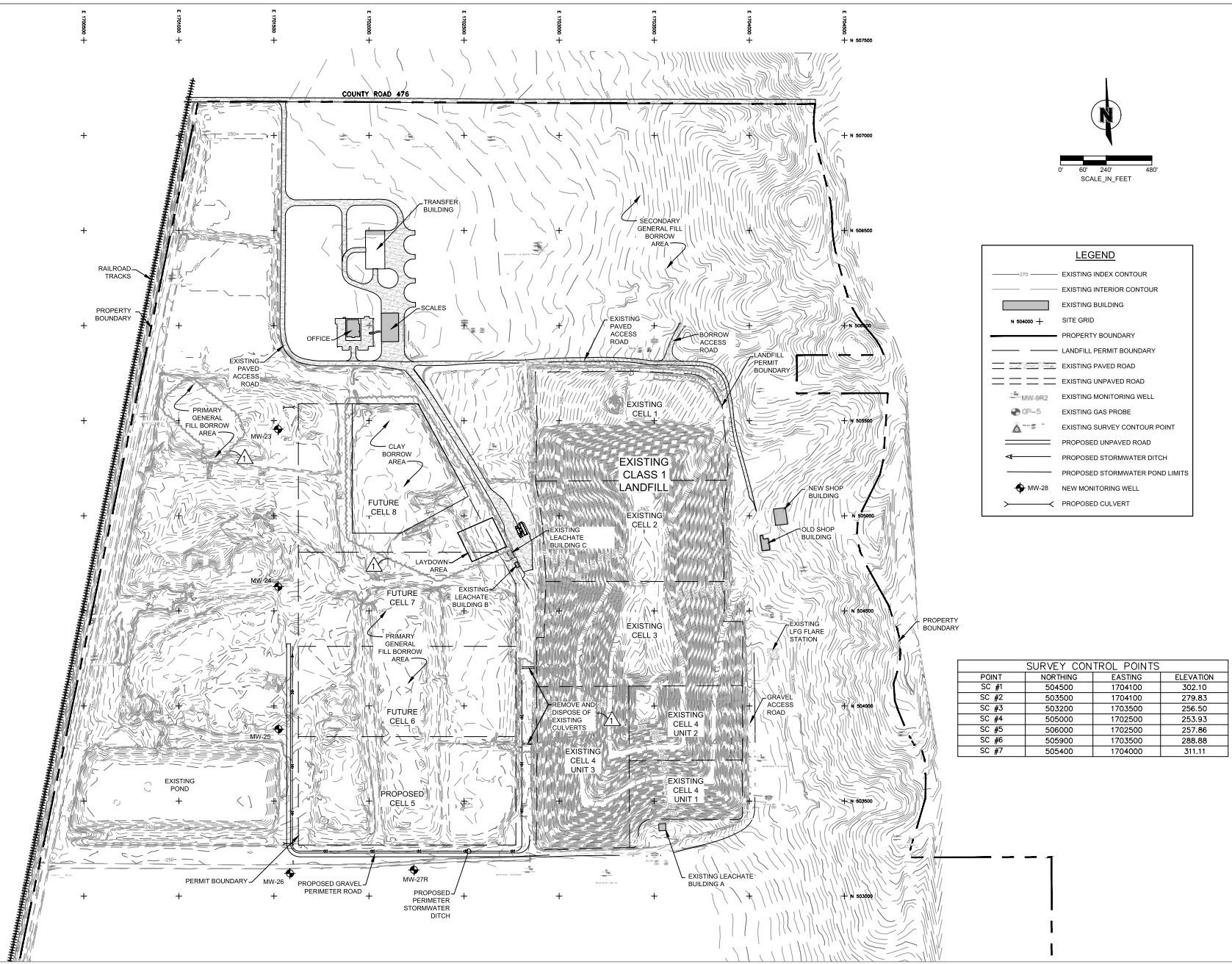
JONESBORO, ARKANSAS

2025

drawn by: JT
designed by: JJG
project no.: 025-02434
date: 08/15/2025

SHEET
01 of 15

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DATE: Aug 15, 2025 9:35am USER: jghidotti



SURVEY CONTROL POINTS

POINT	NORTHING	EASTING	ELEVATION
SC #1	504500	1704100	302.10
SC #2	503500	1704100	279.83
SC #3	503200	1703500	256.50
SC #4	505000	1702500	253.93
SC #5	506000	1702500	257.86
SC #6	505900	1703500	288.88
SC #7	505400	1704000	311.11

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STATE OF ARKANSAS LICENSED PROFESSIONAL ENGINEER No.19031 JASON GHIDOTTI

REVISIONS

REV NO.	DATE	DESCRIPTION	BY
0	07/11/25	ISSUED FOR RFP	JJG
1	07/30/25	ADDITIONAL BORROW AREA	JJG
2	08/15/25	REVISED BORROW AND LAYDOWN AREAS	JJG
		ISSUED FOR CONSTRUCTION	

EXISTING SITE PLAN

CRAIGHEAD COUNTY LANDFILL
CELL 5 CONSTRUCTION PROJECT

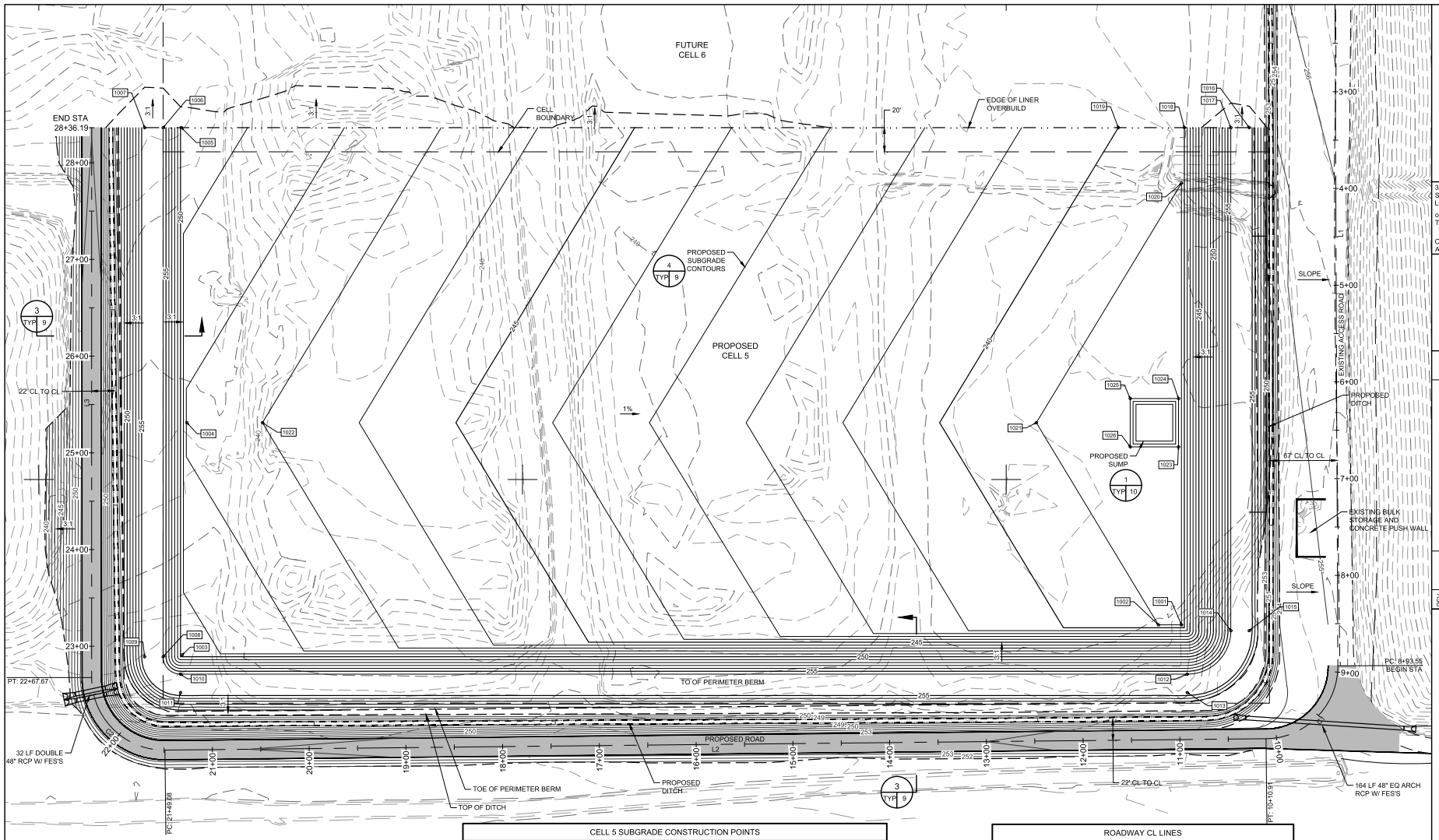
JONESBORO, ARKANSAS

2025

drawn by: JJG
designed by: JJG
project no.: 025-02434
date: 08/15/2025

SHEET
02 of 15

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DATE: Aug 15, 2025 9:28am USER: jghidotti



NOTES:

1. SURVEY DATA IS BASED UPON ARKANSAS NORTH STATE PLANE COORDINATE SYSTEM. ELEVATIONS ARE BASED UPON THE NORTH AMERICAN VERTICAL DATUM OF 1988.
2. LANDFILL COORDINATE SYSTEM IS BASED UPON SITE COORDINATE SYSTEM, WHICH IS TIED INTO ARKANSAS STATE PLANE COORDINATE SYSTEM.
3. CONSTRUCTION OF PROPOSED FACILITIES SHOWN ON THESE DRAWINGS SHALL BE DONE IN ACCORDANCE WITH THE FACILITY PERMIT, CONSTRUCTION DOCUMENTS, AND THE FACILITY CQA PLAN.
4. EXISTING FACILITIES AND FEATURES ARE SHOWN LIGHT-LINED AND/OR SCREENED. NEW FACILITIES AND FEATURES ARE SHOWN SOLID AND HEAVY-LINED.

0' 25' 50' 100'
SCALE IN FEET

CELL 5 SUBGRADE CONSTRUCTION POINTS

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
1001	503349.82	1702681.13	239.00	SBGRD	1014	503343.82	1702732.13	256.00	SBGRD
1002	503349.82	1702657.29	239.00	SBGRD	1015	503343.82	1702751.21	256.00	SBGRD
1003	503318.59	1701648.13	249.41	SBGRD	1016	503863.82	1702751.21	256.00	SBGRD
1004	503558.81	1701653.13	247.78	SBGRD	1017	503863.82	1702732.13	256.00	SBGRD
1005	503863.82	1701647.42	249.68	SBGRD	1018	503863.82	1702684.13	240.00	SBGRD
1006	503863.82	1701628.48	256.00	SBGRD	1019	503863.82	1702615.89	240.00	SBGRD
1007	503863.82	1701609.39	256.00	SBGRD	1020	503806.43	1702681.13	239.00	SBGRD
1008	503316.82	1701628.48	256.00	SBGRD	1021	503558.81	1702531.15	239.00	SBGRD
1009	503316.82	1701609.39	256.00	SBGRD	1022	503558.81	1701731.15	247.00	SBGRD
1010	503298.82	1701646.48	256.00	SBGRD	1023	503533.81	1702678.11	238.00	SBGRD
1011	503279.73	1701646.48	256.00	SBGRD	1024	503583.81	1702678.11	238.00	SBGRD
1012	503298.82	1702687.13	256.00	SBGRD	1025	503583.81	1702628.11	238.00	SBGRD
1013	503279.73	1702687.13	256.00	SBGRD	1026	503533.81	1702628.11	238.00	SBGRD

ROADWAY CL LINES

LINE ID #	STATION RANGE	START COORD.	END COORD.	DIRECTION	LENGTH (FT)
L1	0+00 8+93.55	N: 504200.94 E: 1702838.92	N: 503307.39 E: 1702842.78	S0°14'52"E	893.55
L2	10+10.91 21+49.08	N: 503232.07 E: 1702768.56	N: 503220.26 E: 1701630.45	S89°24'18"W	1138.17
L3	22+67.67 28+36.19	N: 503295.25 E: 1701554.68	N: 503863.78 E: 1701554.68	N0°00'00"E	568.52

ROADWAY CL CURVES

CURVE ID #	STATION RANGE	START COORD.	END COORD.	RADIUS (FT)	LENGTH (FT)	DELTA	CHORD BEARING	CHORD LENGTH (FT)
C1	8+93.55 10+10.91	N: 503307.39 E: 1702842.78	N: 503232.07 E: 1702768.56	75.00	117.36	089°39'10"	S44°34'43"W	105.74
C2	21+49.08 22+67.67	N: 503220.26 E: 1701630.45	N: 503295.25 E: 1701554.68	75.00	118.59	090°35'42"	N45°17'51"W	106.62

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STATE OF ARKANSAS LICENSED PROFESSIONAL ENGINEER No.19531 JASON GHIDOTTI

REVISIONS

REV NO.	DATE	DESCRIPTION	BY
0	07/11/25	ISSUED FOR IBD	JJG
1	08/08/25	ADDED LAYOUT POINTS AND ALIGNMENT INFORMATION	JJG
2	08/15/25	ISSUED FOR CONSTRUCTION	

SUBGRADE PLAN

CRAIGHEAD COUNTY LANDFILL
CELL 5 CONSTRUCTION PROJECT

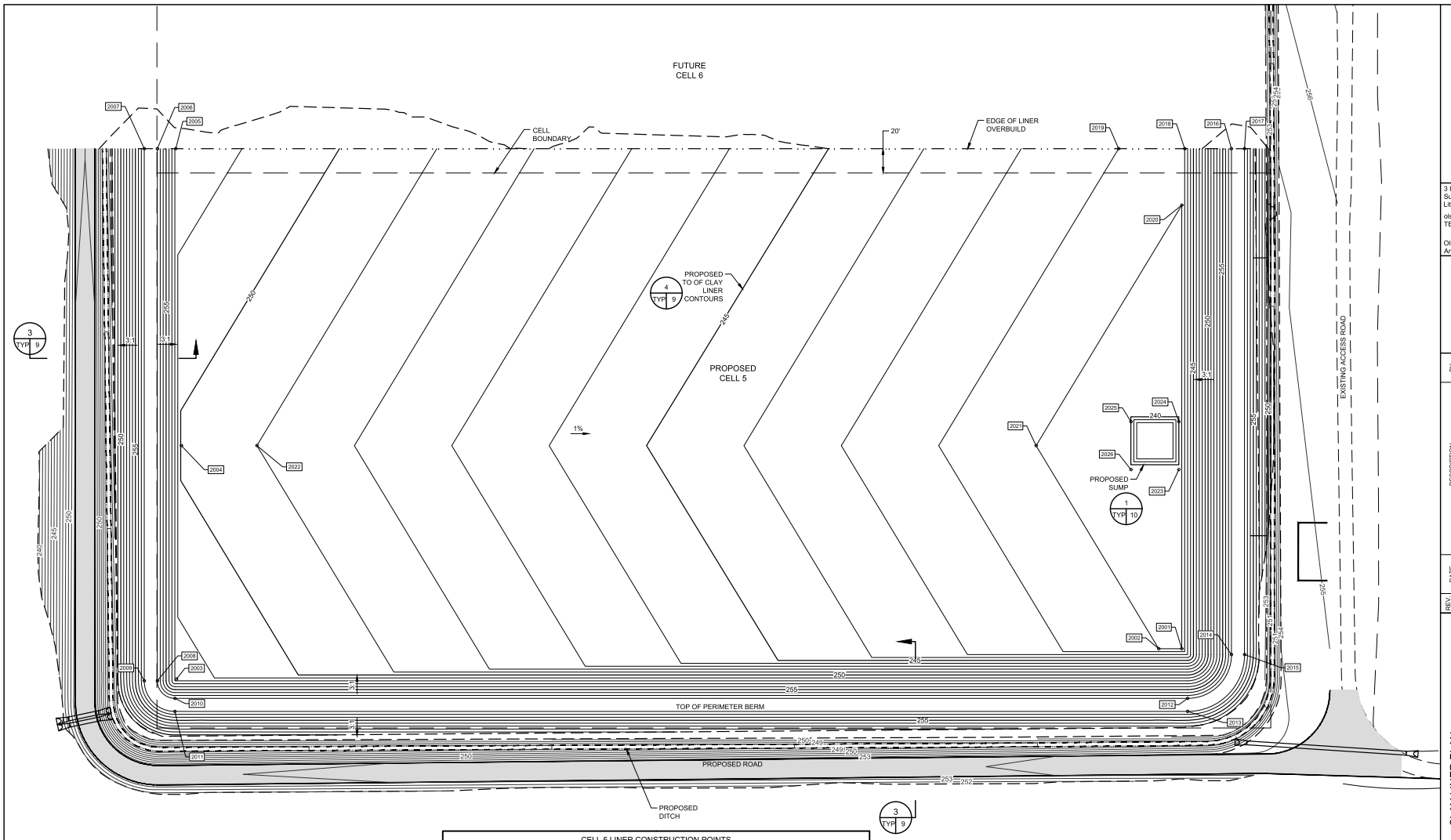
JONESBORO, ARKANSAS

2025

drawn by: JJG
designed by: JJG
project no.: 025-02434
date: 08/15/2025

SHEET 03 of 15

F:\2025\02001-02500\025-02434\40-Design\AutoCAD\Final Plans\Sheets\ENV\25-08-07_ENV_Construction Issue\C_PSIT_025024434-Subgrade Plan-REV02.dwg
DATE: Aug 15, 2025 9:55am USER: jghidotti



NOTES:

1. SURVEY DATA IS BASED UPON ARKANSAS NORTH STATE PLANE COORDINATE SYSTEM. ELEVATIONS ARE BASED UPON THE NORTH AMERICAN VERTICAL DATUM OF 1988.
2. LANDFILL COORDINATE SYSTEM IS BASED UPON SITE COORDINATE SYSTEM, WHICH IS TIED INTO ARKANSAS STATE PLANE COORDINATE SYSTEM.
3. CONSTRUCTION OF PROPOSED FACILITIES SHOWN ON THESE DRAWINGS SHALL BE DONE IN ACCORDANCE WITH THE FACILITY PERMIT, CONSTRUCTION DOCUMENTS, AND THE FACILITY CQA PLAN.
4. EXISTING FACILITIES AND FEATURES ARE SHOWN LIGHT-LINED AND/OR SCREENED. NEW FACILITIES AND FEATURES ARE SHOWN SOLID AND HEAVY-LINED.

0' 25' 50' 100'
SCALE IN FEET

CELL 5 LINER CONSTRUCTION POINTS

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
2001	503350.20	1702680.74	241.00	LINER	2014	503344.20	1702731.74	258.00	LINER
2002	503350.20	1702657.05	241.00	LINER	2015	503344.20	1702745.16	258.00	LINER
2003	503318.99	1701648.54	251.40	LINER	2016	503863.82	1702731.74	258.00	LINER
2004	503558.81	1701653.53	249.78	LINER	2017	503863.82	1702745.16	258.00	LINER
2005	503863.82	1701647.82	251.68	LINER	2018	503863.82	1702683.74	242.00	LINER
2006	503863.82	1701628.86	258.00	LINER	2019	503863.82	1702615.89	242.00	LINER
2007	503863.82	1701615.44	258.00	LINER	2020	503905.79	1702680.74	241.00	LINER
2008	503317.20	1701628.86	258.00	LINER	2021	503558.81	1702531.15	241.00	LINER
2009	503317.20	1701615.44	258.00	LINER	2022	503558.81	1701731.15	249.00	LINER
2010	503299.20	1701646.86	258.00	LINER	2023	503534.19	1702677.74	240.00	LINER
2011	503285.78	1701646.86	258.00	LINER	2024	503583.42	1702677.74	240.00	LINER
2012	503299.20	1702686.74	258.00	LINER	2025	503583.42	1702628.51	240.00	LINER
2013	503285.78	1702686.74	258.00	LINER	2026	503534.19	1702628.51	240.00	LINER

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STATE OF ARKANSAS LICENSED PROFESSIONAL ENGINEER No. 10831 JASON GHIDOTTI

REV NO.	DATE	DESCRIPTION	BY
0	07/11/25	ISSUED FOR BID	JJG
1	07/30/25	ADDED POINTS	JJG
2	08/14/25	ADDED POINTS - ISSUED FOR CONSTRUCTION	JJG

REVISIONS

CLAY LINER PLAN

CRAIGHEAD COUNTY LANDFILL
CELL 5 CONSTRUCTION PROJECT

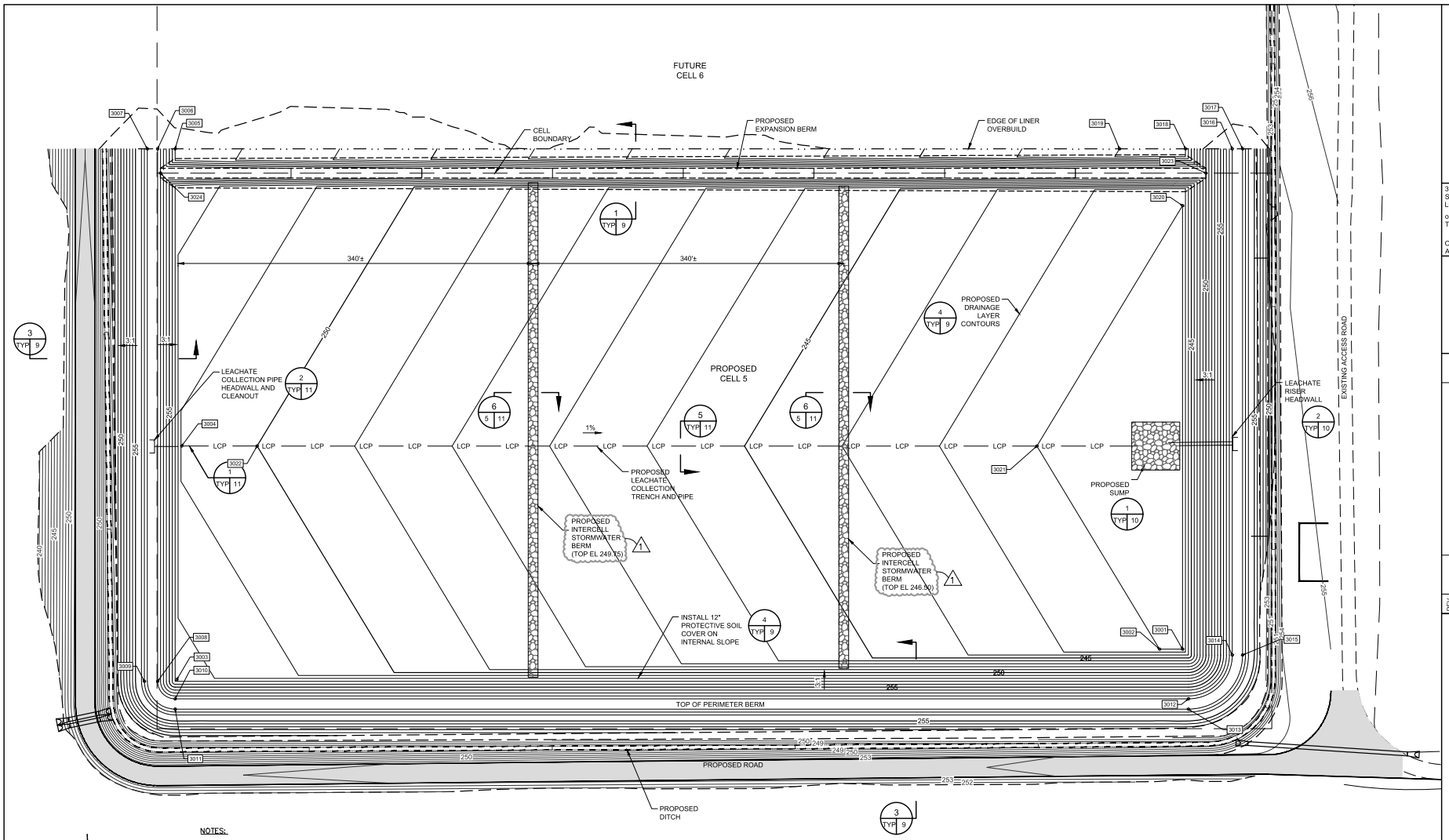
JONESBORO, ARKANSAS

2025

drawn by: _____ JJG
designed by: _____ JJG
project no.: _____ 025-02434
date: _____ 08/14/2025

SHEET
04 of 15

F:\2025\02001-02500\025-02434\40-Design\AutoCAD\Final Plans\Sheets\ENV25-08-07_ENV_Construction Issue\C_PSIT_02502434-Clay Liner Plan-REV02.dwg
DATE: Aug 15, 2025 9:58am USER: jghidotti



NOTES:

1. SURVEY DATA IS BASED UPON ARKANSAS NORTH STATE PLANE COORDINATE SYSTEM. ELEVATIONS ARE BASED UPON THE NORTH AMERICAN VERTICAL DATUM OF 1988.
2. LANDFILL COORDINATE SYSTEM IS BASED UPON SITE COORDINATE SYSTEM, WHICH IS TIED INTO ARKANSAS STATE PLANE COORDINATE SYSTEM.
3. CONSTRUCTION OF PROPOSED FACILITIES SHOWN ON THESE DRAWINGS SHALL BE DONE IN ACCORDANCE WITH THE FACILITY PERMIT, CONSTRUCTION DOCUMENTS, AND THE FACILITY CQA PLAN.
4. EXISTING FACILITIES AND FEATURES ARE SHOWN LIGHT–LINED AND/OR SCREENED. NEW FACILITIES AND FEATURES ARE SHOWN SOLID AND HEAVY–LINED.

0' 25' 50' 100'
SCALE IN FEET

PROTECTIVE COVER/DRAINAGE LAYER CONSTRUCTION POINTS

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
3001	503350.36	1702680.58	242.00	PC/DL	3013	503288.78	1702686.58	259.00	PC/DL
3002	503350.36	1702656.96	242.00	PC/DL	3014	503344.36	1702731.58	259.00	PC/DL
3003	503319.16	1701648.71	252.40	PC/DL	3015	503344.36	1702742.16	259.00	PC/DL
3004	503558.81	1701653.70	249.77	PC/DL	3016	503863.82	1702731.58	259.00	PC/DL
3005	503863.82	1701647.02	253.00	PC/DL	3017	503863.82	1702742.16	259.00	PC/DL
3006	503863.82	1701629.02	259.00	PC/DL	3018	503863.82	1702683.58	243.00	PC/DL
3007	503863.82	1701618.44	259.00	PC/DL	3019	503863.82	1702615.89	243.00	PC/DL
3008	503317.36	1701629.02	259.00	PC/DL	3020	503805.53	1702680.58	242.00	PC/DL
3009	503317.36	1701615.44	258.00	PC/DL	3021	503558.81	1702531.15	242.00	PC/DL
3010	503299.36	1701647.02	259.00	PC/DL	3022	503558.81	1701731.15	250.00	PC/DL
3011	503288.78	1701647.02	259.00	PC/DL	3023	503838.82	1702704.58	250.00	PC/DL
3012	503299.36	1702686.58	259.00	PC/DL	3024	503838.82	1701632.02	258.00	PC/DL

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STATE OF ARKANSAS LICENSED PROFESSIONAL ENGINEER No.19031 JASON GHIOTTO

REV NO.	DATE	DESCRIPTION	BY
0	07/11/25	ISSUED FOR BID	JJG
1	07/30/25	ADDED BERM EL'S	JJG
2	08/15/25	ADDED POINTS - ISSUED FOR CONSTRUCTION	JJG

REVISIONS

DRAINAGE LAYER / PROTECTIVE COVER PLAN

CRAIGHEAD COUNTY LANDFILL
CELL 5 CONSTRUCTION PROJECT

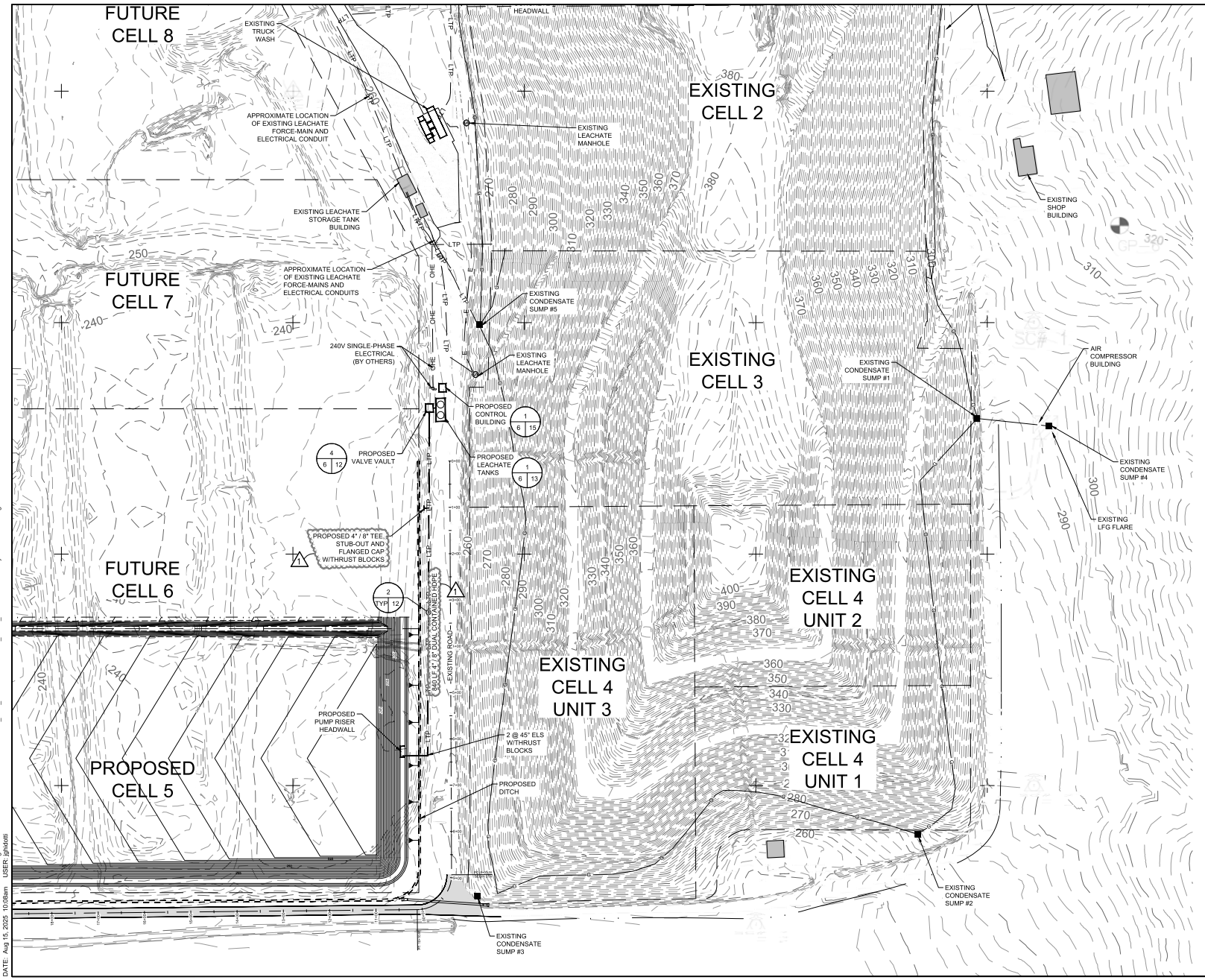
JONESBORO, ARKANSAS

2025

drawn by: JJG
designed by: JJG
project no.: 025-02434
date: 08/15/2025

SHEET
05 of 15

F:\2025\02001-02500\025-02434\40-Design\AutoCAD\Final Plans\Sheets\ENV\25-08-07_ENV_Construction Issue\C_PSIT_025O2434-Protective Cover Layer Plan-REV01.dwg
DATE: Aug 15, 2025 10:03am USER: jghiotti



F:\2025\02001-02500\02025-02434\40-Design\AutoCAD\Final Plans\Sheet\ENV\25-08-07_ENV_Construction Issue\C_PUTL_02502434-Site Utility Plan-REV02.dwg
DATE: Aug 15, 2025 10:08am USER: jghdotti

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STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 10031
JASON GHIDOTTI

REV NO.	DATE	DESCRIPTION	BY
0	07/11/25	ISSUED FOR BID	JJG
1	07/30/25	ISSUED FOR USACE	JJG
2	08/15/25	ISSUED FOR CONSTRUCTION	JJG

REVISIONS

SITE UTILITY PLAN

CRAIGHEAD COUNTY LANDFILL
CELL 5 CONSTRUCTION PROJECT

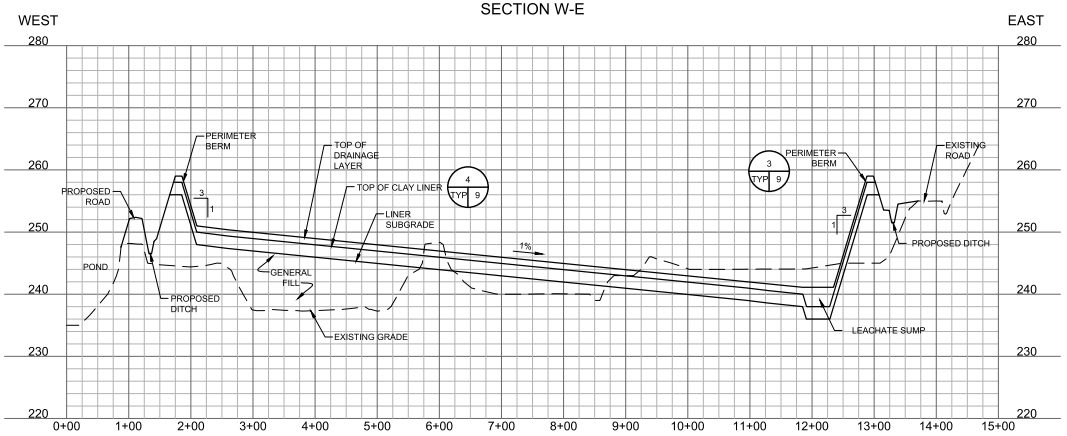
JONESBORO, ARKANSAS

2025

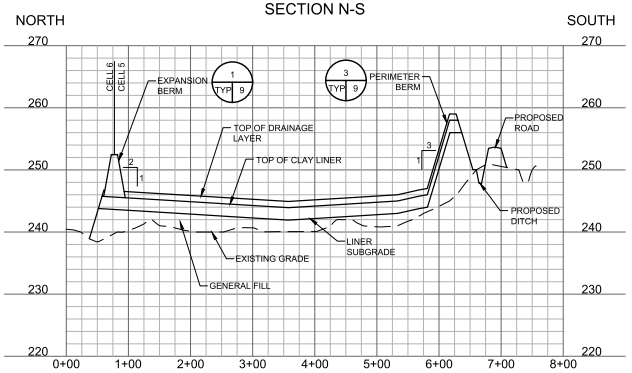
drawn by: JT
designed by: JJG
project no.: 025-02434
date: 08/15/2025

SHEET
06 of 15

SECTION W-E



SECTION N-S



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STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 10831
JASON GHIOTTO

REV. NO.	DATE	DESCRIPTION	BY
0	07/11/25	ISSUED FOR BID	JJG
1	08/15/25	ISSUED FOR CONSTRUCTION	JJG

REVISIONS

CELL 5 SECTIONS

CRAIGHEAD COUNTY LANDFILL
CELL 5 CONSTRUCTION PROJECT

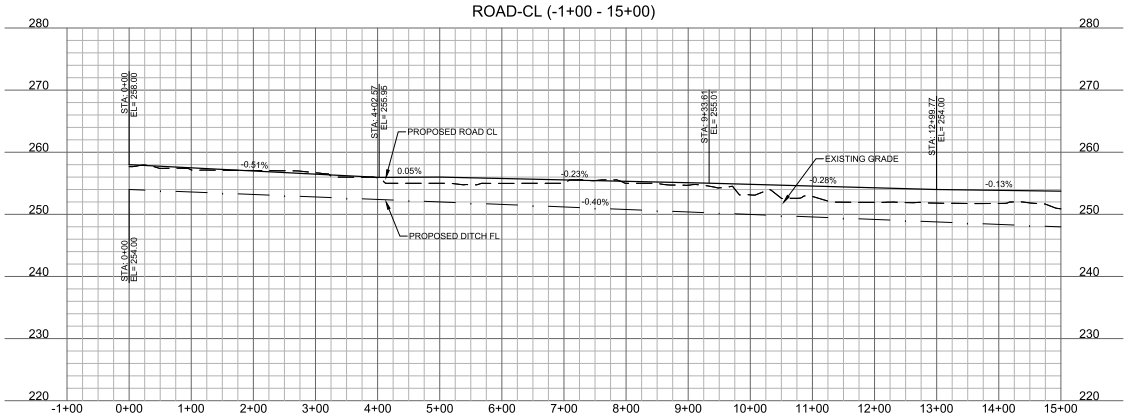
JONESBORO, ARKANSAS

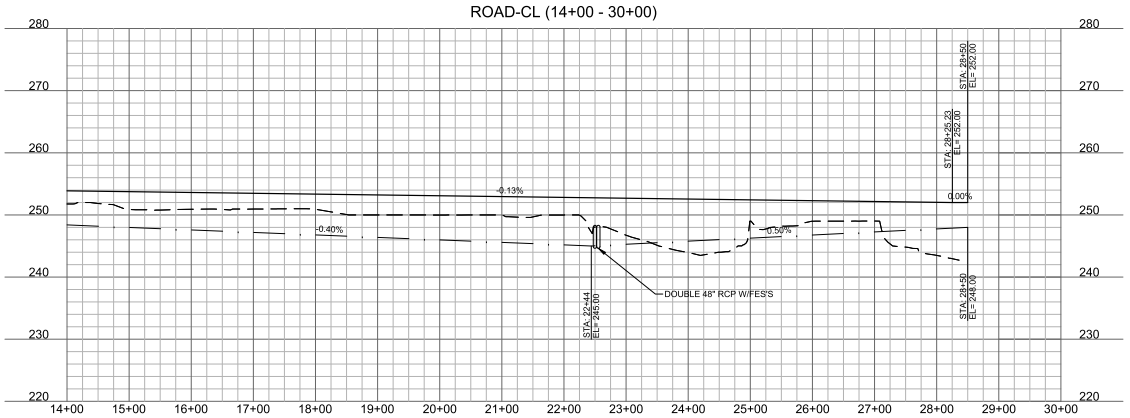
2025

drawn by: JJG
designed by: JJG
project no.: 025-02434
date: 08/15/2025

SHEET
07 of 15

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DATE: Aug 15, 2025 10:11am USER: jghiotti





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STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 19031
JASON GHIDOTTI

REV. NO.	DATE	DESCRIPTION	BY
0	07/11/25	ISSUED FOR BID	JJG
1	08/15/25	ADDED STORMWATER DATA - ISSUED FOR CONSTRUCTION	JJG

REVISIONS

ROAD AND DRAINAGE PROFILES

CRAIGHEAD COUNTY LANDFILL
CELL 5 CONSTRUCTION PROJECT

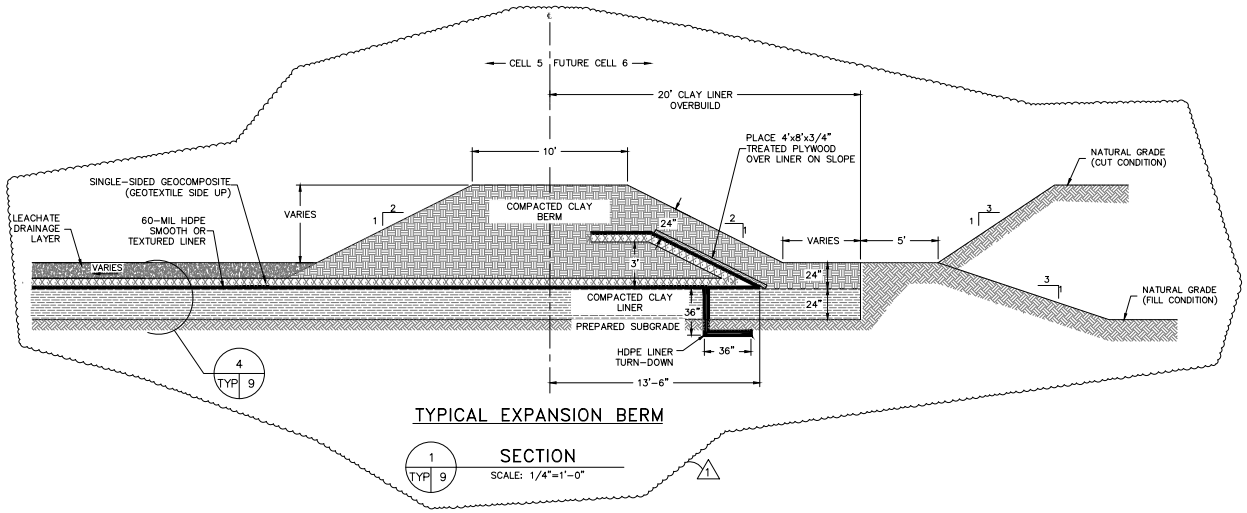
JONESBORO, ARKANSAS

2025

drawn by: JJG
designed by: JJG
project no.: 025-02434
date: 08/15/2025

SHEET
08 of 15

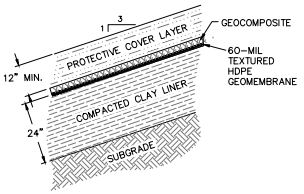
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DATE: Aug 15, 2025 10:15am USER: jghidotti



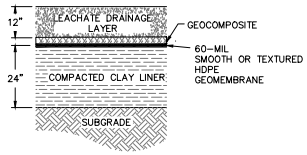
TYPICAL EXPANSION BERM

1 TYP 9 SECTION

SCALE: 1/4"=1'-0"



SIDE-SLOPES

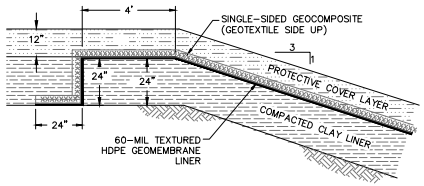


BOTTOM

LANDFILL BOTTOM LINER

4 TYP 9 DETAIL

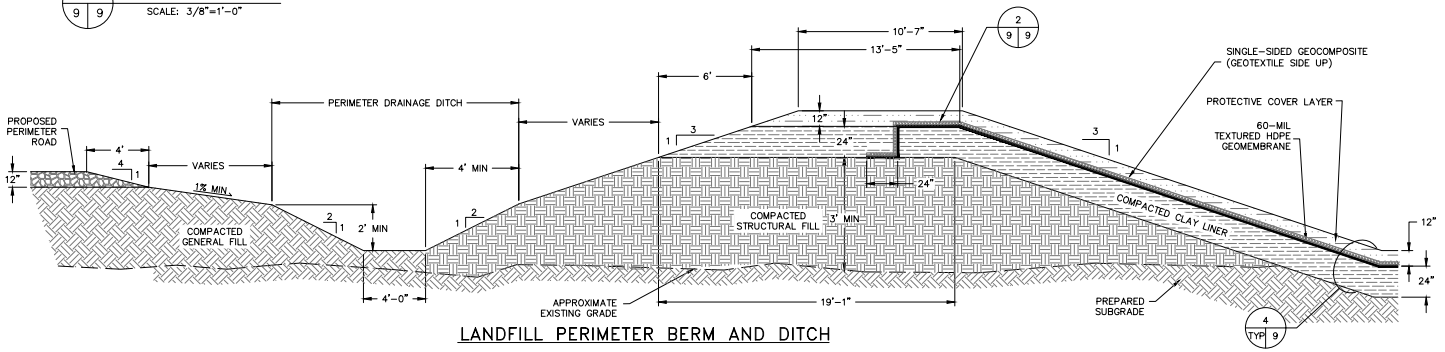
SCALE: 1/2"=1'-0"



TYPICAL SIDE-SLOPE ANCHOR TRENCH

2 9 9 DETAIL

SCALE: 3/8"=1'-0"



LANDFILL PERIMETER BERM AND DITCH

3 TYP 9 SECITON

SCALE: 1/4"=1'-0"

F:\2025\02001-02500\025-02434\40-Design\AutoCAD\Final Plans\Sheet\ENV\25-08-07_ENV_Construction Issue\C_DTL1_02502434-LINER DETAILS-REV02.dwg
DATE: Aug 15, 2025 10:16am USER: jghdotti

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STATE OF ARKANSAS LICENSED PROFESSIONAL ENGINEER No. 13031 JASON GHIDOTTI

REVISIONS

REV. NO.	DATE	DESCRIPTION	BY
0	07/11/25	ISSUED FOR BID	JJG
1	07/31/25	REVISED PER ADDENDUM #1, ADDED HDPE LINER TURN-DOWN	JJG
2	08/15/25	ISSUED FOR CONSTRUCTION	JJG

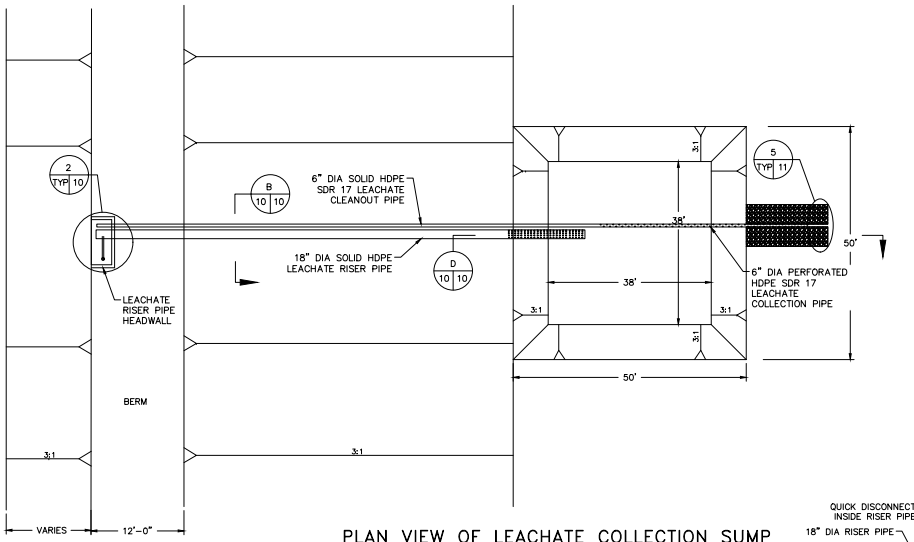
LINER DETAILS

CRAIGHEAD COUNTY LANDFILL
CELL 5 CONSTRUCTION PROJECT
JONESBORO, ARKANSAS

2025

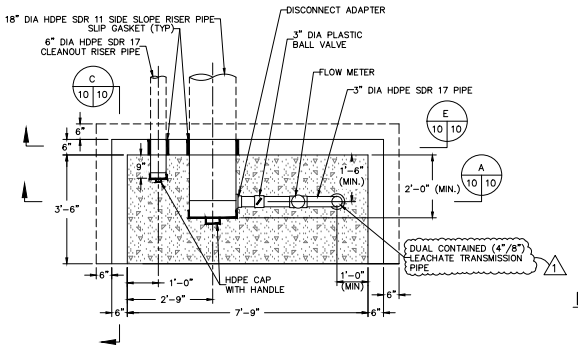
drawn by: JT
designed by: JJG
project no.: 025-02434
date: 08/15/2025

SHEET
09 of 15



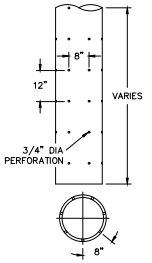
PLAN VIEW OF LEACHATE COLLECTION SUMP AND WEST RISER PIPE

DETAIL 1 TYP 10
SCALE: NTS



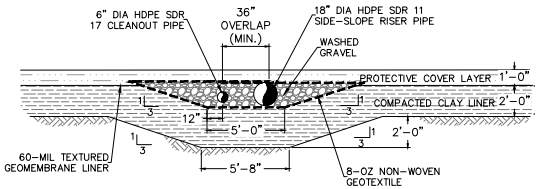
RISER PIPE HEADWALL

DETAIL 2 TYP 10
SCALE: 1/2"=1'-0"



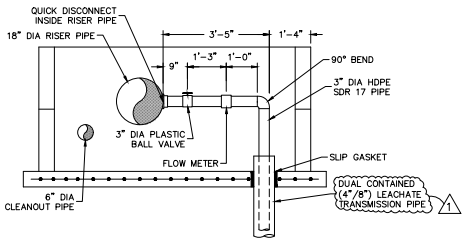
RISER PIPE PERFORATIONS

DETAIL 3 10 10
SCALE: N.T.S.



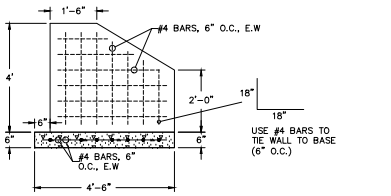
WEST SUMP RISER TRENCH

SECTION B TYP 10
SCALE: 1/4"=1'-0"



LEACHATE DISCHARGE PIPING

SECTION A 10 10
SCALE: 1/2"=1'-0"



RISER PIPE HEADWALL – WING WALL SECTION

SECTION C 10 10
SCALE: 1/2"=1'-0"

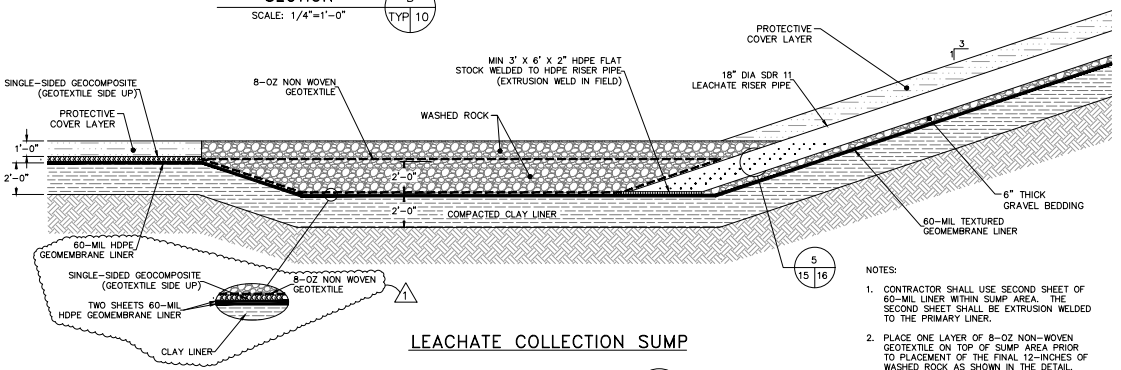
NOTES:

1. HORIZONTAL BARS SHOWN SECTIONS A, C, & E SHALL BE CONTINUOUS AT ACROSS ALL FACES.

2.REFER TO PROJECT SPECIFICATIONS FOR CONCRETE CONSTRUCTION REQUIREMENTS.

3. REFER TO PROJECT SPECIFICATIONS FOR INFORMATION ON CONCRETE AND REINFORCEMENT BAR MATERIAL REQUIREMENTS.

4. BATTEN OR OTHER ATTACHMENT OF THE GEOMEMBRANE TO THE CONCRETE HEADWALL IS NOT REQUIRED.



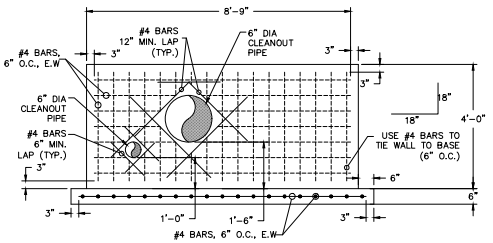
LEACHATE COLLECTION SUMP

SECTION D TYP 10
SCALE: 1/4"=1'-0"

NOTES:

1. CONTRACTOR SHALL USE SECOND SHEET OF 60-MIL LINER WITHIN SUMP AREA. THE SECOND SHEET SHALL BE EXTRUSION WELDED TO THE PRIMARY LINER.

2. PLACE ONE LAYER OF 8-OZ NON-WOVEN GEOTEXTILE ON TOP OF SUMP AREA PRIOR TO PLACEMENT OF THE FINAL 12-INCHES OF WASHED ROCK AS SHOWN IN THE DETAIL.



RISER PIPE HEADWALL – BACK WALL SECTION

SECTION E 10 10
SCALE: 1/2"=1'-0"

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REV. NO.	DATE	DESCRIPTION	BY
0	07/11/25	ISSUED FOR BID	JJG
1	07/30/25	REVISED PER ADDENDUM #1. REMOVED REFERENCE TO TEXTURED GEOMEMBRANE (SECTION D)	JJG
2	08/15/25	ISSUED FOR CONSTRUCTION	JJG

REVISIONS

LEACHATE COLLECTION SYSTEM DETAILS (1 OF 2)

CRAIGHEAD COUNTY LANDFILL
CELL 5 CONSTRUCTION PROJECT

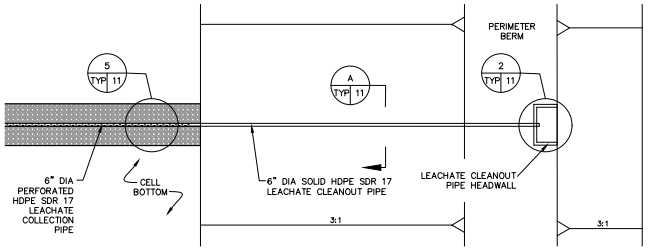
JONESBORO, ARKANSAS

2025

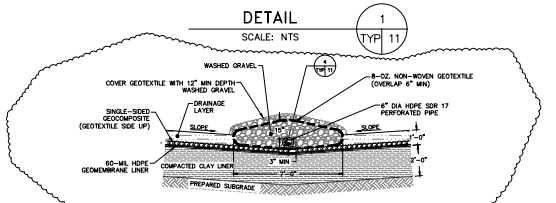
drawn by: JT
designed by: JJG
project no.: 025-02434
date: 08/15/2025

SHEET
10 of 15

F:\2025\02001-02500\025-02434\40-Design\AutoCAD\Final Plans\Sheets\ENV025-08-07_ENV_Construction Issue\C_DTL2_02502434-LEACHATE DETAILS 1-REV02.dwg
DATE: Aug 15, 2025 10:18am USER: jghdotti



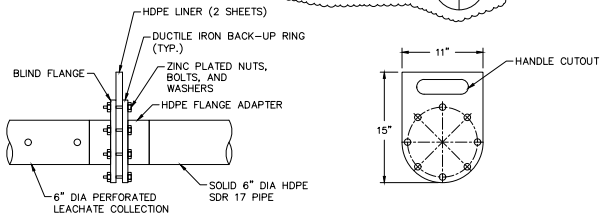
PLAN VIEW OF LEACHATE COLLECTION PIPE CLEANOUT



DETAIL SCALE: NTS (TYP 11) 1

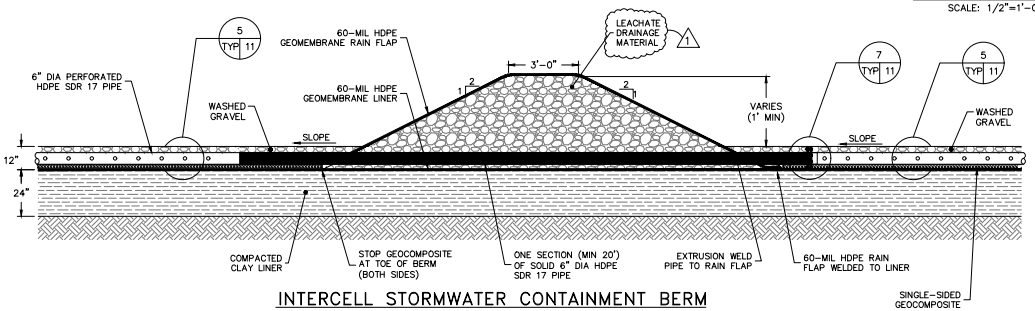
LEACHATE COLLECTION TRENCH

DETAIL SCALE: 1/4"=1'-0" (TYP 11) 5



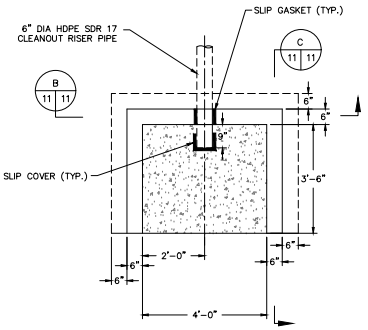
MJ BLIND FLANGE CONNECTION

DETAIL SCALE: N.T.S. (11 11) 3



INTERCELL STORMWATER CONTAINMENT BERM

DETAIL SCALE: 3/8"=1'-0" (5 11) 6



LEACHATE CLEANOUT PIPE HEADWALL

DETAIL SCALE: 1/2"=1'-0" (TYP 11) 2

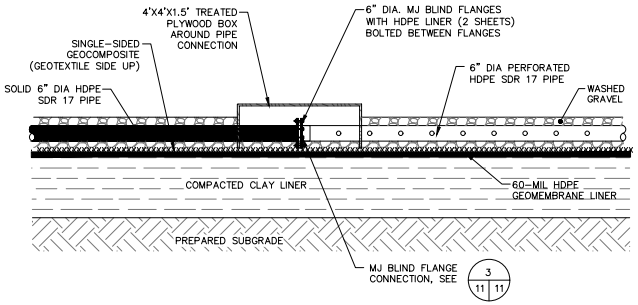
NOTES:

1. HORIZONTAL BARS SHOWN SECTIONS B AND C SHALL BE CONTINUOUS AT ACROSS ALL FACES.

2.REFER TO PROJECT SPECIFICATIONS FOR CONCRETE CONSTRUCTION REQUIREMENTS.

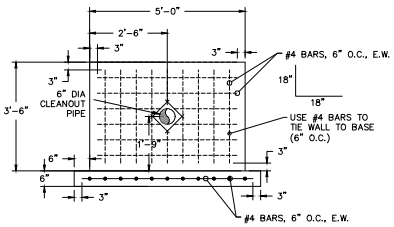
3. REFER TO PROJECT SPECIFICATIONS FOR INFORMATION ON CONCRETE AND REINFORCEMENT BAR MATERIAL REQUIREMENTS.

4. BATTEN OR OTHER ATTACHMENT OF THE GEOMEMBRANE TO THE CONCRETE HEADWALL IS NOT REQUIRED.



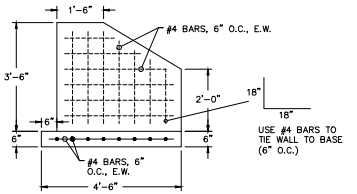
LEACHATE PIPE CONNECTION

DETAIL SCALE: 1/2"=1'-0" (11 11) 7



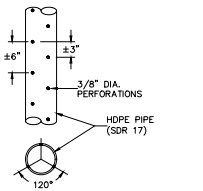
CLEAN OUT RISER PIPE HEADWALL BACK WALL SECTION

SECTION SCALE: 1/2"=1'-0" (B 11 11)



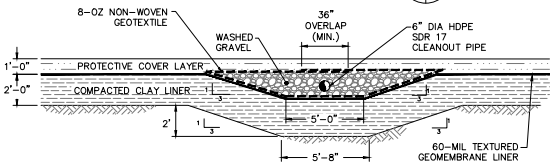
CLEAN OUT RISER HEADWALL WING WALL SECTION

SECTION SCALE: 1/2"=1'-0" (C 11 11)



LEACHATE COLLECTION PIPE

DETAIL SCALE: N.T.S. (TYP 11) 4



LEACHATE CLEANOUT RISER TRENCH

SECTION SCALE: 1/4"=1'-0" (TYP 11) A

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Olsson - Engineering
Arkansas COA #1010

STATE OF ARKANSAS JASON GHIDOTTI LICENSED PROFESSIONAL ENGINEER No.10531

REV. NO.	DATE	DESCRIPTION	BY
0	07/11/25	ISSUED FOR BID	JJG
1	07/31/25	ADDED LEACHATE COLLECTION TRENCH DETAIL	JJG
2	08/15/25	REVISED LEACHATE COLLECTION TRENCH DETAIL. ISSUED FOR CONSTRUCTION.	JJG

REVISIONS

LEACHATE COLLECTION SYSTEM DETAILS (2 OF 2)

CRAIGHEAD COUNTY LANDFILL
CELL 5 CONSTRUCTION PROJECT

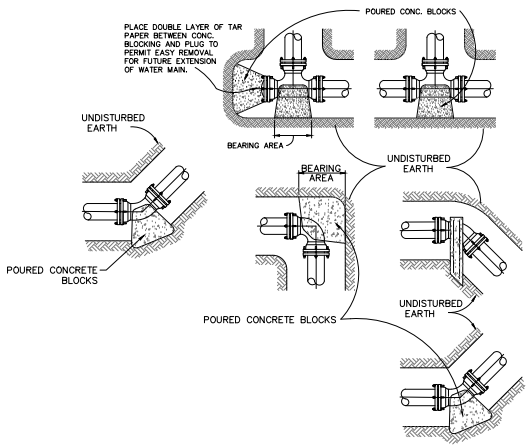
JONESBORO, ARKANSAS

2025

drawn by: JT
designed by: JJG
project no.: 025-02434
date: 08/15/2025

SHEET 11 of 15

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DATE: Aug 15, 2025 10:20am USER: jghidotti



NOTES:

1. ALL–BLOCKING SHALL BE AGAINST UNDISTURBED, HAND DUG SOIL.
2. CLEARANCE SHALL BE A MINIMUM OF 6" BETWEEN PIPE AND OBSTRUCTIONS.
3. WRAP ALL FITTINGS WITH DOUBLE LAYER OF POLYETHYLENE ENCASEMENT PRIOR TO CASTING CONCRETE.

BEARING AREA OF BLOCK IN SQ. FT.

FITTING SIZES	TEE & END	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND
4" & 6"	3.6	5.4	2.5	1.5	0.8
8"	6.8	8.9	4.8	2.5	1.3

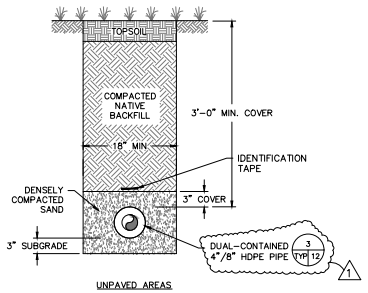
NOTE TO DESIGNER: AREAS BASED ON PIPE BURST PRESSURE OF 250 PSI.

SOIL BEARING PRESSURE	MULTIPLIER
1000	2.0
1500	1.33
2000	1.0
3000	0.67

THRUST BLOCK

DETAIL 1 TYP 12

SCALE: NTS

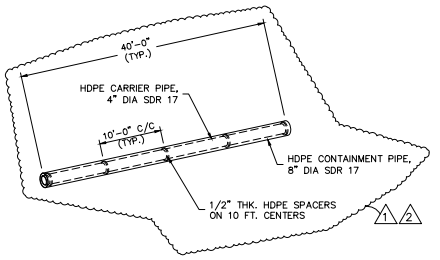


NOTE:
SEED, FERTILIZE, AND MULCH ALL AREAS DISTURBED BY EXCAVATION

HDPE DUAL–CONTAINED PIPELINE BEDDING

DETAIL 2 TYP 12

SCALE: 1"=1'–0"



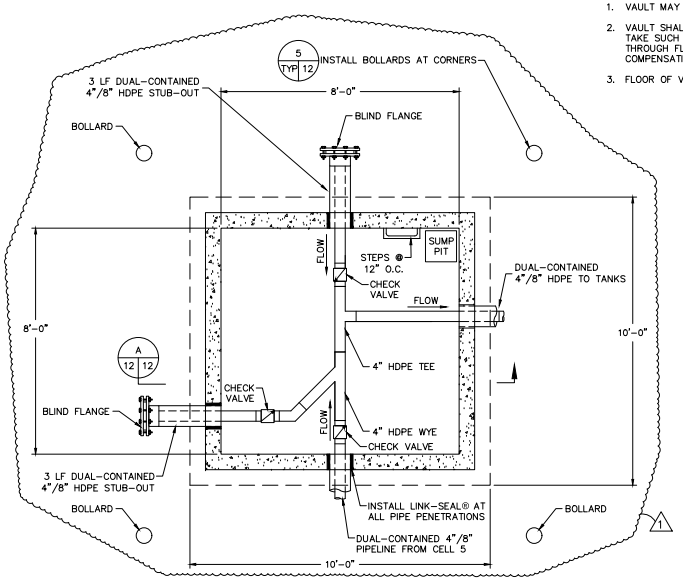
HDPE DUAL CONTAINMENT PIPE

DETAIL 3 TYP 12

SCALE: N.T.S.

NOTES:

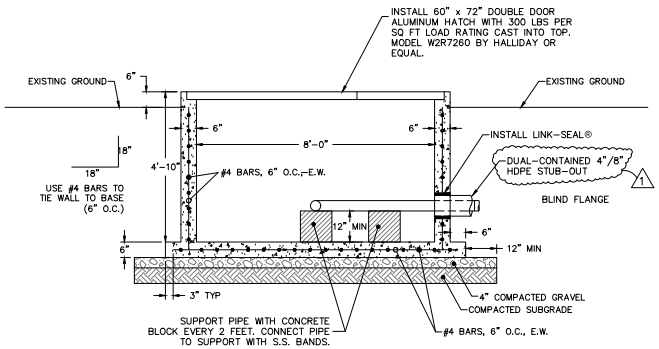
1. VAULT MAY BE EITHER CAST–IN–PLACE OR PRE–CAST CONCRETE.
2. VAULT SHALL BE WATER TIGHT. CONTRACTOR WILL BE REQUIRED TO TAKE SUCH MEANS NECESSARY TO CORRECT ANY AND ALL LEAKAGE THROUGH FLOORS OR WALL OF STRUCTURE WITHOUT ADDITIONAL COMPENSATION FROM OWNER.
3. FLOOR OF VAULT SHALL DRAIN TOWARDS SUMP PIT.



VALVE VAULT

DETAIL 4 6 12

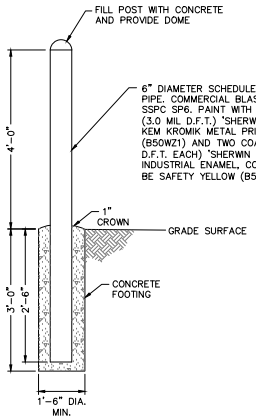
SCALE: NTS



VALVE VAULT

SECTION A 12 12

SCALE: NTS



6" PIPE BOLLARD

DETAIL 5 TYP 12

SCALE: N.T.S.

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STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 19031
JASON GRIGSBY

REVISIONS

REV. NO.	DATE	DESCRIPTION	BY
0	07/22/25	ISSUED FOR BID	JJG
1	07/30/25	REVISED VAULT SIZING	JJG
2	08/15/25	CORRECTED PIPE SDR. ISSUED FOR CONSTRUCTION	JJG

LEACHATE TRANSMISSION SYSTEM DETAILS

CRAIGHEAD COUNTY LANDFILL
CELL 5 CONSTRUCTION PROJECT

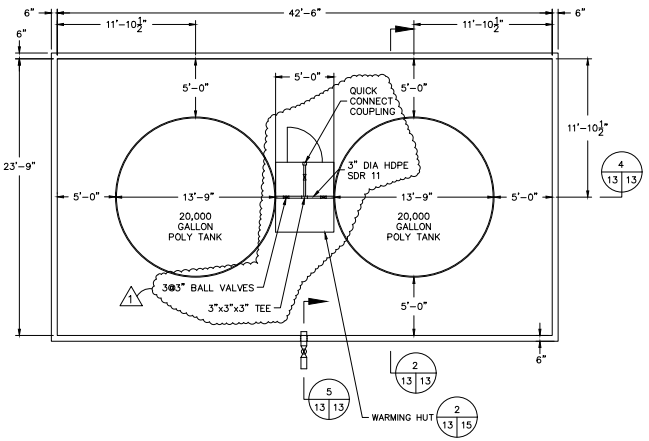
JONESBORO, ARKANSAS

2025

drawn by: JT
designed by: JJG
project no.: 025-02434
date: 08/15/2025

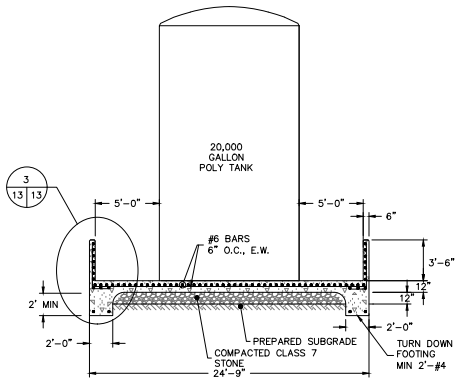
SHEET 12 of 15

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DATE: Aug 15, 2025 10:24am USER: jghdotti



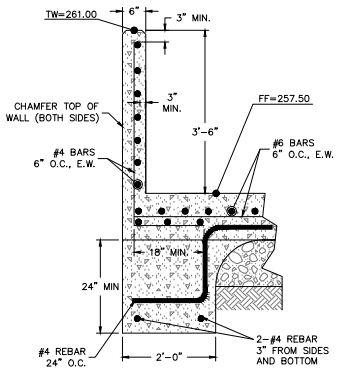
LEACHATE TANK AREA LAYOUT

DETAIL 1 / 6 13 — SCALE: 3/16"=1'-0"



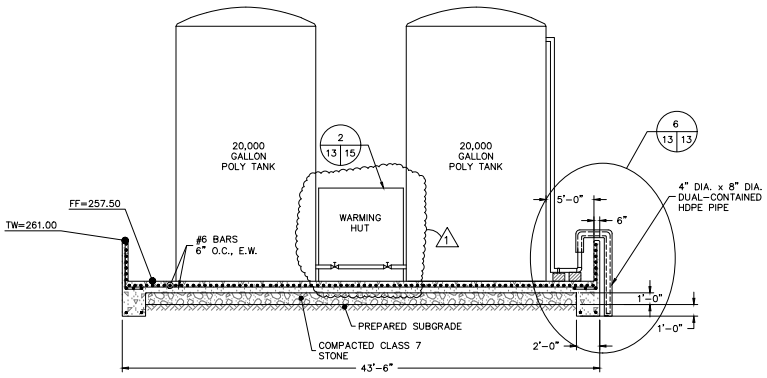
SECTION

DETAIL 2 / 13 13 — SCALE: N.T.S.



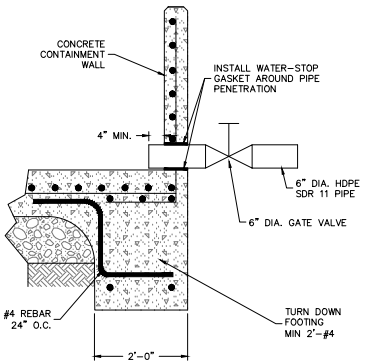
CONCRETE CONTAINMENT SIDE WALL

DETAIL 3 / 13 13 — SCALE: 3/4"=1'-0"



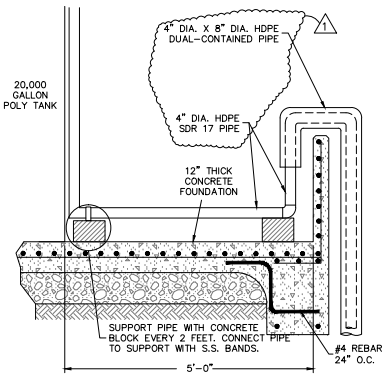
SECTION

DETAIL 4 / 13 13 — SCALE: N.T.S.



SECTION

DETAIL 5 / 13 13 — SCALE: 3/4"=1'-0"



LEACHATE PIPE TO TANK CONNECTION

DETAIL 6 / 13 13 — SCALE: N.T.S.

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Arkansas COA #1010

REGISTERED ARKANSAS LICENSED PROFESSIONAL ENGINEER No.13031 JASON GHIDOTTI

REV. NO.	DATE	DESCRIPTION	BY
0	07/11/25	ISSUED FOR BID	JJG
1	07/29/25	ADDED WARMING HUT CORRECTIONS	JJG
2	08/15/25	ISSUED FOR CONSTRUCTION	JJG

REVISIONS

LEACHATE TANK DETAILS

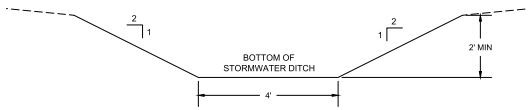
CRAIGHEAD COUNTY LANDFILL
CELL 5 CONSTRUCTION PROJECT
JONESBORO, ARKANSAS

2025

drawn by: JT
designed by: JJG
project no.: 025-02434
date: 08/15/2025

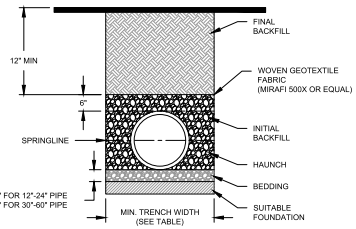
SHEET 13 of 15

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DATE: Aug 15, 2025 10:28am USER: jghdotti



TYPICAL STORMWATER DITCH

DETAIL — SCALE: N.T.S. — TYP 14 / 1



RECOMMENDED MINIMUM TRENCH WIDTHS

PIPE DIAM.	MIN. TRENCH WIDTH
4"	21"
6"	23"
8"	26"
10"	28"
12"	30"
15"	34"
18"	39"
24"	48"
30"	56"
36"	64"
42"	72"
48"	80"
60"	96"

NOTES:

1. ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST ADDITION

2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.

3. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER, AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.

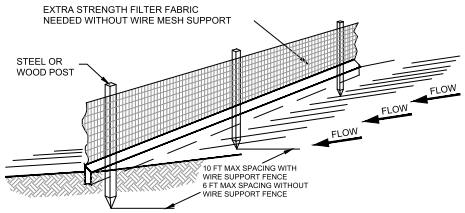
4. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II OR III. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" (100mm) FOR 4"-24" (100mm-600mm); 6" (150mm) FOR 30"-60" (750mm-1500mm).

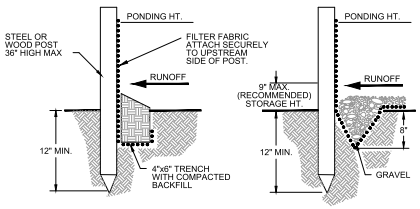
5. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II OR III IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" ABOVE CROWN OF PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.

6. MINIMUM COVER: MINIMUM COVER, H, IN NON-TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" FROM THE TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOTATION. FOR TRAFFIC APPLICATIONS, MINIMUM COVER, H, IS 12" UP TO 48" DIAMETER PIPE AND 24" OF COVER FOR 60" DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT. FOR TRAFFIC APPLICATIONS WITH LESS THAN FOUR FEET OF COVER, EMBEDMENT OF THE PIPE SHALL BE USING ONLY A CLASS I OR CLASS II BACKFILL.

CULVERT TRENCH

DETAIL — SCALE: 1/2"=1'-0" — TYP 14 / 2





STANDARD DETAIL
TRENCH WITH NATIVE BACKFILL

ALTERNATE DETAIL
TRENCH WITH GRAVEL

NOTE:

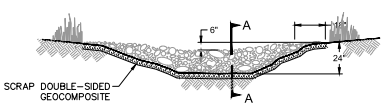
1. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY.

2. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.

3. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.

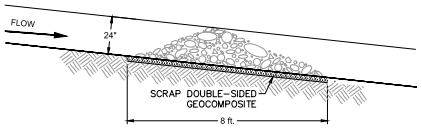
SILT FENCE

DETAIL — SCALE: N.T.S. — TYP 14 / 3



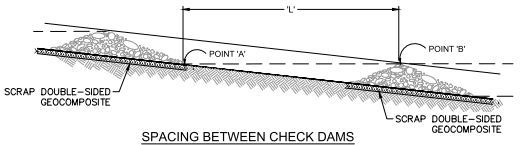
VIEW LOOKING UP STREAM

NOTE: KEY STONE INTO THE DITCH BANKS AND EXTEND IT BEYOND THE ABUTMENTS A MINIMUM OF 18" TO PREVENT OVERFLOW AROUND DAM.



SECTION A-A

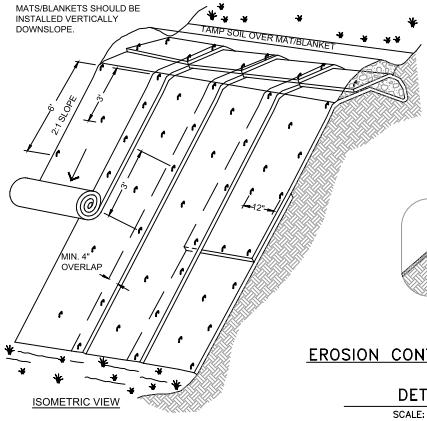
'L' = THE DISTANCE SUCH THAT POINTS 'A' AND 'B' ARE OF EQUAL ELEVATION.



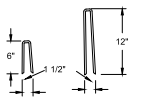
SPACING BETWEEN CHECK DAMS

ROCK CHECK DAM

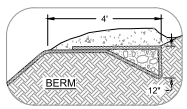
DETAIL — SCALE: N.T.S. — TYP 14 / 4



TYPICAL SLOPE
SOIL STABILIZATION



STAPLES



NOT TO SCALE

NOTES:

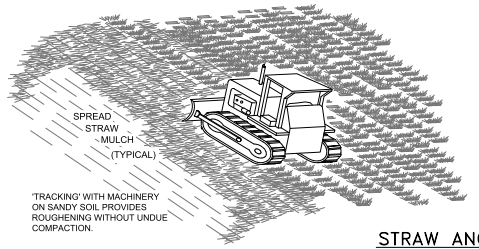
1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/ BLANKETS SHALL HAVE GOOD SOIL CONTACT.

2. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.

3. LAY MATTING LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.

EROSION CONTROL MATTING

DETAIL — SCALE: N.T.S. — TYP 14 / 5



NOTES:

1. ROUGHEN SLOPE WITH BULLDOZER

2. BROADCAST SEED AND FERTILIZER.

3. SPREAD STRAW MULCH 3" THICK. (OTHER MULCHING MATERIALS ARE ACCEPTABLE, REFER TO OPERATIONS NARRATIVE).

4. PUNCH STRAW MULCH INTO SLOPE BY RUNNING BULLDOZER UP AND AND DOWN SLOPE.

STRAW ANCHORING

DETAIL — SCALE: N.T.S. — TYP 14 / 6

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Arkansas COA #1010

STATE OF ARKANSAS — LICENSED PROFESSIONAL ENGINEER — No. 10031 — JASON GHIDOTTI

REV. NO.	DATE	DESCRIPTION	BY
0	07/11/25	ISSUED FOR BID	JJG
1	08/15/25	ISSUED FOR CONSTRUCTION.	JJG

REVISIONS

STORMWATER DETAILS

CRAIGHEAD COUNTY LANDFILL
CELL 5 CONSTRUCTION PROJECT

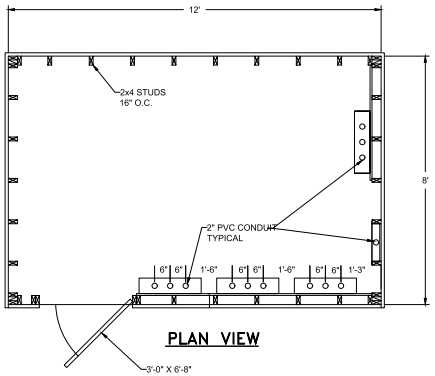
JONESBORO, ARKANSAS

2025

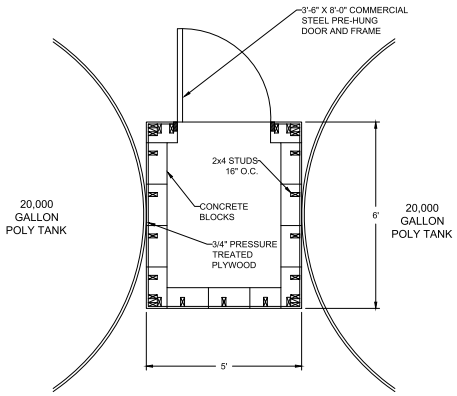
drawn by: JJG
designed by: JJG
project no.: 025-02434
date: 08/15/2025

SHEET
14 of 15

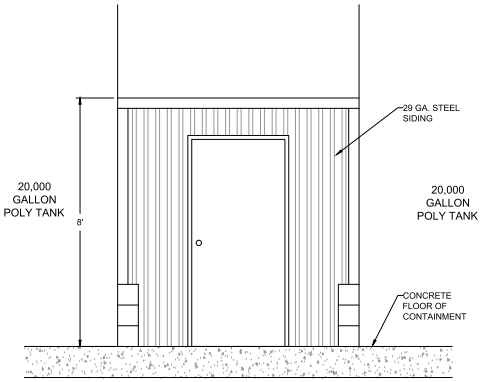
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DATE: Aug 15, 2025 10:32am USER: jghidotti



PLAN VIEW



PLAN VIEW

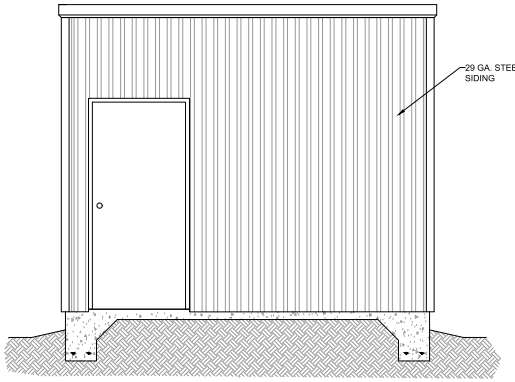


ELEVATION VIEW

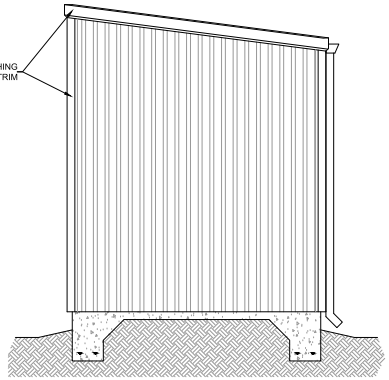
WARMING HUT

DETAIL 2 / 13 | 15

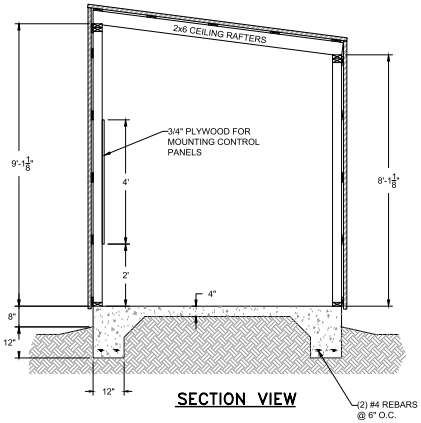
SCALE: 1/2"=1'-0"



ELEVATION VIEW



SIDE VIEW



SECTION VIEW

CONTROL BUILDING

DETAIL 1 / 6 | 15

SCALE: 1/2"=1'-0"

olsson

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Olsson - Engineering
Arkansas COA #1010

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 10031
JASON GHIDOTTI

REVISIONS

REV NO.	DATE	DESCRIPTION	BY
0	07/11/25	ISSUED FOR RFP	JJG
1	07/31/25	REVISED CONTROL BUILDING, ADDED WARMING HUT	PWC
2	08/15/25	ISSUED FOR CONSTRUCTION	JJG

MISCELLANEOUS DETAILS

CRAIGHEAD COUNTY LANDFILL
CELL 5 CONSTRUCTION PROJECT

JONESBORO, ARKANSAS

2025

drawn by: JJG
designed by: PWC
project no.: 025-02434
date: 08/15/2025

SHEET
15 of 15

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DATE: Aug 15, 2025 10:35am USER: jghidotti

APPENDIX C
PHOTOGRAPHIC LOG



Photo 1. Looking east at preparation of subgrade.



Photo 2. Looking east at preparation of subgrade and southern perimeter berm.



Photo 3. Looking northeast at preparation of subgrade.



Photo 4. Looking west at completed subgrade.



Photo 5. Looking east at completed subgrade.



Photo 6. Looking southwest at preparation of clay liner.



Photo 7. Looking southeast at preparation of clay liner.



Photo 8. Looking northeast at preparation of clay liner.



Photo 9. Looking northeast at preparation of clay liner.



Photo 10. Looking southwest at completed clay liner.



Photo 11. Looking north at completed anchor trench along eastern perimeter berm.



Photo 12. Looking southwest at installation of geomembrane.

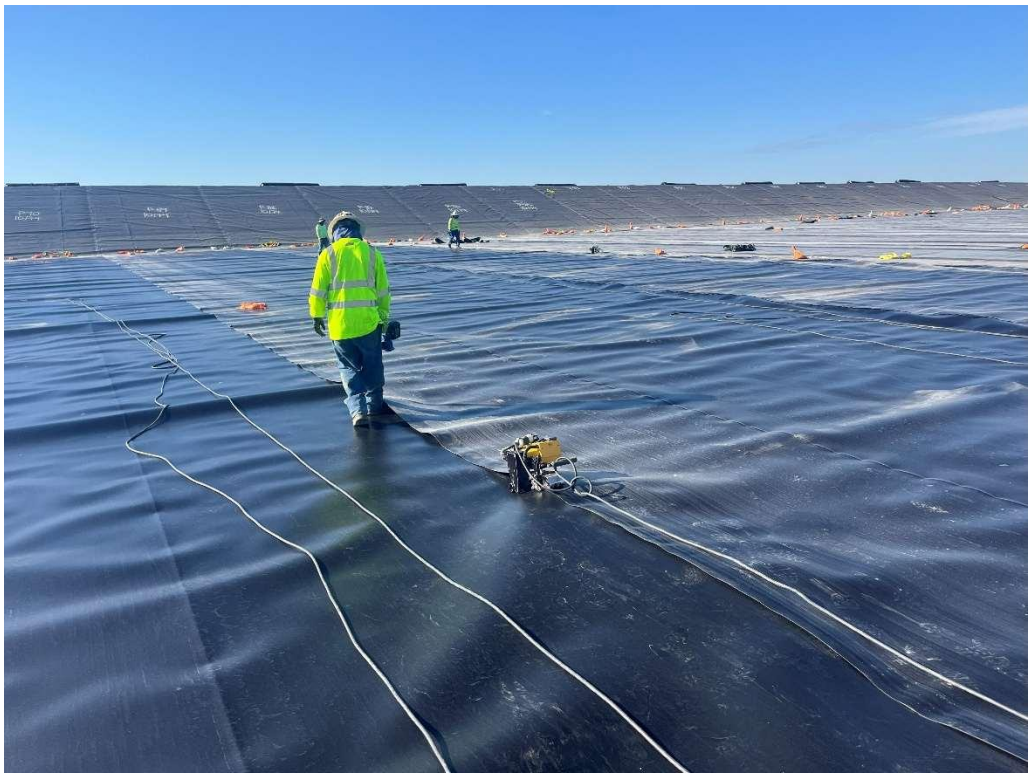


Photo 13. Looking south at geomembrane seaming process.



Photo 14. Air testing of geomembrane seam.



Photo 15. Geomembrane installation and patching activities.



Photo 16. Performing vacuum testing of patch.



Photo 17. Patch of geomembrane of destruct testing location.

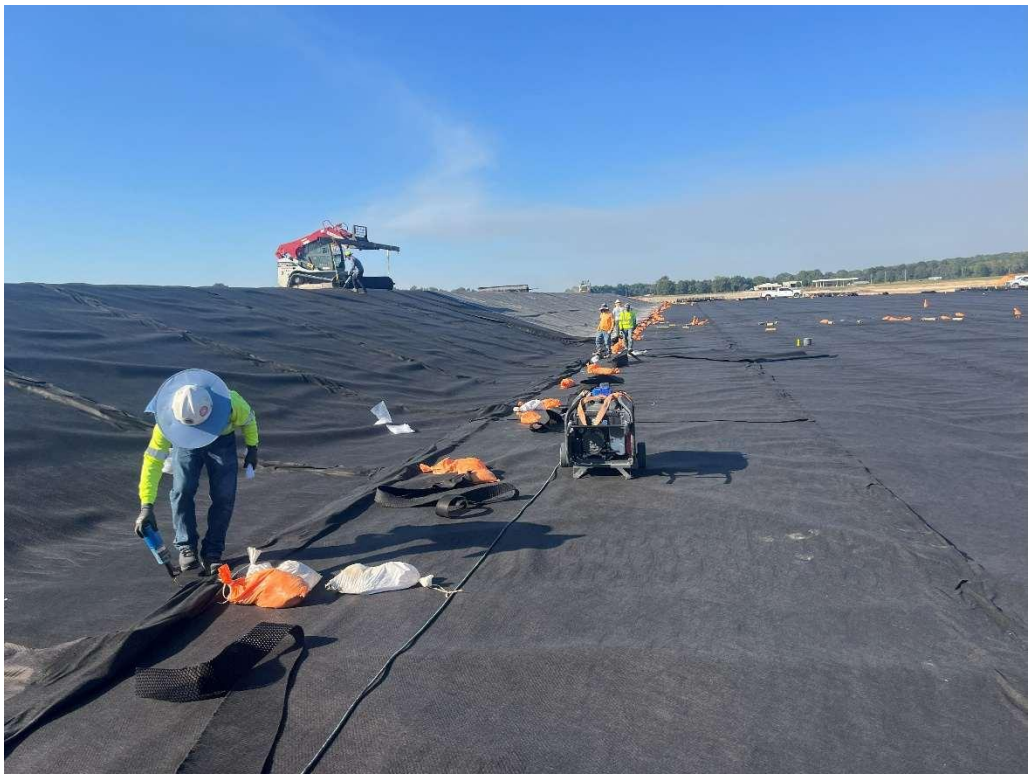


Photo 18. Looking west at installation of geocomposite.



Photo 19. Looking south at the installation of the geocomposite in the anchor trench.



Photo 20. Looking south at the completed installation of the geocomposite.



Photo 21. Looking north at the installation of the geocomposite.



Photo 22. Looking northeast at the installation of the protective cover.



Photo 23. Looking southeast at the initial installation of protective cover layer.



Photo 24. Looking east at the installation of protective cover layer.



Photo 25. Looking southeast at the installation of protective cover layer.



Photo 26. Looking northwest at the installation of protective cover layer.



Photo 27. Looking north at the installation of protective cover layer and intercell berm.



Photo 28. Looking west at the installation of leachate collection pipe.



Photo 29. Looking east at the installation of leachate collection pipe.


Photo 30. Looking east at the installation of leachate collection pipe.

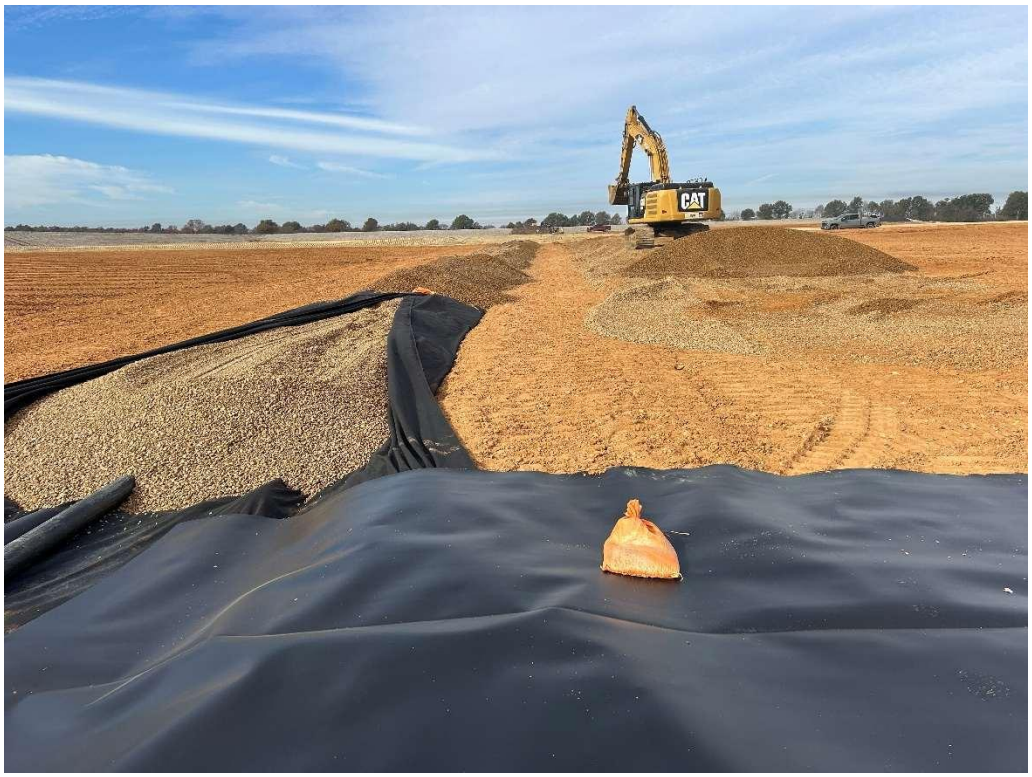


Photo 31. Looking east at the installation of leachate collection pipe.



Photo 32. Looking east at the leachate cleanout riser headwall.



Photo 33. Looking west at the installation of leachate sump and riser pipes.



Photo 34. Looking northwest at the installation of leachate sump gravel layer.



Photo 35. Looking west at the installation of leachate transmission piping from riser headwall.



Photo 36. Looking north at the installation of leachate transmission piping to storage tanks.



Photo 37. Looking west at the installation of leachate storage tanks.

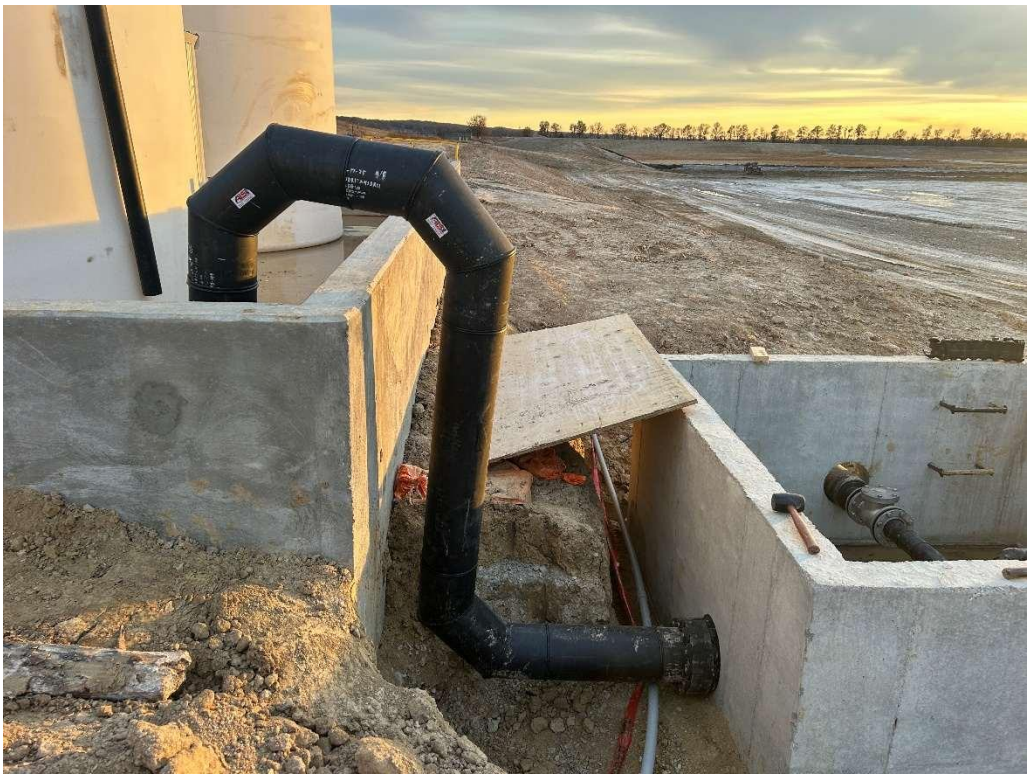


Photo 38. Looking south at installation of leachate transmission piping to storage tanks.



Photo 39. Looking west at the leachate collection system riser headwall.



Photo 40. Looking west at the installation of the expansion berm between Cell 5 and Cell 6.



Photo 41. Looking west at the completed Cell 5.

APPENDIX D
DAILY FIELD LOGS

Daily Log

Site Location: LEGACY LANDFILL	Date: 8-28-25
Project Number: 025-02434	Page of

0636 ARRIVED ON SITE met with Harold Sanders for TOUR of Site
TRACTORS with earth moving PANS - 6
OFF ROAD TRUCKS - 6
DOZER - 2
ROLLER - 1
TRACK HOE - 3
WATER TRUCK - 1
SKID STEERE - 1
FUEL TRUCK - 1
TRACTOR with BOX BLADE - 1
TRACTORS SCRAPING DIRT AND PLACING ON CELL 5
0800 COLLECTED CLAY SAMPLES PC-1, PC-2, PC-3
0830 COLLECTED CLAY SAMPLES C-1, C-2, C-3
0840 LEFT SITE FOR HOME DEPOT, AND FED-X
0930 AT FED-X
1022 LEFT FED-X
1050 BACK ON SITE
DOZER WORKING ON FINAL GRADE FOR SUBGRADE
TRACTORS PLACING FILL ON WEST BERM
1200 DUMEY STOPPED FOR LUNCH
1230 TRACTOR STARTED MOVING DIRT AGAIN
DOZE CONTINUING TO PUSH SUBGRADE TO ELEVATION
TRACTORS STILL WORKING ON WEST BERM
1500
1600 DUMEY STOPED FOR THE DAY

8/28/2025

[redacted]

PROJECT DAILY FIELD REPORT

Date: 8.28.2025

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each
Olsson	1
Dumey	10

Equipment on Site:	Ea.
TRACTOR (with Belly PAN)	6
OFFROAD TRUCK	6
Dozer	2
TRACKhoe	3
Water truck	1
SKID Steer	1
FUEL TRUCK	1
TRACKTOR with BOX BLADE	1
Roller compactor	1

Working Day? Yes ☒ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	60		X				X	2
Weather	pm	90					X		3

Time	
0636	TRACTORS SCRAPPING DIRT AND PLACING ON Cell 5
0800	COLLECTED CLAY SAMPLES PC-1, PC2, PC3
0830	Collected Clay SAMPLES C-1 C-2, C-3
0840	Left site for Fed-X and Home Depot
0930	Arrived at Fed-X
1022	Left Fed-X
1050	Back on Site Dozer working on final grade for subgrade TRACTORS placing fill on West Berm
1200	DUMey Stopped for Lunch
1230	TRACKors STARTED moving dirt again Dozer Continuing to push subgrade to Elevation TRACTOR still working on West Berm
1900	DUMey Stopped work for the day

8/28/25

Signature: [signature]

Daily Log

Site Location:	LEGACY LANDFILL	Date:	8-29-25
Project Number:	025-02434	Page	1 of

0615 ARRIVED ON SITE FOR MEETING
SAME NUMBER OF EQUIPMENT AS 8.28.25
0630 DUMEQ CLEARING WILLOWS AND PUTTING SOIL FROM THOSE AREAS. ALSO WORKING ON BERM AROUND CELL 5 AND WORKING ON FINISHED GRADE FOR SUBGRADE ON CELL 5
1400 TRACTORS STOPPED FOR THE DAY
1730 ONE DOZER STOPPED FOR THE DAY
1740 TRACTOR WITH BOX BLADE STOPPED FOR THE DAY
1800 ONE DOZER STILL PUSHING DIRT LAST TRACTOR STOPPED
1805 OLSON LEFT SITE FOR THE DAY

8/29/2025

PROJECT DAILY FIELD REPORT

Date: 8-29-2025

Project: CCSWDA Legacy LF - Cell 5

General Contractor: Dumey Contractors, Inc.

Rainfall (in)	Calendar Day #	
	Working Day #	

Personnel on Site:	Each
Olsson	1
Dumey	10

Equipment on Site:	Ea.
TRACTOR With Belly PANS	6
OFFROAD TRUCK	6
Dozer	2
TRACKHOE	3
WATER TRUCK	1
SKID Steere	1
FUEL TRUCK	1
TRACTOR With Box Blade	1
Roller Compactor	1

Working Day? Yes ☒ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	68		X				X	3
Weather	pm	89		X			X		2

Time	
0615	Arrived ON Site For Meeting
0630	Dumey Clearing Willows and cutting Soil From those Areas Also working ON Berm Around Cell 5 and working ON finished Grade
1400	Tractors Stopped For the day
1730	TRACTOR With Box Blade Stopped For the day
1800	One Dozer Still pushing Dirt then Stopped
1805	Olsson Stopped for the day

8/29/25

Signature: JamM

PROJECT DAILY FIELD REPORT

Date: 09.02.2025

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each
Olsson	3
Dumey	10

Equipment on Site:	Ea.
TRACTOR with Belly PANS	6
OFF-ROAD TRUCKS	6
DOZER	2
TRACKHOE	3
WATER TRUCK	1
SKID STEER	1
FUEL TRUCK	1
TRACTOR with BOX BLADE	1
COMPACT ROLLER	1

Working Day? Yes ☒ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	68			X				
Weather	pm	89		X					

Time	
0600	ARRIVED ON SITE FOR MEETING
0629	DUMEY CONTINUE TO WORK ON EAST BERM AND BOX BLADING AND ROLLING SUBGRADE
1000	MEETING
1200	STOPPED FOR LUNCH
1300	BACK FROM LUNCH DUMEY WATERING SUBGRADE
1452	WENT TO GET GRAVEL SAMPLE TOOK WASHED SMALL BUT BIG WHEN IT DRIES
1830	DUMEY STOPPED FOR THE DAY

9/2/2025

Signature: [signature]

PROJECT DAILY FIELD REPORT

Date: 09·03·2025

Project: CCSWDA Legacy LF - Cell 5

General Contractor: Dumey Contractors, Inc.

Rainfall (in)	Calendar Day #	
	Working Day #	

Personnel on Site:	Each
Olsson	1
Dumey	10
Survey	1

Equipment on Site:	Ea.
Tractor with Belly pans	6
Offroad truck	6
Dozer	2
Water truck	1
SKID Steese	1
Fuel truck	1
Tractor with Box Blade	1
Trackhoe	3
Compact Roller	1

Working Day? Yes ☒ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	70			X				1
Weather	pm	89		X					3

Time	
0615	Arrived on site for meeting Dumey Continueing to work on finish grade for subgrade, and ditch on South side of cell. Also clearing willow trees, watering subgrade and Berm on North west side
0700	Started Roll testing Subgrade with water truck
0900	Survey on site
0937	Finished Roll testing subgrade
1000	Collecte Bucket of Clay Samples C4, C5, C6, C7, C8, C9, C10
1036	Finished Collecting Buckets Headed to Fed-x
1153	Back on site From fed-x
1230	Dumey digging out Low Area North of Cell 5
1741	Survey Left site
1900	Stopped work for the Day
1905	Left site

Signature: 09·03·2025

PROJECT DAILY FIELD REPORT

Date: 09.04.2025

Project: CCSWDA Legacy LF - Cell 5

General Contractor: Dumey Contractors, Inc.

Rainfall (in)		Calendar Day #	
		Working Day #	

Personnel on Site:	Each
Olsson	1
Dumey	16
MTA	1

Equipment on Site:	Ea.
TRACKtors with Belly PANS	4
Off-Road TRUCK	6
Dozer	2
TRACKhoe	3
water truck	1
SKID Steere	1
fuel TRUCK	1
TRACKtor with BOX Blade	1
Roller COMPACKtor	1

Working Day? Yes ☒ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	71		X					5 mph
Weather	pm	83		X					4

Time	
0600	Arrived on site for Meeting
0630	Dumey STARTED WORKING ON CUTTING Clay for First Lift and continuing to Fill PONDS ON NORTH side of Cell 5
0645	TAKING Clay from far western most Clay (Proctors - 8, 9, 10, 11, 12, 14)
0755	Called MCA ENGINEERING per Request from DUMEY for MOISTURE test
1140	MTA ARRIVED FOR MOISTURE test FOR DUMEY
	TOOK 5 tests
1218	MTA LEFT SITE
1855	Dumey STOPPED Hauling FOR THE day Water TRUCK STILL watering and one dozer still pushing clay
1900	Stopped WORK for the day

Signature: 9/4/2025

PROJECT DAILY FIELD REPORT

Date: 09.05.2025

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each
Olsson	1
Dumey	14
MTA	1

Equipment on Site:	Ea.
Tractors with Belly pans	6
Offroad Truck	6
Dozer	2
Trackhoe	3
Water Truck	1
Skid Steer	1
Fuel Truck	1
Tractor with Box Blade	1
Roller Compactor	1

Working Day? Yes ☒ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	71			X				3
Weather	pm	84			X				4

Time	
0615	ON SITE FOR MEETING DUMEY CONTINUING TO Haul Clay TO Cell 5 FOR First Lift AND watering
0810	MTA ARRIVED ON SITE
11:45	MTA Left SITE WE tested 30 LOCATIONS
1300	STARTED POSHING Shelby TUBES
1323	FINISH PUSHING Shelby TUBES & 1A+1B 2A+2B, 3A+3B, 4A, 4B AND Left FOR Fex-X
1445	BACK FROM Fed-X
1800	DUMEY finished Hauling first Lift of Clay dragging with Box Blade AND Roller
1845	Dumey Stopped for the day
1900	Left TO Meet MIKE @ Bald KNOB TO pick up Shelby TUBES
2125	BACK TO HOTEL

Signature: Jam M Ph

PROJECT DAILY FIELD REPORT

Date: 09-06-2025

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in) 0.41 | Calendar Day # | Working Day #

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each
Olsson	1
Dumey	1

Equipment on Site:	Ea.
TRACTOR WITH Bellygun	1
OFFROAD TRUCK	6
Dozer	2
TRACK hoe	3
Water TRUCK	1
SKID STEER	1
Fuel TRUCK	1
TRACTOR WITH Box Blade	1
Roller /Compactor	1

Working Day?

Yes ☐ No ☒

If No, Reason for Non-Working Day

Sunday	☐
Rain	☒
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	59	X						8
Weather	pm								

Time	
0600	ARRIVED ON SITE "RAINING"
0645	LEFT SITE TO WET TO WORK

Signature: 9/8/25

PROJECT DAILY FIELD REPORT

Date: 09.08.2025

Project: CCSWDA Legacy LF - Cell 5

General Contractor: Dumey Contractors, Inc.

Rainfall (in)	Calendar Day #	
	Working Day #	

Personnel on Site:	Each
Olsson	1
Dumey	13
MTA	1

Equipment on Site:	Ea.
Tractor with Belly Plows	6
Offroad Truck	6
Dozer	2
Trencher	3
Water Truck	1
Skid Steer	1
Fuel Truck	1
Tractor with Box Blade	1
Roller Compactor	1

Working Day? Yes ☐ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	56		X					3
Weather	pm	79		X					6

Time	
0650	Arrived on site Dumey Hauling Clay for second Lift
0830	Red dirt Being hauled in to Site Between Cell 6 & 7
0845	MTA Arrived on Site Protective Cover Being hauled in
10:45	Finish Testing Density & compaction
12:35	Finish Pushing and PACKING Shelby tubes Heading to Fedex
1323	Lowes To pick up more buckets
1400	Back on Site
1900	Stopped work for the day

Signature: 9/8/25

PROJECT DAILY FIELD REPORT

Date: 09/09/2025

Project: CCSWDA Legacy LF - Cell 5

General Contractor: Dumey Contractors, Inc.

Rainfall (in)	Calendar Day #	
	Working Day #	

Personnel on Site:	Each
Olsson	1
Dumey	14
MTA	1

Equipment on Site:	Ea.
TRACTOR with Belly PAN	6
OFFROAD TRUCK	6
Dozer	2
TRACKhoe	3
WaterTRUCK	1
SKID STEER	1
TRACTor with Box Blade	1
fuel TRUCK	1
Roller Compactor	

Working Day? Yes ☑ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	60		X				X	5
Weather	pm	84		X		X			3

Time	
0615	ARRIVED ON SITE FOR MORNING MEETING
	DUMEY HAULING CLAY, PUMPING OUT SUMP OLSSON
	PAINTING GRID AND BERM FOR MORNING DENSITY TESTS
0805	MTA ARRIVED ON SITE FOR DENSITY TESTING
0900	MTA LEFT TO CHARGE UP TESTING MACHINE
0930	ONE DOZER BROKE DOWN SO TRACTORS STOPPED HAULING CLAY
1300	MTA BACK ON SITE FOR TESTING (1600 LEFT SITE)
1630	LEFT SITE FOR FED-X TO SHIP HALF OF LIFT
1741	BACK FROM FED-X (PROTECTIVE COVER BEING HAULED IN)
1800	STOPPED WORK FOR THE DAY

9/9/25

Signature: _____

PROJECT DAILY FIELD REPORT

Date: 9/10/2025

Project: CCSWDA Legacy LF - Cell 5

General Contractor: Dumey Contractors, Inc.

Rainfall (in)	Calendar Day #	
	Working Day #	

Personnel on Site:	Each
Olsson	1
Dumey	11
MTA	1

Equipment on Site:	Ea.
TRACTOR with Belly pan	4
OFFROAD TRUCK	6
Dozer	2
trackhoe	3
water truck	1
Skid steer	1
TRACTOR with box Blade	1
Fuel truck	1
Roller	1

Working Day? Yes ☒ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	Cold		X				X	3
Weather	pm	88		X		X			4

Time	
0600	Arrived on site for Meeting
	Dumey Continues to haul clay for Second Lift and clear trees
0730	Protective cover being hauled in
0805	MTA Arrived on site for testing
1141	Finished testing Dumey working on Berm for Lift 3
1230	Pushed Shelby TUBES
1255	Done pushing TUBES
1316	Left site for fed-x
1456	2nd dozer back in operation
1900	Stopped for the day

9/10/25

Signature: _____

PROJECT DAILY FIELD REPORT

Date: 9/11/2025

Project: CCSWDA Legacy LF - Cell 5

General Contractor: Dumey Contractors, Inc.

Rainfall (in)	Calendar Day #	
	Working Day #	

Personnel on Site:	Each
Olsson	1
Dumey	14
MTA	1

Equipment on Site:	Ea.
tractor with Bosley pkg	4
offroad truck	6
Dozer	2
Excavator	3
water truck	1
Skidsteer	1
Tractor w Box Blade	1
water truck	1
Compactor	1

Working Day? Yes ☒ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	68		X				X	3
Weather	pm	95		X			X		3

Time	
0615	Arrived ON SITE for Meeting Dumey continues to Haul Clay for Lift 3
0830	MTA ARRIVED ON SITE FOR TEST
1111	Finished testing half of Lift 3
1234	Left SITE for Fed-X
1358	Back from Fed-X Dumey STARTING ON 4th Lift Western side and 3rd Lift ON N/E side of Cell
	Trucks still HAULING IN Protective Cover MATERIAL
1815	Stopped WORK for the day

Signature: 9/11/2025

PROJECT DAILY FIELD REPORT

Date: 09/12

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each
Olsson	1
Dumey	13
MTA	1

Equipment on Site:	Ea.
TRACTOR with Belly PAN	
OFFROAD TRUCK	
Dozer	
TRACTOR	
Water truck	
Skid Steer	
Box Blade TRACTOR	
Fuel truck	
Roller	

Working Day? Yes ☑ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	65		X				X	2
Weather	pm	96		X			X		4

Time	
0615	Arrived on Site for meetin Dumey continuing to haul @ lay for Lift 4
0715	MTA Arrived for Testing
1005	Finished Testing Lift 3
1030	Pushed Tubes on Lift 3
1050	Done pushing Tubes on Lift 3
1118	Headed to fed-x
1221	Back on Site from fed-x
	Dumey finishing up west end of Lift 4 and continuing to Haulin protective Cover material
1848	Dumey Stopped for the day

Signature: 9/12/2025

PROJECT DAILY FIELD REPORT

Date: 09/13

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each
Olsson	1
Dumey	13
M+A	1

Equipment on Site:	Ea.
TRACTOR with Bellypan	6
Offroad Truck	6
Dozer	2
TRACKhoe	3
Water TRUCK	1
Skid Steese	1
TRACTOR with Box Blade	1
Fuel TRUCK	1
Roller	1

Working Day? Yes ☑ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	70				X			3
Weather	pm	90			X		X		3

Time	
0600	Arrived on Site For Meeting DUMEY Continuing to Place Clay on Cell Lift 4
0800	M+A Arrived to TEST 1/2 Lift 4
1030	Finished Testing half Lift 4
1045	STARTED PUSHING half of Lift 4 Shelby TUBES
1120	Finished PUSHING TUBES
1256	Back on Site from fed-x
1500	DUMEY Stopped for the day

Signature: 9/13/2005

PROJECT DAILY FIELD REPORT

Date: 09/15/2025

Project: CCSWDA Legacy LF - Cell 5

General Contractor: Dumey Contractors, Inc.

Rainfall (in) 0.07

Calendar Day #

Working Day #

Personnel on Site:	Each
Olsson	1
Dumey	11
MTA	1

Equipment on Site:	Ea.
TRACTORS with Belly PAN	6
Offroad TRUCKS	6
DOZER	2
TRACTOR hoe	3
Water TRUCK	1
SKID Steere	1
TRACTOR with Box BLADE	1
Fuel TRUCK	1
Rollers	1

Working Day? Yes ☒ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	73			X	X			3
Weather	pm	93		X			X		2 mph

Time	
0600	Arrived on site Dumey finishing grading on May 4th Lift Liner expected in today
0640	1st TRUCK with Liner Arrived ONSITE
	TRUCKS Still Hauling protective COVER
0805	MTA Arrived for Testing
1020	Finished Testing Lift 4
1100	STARTED Pushing TUBES
1240	FINISHED PUSHING TUBES AND LEFT FOR Lunch
	Dumey Rolling Berms AND FINAL grading Lift 4
1900	Dumey Stopped for the Day
	Rain Came IN

Signature: [signature] 9/15/2025

PROJECT DAILY FIELD REPORT

Date: 9/16/2025

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each
Olsson	1
Dumey	11

Equipment on Site:	Ea.
Tracktor with Belly pans	6
Trackhoe	3
offload truck	0
Dozer	2
water truck	1
Fuel Truck	1
Skid Steere	1
tractor with Box Blade	1
Roller	1

Working Day? Yes ☑ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	71		X				X	3
Weather	pm	93		X			X		6

Time	
0600	Arrived on Site for Meeting Dumey Continues to push 4th Lift to FINAL Grade and roll
0807	TRUCK with Liner Arrived on Site
	STILL Hauling IN protective Cover and Digging platform
	for New Leachate TANKS
1045	Dumey Started digging east Anchor trench on Berm
1329	elepTICAL Concrete pipe Arrived
1430	Liner Crew started Bringing stuff IN to Site
1440	TRUCK with Liner Arrived on Site
1500	Concrete culvert Arrived
1830	Dumey Stopped for the day

Signature: [signature] 9/16/2025

PROJECT DAILY FIELD REPORT

Date: 9/17/2025

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each
Olsson	3
Dumey	10
Patriot	12
Ridge	1

Equipment on Site:	Ea.
Track hoe	3
Tractor with Belly plow	6
Dozer	2
Skid Steer	3
water truck	1
Tractor with Box Blade	1
Compactor	1
fuel truck	1
Side by Side	1

Working Day? Yes ☒ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	65		X		✓			1
Weather	pm	96		X			X		1

Time	
0600	Arrive ON site for Meeting Dumey Continuing to Roll Lift 4 and dig Anchor Trench
0715	Patriot Arrived ON site to fill SAND Bags
	Dumey working on Leachate PAD placing Rebar
1004	Surveyor Arrived ON site
1030	PAUL Arrived ON site Along with TRUCK Loaded with eliptical pipe
1100	Meeting
1534	TRUCK with eliptical pipe Arrived
	Dumey working on West Access Road
1539	Ridge Survey finished Survey ON May Liner
1830	Dumey Stopped for the day

Signature: 09/17/2025

PROJECT DAILY FIELD REPORT

Date: 9/18/2025

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each
Olsson	1
Dumey	11

Equipment on Site:	Ea.
TRACKhoe	3
TRACTOR with Bellypan	6
TRACTOR with Box Blade	1
SKID Steer	3
water truck	1
Roller	1
Fuel TRUCK	1
Dozer	2

Working Day? Yes ☑ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	69		X				X	1
Weather	pm	95		X			X		3

Time	
0615	Arrived on site for meeting. Dumey continuing on access road west side of cell and placing elliptical culvert in the southeast side of cell C access road, watering Cell 5 Clay to keep wet.
0800	TRUCK with Liner Arrived on site
1300	TRUCK with round Culvert material Arrived with a flared end
1400	Finished Installing South east elliptical culvert on Cell-5
1413	Started on Southwest culvert on Cell-5
1800	Stopped for the day

Signature: [signature] 09/18/2025

PROJECT DAILY FIELD REPORT

Date: 9/19/2025

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each
Olsson	1
Dumey	6

Equipment on Site:	Ea.
TRACK hoe	3
Tractor with Belly plow	1
Dozer	2
SKID Steere	3
Water TRUCK	1
COMPACTOR	1
Tractor with Box Blade	1
FUEL TRUCK	1

Working Day? Yes ☒ No ☒

If No, Reason for Non-Working Day

Sunday	☐
Rain	☒
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	72			X				/
Weather	pm								

Time	
0615	Arrived for meeting Dumey setting pump in sump for rain
0715	STARTED RAINING
0900	Left Site DUE TO wet CONDITIONS

Signature: 9/19/25

PROJECT DAILY FIELD REPORT

Date: 09/24/2025

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in) 1.70

Calendar Day #

Working Day #

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each
Olsson	1
Dumey	1
PATRIOTE	1

Equipment on Site:	Ea.
TRACTOR WITH Bellypan	6
TRACK hoe	2
Dozer	2
SKID Steere	3
Fuel TRUCK	1
Roller	1
TRACTOR with Box Blade	1
SKY Lift	1
water pump	1

Working Day?

Yes ☐ No ☒

If No, Reason for Non-Working Day

Sunday	☐
Rain	☒
Wet Site Conditions	☒
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	73			X				1 mph
Weather	pm								

Time	
0830	Arrived on site met with DUMEY and PATRIOTE discussed work conditions to wet for work
0930	Left Site TO Buy Buckets and get washed gravel for TESTING
1152	Dropped off Samples at MTA

Signature: 9/24/2025

PROJECT DAILY FIELD REPORT

Date: 9/25/2025

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in) 0.28 | Calendar Day # | Working Day #

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each
Olsson	1
Dumey	4

Equipment on Site:	Ea.
TRACTOR with Belly PAN	4
TRACCHOE	3
Dozer	2
TRACTOR with Box Blade	1
Water TRUCK	1
Roller	1
SIDE BY SIDE	3
Water PUMP	1

Working Day? Yes ☐ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☒
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	71			X			X	
Weather	pm								

Time	
0630	ARRIVED ON SITE DUMEY PUMPING WATER AND CLEANING ROAD FOR protective cover HAUL TRUCKS
0730	DUMEY PREPARING TRACTORS WITH BELLY PANS TO LEVEL SITE AND WORKING ON DRAINAGE DITCHES SO WATER WILL DRAIN
0819	PUMP STOPPED PUMPIN Called MIKE TO TELL HIM
0832	PUMP STARTED WORKING AGAIN
1027	PUMP STOPPED AGAIN
1130	DUMEY LEFT SITE AND SO DID I

Signature: 9/25/2025

PROJECT DAILY FIELD REPORT

Date: 09/26/2025

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

Tractor with Box Blade 1

Personnel on Site:	Each
Olsson	1
Dumey	2
~~PATRIOT~~	

Equipment on Site:	Ea.
Tractor with Belly plow	3
Backhoe	2
Dozer	1
Roller	1
Water truck	1
fuel truck	1
Side by Side	1
Skid Steers	3
Sky lift	1

Working Day? Yes ☐ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	60		X				X	5
Weather	pm	82		X		X			5

Time	
0820	Arrived on site & Recheck Liner Roll Numbers
	Dumey working on pumping water
0814	Patriot Arrived to check condition said they will be back
	By Noon to start putting Liner on Berm
1019	Dumey started fire on Brush pile ~~workers working on building pad~~
1033	Load of Geocomposit Arrived on site
1135	Truck Left After unloading Geosemetic
	Construction on Leachate Tank pad
1400	Left Site

Signature: 9/26/2025

PROJECT DAILY FIELD REPORT

Date: 09/27/2025

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

TRACKHOE 1

Personnel on Site:	Each	Equipment on Site:	Ea.
Olsson	1	TRACTOR with Belly PAN	3
Dumey		TRACTOR with Box Blade	1
PATRIOT	4	SKID STEER	3
		DOZER	2
		SIDE BY SIDE	1
		WATER TRUCK	1
		FUEL TRUCK	1
		ROLLER	1
		WATER PUMP	1

Working Day? Yes ☒ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	60		X				X	3
Weather	pm	85							3

Time	
6:15	ARRIVED ON SITE INSPECTED SURVEY STAKE POINTS FOR EDGE OF CELL AND WATER LEVEL IN CELL
0720	PATRIOT ARRIVED ON SITE
0930	PATRIOT STARTED ROLLING OUT LINER ON WEST BERM
12:00	PATRIOT WENT FOR LUNCH
12:26	I STARTED DUMEY'S PUMP THAT STOPPED RUNNING
1300	PATRIOT BACK ON SITE
1748	STARTED DUMEY'S PUMP
1800	PATRIOT STOPPED FOR THE DAY

Signature: [signature] 9/27/2025

PROJECT DAILY FIELD REPORT

Date: 9/28/2025

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each
Olsson	1
Dumey	0
PATRIOT	11

Equipment on Site:	Ea.
TRACTOR WITH BELLY DAMS	3
TRACTOR WITH BOX BLADE	1
SKID STEER	3
TRACK HOE	2
DOZER	1
WATER TRUCK	1
FUEL TRUCK	1
ROLLER	1
WATER PUMP BIG	1

Working Day? Yes ☒ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	63						X	1
Weather	pm	86				X			6

Time	
0645	ARRIVED ON SITE TOOK PICTURES WITH DRONE
0710	PATRIOT ARRIVED ON SITE
0725	I STARTED LUMEY'S PUMP
0800	STARTED ROLLING OUT BOTTOM OF CELL 5
1200	PATRIOT TOOK LUNCH
1300	PATRIOT BACK FROM LUNCH
1530	PATRIOT LEFT FOR THE DAY
1600	OLSSON LEFT SITE FOR THE DAY

Signature: [signature] 9/28/2025

PROJECT DAILY FIELD REPORT

Date: 9/29/2025

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each
Olsson	1
Dumey	2
Patriot	1

Equipment on Site:	Ea.
Tractors with Belly Pan	3
Tractor with Box Blade	1
Dozer	1
Skid-steer	3
Side by Side	1
Roller	1
Water Truck	1
Fuel Truck	1
Track hoe	2
Sky Jack	1

Working Day? Yes ☒ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	64		X				X	5.
Weather	pm	86		X		X			6

Time	
0645	Arrived on site took pictures with drone of liner progress
0715	Patriot Arived on site
0720	Truck hauling protective cover started sanding
	Dumey Cleaning out drainage Lanes along future Cell 6
0800	Truck load of GeoComposite Arived on site
1052	Push Last Shelby tube for paul Lift 4
1133	took Samples to fed-x
1245	Back from fed-x Patriot At Lunch
1300	Patriot Back from Lunch
1648	Patriot Stopped for the day
	Dumey Unloading NON WOVEN GEO TEXTILE
1730	Left site for the day

Signature: 9/29/2025

PROJECT DAILY FIELD REPORT

Date: 9/30/2025

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each	Equipment on Site:	Ea.
Olsson	1	tractors Belly dump	3
~~Dumey~~ Patriot	11	tractor Box blade	1
Dumey	2	Roller	1
		Skid steer	2
		Dozer	1
		Trackhoe	2
		water truck	1
		Fuel truck	1
		Sky Jack	1

Working Day? Yes ☐ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	70		X				X	5
Weather	pm	86		X		X			7

Time	
0645	Arrived on site took photos with drone
0713	Patriot arived continuing to place Liner
1003	Truck Load of geocomposit arrived
1130	Dumey Box Bladed area by sump
1200	Patriot took lunch
1300	Patriot back from Lunch
1315	pushed one mor Shelby tube for Paul
1400	Headed to Fed-x
1508	Back from fed-x
1645	Patriot stopped for the day Dumey pushing protective cover
1700	I left site

Signature: 9/30/2025

PROJECT DAILY FIELD REPORT

Date: 10/01/2025

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each
Olsson	4
Dumey	1
Patriot	11

Equipment on Site:	Ea.
TRACTOR WITH BELLY PANS	3
TRACTOR WITH BOX BLADE	1
DOZER	1
SKID STEER	2
SIDE BY SIDE	1
WATER TRUCK	1
FUEL TRUCK	1
ROLLER	1
TRACKHOE	2

Working Day? Yes ☒ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	65		X				X	5
Weather	pm	89		X			X		6

Time	
06:45	ARRIVED ON SITE FOR PHOTOS
07:20	PATRIOT ARRIVED TO START WORKING ON PACKING AS DESTRUCTS
1000	PAUL ARRIVED
1115	TRUCK WITH GEOSYNTHETIC ARRIVED
1130	WENT TO LUNCH
1230	BACK SOON LUNCH TESTING DESTRUCTS
1700	PATRIOT STOPPED FOR THE DAY

Signature: 10/01/2025

PROJECT DAILY FIELD REPORT

Date: 10-3-25

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in) —

Calendar Day #

Working Day #

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each	Equipment on Site:	Ea.
Olsson	1		
Dumey	1		
PATRIOT	IIII		

Working Day? Yes ☒ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	73	—	X				X	7 mph
Weather	pm								

Time	
0720	PATRIOT ARRIVED & BEGAN STAGING FOR WORK TODAY
0810	PATRIOT BEGAN LAYING GEO COMPOSITE ON SOUTH BERM @ WEST END OF CELL 5
0817	DUMEY ARRIVED ONSITE TO TAKE SURVEY SHOTS AT LEACHATE TANK FOUNDATION (PROP)
0824	PATRIOT BEGAN SUCTION TEST ON REPAIRS
0844	DUMEY LEFT SITE
0857	DUMEY TRUCKS START DELIVERED PROTECTIVE SOILS STOCKPILE
1130	

Signature: Wesley Adams

PROJECT DAILY FIELD REPORT

Date: 10-4-25, SAT

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	—	Calendar Day #	
		Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each
Olsson	1
Dumey	0
PATRIOT	5

Equipment on Site:	Ea.
TRACTOR W/BELLY PAN	3
TRACTOR W/BOX BLADE	1
WATER TRUCK	1
SKID STEER	2

Working Day? Yes ☒ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	60		X				X	>10mph
Weather	pm	86		X		X			>20mph

Time	
0720	PATRIOT ARRIVED ONSITE
0820	PATRIOT CONTINUED LAYING GEOTEXTILE LINER, SPECIFICALLY ALONG THE SOUTH BERM & ~~WEST~~ BERM
1205	PATRIOT TOOK 1 HR LUNCH
1305	PATRIOT ARRIVED ONSITE & CONTINUED TO LAY/WELD LINER ALONG EAST BERM
1700	PATRIOT LEFT SITE

Signature: Wesley Dumey

PROJECT DAILY FIELD REPORT

Date: 10-5-25, SUN

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each	Equipment on Site:	Ea.
Olsson		TRACTOR W/BELLY PAN	3
Dumey		TRACTOR W/BOX BLADE	1
PATRIOT	11	WATER TRUCK	1
		SKID STEER	2

Working Day? Yes ☒ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	62		X					10-15 mph
Weather	pm	87		X					15-20 mph

Time	
0720	PATRIOT ON SITE & BEGAN STAGING FOR THE DAY'S WORK
0800	PATRIOT CONTINUED WORK PATCHING SEAMS & REPAIRS, COMPLETING REPAIRS
1700	BEFORE LEAVING FOR THE DAY @ 1700

Signature: Wesley Jam

PROJECT DAILY FIELD REPORT

Date: 10-6-25, MON

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in) 0.40"	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each
Olsson	1
Dumey	0
PATRIOT	11

Equipment on Site:	Ea.
TRACTOR W/BELLY PAN	3
TRACTOR W/BOX BLADE	1
WATER TRUCK	1
SKID STEER	2

Working Day? Yes ☒ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☒
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	71	X			X			0-10 mph
Weather	pm	79	X			X			0-10 mph

Time	
0720	PATRIOT ARRIVED ONSITE & BEGAN STAGING FOR THE DAY'S WORK
0800	PATRIOT CONTINUED LAYING GEOCOMPOSITE FABRIC UNTIL RAINS STARTED
1110	RAINS BEGAN
1130	PATRIOT LEFT SITE DUE TO ONGOING RAINS
1615	OLSSON LEFT SITE AFTER CONTINUING TO DOCUMENT WORK COMPLETED SAT/SUB

Signature: Wesley Adams

PROJECT DAILY FIELD REPORT

Date: 10-7-25, TUES

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in) 0.10"

Calendar Day #

Working Day #

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each	Equipment on Site:	Ea.
Olsson	1	TRACTOR W/BOX BLADE	3
Dumey	1	TRACTOR W/BOX BLADE	1
PATRIOT	6	WATER TRUCK	1
		SKID STEER	2

Working Day? Yes ☐ No ☒

If No, Reason for Non-Working Day

- Sunday ☐
- Rain ☐
- Wet Site Conditions ☒
- Other (explain below) ☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	65	X					X	5-10 mph
Weather	pm	85			X	X			0-5 mph

Time	
0720	PATRIOT ARRIVED ONSITE & DETERMINED SITE CONDITIONS TOO WET TO WORK
0800	OLSSON CHECK SITE CONDITIONS & DOCUMENT WORK PERFORMED SAT/SUN
1405	OLSSON LEFT JOBSITE

Signature: Weston Olsson

PROJECT DAILY FIELD REPORT

Date: 10-8-25, WED

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	—	Calendar Day #	
		Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each
Olsson	1
Dumey	3
PATRIOT	11

Equipment on Site:	Ea.
TRACTOR W/BELLY PAN	3
TRACTOR W/ BOX BLADE	1
WATER TRUCK	1
SKID STEER	2

Working Day?

Yes ☐ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	60	—	X				X	12 mph
Weather	pm	73	—	X				X	18 mph

Time	
0720	PATRIOT ARRIVED ONSITE & BEGAN STAGING FOR TODAY'S WORK.
0800	DUMEY BEGAN WORK ON CONTROL BUILDING FOUNDATION & WARMING HOT WALL FORMS FOR TOMORROW'S POUR
1040	DUMEY'S ELECTRICAL SUB SHOWED UP TO INSTALL CONTROL BUILDING CONDUIT ↳ LEFT @ 1420
1215	PATRIOT WENT TO LUNCH (1 HR)
1315	PATRIOT CONTINUED TO LAY GEO COMPOSITE UNTIL THE END OF THE DAY
1700	PATRIOT LEFT THE SITE
AFTER 1700	DUMEY ARRIVED ONSITE SOMETIME AFTER 1700 TO DRESS STOCKPILED SOIL

Signature: Wesley Jeans

PROJECT DAILY FIELD REPORT

Date: 10-9-25, THURS

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in) —

Calendar Day #

Working Day #

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each
Olsson	1
Dumey	3
PATRIOT	11

Equipment on Site:	Ea.
TRACTOR W/BELLY PAN	3
TRACTOR W/ BOX BLADE	1
WATER TRUCK	1
SKID STEER	2

Working Day? Yes ☒ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	52°		X				X	7-15 mph
Weather	pm	76°F		X		X			20-25 mph

Time	
0720	PATRIOT ARRIVED ON SITE & BEGAN STAGING FOR THE DAY'S WORK
0800	PATRIOT CREW CONTINUED TO LAY GEOCOMPOSITE FABRIC
0830	DUMEY CONCRETE SUB POURED CONTROL BUILDING FOUND & WARMING HUT WALLS
1145	PATRIOT & DUMEY CREWS WENT TO LUNCH
1300	PATRIOT & DUMEY CREWS RETURNED TO SITE
	PATRIOT CONTINUED LAYING GEOCOMPOSITE TOWARD THE EAST END OF CELL 5
1700	PATRIOT LEFT SITE
AFTER 1700	DUMEY DIRT CREW SHAPED SOIL STOCKPILE TO RECEIVE MORE SOILS

Signature: Wesley Lam

PROJECT DAILY FIELD REPORT

Date: 10-10-25, FRI

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	—	Calendar Day #	
		Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each
Olsson	1
Dumey	
PATRIOT	11

Equipment on Site:	Ea.
TRACKTOR W/BOX BLADE	1
TRACTOR W/BED PAN	3
WATER TRUCK	1
SKID STEER	1

Working Day?

Yes ☐ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	64°		X				X	>5 mph
Weather	pm	78°		X					5 mph

Time	
0720	PATRIOT ARRIVED ONSITE & BEGAN STAGING FOR THE DAY'S WORK
0800	PATRIOT BEGAN LAYING GEOCOMPOSITE AT EAST SIDE OF CELL 5
1145	PATRIOT WENT TO LUNCH
1230	OLSSON HAD CONVERSATION WITH ROBERT (LEGACY ENGINEER) ABOUT SOILS
	IMPORTED BY DUMEY NOT BEING SUITABLE FOR LINER COVER, OLSSON LET DUMEY
	KNOW SHORTLY AFTER, CONTACTING MICHAEL
1700	PATRIOT LEFT SITE

Signature: [signature]

PROJECT DAILY FIELD REPORT

Date: 10-11-25, SAT

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	—	Calendar Day #	
		Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each
Olsson	1
Dumey	
PATRIOT	11

Equipment on Site:	Ea.
TRACTOR W/BELLY PAN	3
TRACTOR W/BOX BLADE	1
WATER TRUCK	1
SKID STEER	2

Working Day? Yes ☒ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	65°F		X		-		X	5 mph
Weather	pm	78°F		X		X			5-10 mph

Time	
0700	PATRIOT ARRIVED ONSITE & BEGAN STAGING FOR THE DAY'S WORK
0800	PATRIOT BEGAN INSTALLING (WELDING) RAIN FLAP ON EAST INTERCELL ST. WATER BERM
1025	PATRIOT TESTED TRIAL SEAM WELDS - ALL PASSED
1145	PATRIOT WENT TO LUNCH (1HR)
1300	PATRIOT BEGAN WORK ON P-139 & EAST BERM PANELS (128-137) FROM THE FAILED DESTRUCTS (53-55) FROM YESTERDAY
1940	PATRIOT CREW FINISHED PATCHING NEAR EAST BERM TOE
1455	PATRIOT MOVED TO INSTALLING WEST INTERCELL STORM WATER BERM
1745	PATRIOT FINISHED WELDING (EXTRUSION) WEST INTERCELL STORM WATER BERM

Signature: Wesley Dumey

PROJECT DAILY FIELD REPORT

Date: 10/13/2025

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each
Olsson	1
Dumey	3

Equipment on Site:	Ea.
TRACKtor with Belly pan	3
Dozer	1
TRACKhoe	1
Water truck	1
Roller	1
Skid steere	1

Working Day?

Yes ☐ No ☒

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	104						X	3
Weather	pm								

Time	
0845	OLSSON ARRIVED ON SITE TRUCKS HAULING IN protective COVER DUMEY SAID THEY WERE NOT WORKING ALL PROBABLY THE 15th OF March
1145	OLSSON LEFT SITE

Signature: [signature]

PROJECT DAILY FIELD REPORT

Date: 10/15/2025

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each
Olsson	3
Dumey	3

Equipment on Site:	Ea.
Dozer	1
Trackhoe	1
Tractor with Belly PAN	3
Water Truck	1
Tractor with Box Blade	1
Highlift	1
Roller	1
Fuel Truck	1

Working Day? Yes ☒ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	60		X				X	3
Weather	pm	84		X		X			9

Time	
7130	Arrived on site Dumey pushing cover over west berm
	Truck continuely to haul in protective cover
8:00	Dumey has one tractor hauling cover for the berms
10:30	Paul Arrived on Site For meetings
1500	Paul Left Site after Meeting
1730	Dumey Stopped working on berm and started pushing protective cover pile
1800	Dumey Stopped for the day

Signature: [signature] 10/15/2025

PROJECT DAILY FIELD REPORT

Date: 10/20/2025

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each
Olsson	1
Dumey	4

Equipment on Site:	Ea.
Trackhoe	1
Tractor with Belly pan	3
Roller	1
Tractor with Box Blade	1
Water truck	1
Fuel truck	1
Water pump	1
Dozer	1
Off road truck	1

Working Day? Yes ☒ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	45		X				X	6
Weather	pm	68		X				X	12

Time	
0630	Arrived on Site Did JSA waiting on Dumey to Arrive
0650	Dumey Arrived on Site Started working on Haul Road
0940	Foil protective Cover to Cell
0940	Dumey Started Hauling protective cover on to Cell
1200	Dumey Stopped for Lunch
1230	Dumey Back from Lunch
1840	Dumey Stopped for the day

Signature: _____

PROJECT DAILY FIELD REPORT

Date: 10/21/2025

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each
Olsson	1
Dumey	5

Equipment on Site:	Ea.
Trackhoe	2
Dozer	1
tractor with Belly pan	3
tractor with Box Blade	1
Roller	1
fuel truck	1
water truck	1
water pump	1

Working Day? Yes ☒ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	55		X				X	7
Weather	pm	75		X				X	14

Time	
0645	Arrived on site JSA Sheet filled out Dumey continues to haul protective cover and trucks still having it in to site
1100	Dumey Brought in a second offroad truck more clay hauled in with protective cover told Dumey to call loader
1201	Dumey went to lunch
1230	Back from lunch
1358	Dumey started running second offroad truck
1815	Dumey Stopped for the day

Signature: Jan Mn

Daily Log

Site Location:	LEGACY	Date: 10/22
Project Number:	025-04356	Page of

OLSSON	1	TRACTOR with Belly pan	3
DUMEY	4	TRACTOR with Box Blade	1
		TRACKhoe	2
		Dozer	1
		Water truck	1
		ROLLER	1
		highlift	1
		Fuel truck	1
		off Road truck	2

490
72

Clear X Cool X Wind 5
+ X 6

0630 ARRIVED ON SITE DIR >SA and field Log
0700 DUMEY CONTINUE, TO PUT DOWN PROTECTIVE COVER
CREW ARRIVED TO CONSTRUCT BUILDING BY NEW LEACHATE TANK LOCATION
TRUCKS STILL HAULING PROTECTIVE COVER TO SITE
1200 DUMEY STOPPED FOR LUNCH
1230 DUMEY BACK FROM LUNCH CONTINUED TO HAUL PROTECTIVE COVER
1900 DUMEY STOPPED HAULING PROTECTIVE COVER FOR THE DAY

[redacted]

Daily Log

Site Location: C25-04395	Date: 10/23/2025
Project Number: CCSWDA LEGACY LF-CELL 5	Page of

General Contractors, Inc. Dumey Contractors, Inc.

Personnel on Site		Each	Equipment on Site	Working Day Yes	No
Olscon	1	2	Excavator		
Dumey	4	2	Offroad Truck		
		1	Tractor with Belly pan		
		1	Tractor with Box Blade		
		1	Dozer		
		1	Roller		
		1/1	Water Truck / Fuel Truck		
		1	High lift Forklift		

		Temp	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	AM	49		X				X	
Weather	PM	70		X					S

Time	
630	Arrived on site Dumey Continue to haul protective cover to Cell 5
0719	First DUMP truck with protective cover Arrived onsite
1200	Dumey Stopped for lunch
1230	Dumey Back from Lunch
1800	Dumey Stopped for the day

Daily Log

Site Location:		Date: 10/24/25
Project Number: CCSWDA LEGACY LF-CELL 5		Page of
General Contractors, Inc	Dumey Contractors, Inc	

Personnel on Site	Each	Equipment on Site	Working Day Yes	No
CISCON 1	2	TRACKHOE		
DUMEY 5	1	Dozer		
	2	OFFROAD TRUCK		
	3	TRACKTORS with Belly		
	1	tracktor with Box Blade		
	1	Water TRUCK		
	1	Fuel TRUCK		
	1/1	ROLLER / HIGHLIFT		

Weather		Temp	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
	AM								
Weather	AM	53		X	X			X	3
	PM	61			X			X	9

TIME	
0645	ARRIVED ON SITE. DUMEY CONTINUING TO HAUL PROTECTIVE COVER TO CELL
1330	DUMEY CHECKING OUT DRAINAGE DITCH NORTH OF CELL 1E
1630	DUMEY BUILDING CROSSING IN CENTER PORTION OF CELL TO START HAUL ROAD
1815	DUMEY STOPPED FOR THE DAY

Daily Log

Site Location:	Date: 10/25/25
Project Number: CCSWDA LEGACY LF-CELL 5	Page of

General Contractor: TNC Dumey Contractors, Inc.

Personnel on Site		Each	Equipment on Site	Working Day Yes	No
OSCAR	1	2	Trackhoe		
DUMEY	5	1	Dozer		
		4	Tractor with Attachment		
		1	Roller		
		1	Water truck		
		1	High lift		
			Fuel truck		

		Temp	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	AM	55			X			X	8
Weather	PM								

TIME	
0638	Arrived on site Dumey Continues to haul protective cover and trucks continues to haul protective covers to the site.
1137	Dumey Finished west 1/3 of Cell 5
1145	Dumey Started hauling to center third of Cell
1540	Dumey Stopped for the day

Daily Log

Site Location:	Date: 10/27
Project Number: CC SINDA LEGACY LF-CELL 5	Page of

General Contractor: TJC Dumpy Contractor: [redacted]

Personnel on Site	Each	Equipment on Site	Working Day Yes / No
CISCO	1		
DUMPY			Wet Conditions

Weather	AM	TEMP	RAIN	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	AM								
	PM								

TIME	
	NO WORK DUE TO WET CONDITIONS

[redacted]

Daily Log

Site Location:	Date: 11/3/2025
Project Number: CC SINDA LEGACY LF-CELL 5	Page of

General Contractor: TNC Dumpy Contractor: [redacted]

Personnel on Site		Each	Equipment on Site	Working Day Yes	No
Oscon	1	3	Tractors with Belly Pan		
Dumpy	3	1	Tractor with Bot Blade		
		2	Offroad Truck		
		1	Dozer		
		2	Backhoe		
		1	Highlift		
		1	Roller		
		1	Water Truck		

Weather		Temp	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
	AM								
Weather	AM	45		X				X	2
	PM	100		X				X	5

Time	
8:40	Arrived on Site, Dumpy Hauling protective Covers to west end of cell for haul road to center of Cell to ADD more cover to the western 1/3
1300	Dumpy stopped for Lunch
1330	Dumpy Back on Site Hauling protective cover
1930	Dumpy Stopped for the day

[redacted]

Daily Log

Site Location:	Date: 11/4
Project Number: CC SINDA LEGACY LF-CELL 5	Page of

General Contractor: TNC Dumey Contractors, Inc.

Personnel on Site	Each	Equipment on Site	Working Day Yes/X	No
Oscon	1	Tractor with Belly Pan		
Dumey	4	Tractor with Box Blade		
	2	Off-Road Truck		
	1	Roller		
	2	Trackhoe		
	1	Dozer		
	1	Water Truck		
	1	Hi-Lift		

Weather		Temp	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
	AM	47		X				X	3
Weather	PM	71		X				X	6

Time	
0630	Arrived on Site Dumey pushing Blade Grade. Cover on piles that were delivered yesterday
	Dumey building Haul Road across width of Cell
1200	Stopped for Lunch
1230	Back from Lunch Continuing on center Cell Haul Road
1700	Dumey Stopped for the Day.

Daily Log

Site Location:	Date: 11/5/2025
Project Number: CC SINDA LEGACY LF-CELL 5	Page of

General Contractors Inc. Dumey Contractors, Inc.

Personnel on Site	Each	Equipment on Site	Working Day Yes	No
Olscon 3	3	Tractor with Berg pan		
Dumey 3	1	Tractor with Box		
	2	Offroad Truck		
	2	Trackhoe		
	1	Dozer		
	1	Highlift		
	1	Roller		
	1	Water Truck		

Weather AM	Temp	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
AM	50		X				X	8
Weather PM								

TIME	
0630	Arrived on site Dumey going to try folding over rain flap on western side of cell 1
0739	Dumey started trying to pull rain flap over Dumey took liner near south berm rain flap
0930	Dumey left site for another job
1447	Took samples of protective cover to be tested
1600	Back on site
1700	Left site

Daily Log

Site Location:	Date: 11/6/2025
Project Number: CCSWDA LEGACY LF-CELL 5	Page of

General Contractors, Inc. Dumey Contractors, Inc.

Personnel on Site	Each	Equipment on Site	Working Day Yes	No
Olson 1	3	Trackhoe with Belly		
Dumey # 5	1	Trackhoe with Box		
	2	Off Road Truck		
	2	Dozer		
	3	Trackhoe		
	1	Water Truck		
	1	Roller		
	1	Highlift		

Weather		Temp	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
	AM								
	AM	53		X				X	9
Weather	PM	68		X		X			7
	PM								

Time	
0630	Arrived on site Dumey Hauling and pushing protective cover to form up Intercell Berm
1030	Dumey Brough another dozer on site
1300	Dumey removing temp Berm along Access Road and putting the Clay on Cell Berm
1400	Dumey Brought in another Trackhoe
1730	Dumey Stopped for the day

Daily Log

Site Location:	Date: 11-7-2025
Project Number: CCSWDA LEGACY LF-CELL 5	Page of

General Contractor: DUMEY CONTRACTING INC

Personnel on Site	Each	Equipment on Site	Working Day Yes	Working Day No
CISCON 1	3	~~tracks with Belly~~		
DUMEY 6	1	TRACTOR with BOX		
	3	TRACTOR		
	2	DOZER		
	2	OFFROAD TRUCK		
	1	ROLLER		
	1	WATER TRUCK		

Weather		Temp	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
	AM								
	AM	62			X			X	10
Weather	PM	75		X		X			5
	~~PM~~								

TIME	
0615	Arrived on site DUMEY pulling Rain flap and putting down protective cover
0815	DUMEY pull crossing on western 1/3 of Cell and hauling material from CANDIN pit for Intercell berm
845	~~DUMEY brought to another offroad truck~~
1400	DUMEY working on ditch at west side of cell cutting back where flared end come out in ditch
1730	Dumey stopped for the day

[redacted]

Daily Log

Site Location:	Date: 11-8-25
Project Number: CC SINDA LEGACY LF-CELL 5	Page of

General Contractor: TNC Dumey Contractors, Inc.

Personnel on Site	Each	Equipment on Site	Working Day Yes	No
Colson	1	3 Tractor with Bobcat Bucket		
Dumey		1 Tractor with Box		
		2 Off Road Truck		
		3 Trackhoe		
		2 Dozer		
		1 High Lift		
		1 Water Truck		
		1 Roller		

Weather	AM/PM	Temp	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
	AM	50		X				X	3
Weather	PM	74							8

TIME	
0630	Arrived on site Dumey working on protective cover and putting fabric down on wester perimiter Road so they can put sand material on it
1030	Dumey ran out of protective cover but almost finished west access Road and flared end sections on stream pipes
1430	Dumey finished working flared end sections and stopped for the day

Daily Log

Site Location:		Date:
Project Number: CC SINDA LEGACY LF-CELL 5		Page of
General Contractors Inc	Dumey Contractors, Inc	

Personnel on Site		Each	Equipment on Site	Working Day Yes	No
Oscon	1	3	Tractor with Belly		
Dumey	5	1	Tractor with Box		
		2	Offroad Truck		
		2	Dozer		
		3	Trackhoe		
		1	Roller		
		1	Mini Excavator		
		1	Water Truck		

Weather		Temp	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
	AM								
	AM	28		X				X	10
Weather	PM	40		X				X	7

TIME	
0615	Arrived on site Dumey Removing Temporary Berm on East Access Road and Truck continuing to haul protective cover to site and Removing crossings on Intecell Berms
0700	adding cover to Berm sides on East end of Cell
0900	Loads of Rock Arrived on site for Sump and Leachate pipe Buried wrap center of cell
1730	Dumey Stopped for the day.

Daily Log

Site Location:	Date: 11/14/2025
Project Number: CCSWDA Legacy LF-Cell 5	Page of

General Contractor: TNC Dumey Contractors, Inc.

Working Day: Yes ☒ No ☐

Personnel on Site	Each	Equipment on Site
Oscon	1	3 Tractor with Belly PAN
Dumey	6	1 Tractor with Box
		2 Off Road Truck
		3 Trackhoe
		2 Dozer
		1 Roller
		1 Mini-X
		1 Water Truck

		Temp	Rain	Clear	Cloudy	Wet	Hot	Cool	Wind
Weather	AM	32		X				X	10
Weather	PM	54		X				X	16

TIME	
0615	Arrived on site Dumey ~~Dozer~~ continuing pushing protective cover and Trucks Hauling in protective cover on site Dumey Hauling cover from Landfill pit and welding pipe together for Leachate pipe
1301	Dumey Building access Road on last ½ of Cell with protective cover
1617	Dumey dragged Piping to Cell for Leachate Collection pipe
1745	Dumey stopped for the day

[redacted]

Daily Log

Site Location:		Date: 11.12.25
Project Number: CC SINDA LEGACY LF - CELL 5		Page of

General Contractor: Dumey Contractors, Inc

Personnel on Site		Each	Equipment on Site	Working Day Yes	No
OSCAR	1	3	TRACKhoe		
DUMEY	9	2	Dozer		
DAF		2	offroad TRUCK		
		1	MINI X		
		1	Roller		
		1	High lift		
		1	water TRUCK		
		3	TRACTORS with Belly		

		Temp	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	AM								
	AM	43		X				X	8
Weather	PM	60		X		X			3
	PM								

TIME	
0615	Arrived ON SITE Dumey working ON Berms and INSTALLING FABRIC FOR Leachate PIPE CENTER OF CELL PRF welding PIPE
1000	STARTED placing washed gravel over Leachate grid Center OF Cell western SIDE and STill placing protective cover
1549	Dumey Bringing Leachate Headwall to Cell
1845	Dumey Stopped working For the day

PROJECT DAILY FIELD REPORT

Date: 11.13.2025

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each	Equipment on Site:	Ea.
Olsson FTN	1	OFFRoad Truck	2
~~DUMEY~~	10	SKID Steer	3
PATRIOT	3	Dozer	2
PFF	2	Mini X	1
		Roller	1
		Water Truck	1
		Tractor with Belly	1
		Tractor with Box	1

Working Day? Yes ☒ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	43		X				X	0
Weather	pm	60			X			X	5

Time	
0615	Arrived on Site
	Trucks Hauling in protective cover
	Dumey Continuing to Haul protective cover to Cell
	and placing washed rock on Leachate Collection Pipe
0830	Patriot Arrived To Repair Liner and Put Boot on
	Leachate pipe PFF welding pipe
~~1145~~	Patriot Stopped Generator went Down 1630
1630	
1745	Patriot Left for the day
1830	Dumey Stopped for the day

Signature: _____

PROJECT DAILY FIELD REPORT

Date: 11.14.2025

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each	Equipment on Site:	Ea.
Olsson FTN	1	TRACTORS with Belly	3
~~4X~~ Dumey	9	Tractor with Box	1
Patriot	3	TRACKHOE	3
PFF	1	OFF ROAD TRUCK	2
		Dozer	2
		Roller	1
		Water TRUCK	1
		MINI X	1

Working Day?	
Yes ☒	No ☐
If No, Reason for Non-Working Day	
Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	53			X			X	7
Weather	pm	77		X		X			13

Time	
0615	DUMEY AND PATRIOT ON SITE
	Dumey continue to work on protective cover and Intercell berm PFF welding pipe
	PATRIOT FINISHING BOOT ON first Intercell Berm pipe crossing
0815	PATRIOT FINISHED 1st BOOT ON, west Intercell Berm
1321	PATRIOT FINISHED 2nd Boot and LEFT
1415	Dumey STOPPED for the day

Signature: _____

PROJECT DAILY FIELD REPORT

Date: 11-15-2025

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each
Olsson FTN	1
~~Dumey~~ Dumey	9
PFF	1

Equipment on Site:	Ea.
TRACTOR WITH BELLY PAN	3
TRACTOR WITH BOX	1
TRACHOE	3
DOZER	2
OFFLOAD TRUCK	4
ROVER	1
MINI-X	1
HIGH LIFT	1
WATER TRUCK	1

Working Day? Yes ☒ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	63		X				X	12
Weather	pm	75		X		X			10

Time	
0615	Arrived ONSITE Dumey Still Covering protect le Cover on FINAL 1/4 of Cell east side, PFF welding pipe
0700	Dumey placing Sump Leachate Riser pipe
1100	Dumey went to Lunch
1250	Dumey Back from Lunch placing washed Rock over Sump
1900	Dumey Stopped for the Day

Signature: _____

PROJECT DAILY FIELD REPORT

Date: 11.16

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each	Equipment on Site:	Ea.
Olsson FTN	1	Tractor with Belly	3
~~XX~~ Dumey	5	tractor with Box	1
		Dozer	2
		Trackhoe	3
		Offroad Truck	2
		Skid Steer	1
		Mixix	1
		Water Truck	1
		Highlift	1

Working Day? Yes ☒ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	59		X				X	S
Weather	pm	67		X				X	S

Time	
0615	Dumey continuing to place cover on east berm and working on washed gravel over leachate pipe and pushing protective cover over east side of cell
1315	Dumey done for the day after covering cell to completion

Signature: _____

PROJECT DAILY FIELD REPORT

Date: 11-17

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each	Equipment on Site:	Ea.
Olsson FTN	1	TRACTOR WITH BELLY	3
DUMEY	10	TRACTOR WITH BOX	1
SURVEY	2	EXCAVATOR	3
		OFFROAD TRUCK	2
		DOZER	2
		MINI X	1
		ROLLER	1
		HIGHLIFT	1
		WATER TRUCK	1

Working Day?		
Yes	☒	No ☐
If No, Reason for Non-Working Day		
Sunday	☐	
Rain	☐	
Wet Site Conditions	☐	
Other (explain below)	☐	

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	44		X				X	S
Weather	pm	67			X			X	9

Time	
0615	ARRIVED ON SITE DUMEY FINISHING DIRT ON WEST BERM AND PLACING HEADWALL ON EAST OF BERM
0715	DUMEY STARTING ON EXPANSION BERM
1040	SURVEY CREW ARRIVED TO TOPO CELL
1200	DUMEY TOOK LUNCH
1230	DUMEY BACK FROM LUNCH
1715	DUMEY FINISHED NORTH EXPANSION BERM AND STOPPED FOR THE DAY

Signature: _____

PROJECT DAILY FIELD REPORT

Date: 11-18

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each
Olsson FTN	1
~~XX~~ DUMEY	10
PM	1

Equipment on Site:	Ea.
TRACTOR WITH BESLY	3
TRACTOR WITH BOX	1
OFFROAD TRUCK	2
TRACK HOE	3
MINI-X	1
LIGHT LIFT	1
DOZER	2
WATER TRUCK	1

Working Day?	
Yes ☒	No ☐
If No, Reason for Non-Working Day	
Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	62			X			X	11
Weather	pm	70			X	X			13

Time	
0615	ARRIVED ON SITE DUMEY REMOVING TEMPORARY CROSSING USED TO BRING PROTECTIVE COVER TO CELL, AND HAULING PIPE DITCH FILL
1100	DUMEY GETTING READY TO DEPLOY TO PULL LINER OVER EXPANSION BERM WIND BLOWING TO HARD AT THE TIME
1130	DUMEY WENT TO LUNCH
1200	BACK FROM LUNCH
1230	DUMEY STARTED DIGGING LEACHATE COLLECTION PIT FROM TAIL LOCATION VAULT ~~BOX~~ VAULT AND DIGGING TRENCH TO LEACHATE HEAD WALL
1700	DUMEY STOPPED FOR THE DAY

Signature: _____

PROJECT DAILY FIELD REPORT

Date: 11.19

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each	Equipment on Site:	Ea.	Working Day?
Olsson FTN	1	TRACTOR with Belly	3	Yes ☒ No ☐
~~X~~ Dumey		TRACTOR WITH BOX	1	If No, Reason for Non-Working Day
PFF	1	Trackhoe	3	Sunday ☐
		Dozer	2	Rain ☐
		Offroad Truck	2	Wet Site Conditions ☐
		Mini-X	1	Other (explain below) ☐
		Roller	1	
		Water Truck	1	

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	57		X				X	6
Weather	pm	61			X			X	16

Time	
0630	ARRIVED ON Site Dumey working on Leachate collection pipe TRENCH east of Cell to VAlve VAult
	Placed Leachate pipe IN TRENCH COVERED with SAND and BACK filling TRENCH
1130	& Left the Site

Signature: Jon Olsson

PROJECT DAILY FIELD REPORT

Date: 12-2-2025

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each	Equipment on Site:	Ea.
Olsson FTN	1	TRACKHOE	2
~~4~~ Dumey	2	Dozer	2
PFF	1	OFFroad Truck	2
		fuel truck	1
		Mini-X	1
		TRACTOR with Box	1
		highlift	
		Roller	1

Working Day? Yes ☐ No ☒

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	25			X			X	S
Weather	pm								

Time	
0630	Arrived on site Dumey Decided to Hold off for one more day TO work on liner due to Rain that came in PFF over night
~~0645~~	~~Left Site~~ PFF Unloaded equipment
0900	Left Site

Signature: Jonathan

PROJECT DAILY FIELD REPORT

Date: 12-3-2025

Project: CCSWDA Legacy LF - Cell 5

Rainfall (in)	Calendar Day #	
	Working Day #	

General Contractor: Dumey Contractors, Inc.

Personnel on Site:	Each	Equipment on Site:	Ea.	Working Day?
Olsson FTN	1	OffRoad truck	2	Yes ☐ No ☐
~~DUMey~~ PF ~~D~~		Dozer	2	If No, Reason for Non-Working Day
PF ~~D~~	1	Mini-x	1	Sunday ☐
		Roller	1	Rain ☐
		tractor with Box	1	Wet Site Conditions ☐
		highlift	1	Other (explain below) ☐
		Trackhoe	2	
		fuel truck	1	
		water truck	1	

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	30			X			X	4
Weather	pm								

Time	
0615	Arrived on site
0657	Dumey Arrived on site
	PF welding pipe and Dumey working on access to trench at collection vault for pipe fitting
	Dumey moved vault to the North about 8 inches to Accomodate pipe layer coming in to it
	PF working on piping in the vault
1300	Dumey said not working on liner till next week
	Called paul and decided to leave town till next week

Signature: _____

PROJECT DAILY FIELD REPORT

Date: 12·8·2025

Project: CCSWDA Legacy LF - Cell 5

General Contractor: Dumey Contractors, Inc.

Rainfall (in)	Calendar Day #	
	Working Day #	

Personnel on Site:	Each
Olsson FTN	1
4X	4

Equipment on Site:	Ea.
SKID Steer	1
Dozer	2
Highlift Fork	1
TRACKhoe	2
OFF.Road TRUCK	2
MiNiX	1
Water Truck	1
ROLLER	1
TRACTOR TBOX	

Working Day?

Yes ☐ No ☐

If No, Reason for Non-Working Day

Sunday	☐
Rain	☐
Wet Site Conditions	☐
Other (explain below)	☐

		Temp.	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	am	36			X			X	10
Weather	pm	40			X			X	5

Time	
0630	ARRIVED ON SITE NEW leachate TANK ONSITE
0650	DUMEY ARRIVED STARTED WORKING ON South ACCESS Road
	SAND/Clay COVER and ON LINER ON North EXPANSION BERM
1135	DUMEY STARTED DIGGING ANCHOR TRENCH ON EXPANSION BERM
1200	DUMEY WENT TO LUNCH
1300	BACK FROM LUNCH
1710	DUMEY STOPPED FOR THE DAY
1715	I LEFT SITE

Signature: Jen Myers

Daily Log

Site Location:	Date: 12.9.25
Project Number: CC SWDA LEGACY LF-CELL 5	Page of

General Contractor: TNC Dumey Contractors, Inc.

Personnel on Site		Each	Equipment on Site	Working Day Yes	No
Olscon	1	2	Trackhoe		
Dumey	5	2	Articed Truck		
DEE	1	2	Dozer		
Electric	3	3	Rollers		
		2	Tractor		
		1	High lift		
		1	Mini X		
		1	Skid Steer		

Weather		Temp	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
	AM								
	AM	33		X				X	8
Weather	PM	45		X				X	11
	PM								

TIME	
0630	Arrived on site
0645	Dumey Arrived ON Site WORKING ON South Access Road adding Sand/Clay and working on making New Leachate TANK
0820	Placed Leachate TANK IN place
0830	Dumey moved ON TO EXPANSION Berm FOR WORK
1200	Dumey Stopped For Lunch
1230	Dumey Back from Lunch Finished South Access Road STARTED Applying SAND TO EAST Access Road Plumbing Leachate pump running electric Lines from Sump to New TANK Control building and testing water through pipe to TANK from Leachate headwall
1730	Dumey Stopped for the day

Daily Log

Site Location:	Date: 12.10.25
Project Number: CC SINDA LEGACY LF-CELL 5	Page of

General contractor: TNC Dumpy contractor:

Personnel on site		Each	Equipment on site	Working day Yes	No
CISCO	1	2	Trackhoe		
DUMPY	5	2	Offroad truck		
PF	1	2	Dozer		
		1	Skid steer		
		1	Mini-X		
		1	Roller		
		2	Tractor		
		1	highlift		

Weather		Temp	Rain	Clear	Cloudy	Rain	Hot	Cool	Wind
	AM								
	AM	44			X			X	12
Weather	PM	58		X				X	19

TIME	
0630	Arrived on site
0645	Dumpy Arrived onsite SAND being delivered for Egg Access Road and North expansion Berm trench and liner cover
1430	The other Leachate tank Arrived and Dumpy Putting it in place
1700	Stopped for the Day

Daily Log

Site Location:	Legacy	Date:	12-11-25
Project Number:	CCSINDA LEGACY LF-CELL 5	Page	of

General Contractor: TNC Dumey Contractors, Inc.

Personnel on Site		Each	Equipment on Site	Working Day Yes	No
Olson	1	2	track hoe		
Dumey	7	2	Dozer		
PEF	1	1	Roller		
		2	Off Road Truck		
		2	Tractor		
		1	Skid Steer		
		1	Mini-X		

		Temp	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	AM								
	AM	37			X			X	2
Weather	PM								
	PM								

TIME	
0630	Arrived on site.
0645	Dumey Arrived onsite and continuing to work on expansion Berm Trench for Liner and plumbing tank for leachate collection
	Dumey placing plywood on western third of expansion berm
1200	Dumey went to Lunch
1230	Dumey back from Lunch Installed 2nd tank for leachate
1615	Finish putting down plywood on expansion Berm
1630	Stopped for the day

[redacted]

Daily Log

Site Location: Legacy	Date: 12.12.25
Project Number: CCSWDA Legacy LF-Cell 5	Page of

General Contractor TDC Dumpy Contractor, Inc.

Personnel on Site		Each	Equipment on Site	Working Day Yes	No
Oscon	1	2	track hoe		
Dumpy	10	2	Off load dozer		
Ref	1	2	Dozer		
		1	Skid steer		
		1	Mini-X		
		1	Wheel loader		
		2	Tractor		
		1	Roller		

Weather		Temp	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
	AM								
	AM	42		X				X	6
Weather	PM	52		X				X	9
	PM								

TIME	
0630	Arrived on site
0645	Dumpy Arrived on site continuing to haul dirt to cover Liner on expansion berm
1700	Dumpy stopped for the day

Daily Log

Site Location:	Date: 12.13.25
Project Number: CC SW DA LEGACY LF-CELL 5	Page of

General Contractors Inc Dumey Contractors Inc

Personnel on Site	Each	Equipment on Site	Working Day Yes	No
Olscan	2	~~Trackhoe~~		
Dumey 5	2	Dozer		
~~P&S~~	2	offroad truck		
	1	mini-x		
	1	skid steer		
	1	Roller		
	2	~~Tractor~~		
	1	high lift		

		Temp	Rain	Clear	Cloudy	Warm	Hot	Cool	Wind
Weather	AM								
	AM	32		X				X	Lt
Weather	PM								
	~~PM~~								

TIME	
0645	Arrived on site Dumey finishing expansion berm and prepping ground for seed
1100	Berm is almost finished liner is covered up and I left site

[redacted]

APPENDIX E
CLAY LINER – INSTALLER QUALIFICATIONS

Dumey Contracting, Inc. Clay Liner Construction Experience

Project - Utility Waste Landfill Leachate Collection Expansion

Site Name - New Madrid Power Plant

Owner - Associated Electric Cooperative, Inc. – Marston, MO

Date of Construction – 2023

Quantity of Clay Liner Const. – 86,400 SF

Project - Coal Pond Runoff Secondary Settling Basin

Site Name - New Madrid Power Plant

Owner - Associated Electric Cooperative, Inc. – Marston, MO

Date of Construction – 2022

Area of Clay Liner Const. – 634,500 SF

Project - Cell 2/3 Construction Project

Site Name - Legacy Landfill

Owner - Craighead County Solid Waste Disposal Authority

Date of Construction – 2018

Area of Clay Liner Const. – 522,700 SF

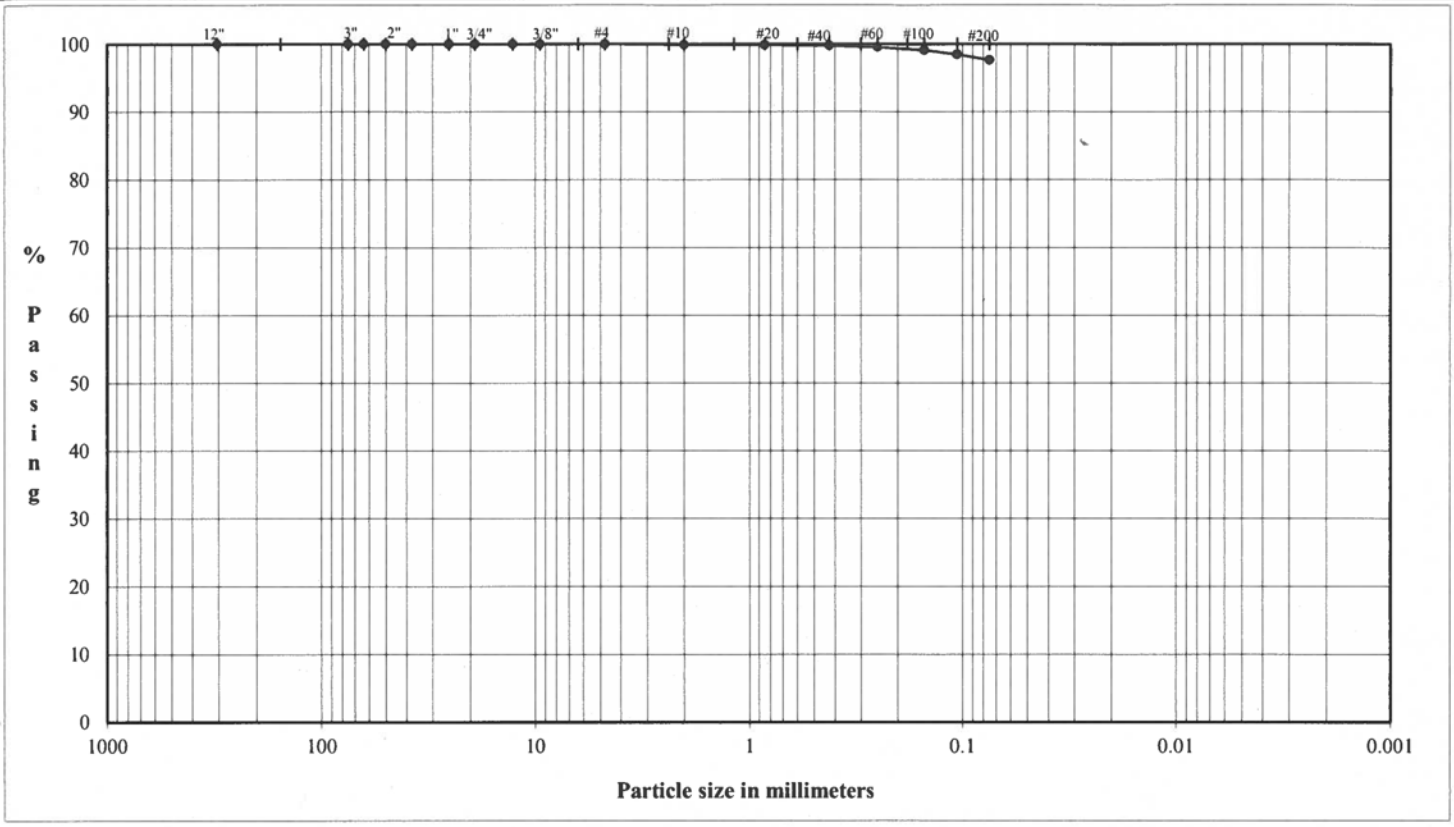
APPENDIX F
CLAY LINER MATERIAL – PRE-CONSTRUCTION TESTING RESULTS

SEPTEMBER 2025 US-0048676.8029

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D6913 & D4318

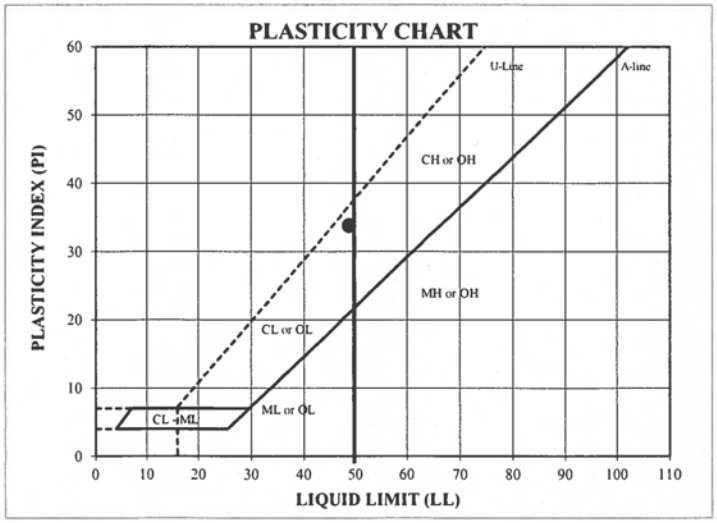
PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
SAMPLE ID: **PC-1** Depth: -
TYPE: **Bulk**



	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
COBBLES	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.0	**99.9**	Coarse Sand	**0.1**
#20	0.85	**99.9**		
#40	0.43	**99.8**	Medium Sand	**0.2**
#60	0.25	**99.5**		
#100	0.15	**99.1**		
#140	0.11	**98.4**		
#200	0.08	**97.6**	Fine Sand	**2.1**
			Fines	**97.6**



ATTERBERG LIMITS

Method - B (Dry preparation)

M_c	LL	PL	PI	LI
22.9	**49**	**15**	**34**	**0.24**

DESCRIPTION: SILTY CLAY, trace sand; gray.

USCS: CL

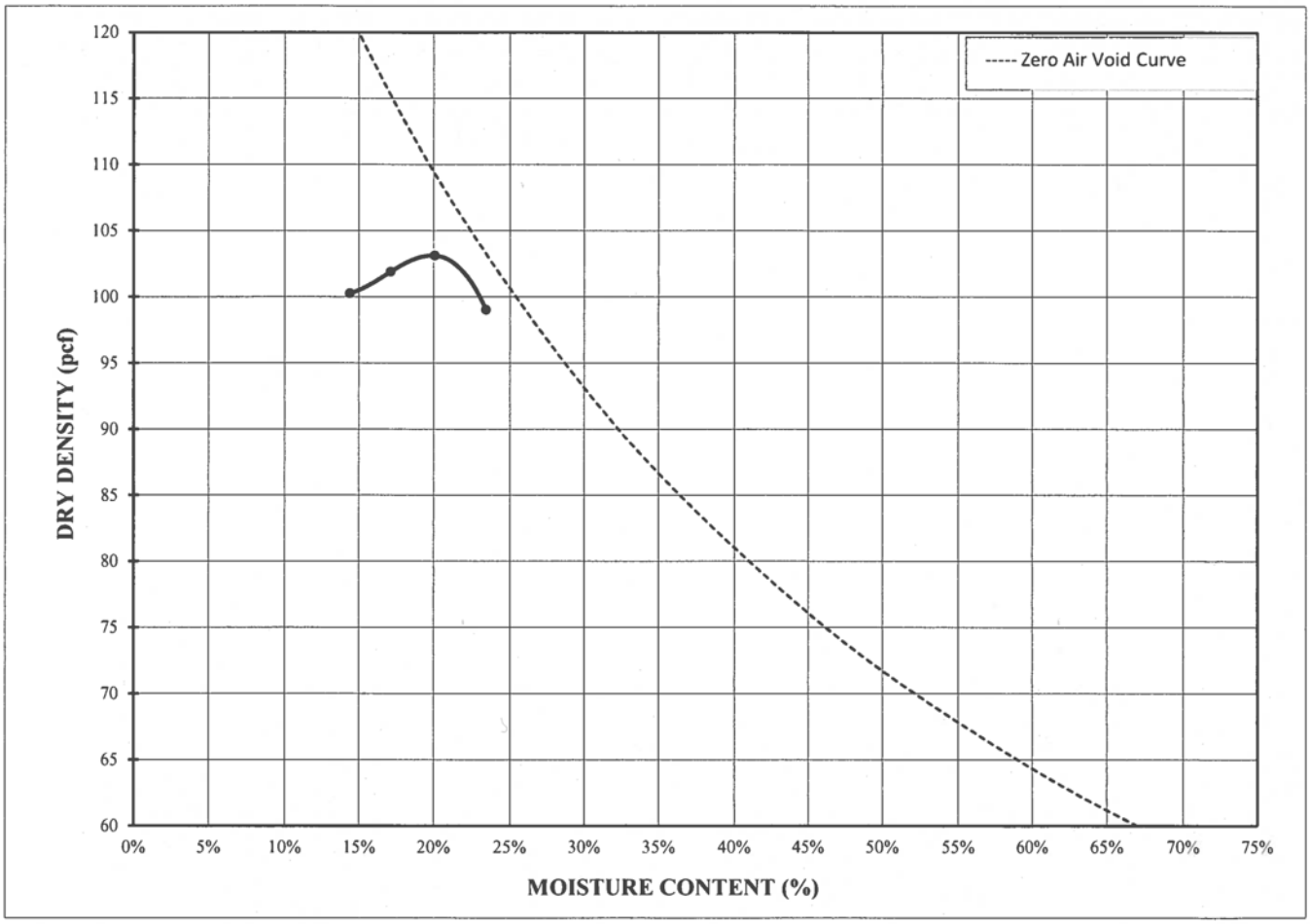
LL (oven-dried) / < 0.75 = ORGANIC (OL OH)

TECH	JC/DA
DATE	9/4/25
CHECK	
REVIEW	
APPROVE	

MOISTURE / DRY DENSITY CURVE
ASTM D698 Method A

Mechanical	Standard	Dry Method

PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
PROJECT NUMBER: **US-0048676.8029**
SAMPLE ID: **PC-1** DEPTH: - SAMPLE TYPE: **Bulk**



COMPACTION POINTS		
Specimen Number	Dry Density (pcf)	Moisture Content (%)
1	100.3	14.4%
2	101.9	17.1%
3	103.1	20.1%
4	99.0	23.4%

Maximum Dry Density (pcf)	**103.1**
Optimum Moisture (%)	**20.0**
Corrected Maximum Dry Density (pcf)	
Corrected Optimum Moisture (%)	
As-Received Moisture Content	**22.9%**
% Retained on # 4 sieve	
% Retained on 3/8" sieve	
% Retained on 3/4" sieve	
Specific Gravity (assumed)	**2.7**

DESCRIPTION SILTY CLAY, trace sand; gray.

USCS CL

CHECK DA
REVIEW
APPROVE

FLEXIBLE WALL PERMEABILITY
ASTM D5084
METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	12	
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	PC-1	-	Flow Pump Speed	12	
SAMPLE TYPE	Bulk		Technician	CJ	

COMMENTS: The sample was remolded to 95.4% of the Maximum Dry Density and OPTM + 3.9% (using ASTM D698).

Sample Data - Initial			
Height (in)	3.004	B-Value, f	0.98
Diameter (in)	2.790	Cell Pres.	90.0
Area (cm²)	39.44	Bot. Pres.	80.0
Volume (cm³)	300.95	Top Pres.	80.0
Mass (g)	587.18	Tot. B.P.	80.0
Moisture Content (%)	23.9	Head, max.	151.23
Dry Density (pcf)	98.3	Head, min.	151.23
Spec. Gravity(assumed)	2.700	Max. Grad.	19.88
Volume Solids (cm³)	175.54	Min. Grad.	19.88
Volume Voids (cm³)	125.42		
Void Ratio	0.71		
Saturation (%)	90%		

Sample Data- Final	
Height (in)	2.995
Diameter (in)	2.806
Area (cm²)	39.90
Volume (cm³)	303.50
Mass (g)	593.96
Moisture Content (%)	25.3
Dry Density (pcf)	97.4
Volume Solids (cm³)	175.54
Volume Voids (cm³)	127.97
Void Ratio	0.73
Saturation (%)	94%

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare - I	g	587.18	601.95
Wt Soil & Tare - F	g	473.95	482.00
Wt Tare	g	0.00	8.30
Wt Moisture Lost	g	113.23	119.95
Wt Dry Soil	g	473.95	473.70
Water Content	%	23.9%	25.3%

DESCRIPTION: SILTY CLAY, trace sand; gray.

Flow Pump Rate: 4.46E-06 cm³/sec

PERMEANT: Deaired Tap Water

USCS: CL

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
10/01/25	45931	11	0	20.3	0	0	0	0	2.15	151.23	19.88	5.6E-09
10/01/25	45931	11	5	20.3	5	5	300	300	2.15	151.23	19.88	5.6E-09
10/01/25	45931	11	10	20.3	5	10	300	600	2.15	151.23	19.88	5.6E-09
10/01/25	45931	11	15	20.3	5	15	300	900	2.15	151.23	19.88	5.6E-09 *
10/01/25	45931	11	20	20.3	5	20	300	1200	2.15	151.23	19.88	5.6E-09 *
10/01/25	45931	11	25	20.3	5	25	300	1500	2.15	151.23	19.88	5.6E-09 *
10/01/25	45931	11	30	20.3	5	30	300	1800	2.15	151.23	19.88	5.6E-09 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 5.6E-09 cm/sec **

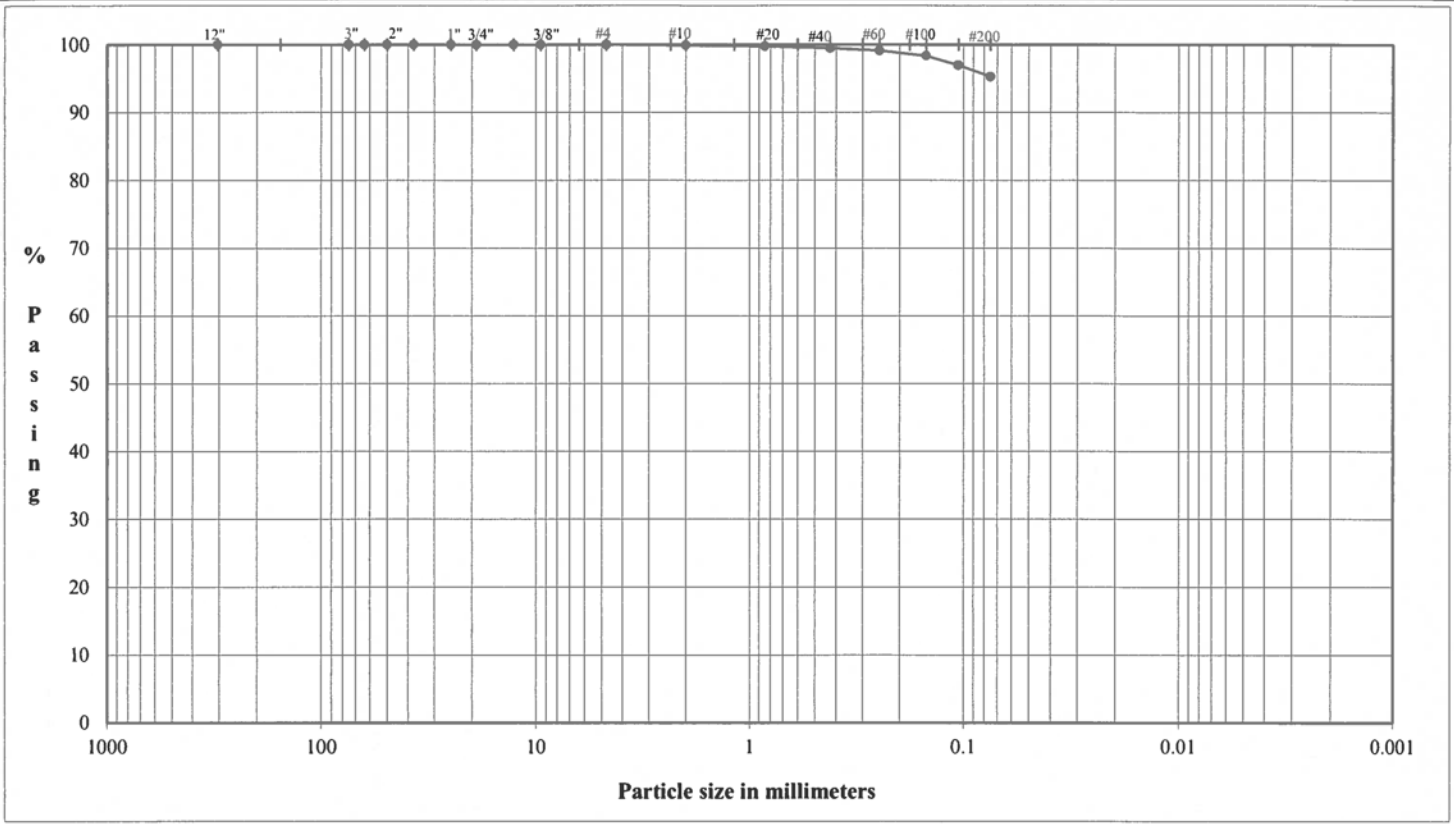
DATE	10/1/25
CHECK	DA
REVIEW	
APPROVE	

SEPTEMBER 2025 US-0048676.8029

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D6913 & D4318

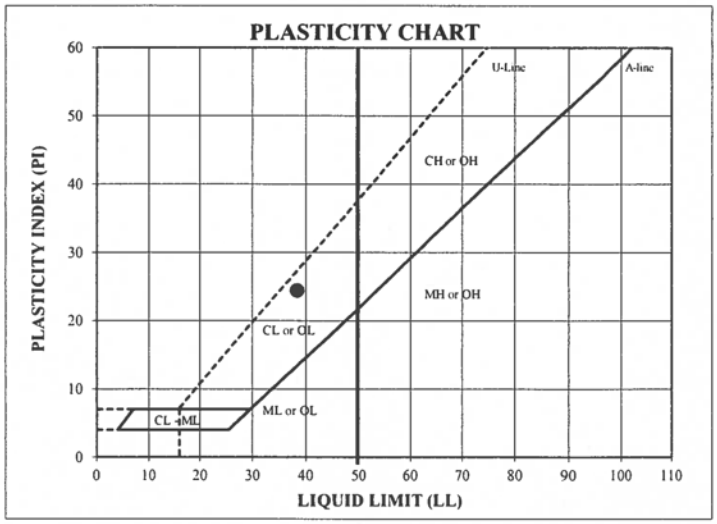
PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
SAMPLE ID: **PC-2** Depth: -
TYPE: **Bulk**



COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.0	**99.9**	Coarse Sand	**0.1**
#20	0.85	**99.8**		
#40	0.43	**99.5**	Medium Sand	**0.4**
#60	0.25	**99.1**		
#100	0.15	**98.4**		
#140	0.11	**97.0**		
#200	0.08	**95.3**	Fine Sand	**4.2**
			Fines	**95.3**



ATTERBERG LIMITS
Method - B (Dry preparation)

M_c	LL	PL	PI	LI
20.9	**38**	**14**	**24**	**0.27**

DESCRIPTION: SILTY CLAY, trace sand; gray.

USCS: CL

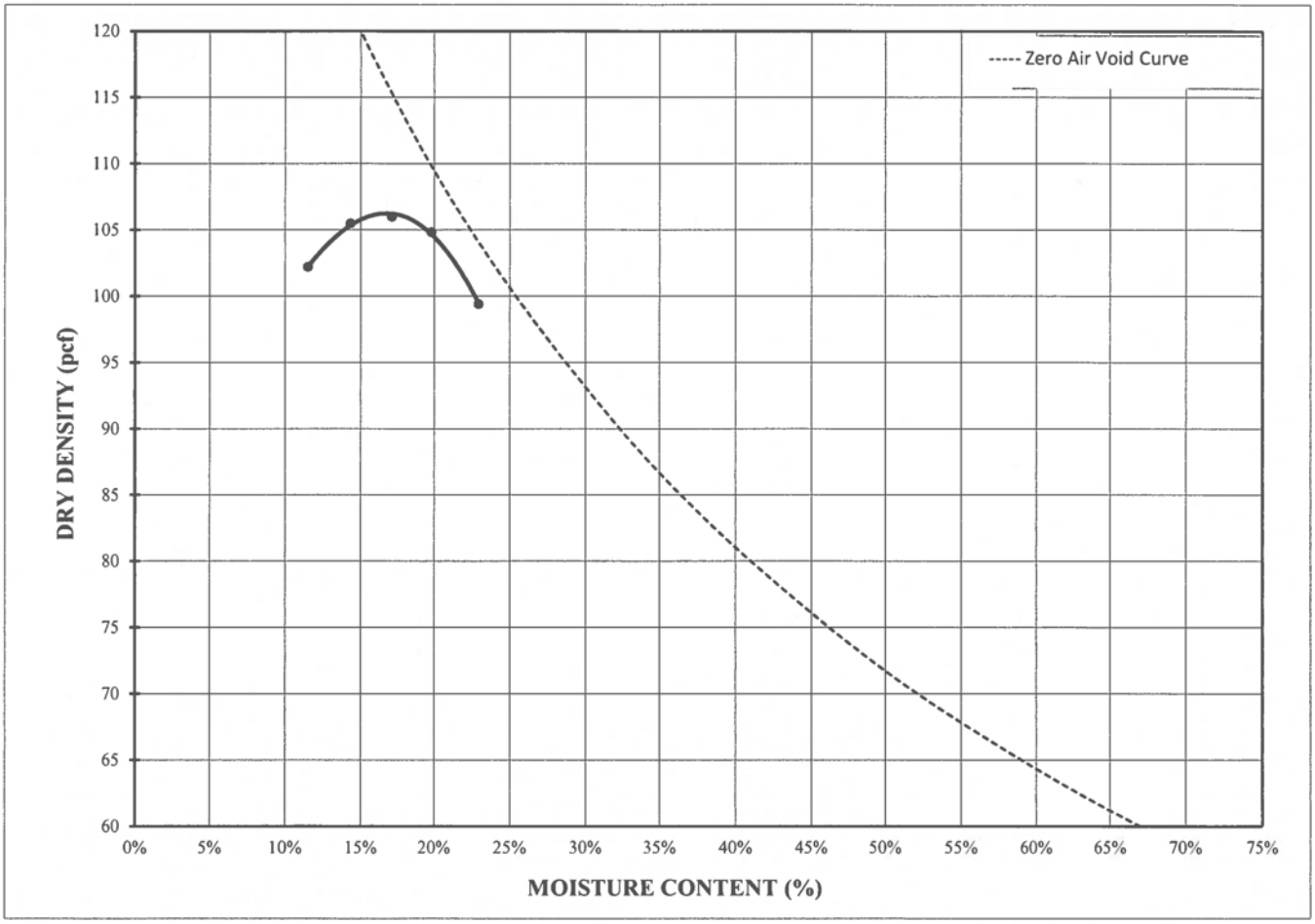
LL (oven-dried) / < 0.75 = ORGANIC (OL OH)

TECH	JC/DA
DATE	9/4/25
CHECK	
REVIEW	
APPROVE	

MOISTURE / DRY DENSITY CURVE
ASTM D698 Method A

Mechanical	Standard	Dry Method

PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
PROJECT NUMBER: **US-0048676.8029**
SAMPLE ID: **PC-2** DEPTH: **-** SAMPLE TYPE: **Bulk**



COMPACTION POINTS		
Specimen Number	Dry Density (pcf)	Moisture Content (%)
1	102.2	11.5%
2	105.5	14.3%
3	106.0	17.1%
4	104.8	19.8%
5	99.4	23.0%

Maximum Dry Density (pcf)	**106.2**
Optimum Moisture (%)	**16.8**
Corrected Maximum Dry Density (pcf)	
Corrected Optimum Moisture (%)	
As-Received Moisture Content	**20.9%**
% Retained on # 4 sieve	
% Retained on 3/8" sieve	
% Retained on 3/4" sieve	
Specific Gravity (assumed)	**2.7**

DESCRIPTION SILTY CLAY, trace sand; gray.

USCS CL

CHECK JA
REVIEW
APPROVE

FLEXIBLE WALL PERMEABILITY
ASTM D5084
METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	13	COMMENTS: The sample was remolded to 94.9% of the Maximum Dry Density and OPTM + 4.2% (using ASTM D698).
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	PC-2	-	Flow Pump Speed	12	
SAMPLE TYPE	Bulk		Technician	CJ	

Sample Data - Initial				Sample Data- Final	
Height (in)	3.007	B-Value, f	1.00	Height (in)	3.008
Diameter (in)	2.790	Cell Pres.	90.0	Diameter (in)	2.780
Area (cm^2)	39.44	Bot. Pres.	80.0	Area (cm^2)	39.16
Volume (cm^3)	301.25	Top Pres.	80.0	Volume (cm^3)	299.20
Mass (g)	588.98	Tot. B.P.	80.0	Mass (g)	596.74
Moisture Content (%)	21.0	Head, max.	93.55	Moisture Content (%)	22.6
Dry Density (pcf)	100.8	Head, min.	93.55	Dry Density (pcf)	101.5
Spec. Gravity(assumed)	2.700	Max. Grad.	12.24	Volume Solids (cm^3)	180.21
Volume Solids (cm^3)	180.21	Min. Grad.	12.24	Volume Voids (cm^3)	118.99
Volume Voids (cm^3)	121.05			Void Ratio	0.66
Void Ratio	0.67			Saturation (%)	93%
Saturation (%)	85%				

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare - I	g	588.98	604.92
Wt Soil & Tare - F	g	486.56	494.79
Wt Tare	g	0.00	8.44
Wt Moisture Lost	g	102.42	110.13
Wt Dry Soil	g	486.56	486.35
Water Content	%	21.0%	22.6%

DESCRIPTION: SILTY CLAY, trace sand; gray.

Flow Pump Rate: 4.46E-06 cm^3/sec

PERMEANT: Deaired Tap Water

USCS: CL

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
10/01/25	45931	15	0	20.4	0	0	0	0	1.33	93.55	12.24	9.2E-09	
10/01/25	45931	15	5	20.4	5	5	300	300	1.33	93.55	12.24	9.2E-09	
10/01/25	45931	15	10	20.4	5	10	300	600	1.33	93.55	12.24	9.2E-09	
10/01/25	45931	15	15	20.4	5	15	300	900	1.33	93.55	12.24	9.2E-09	*
10/01/25	45931	15	20	20.4	5	20	300	1200	1.33	93.55	12.24	9.2E-09	*
10/01/25	45931	15	25	20.4	5	25	300	1500	1.33	93.55	12.24	9.2E-09	*
10/01/25	45931	15	30	20.4	5	30	300	1800	1.33	93.55	12.24	9.2E-09	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 9.2E-09 cm/sec **

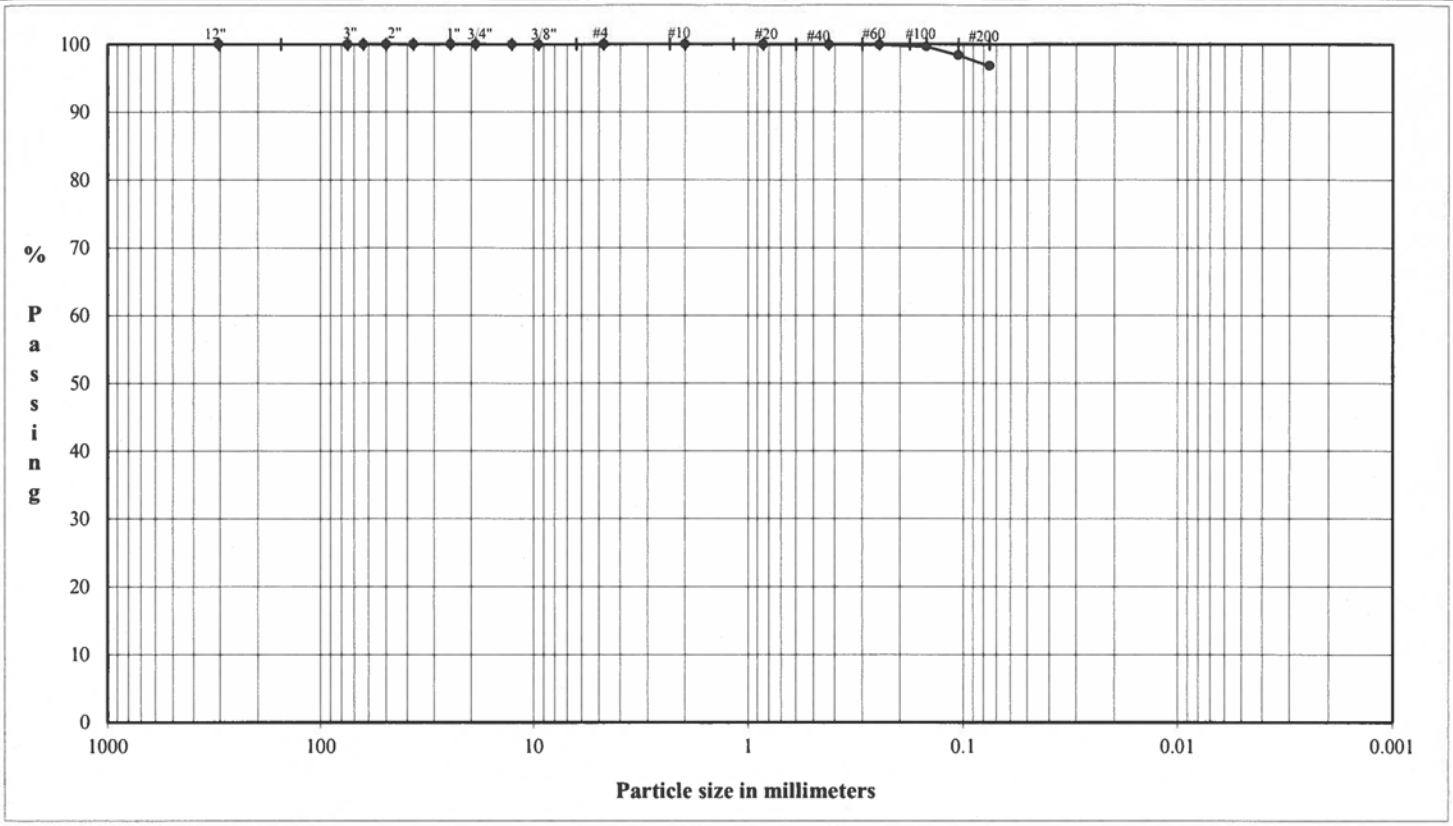
DATE	10/1/25
CHECK	DA
REVIEW	
APPROVE	

SEPTEMBER 2025 US-0048676.8029

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D6913 & D4318

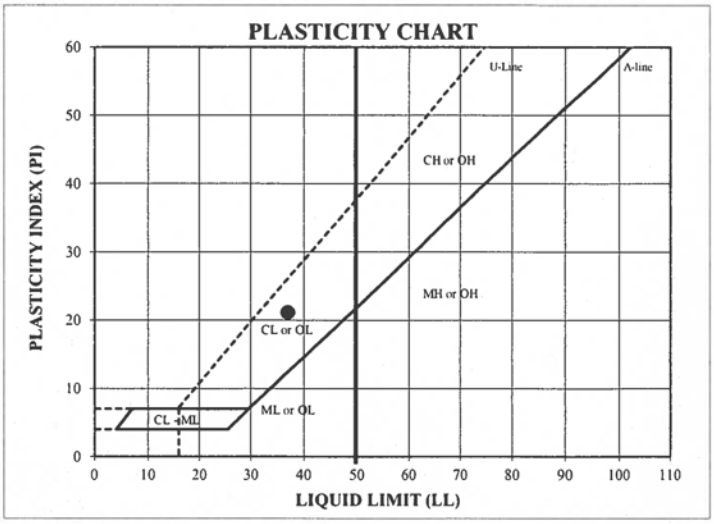
PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
SAMPLE ID: **PC-3** Depth: -
TYPE: **Bulk**



COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.0	**100.0**	Coarse Sand	**0.0**
#20	0.85	**100.0**		
#40	0.43	**100.0**	Medium Sand	**0.0**
#60	0.25	**99.9**		
#100	0.15	**99.6**		
#140	0.11	**98.4**		
#200	0.08	**96.8**	Fine Sand	**3.2**
			Fines	**96.8**



ATTERBERG LIMITS

Method - B (Dry preparation)

M_c	LL	PL	PI	LI
23.0	**37**	**16**	**21**	**0.32**

LL (oven-dried) / < 0.75 = ORGANIC (OL OH)

DESCRIPTION: SILTY CLAY, trace sand; very pale brown.

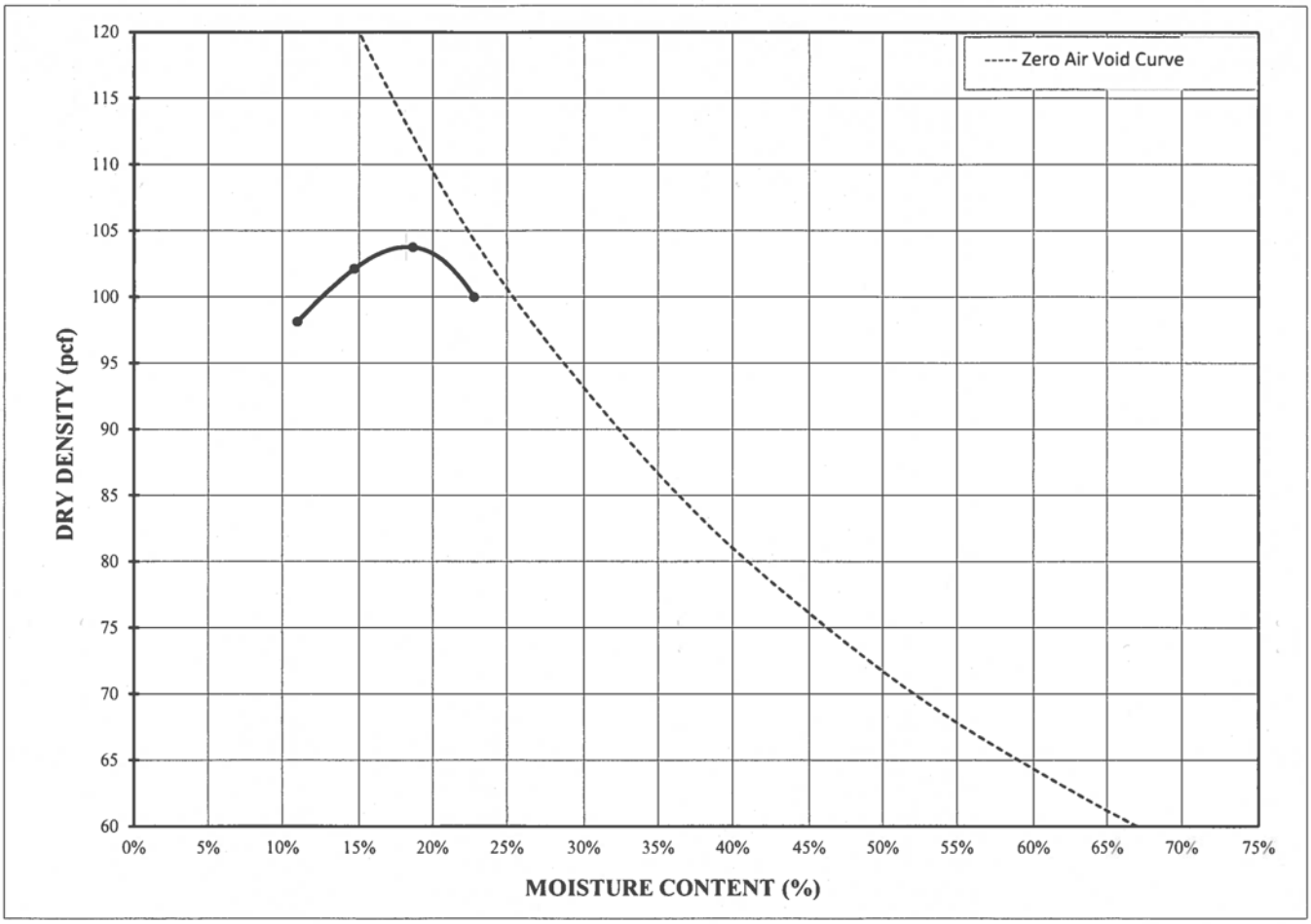
USCS: CL

TECH	JC/DA
DATE	9/4/25
CHECK	DA
REVIEW	
APPROVE	

MOISTURE / DRY DENSITY CURVE
ASTM D698 Method A

Mechanical	Standard	Dry Method

PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
PROJECT NUMBER: **US-0048676.8029**
SAMPLE ID: **PC-3** DEPTH: **-** SAMPLE TYPE: **Bulk**



COMPACTION POINTS		
Specimen Number	Dry Density (pcf)	Moisture Content (%)
1	98.1	11.0%
2	102.1	14.7%
3	103.7	18.6%
4	100.0	22.8%

Maximum Dry Density (pcf)	**103.8**
Optimum Moisture (%)	**18.2**
Corrected Maximum Dry Density (pcf)	
Corrected Optimum Moisture (%)	
As-Received Moisture Content	**23.0%**
% Retained on # 4 sieve	
% Retained on 3/8" sieve	
% Retained on 3/4" sieve	
Specific Gravity (assumed)	**2.7**

DESCRIPTION SILTY CLAY, trace sand; very pale brown.

USCS CL

CHECK DA
REVIEW
APPROVE

FLEXIBLE WALL PERMEABILITY
ASTM D5084
METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	14	COMMENTS: The sample was remolded to 95.4% of the Maximum Dry Density and OPTM + 5.2% (using ASTM D698).
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	PC-3	-	Flow Pump Speed	11	
SAMPLE TYPE	Bulk		Technician	DA	

Sample Data - Initial

Height (in)	2.998	B-Value, f	0.98
Diameter (in)	2.790	Cell Pres.	90.0
Area (cm²)	39.44	Bot. Pres.	80.0
Volume (cm^3)	300.35	Top Pres.	80.0
Mass (g)	588.19	Tot. B.P.	80.0
Moisture Content (%)	23.4	Head, max.	207.50
Dry Density (pcf)	99.0	Head, min.	207.50
Spec. Gravity(assumed)	2.700	Max. Grad.	27.29
Volume Solids (cm^3)	176.50	Min. Grad.	27.29
Volume Voids (cm^3)	123.85		
Void Ratio	0.70		
Saturation (%)	90%		

Sample Data- Final

Height (in)	2.994
Diameter (in)	2.783
Area (cm²)	39.24
Volume (cm^3)	298.45
Mass (g)	597.07
Moisture Content (%)	25.3
Dry Density (pcf)	99.6
Volume Solids (cm^3)	176.50
Volume Voids (cm^3)	121.95
Void Ratio	0.69
Saturation (%)	99%

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare - I	g	588.19	605.08
Wt Soil & Tare - F	g	476.55	484.61
Wt Tare	g	0.00	8.28
Wt Moisture Lost	g	111.64	120.47
Wt Dry Soil	g	476.55	476.33
Water Content	%	23.4%	25.3%

DESCRIPTION: SILTY CLAY, trace sand; very pale brown.

Flow Pump Rate: 1.11E-05 cm^3/sec

PERMEANT: Deaired Tap Water

USCS: CL

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
10/02/25	45932	12	10	20.6	0	0	0	0	2.95	207.50	27.29	1.0E-08	
10/02/25	45932	12	15	20.6	5	5	300	300	2.95	207.50	27.29	1.0E-08	
10/02/25	45932	12	20	20.6	5	10	300	600	2.95	207.50	27.29	1.0E-08	
10/02/25	45932	12	25	20.6	5	15	300	900	2.95	207.50	27.29	1.0E-08	*
10/02/25	45932	12	30	20.6	5	20	300	1200	2.95	207.50	27.29	1.0E-08	*
10/02/25	45932	12	35	20.6	5	25	300	1500	2.95	207.50	27.29	1.0E-08	*
10/02/25	45932	12	40	20.6	5	30	300	1800	2.95	207.50	27.29	1.0E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 1.0E-08 cm/sec **

DATE	10/2/25
CHECK	DA
REVIEW	JJ
APPROVE	

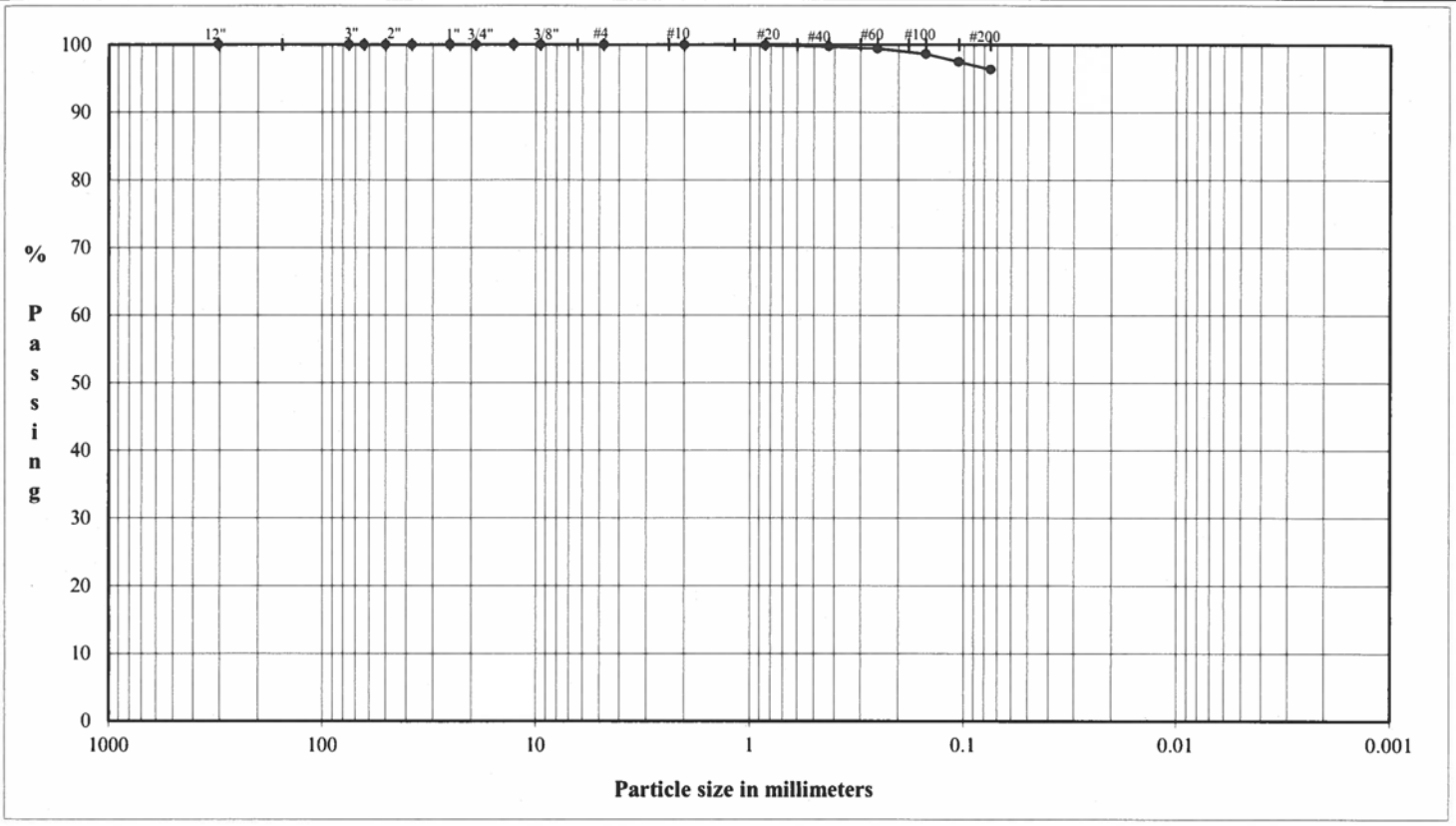
APPENDIX G
CLAY LINER MATERIAL – CONSTRUCTION TESTING RESULTS

SEPTEMBER 2025 US-0048676.8029

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D6913 & D4318

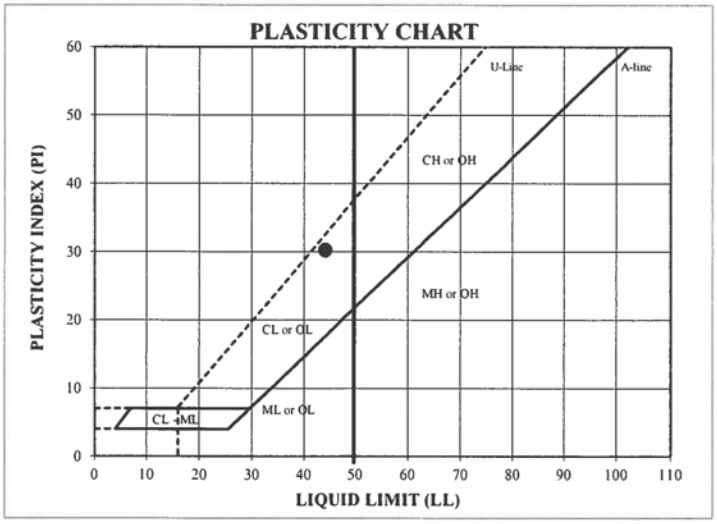
PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
SAMPLE ID: **C-1** Depth: -
TYPE: **Bulk**



COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Particle Size Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.0	**100.0**	Coarse Sand	**0.0**
#20	0.85	**99.9**		
#40	0.43	**99.7**	Medium Sand	**0.2**
#60	0.25	**99.4**		
#100	0.15	**98.6**		
#140	0.11	**97.5**		
#200	0.08	**96.3**	Fine Sand	**3.4**
			Fines	**96.3**



ATTERBERG LIMITS
Method - B (Dry preparation)

M,	LL	PL	PI	LI
19.3	**44**	**14**	**30**	**0.18**

DESCRIPTION: SILTY CLAY, trace sand; gray.

USCS: CL

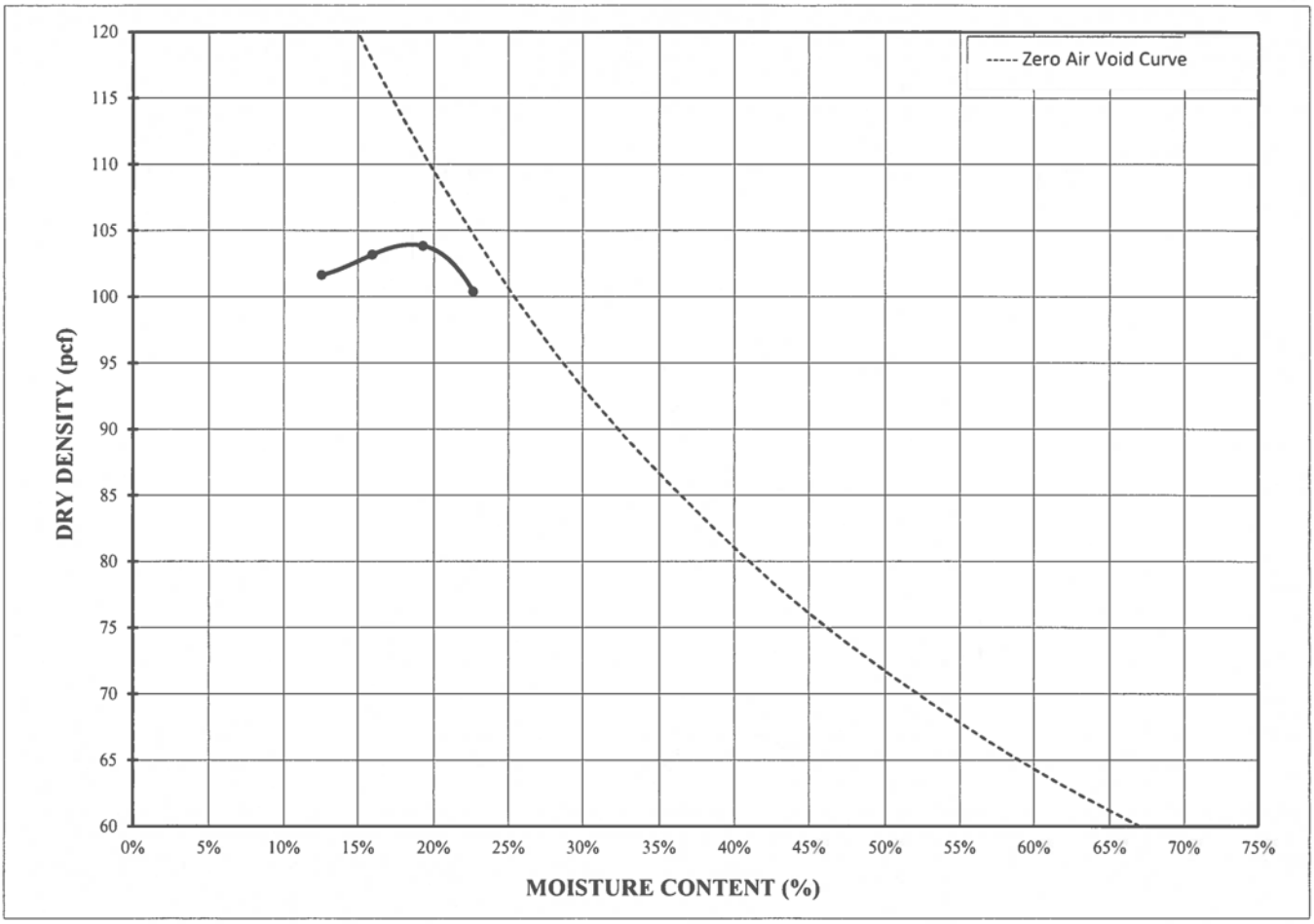
LL (oven-dried) / < 0.75 = ORGANIC (OL OH)

TECH	TB/JC/EK
DATE	9/5/25
CHECK	
REVIEW	
APPROVE	

MOISTURE / DRY DENSITY CURVE
ASTM D698 Method A

Mechanical	Standard	Dry Method

PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
PROJECT NUMBER: **US-0048676.8029**
SAMPLE ID: **C-1** DEPTH: **-** SAMPLE TYPE: **Bulk**



COMPACTION POINTS		
Specimen Number	Dry Density (pcf)	Moisture Content (%)
1	101.6	12.6%
2	103.2	16.0%
3	103.8	19.3%
4	100.4	22.6%

Maximum Dry Density (pcf)	**103.9**
Optimum Moisture (%)	**18.6**
Corrected Maximum Dry Density (pcf)	
Corrected Optimum Moisture (%)	
As-Received Moisture Content	**19.3%**
% Retained on # 4 sieve	
% Retained on 3/8" sieve	
% Retained on 3/4" sieve	
Specific Gravity (assumed)	**2.7**

DESCRIPTION SILTY CLAY, trace sand; gray.

USCS CL

CHECK
REVIEW
APPROVE

FLEXIBLE WALL PERMEABILITY
ASTM D5084
METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	6	COMMENTS: The sample was remolded to 94.9% of the Maximum Dry Density and OPTM + 4.4% (using ASTM D698).
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	C-1	-	Flow Pump Speed	12	
SAMPLE TYPE	Bulk		Technician	DA	

Sample Data - Initial

Height (in)	3.009	B-Value, f	0.99
Diameter (in)	2.790	Cell Pres.	90.0
Area (cm²)	39.44	Bot. Pres.	80.0
Volume (cm^3)	301.45	Top Pres.	80.0
Mass (g)	585.56	Tot. B.P.	80.0
Moisture Content (%)	23.0	Head, max.	123.80
Dry Density (pcf)	98.5	Head, min.	123.80
Spec. Gravity(assumed)	2.700	Max. Grad.	16.25
Volume Solids (cm^3)	176.27	Min. Grad.	16.25
Volume Voids (cm^3)	125.18		
Void Ratio	0.71		
Saturation (%)	88%		

Sample Data- Final

Height (in)	3.000
Diameter (in)	2.784
Area (cm²)	39.27
Volume (cm^3)	299.26
Mass (g)	591.40
Moisture Content (%)	24.3
Dry Density (pcf)	99.2
Volume Solids (cm^3)	176.27
Volume Voids (cm^3)	122.99
Void Ratio	0.70
Saturation (%)	94%

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare - I	g	585.56	599.64
Wt Soil & Tare - F	g	475.94	484.22
Wt Tare	g	0.00	8.47
Wt Moisture Lost	g	109.62	115.42
Wt Dry Soil	g	475.94	475.75
Water Content	%	23.0%	24.3%

DESCRIPTION: SILTY CLAY, trace sand; gray.

Flow Pump Rate: 4.46E-06 cm^3/sec

PERMEANT: Deaired Tap Water

USCS: CL

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
10/03/25	45933	12	25	20.3	0	0	0	0	1.76	123.80	16.25	6.9E-09
10/03/25	45933	12	30	20.3	5	5	300	300	1.76	123.80	16.25	6.9E-09
10/03/25	45933	12	35	20.3	5	10	300	600	1.76	123.80	16.25	6.9E-09
10/03/25	45933	12	40	20.3	5	15	300	900	1.76	123.80	16.25	6.9E-09 *
10/03/25	45933	12	45	20.3	5	20	300	1200	1.76	123.80	16.25	6.9E-09 *
10/03/25	45933	12	50	20.3	5	25	300	1500	1.76	123.80	16.25	6.9E-09 *
10/03/25	45933	12	55	20.3	5	30	300	1800	1.76	123.80	16.25	6.9E-09 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 6.9E-09 cm/sec **

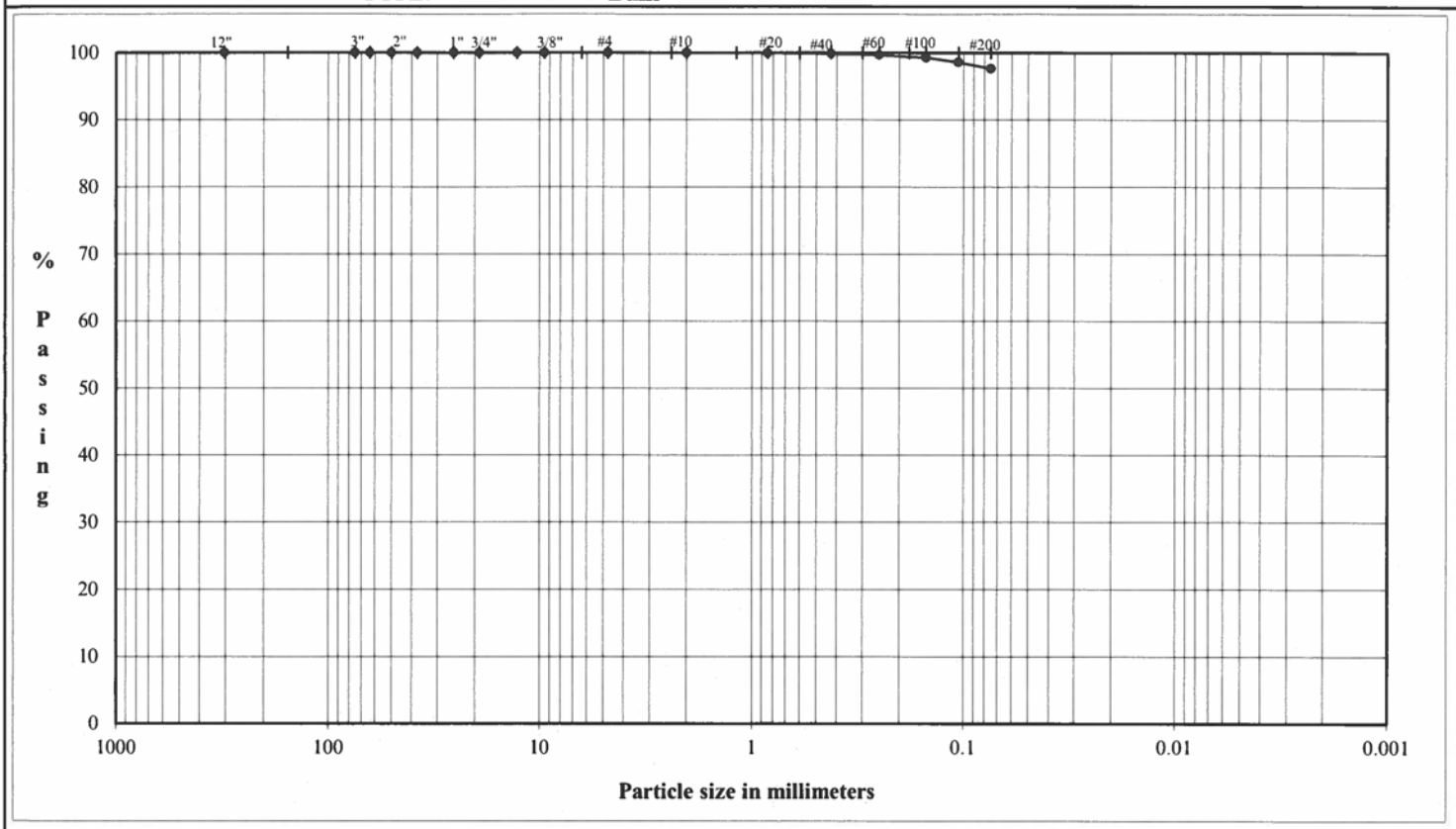
DATE	10/3/25
CHECK	
REVIEW	
APPROVE	

SEPTEMBER 2025 US-0048676.8029

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D6913 & D4318

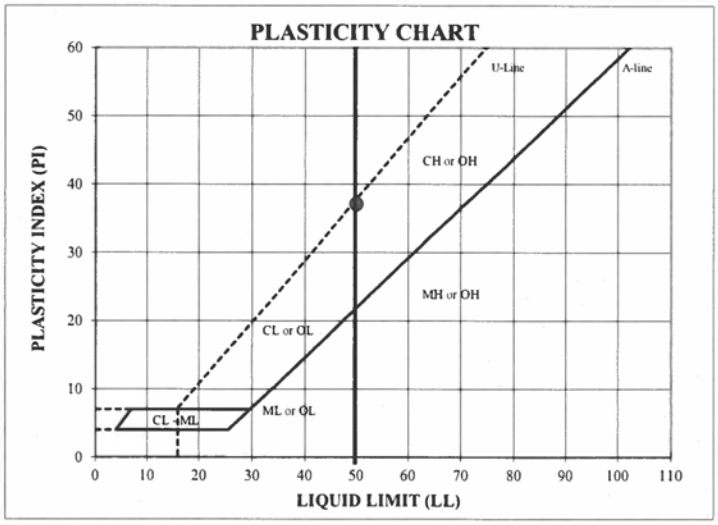
PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
SAMPLE ID: **C-2** Depth: -
TYPE: **Bulk**



COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Particle Size Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.0	**100.0**	Coarse Sand	**0.0**
#20	0.85	**100.0**		
#40	0.43	**99.9**	Medium Sand	**0.1**
#60	0.25	**99.7**		
#100	0.15	**99.3**		
#140	0.11	**98.6**		
#200	0.08	**97.6**	Fine Sand	**2.2**
			Fines	**97.6**



ATTERBERG LIMITS
Method - B (Dry preparation)

M_c	LL	PL	PI	LI
21.4	**50**	**13**	**37**	**0.22**

DESCRIPTION: CLAY, trace sand; gray.

USCS: CH

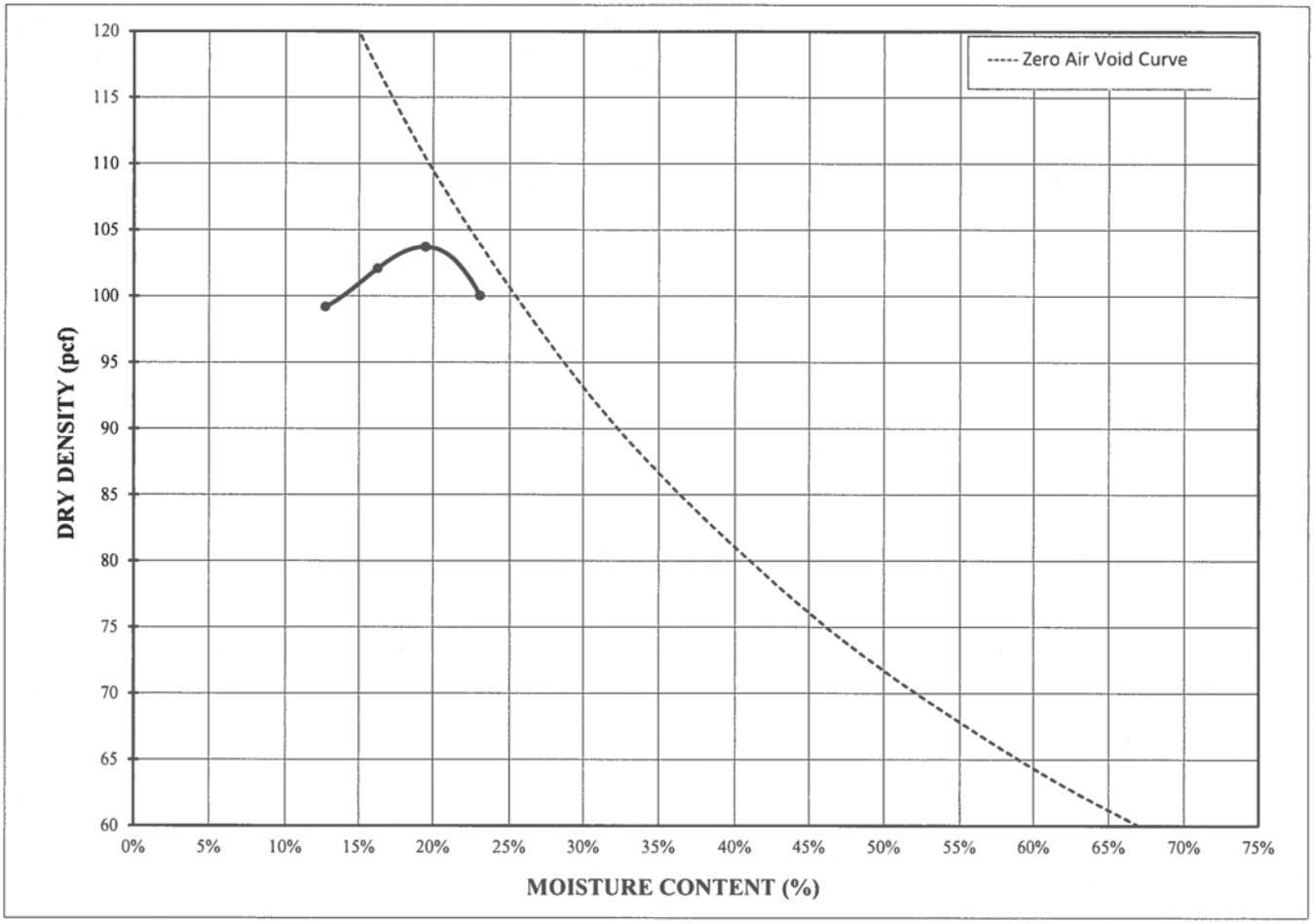
LL (oven-dried) / < 0.75 = ORGANIC (OL OH)

TECH	/TBJC/EK
DATE	9/5/25
CHECK	
REVIEW	
APPROVE	

MOISTURE / DRY DENSITY CURVE
ASTM D698 Method A

Mechanical	Standard	Dry Method

PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
PROJECT NUMBER: **US-0048676.8029**
SAMPLE ID: **C-2** DEPTH: **-** SAMPLE TYPE: **Bulk**



COMPACTION POINTS		
Specimen Number	Dry Density (pcf)	Moisture Content (%)
1	99.2	12.7%
2	102.1	16.3%
3	103.7	19.5%
4	100.0	23.0%

Maximum Dry Density (pcf)	**103.7**
Optimum Moisture (%)	**19.5**
Corrected Maximum Dry Density (pcf)	
Corrected Optimum Moisture (%)	
As-Received Moisture Content	**21.4%**
% Retained on # 4 sieve	
% Retained on 3/8" sieve	
% Retained on 3/4" sieve	
Specific Gravity (assumed)	**2.7**

DESCRIPTION CLAY, trace sand; gray.

USCS CH

CHECK DA
REVIEW
APPROVE

FLEXIBLE WALL PERMEABILITY
ASTM D5084
METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	3	COMMENTS: The sample was remolded to 94.5% of the Maximum Dry Density and OPTM + 4.5% (using ASTM D698).
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	C-2	-	Flow Pump Speed	11	
SAMPLE TYPE	Bulk		Technician	DA	

Sample Data - Initial

Height (in)	2.992	B-Value, f	0.99
Diameter (in)	2.790	Cell Pres.	90.0
Area (cm²)	39.44	Bot. Pres.	80.0
Volume (cm³)	299.75	Top Pres.	80.0
Mass (g)	583.40	Tot. B.P.	80.0
Moisture Content (%)	24.0	Head, max.	168.82
Dry Density (pcf)	97.9	Head, min.	168.82
Spec. Gravity(assumed)	2.700	Max. Grad.	22.58
Volume Solids (cm³)	174.23	Min. Grad.	22.58
Volume Voids (cm³)	125.52		
Void Ratio	0.72		
Saturation (%)	90%		

Sample Data- Final

Height (in)	2.943
Diameter (in)	2.790
Area (cm²)	39.44
Volume (cm³)	294.84
Mass (g)	588.84
Moisture Content (%)	25.2
Dry Density (pcf)	99.6
Volume Solids (cm³)	174.23
Volume Voids (cm³)	120.61
Void Ratio	0.69
Saturation (%)	98%

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare - I	g	583.40	596.77
Wt Soil & Tare - F	g	470.43	478.46
Wt Tare	g	0.00	8.45
Wt Moisture Lost	g	112.97	118.31
Wt Dry Soil	g	470.43	470.01
Water Content	%	24.0%	25.2%

DESCRIPTION: CLAY, trace sand; gray.

Flow Pump Rate: 1.11E-05 cm³/sec

PERMEANT: Deaired Tap Water

USCS: CH

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
10/04/25	45934	14	0	20.4	0	0	0	0	2.40	168.82	22.58	1.2E-08	
10/04/25	45934	14	5	20.4	5	5	300	300	2.40	168.82	22.58	1.2E-08	
10/04/25	45934	14	10	20.4	5	10	300	600	2.40	168.82	22.58	1.2E-08	
10/04/25	45934	14	15	20.4	5	15	300	900	2.40	168.82	22.58	1.2E-08	*
10/04/25	45934	14	20	20.4	5	20	300	1200	2.40	168.82	22.58	1.2E-08	*
10/04/25	45934	14	25	20.4	5	25	300	1500	2.40	168.82	22.58	1.2E-08	*
10/04/25	45934	14	30	20.4	5	30	300	1800	2.40	168.82	22.58	1.2E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 1.2E-08 cm/sec **

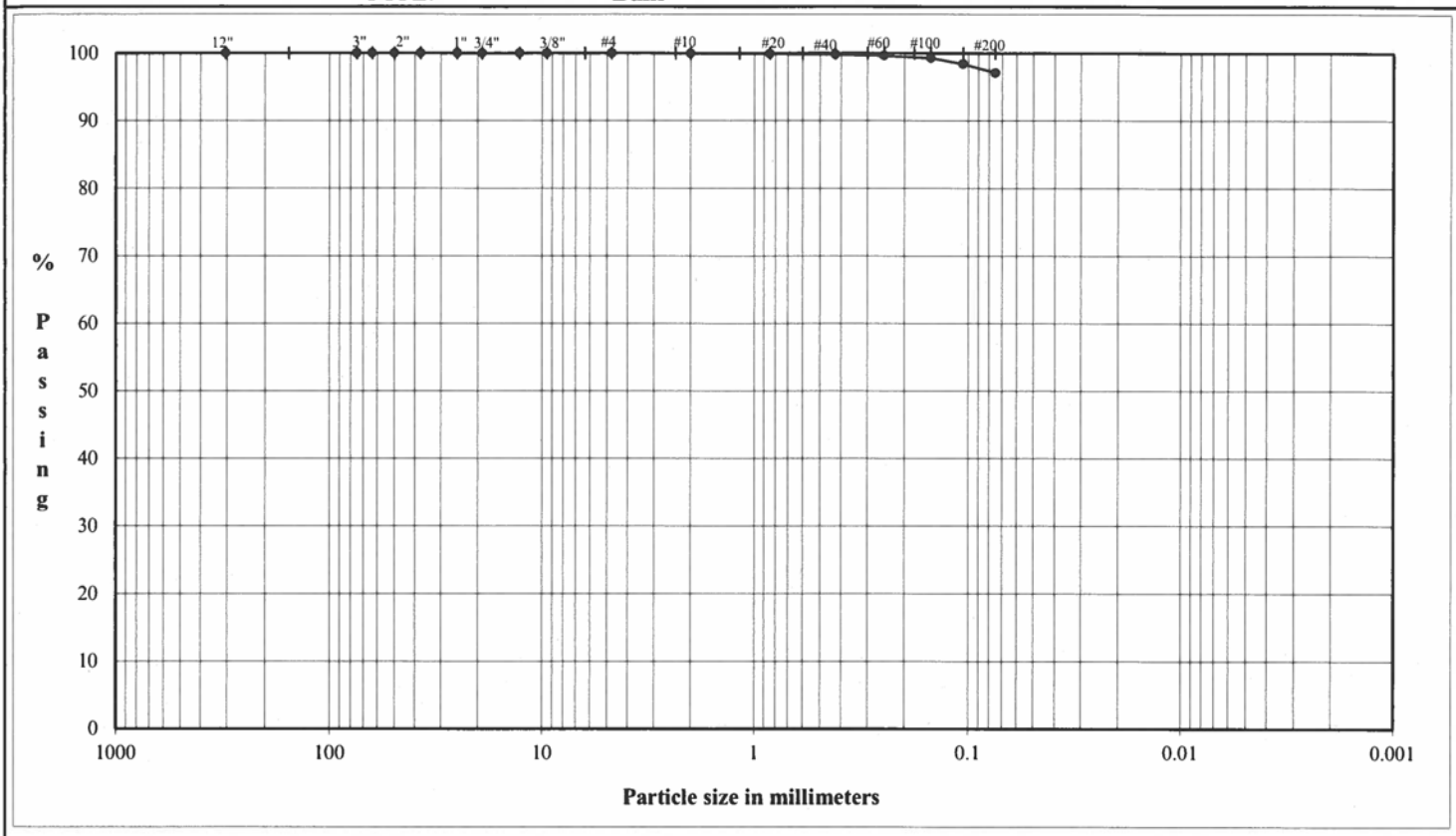
DATE	10/4/25
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APPROVE	

SEPTEMBER 2025 US-0048676.8029

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D6913 & D4318

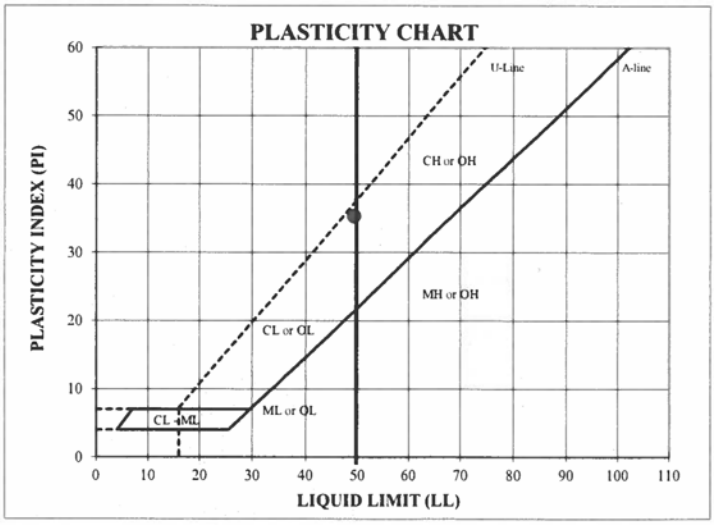
PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
SAMPLE ID: **C-3** - Depth: -
TYPE: **Bulk**



COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.0	**100.0**	Coarse Sand	**0.0**
#20	0.85	**99.9**		
#40	0.43	**99.9**	Medium Sand	**0.1**
#60	0.25	**99.7**		
#100	0.15	**99.3**		
#140	0.11	**98.4**		
#200	0.08	**97.1**	Fine Sand	**2.7**
			Fines	**97.1**



ATTERBERG LIMITS
Method - B (Dry preparation)

M_c	LL	PL	PI	LI
17.1	**49**	**14**	**35**	**0.08**

LL (oven-dried) / < 0.75 = ORGANIC (OL OH)

DESCRIPTION: SILTY CLAY, trace sand; gray.

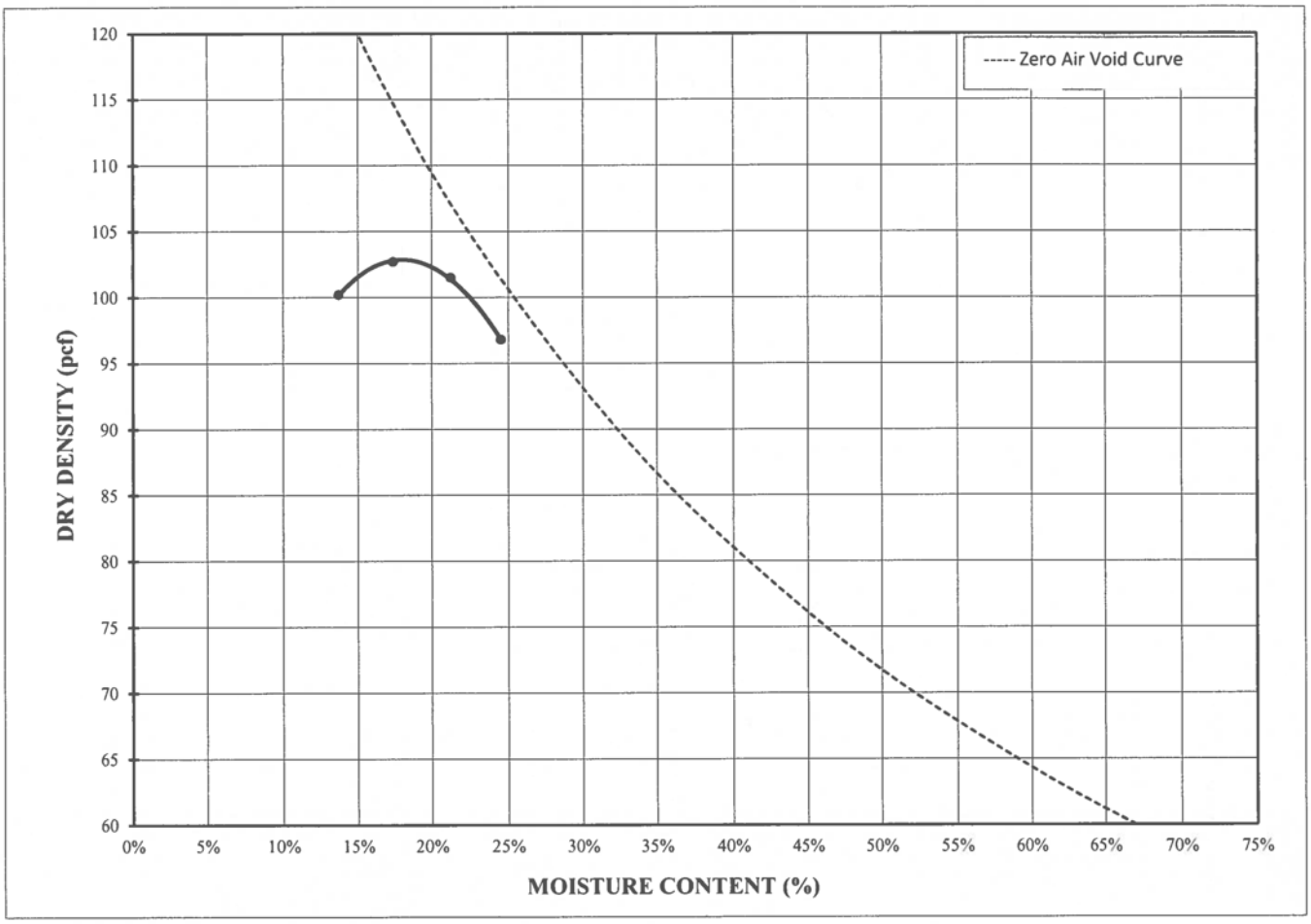
USCS: CL

TECH	TB/EK
DATE	9/4/25
CHECK	DH
REVIEW	
APPROVE	

MOISTURE / DRY DENSITY CURVE
ASTM D698 Method A

Mechanical	Standard	Dry Method

PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
PROJECT NUMBER: **US-0048676.8029**
SAMPLE ID: **C-3** DEPTH: **-** SAMPLE TYPE: **Bulk**



COMPACTION POINTS		
Specimen Number	Dry Density (pcf)	Moisture Content (%)
1	100.2	13.7%
2	102.7	17.4%
3	101.5	21.3%
4	96.8	24.5%

Maximum Dry Density (pcf)	**102.8**
Optimum Moisture (%)	**18.0**
Corrected Maximum Dry Density (pcf)	
Corrected Optimum Moisture (%)	
As-Received Moisture Content	**17.1%**
% Retained on # 4 sieve	
% Retained on 3/8" sieve	
% Retained on 3/4" sieve	
Specific Gravity (assumed)	**2.7**

DESCRIPTION SILTY CLAY, trace sand; gray.

USCS CL

CHECK JN
REVIEW
APPROVE

FLEXIBLE WALL PERMEABILITY
ASTM D5084
METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	4	COMMENTS: The sample was remolded to 94.8% of the Maximum Dry Density and OPTM + 5.2% (using ASTM D698).
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	C-3	-	Flow Pump Speed	10	
SAMPLE TYPE	Bulk		Technician	DA	

Sample Data - Initial

Height (in)	2.990	B-Value, f	0.98
Diameter (in)	2.790	Cell Pres.	90.0
Area (cm²)	39.44	Bot. Pres.	80.0
Volume (cm³)	299.55	Top Pres.	80.0
Mass (g)	575.99	Tot. B.P.	80.0
Moisture Content (%)	23.2	Head, max.	173.04
Dry Density (pcf)	97.4	Head, min.	173.04
Spec. Gravity(assumed)	2.700	Max. Grad.	23.29
Volume Solids (cm³)	173.13	Min. Grad.	23.29
Volume Voids (cm³)	126.42		
Void Ratio	0.73		
Saturation (%)	86%		

Sample Data- Final

Height (in)	2.925
Diameter (in)	2.787
Area (cm²)	39.36
Volume (cm³)	292.41
Mass (g)	582.56
Moisture Content (%)	24.6
Dry Density (pcf)	99.8
Volume Solids (cm³)	173.13
Volume Voids (cm³)	119.28
Void Ratio	0.69
Saturation (%)	97%

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare - I	g	575.99	590.78
Wt Soil & Tare - F	g	467.44	475.71
Wt Tare	g	0.00	8.47
Wt Moisture Lost	g	108.55	115.07
Wt Dry Soil	g	467.44	467.24
Water Content	%	23.2%	24.6%

DESCRIPTION: SILTY CLAY, trace sand; gray.

Flow Pump Rate: 2.19E-05 cm³/sec

PERMEANT: Deaired Tap Water

USCS: CL

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
10/04/25	45934	14	50	20.4	0	0	0	0	2.46	173.04	23.29	2.4E-08	
10/04/25	45934	14	55	20.4	5	5	300	300	2.46	173.04	23.29	2.4E-08	
10/04/25	45934	15	0	20.4	5	10	300	600	2.46	173.04	23.29	2.4E-08	
10/04/25	45934	15	5	20.4	5	15	300	900	2.46	173.04	23.29	2.4E-08	*
10/04/25	45934	15	10	20.4	5	20	300	1200	2.46	173.04	23.29	2.4E-08	*
10/04/25	45934	15	15	20.4	5	25	300	1500	2.46	173.04	23.29	2.4E-08	*
10/04/25	45934	15	20	20.4	5	30	300	1800	2.46	173.04	23.29	2.4E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 2.4E-08 cm/sec **

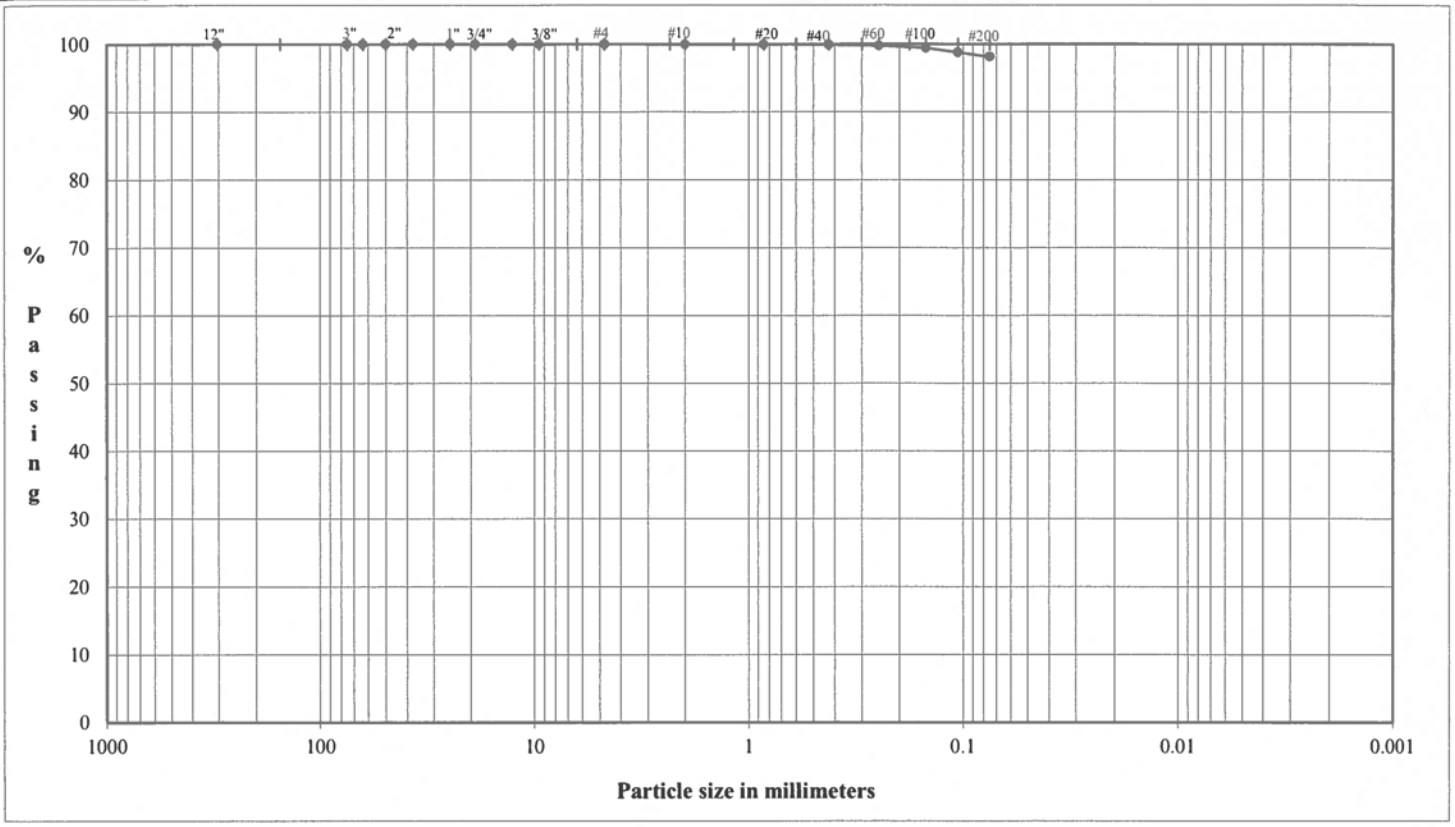
DATE	10/4/25
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SEPTEMBER 2025 US-0048676.8029

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D6913 & D4318

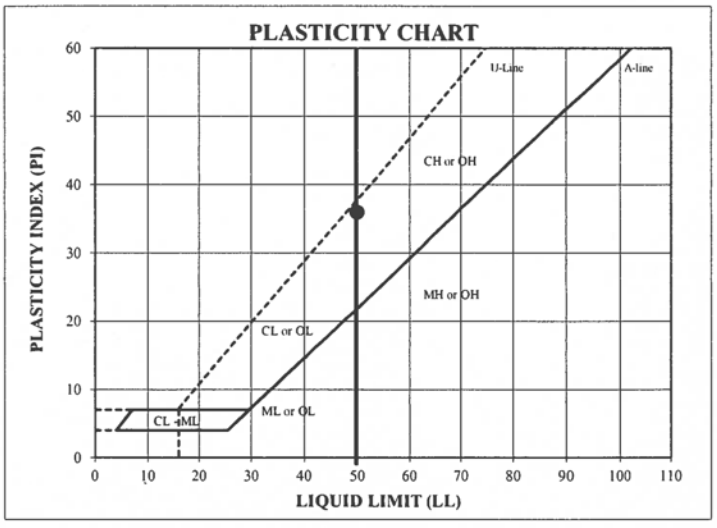
PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
SAMPLE ID: **C-4** Depth: -
TYPE: **Bulk**



COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Particle Size Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.0	**100.0**	Coarse Sand	**0.0**
#20	0.85	**100.0**		
#40	0.43	**99.9**	Medium Sand	**0.1**
#60	0.25	**99.8**		
#100	0.15	**99.4**		
#140	0.11	**98.8**		
#200	0.08	**98.1**	Fine Sand	**1.8**
			Fines	**98.1**



ATTERBERG LIMITS
Method - B (Dry preparation)

M_c	LL	PL	PI	LI
20.2	**50**	**14**	**36**	**0.17**

DESCRIPTION: CLAY, trace sand; gray.

USCS: CH

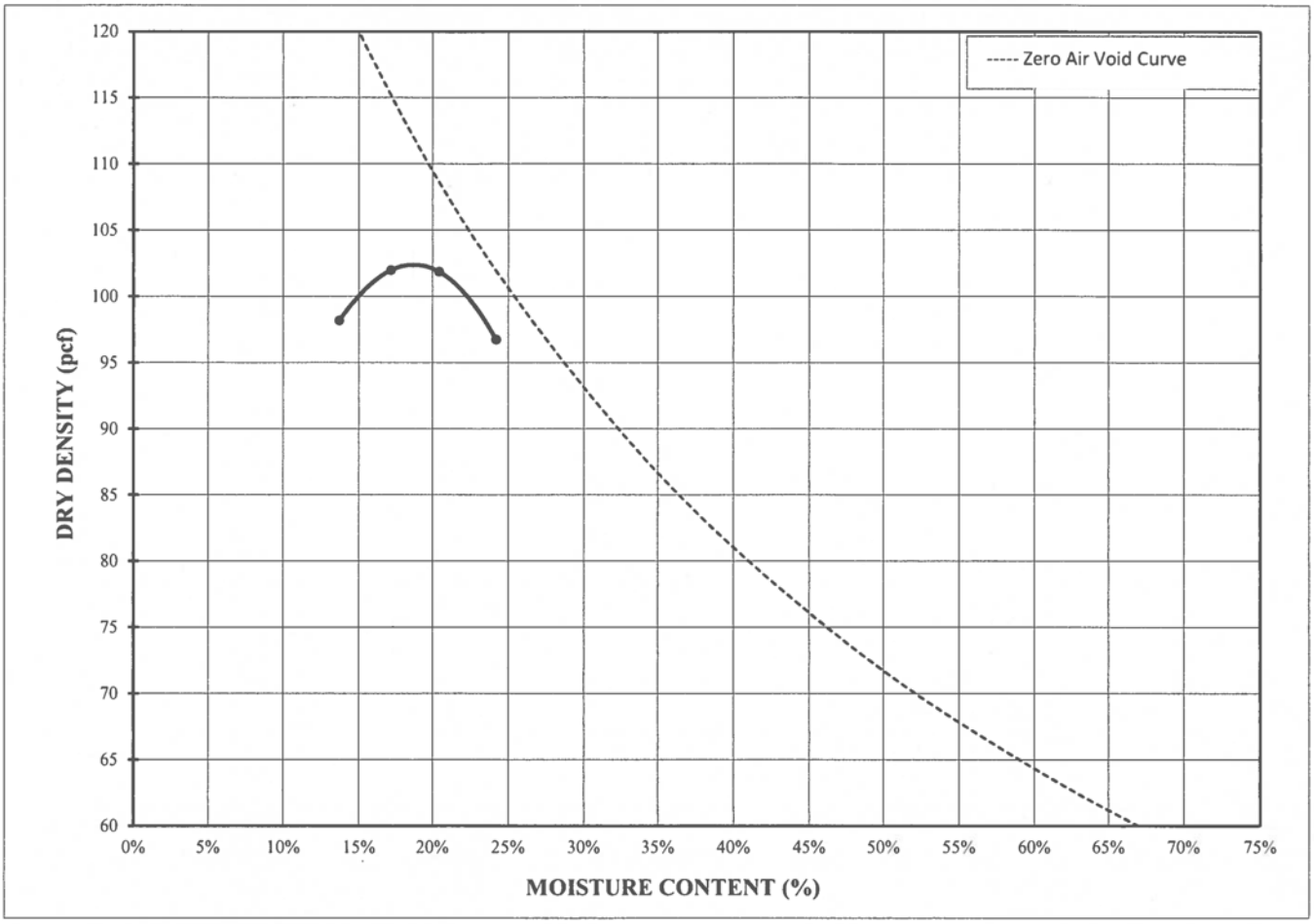
LL (oven-dried) / < 0.75 = ORGANIC (OL OH)

TECH	TB/JC/EK
DATE	9/8/25
CHECK	
REVIEW	
APPROVE	

MOISTURE / DRY DENSITY CURVE
ASTM D698 Method A

Mechanical	Standard	Dry Method

PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
PROJECT NUMBER: **US-0048676.8029**
SAMPLE ID: **C-4** DEPTH: **-** SAMPLE TYPE: **Bulk**



COMPACTION POINTS		
Specimen Number	Dry Density (pcf)	Moisture Content (%)
1	98.2	13.7%
2	102.0	17.2%
3	101.8	20.5%
4	96.7	24.2%

Maximum Dry Density (pcf)	**102.4**
Optimum Moisture (%)	**18.7**
Corrected Maximum Dry Density (pcf)	
Corrected Optimum Moisture (%)	
As-Received Moisture Content	**20.2%**
% Retained on # 4 sieve	
% Retained on 3/8" sieve	
% Retained on 3/4" sieve	
Specific Gravity (assumed)	**2.7**

DESCRIPTION CLAY, trace sand; gray.

USCS CH

CHECK DA
REVIEW
APPROVE

FLEXIBLE WALL PERMEABILITY
ASTM D5084
METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	2	COMMENTS: The sample was remolded to 94.2% of the Maximum Dry Density and OPTM + 4.5% (using ASTM D698).
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	C-4	-	Flow Pump Speed	12	
SAMPLE TYPE	Bulk		Technician	DA	

Sample Data - Initial

Height (in)	3.003	B-Value, f	1.00
Diameter (in)	2.790	Cell Pres.	90.0
Area (cm^2)	39.44	Bot. Pres.	80.0
Volume (cm^3)	300.85	Top Pres.	80.0
Mass (g)	572.81	Tot. B.P.	80.0
Moisture Content (%)	23.2	Head, max.	133.65
Dry Density (pcf)	96.4	Head, min.	133.65
Spec. Gravity(assumed)	2.700	Max. Grad.	17.52
Volume Solids (cm^3)	172.18	Min. Grad.	17.52
Volume Voids (cm^3)	128.67		
Void Ratio	0.75		
Saturation (%)	84%		

Sample Data- Final

Height (in)	3.003
Diameter (in)	2.792
Area (cm^2)	39.50
Volume (cm^3)	301.28
Mass (g)	586.28
Moisture Content (%)	26.1
Dry Density (pcf)	96.3
Volume Solids (cm^3)	172.18
Volume Voids (cm^3)	129.10
Void Ratio	0.75
Saturation (%)	94%

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare - I	g	572.81	594.59
Wt Soil & Tare - F	g	464.89	473.26
Wt Tare	g	0.00	8.58
Wt Moisture Lost	g	107.92	121.33
Wt Dry Soil	g	464.89	464.68
Water Content	%	23.2%	26.1%

DESCRIPTION: CLAY, trace sand; gray.

USCS: CH

Flow Pump Rate: 4.46E-06 cm^3/sec

PERMEANT: Deaired Tap Water

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
10/04/25	45934	12	30	20.4	0	0	0	0	1.90	133.65	17.52	6.4E-09
10/04/25	45934	12	35	20.4	5	5	300	300	1.90	133.65	17.52	6.4E-09
10/04/25	45934	12	40	20.4	5	10	300	600	1.90	133.65	17.52	6.4E-09
10/04/25	45934	12	45	20.4	5	15	300	900	1.90	133.65	17.52	6.4E-09 *
10/04/25	45934	12	50	20.4	5	20	300	1200	1.90	133.65	17.52	6.4E-09 *
10/04/25	45934	12	55	20.4	5	25	300	1500	1.90	133.65	17.52	6.4E-09 *
10/04/25	45934	13	0	20.4	5	30	300	1800	1.90	133.65	17.52	6.4E-09 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 6.4E-09 cm/sec **

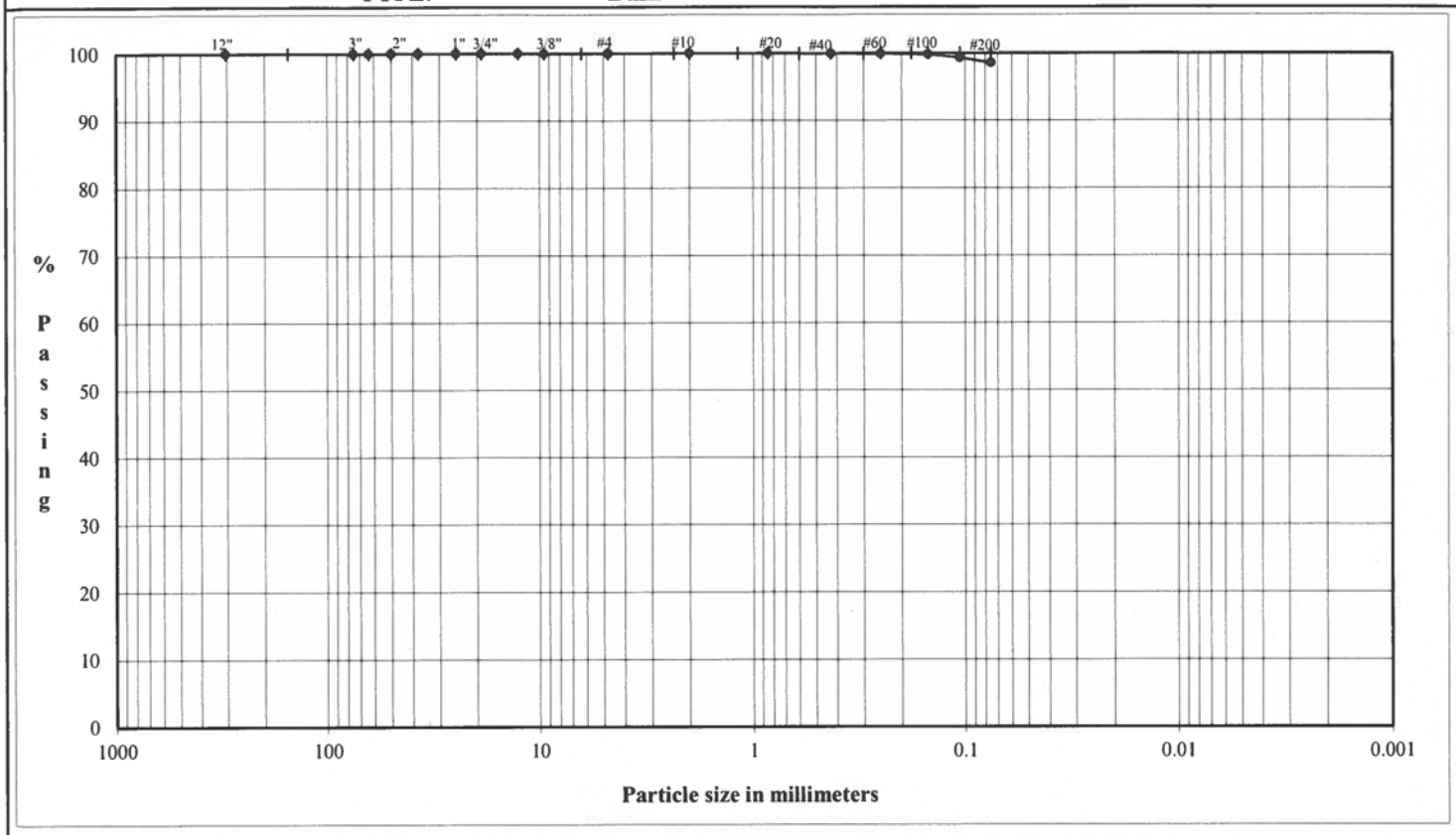
DATE	10/4/25
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SEPTEMBER 2025 US-0048676.8029

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D6913 & D4318

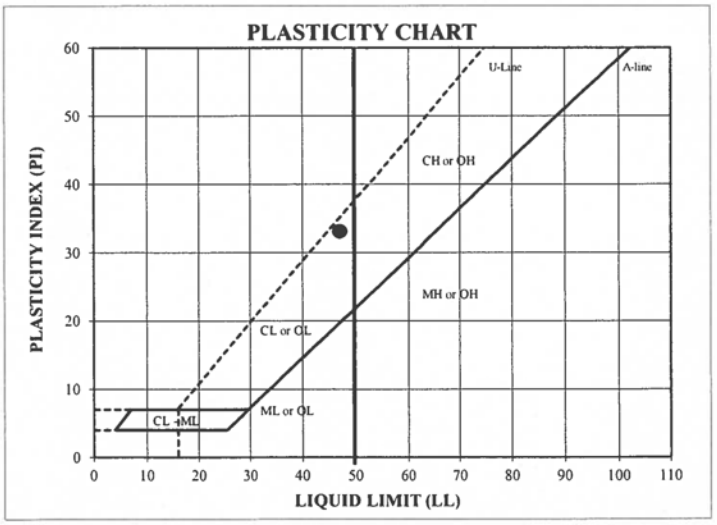
PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
SAMPLE ID: **C-5** Depth: -
TYPE: **Bulk**



COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.0	**100.0**	Coarse Sand	**0.0**
#20	0.85	**100.0**		
#40	0.43	**100.0**	Medium Sand	**0.0**
#60	0.25	**99.9**		
#100	0.15	**99.8**		
#140	0.11	**99.3**		
#200	0.08	**98.5**	Fine Sand	**1.4**
			Fines	**98.5**



ATTERBERG LIMITS
Method - B (Dry preparation)

M.	LL	PL	PI	LI
21.5	**47**	**14**	**33**	**0.22**

DESCRIPTION: SILTY CLAY, trace sand; gray.

USCS: CL

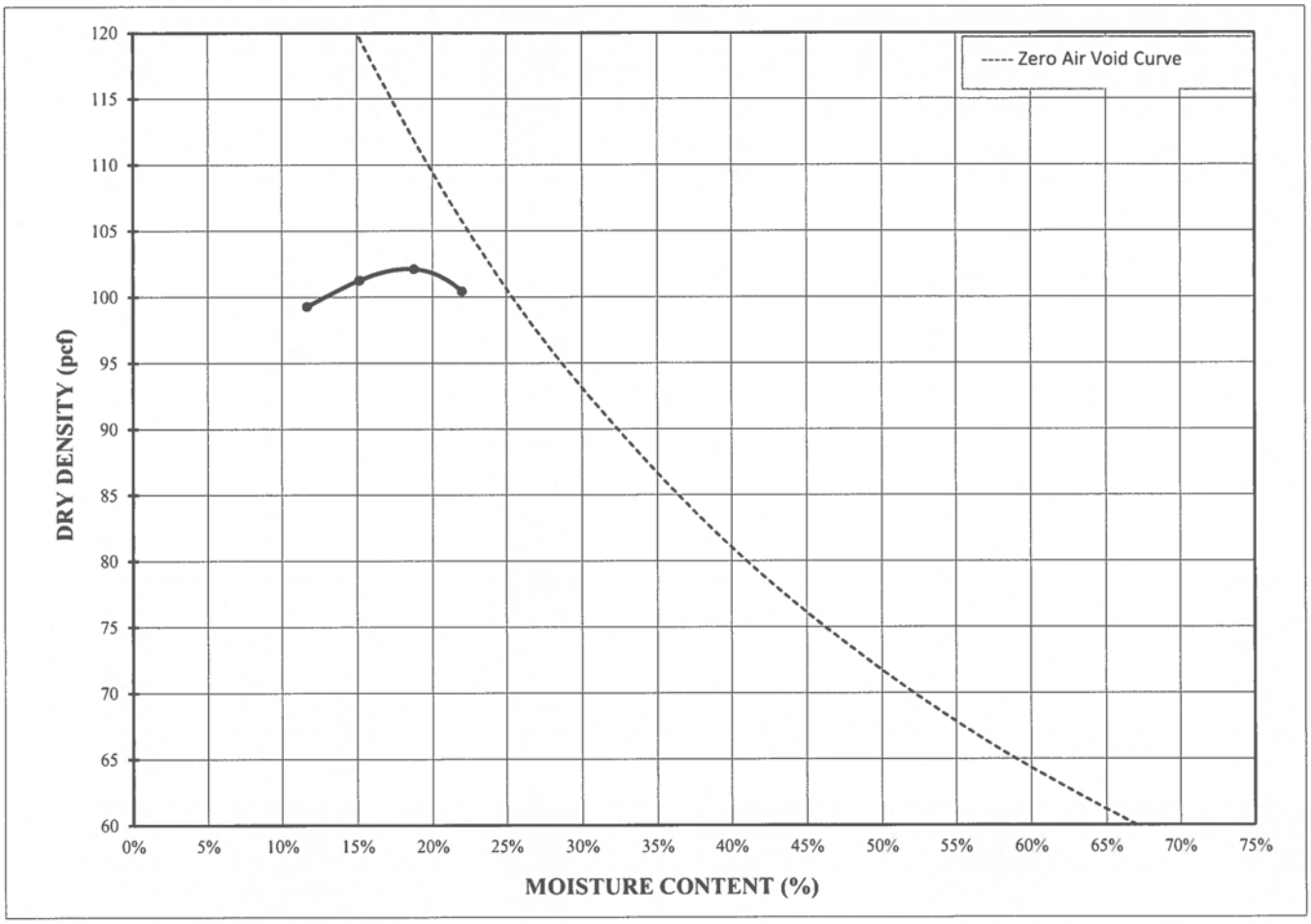
LL (oven-dried) / < 0.75 = ORGANIC (OL OH)

TECH	JC/EK
DATE	9/8/25
CHECK	
REVIEW	
APPROVE	

MOISTURE / DRY DENSITY CURVE
ASTM D698 Method A

Mechanical	Standard	Dry Method

PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
PROJECT NUMBER: **US-0048676.8029**
SAMPLE ID: **C-5** DEPTH: **-** SAMPLE TYPE: **Bulk**



COMPACTION POINTS		
Specimen Number	Dry Density (pcf)	Moisture Content (%)
1	99.3	11.7%
2	101.3	15.2%
3	102.1	18.8%
4	100.4	22.0%

Maximum Dry Density (pcf)	**102.2**
Optimum Moisture (%)	**18.3**
Corrected Maximum Dry Density (pcf)	
Corrected Optimum Moisture (%)	
As-Received Moisture Content	**21.5%**
% Retained on # 4 sieve	
% Retained on 3/8" sieve	
% Retained on 3/4" sieve	
Specific Gravity (assumed)	**2.7**

DESCRIPTION SILTY CLAY, trace sand; gray.

USCS CL

CHECK DA
REVIEW
APPROVE

FLEXIBLE WALL PERMEABILITY
ASTM D5084
METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	1	COMMENTS: The sample was remolded to 96.4% of the Maximum Dry Density and OPTM + 4.0% (using ASTM D698).
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	C-5	-	Flow Pump Speed	12	
SAMPLE TYPE	Bulk		Technician	CJ/DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.990	B-Value, f	0.97	Height (in)	3.031
Diameter (in)	2.790	Cell Pres.	90.0	Diameter (in)	2.801
Area (cm^2)	39.44	Bot. Pres.	80.0	Area (cm^2)	39.75
Volume (cm^3)	299.55	Top Pres.	80.0	Volume (cm^3)	306.06
Mass (g)	577.83	Tot. B.P.	80.0	Mass (g)	594.71
Moisture Content (%)	22.3	Head, max.	128.72	Moisture Content (%)	25.8
Dry Density (pcf)	98.5	Head, min.	128.72	Dry Density (pcf)	96.4
Spec. Gravity(assumed)	2.700	Max. Grad.	16.72	Volume Solids (cm^3)	175.05
Volume Solids (cm^3)	175.05	Min. Grad.	16.72	Volume Voids (cm^3)	131.01
Volume Voids (cm^3)	124.50			Void Ratio	0.75
Void Ratio	0.71			Saturation (%)	93%
Saturation (%)	84%				

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare - I	g	577.83	602.97
Wt Soil & Tare - F	g	472.63	480.93
Wt Tare	g	0.00	8.45
Wt Moisture Lost	g	105.20	122.04
Wt Dry Soil	g	472.63	472.48
Water Content	%	22.3%	25.8%

DESCRIPTION: SILTY CLAY, trace sand; gray.

Flow Pump Rate: 4.46E-06 cm^3/sec

PERMEANT: Deaired Tap Water

USCS: CL

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
10/07/25	45937	10	20	20.4	0	0	0	0	1.83	128.72	16.72	6.7E-09	
10/07/25	45937	10	25	20.4	5	5	300	300	1.83	128.72	16.72	6.7E-09	
10/07/25	45937	10	30	20.4	5	10	300	600	1.83	128.72	16.72	6.7E-09	
10/07/25	45937	10	35	20.4	5	15	300	900	1.83	128.72	16.72	6.7E-09	*
10/07/25	45937	10	40	20.4	5	20	300	1200	1.83	128.72	16.72	6.7E-09	*
10/07/25	45937	10	45	20.4	5	25	300	1500	1.83	128.72	16.72	6.7E-09	*
10/07/25	45937	10	50	20.4	5	30	300	1800	1.83	128.72	16.72	6.7E-09	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 6.7E-09 cm/sec **

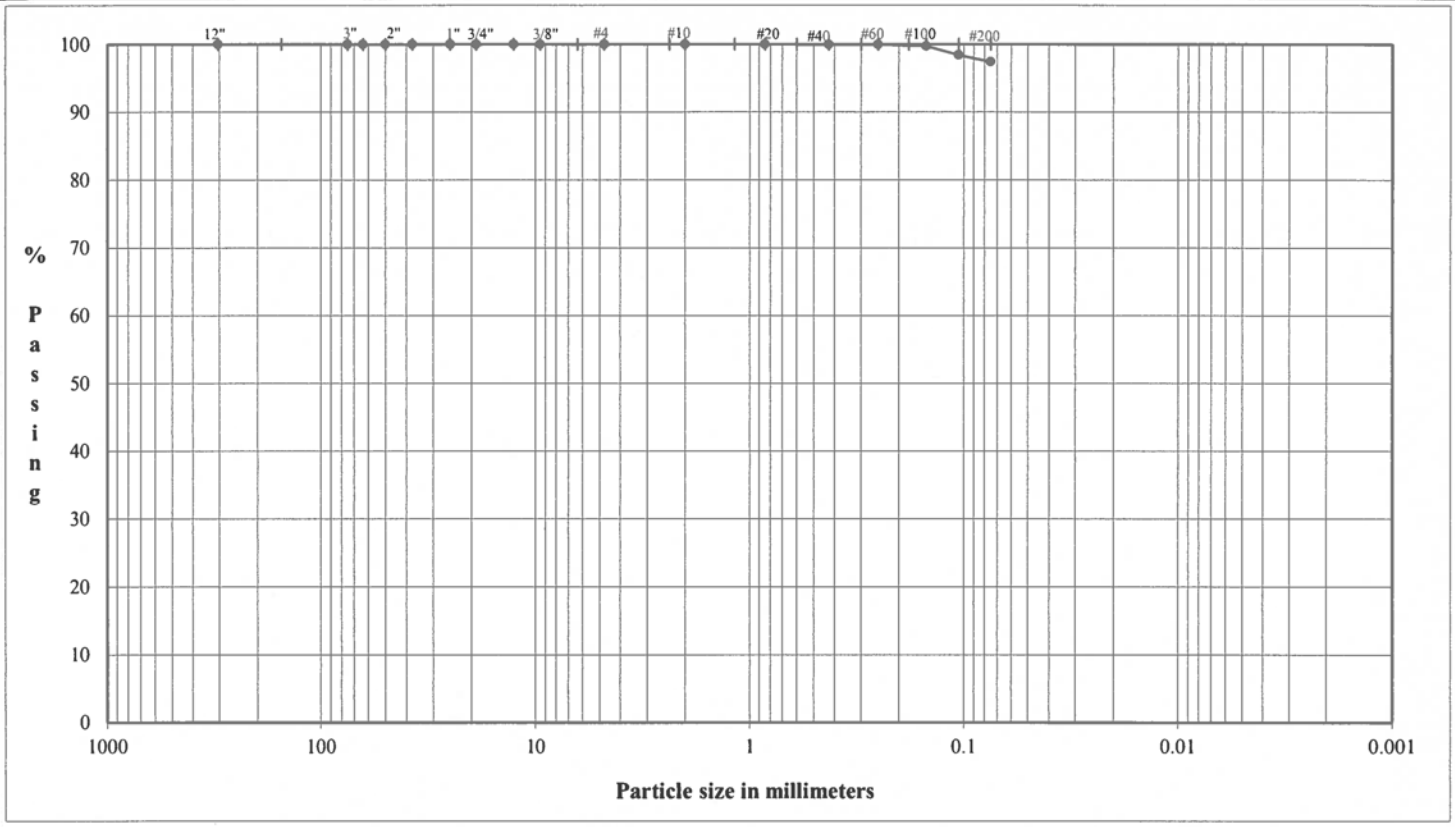
DATE	10/7/25
CHECK	
REVIEW	
APPROVE	

SEPTEMBER 2025 US-0048676.8029

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D6913 & D4318

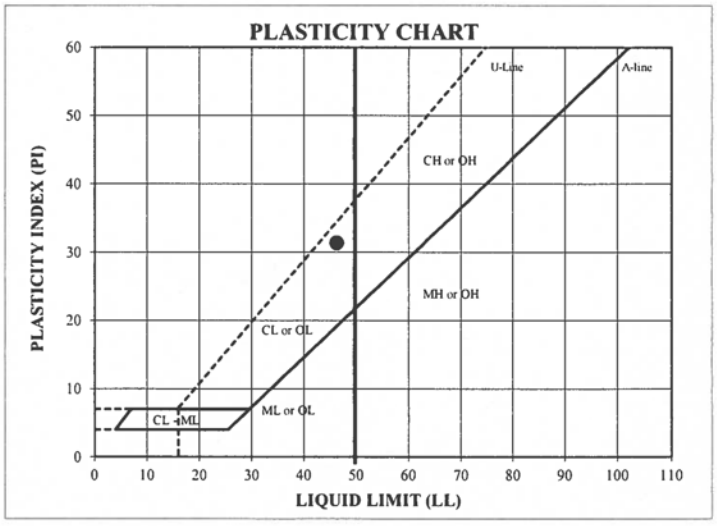
PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
SAMPLE ID: **C-6** - Depth: -
TYPE: **Bulk**



COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Particle Size Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.0	**100.0**	Coarse Sand	**0.0**
#20	0.85	**100.0**		
#40	0.43	**100.0**	Medium Sand	**0.0**
#60	0.25	**99.9**		
#100	0.15	**99.7**		
#140	0.11	**98.4**		
#200	0.08	**97.4**	Fine Sand	**2.6**
			Fines	**97.4**



ATTERBERG LIMITS
Method - B (Dry preparation)

M_c	LL	PL	PI	LI
20.6	**46**	**15**	**31**	**0.17**

DESCRIPTION: SILTY CLAY, trace sand; gray.

USCS: CL

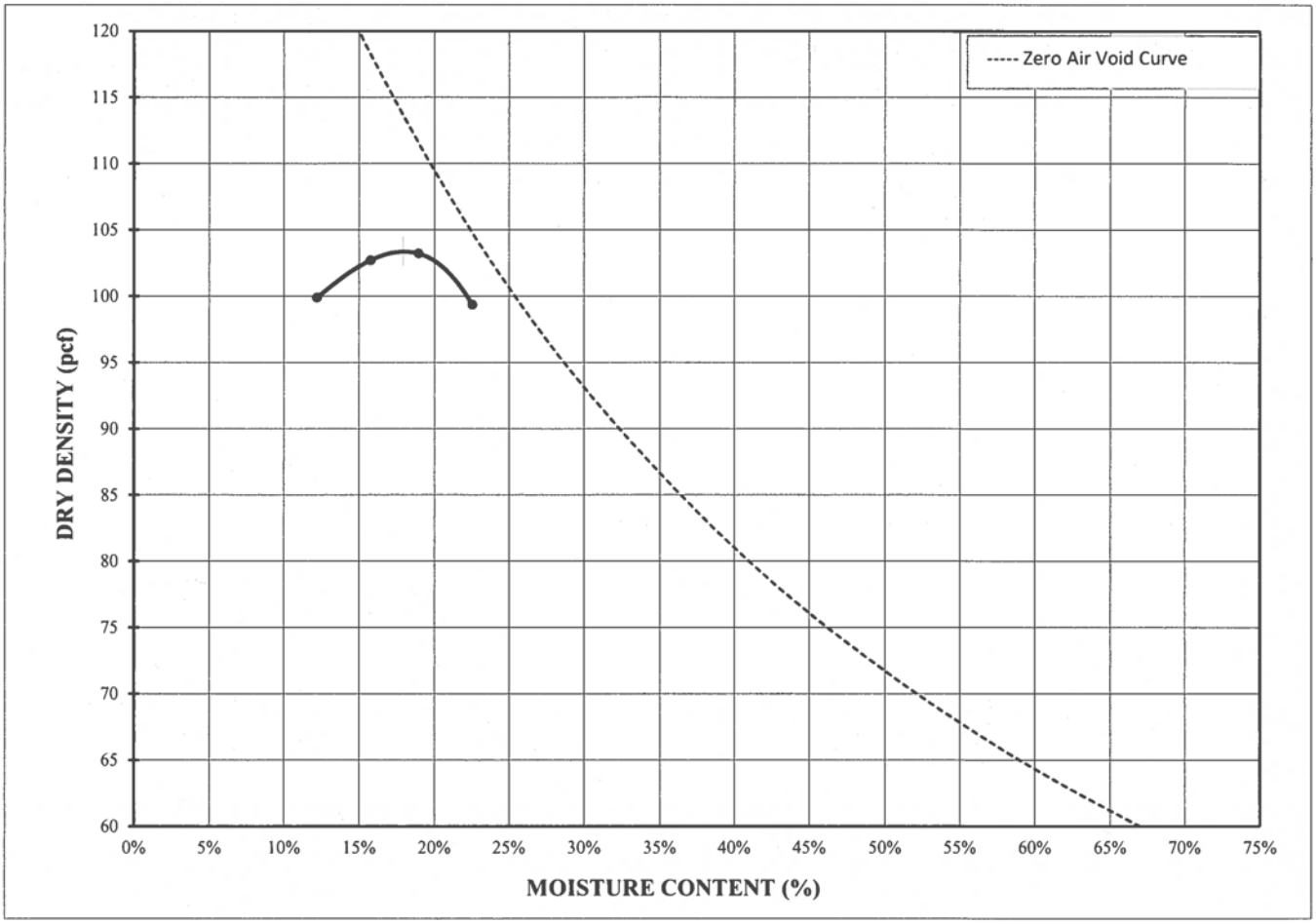
LL (oven-dried) / < 0.75 = ORGANIC (OL OH)

TECH	TB/JC/EK
DATE	9/5/25
CHECK	
REVIEW	
APPROVE	

MOISTURE / DRY DENSITY CURVE
ASTM D698 Method A

Mechanical	Standard	Dry Method

PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
PROJECT NUMBER: **US-0048676.8029**
SAMPLE ID: **C-6** DEPTH: **-** SAMPLE TYPE: **Bulk**



COMPACTION POINTS		
Specimen Number	Dry Density (pcf)	Moisture Content (%)
1	99.9	12.2%
2	102.7	15.8%
3	103.2	18.9%
4	99.3	22.6%

Maximum Dry Density (pcf)	**103.4**
Optimum Moisture (%)	**17.9**
Corrected Maximum Dry Density (pcf)	
Corrected Optimum Moisture (%)	
As-Received Moisture Content	**20.6%**
% Retained on # 4 sieve	
% Retained on 3/8" sieve	
% Retained on 3/4" sieve	
Specific Gravity (assumed)	**2.7**

DESCRIPTION SILTY CLAY, trace sand; gray.

USCS CL

CHECK DA
REVIEW
APPROVE

FLEXIBLE WALL PERMEABILITY
ASTM D5084
METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	2	COMMENTS: The sample was remolded to 95.5% of the Maximum Dry Density and OPTM + 4.0% (using ASTM D698).
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	C-6	-	Flow Pump Speed	11	
SAMPLE TYPE	Bulk		Technician	DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.998	B-Value, f	0.97	Height (in)	3.021
Diameter (in)	2.790	Cell Pres.	90.0	Diameter (in)	2.790
Area (cm²)	39.44	Bot. Pres.	80.0	Area (cm²)	39.44
Volume (cm^3)	300.35	Top Pres.	80.0	Volume (cm^3)	302.66
Mass (g)	578.99	Tot. B.P.	80.0	Mass (g)	592.82
Moisture Content (%)	21.9	Head, max.	128.72	Moisture Content (%)	24.8
Dry Density (pcf)	98.7	Head, min.	128.72	Dry Density (pcf)	97.9
Spec. Gravity(assumed)	2.700	Max. Grad.	16.78	Volume Solids (cm^3)	175.87
Volume Solids (cm^3)	175.87	Min. Grad.	16.78	Volume Voids (cm^3)	126.79
Volume Voids (cm^3)	124.48			Void Ratio	0.72
Void Ratio	0.71			Saturation (%)	93%
Saturation (%)	84%				

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare - I	g	578.99	601.01
Wt Soil & Tare - F	g	474.85	483.11
Wt Tare	g	0.00	8.53
Wt Moisture Lost	g	104.14	117.90
Wt Dry Soil	g	474.85	474.58
Water Content	%	21.9%	24.8%

DESCRIPTION: SILTY CLAY, trace sand; gray.

Flow Pump Rate: 1.11E-05 cm^3/sec

PERMEANT: Deaired Tap Water

USCS: CL

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
10/07/25	45937	11	0	20.4	0	0	0	0	1.83	128.72	16.78	1.7E-08	
10/07/25	45937	11	5	20.4	5	5	300	300	1.83	128.72	16.78	1.7E-08	
10/07/25	45937	11	10	20.4	5	10	300	600	1.83	128.72	16.78	1.7E-08	
10/07/25	45937	11	15	20.4	5	15	300	900	1.83	128.72	16.78	1.7E-08	*
10/07/25	45937	11	20	20.4	5	20	300	1200	1.83	128.72	16.78	1.7E-08	*
10/07/25	45937	11	25	20.4	5	25	300	1500	1.83	128.72	16.78	1.7E-08	*
10/07/25	45937	11	30	20.4	5	30	300	1800	1.83	128.72	16.78	1.7E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 1.7E-08 cm/sec **

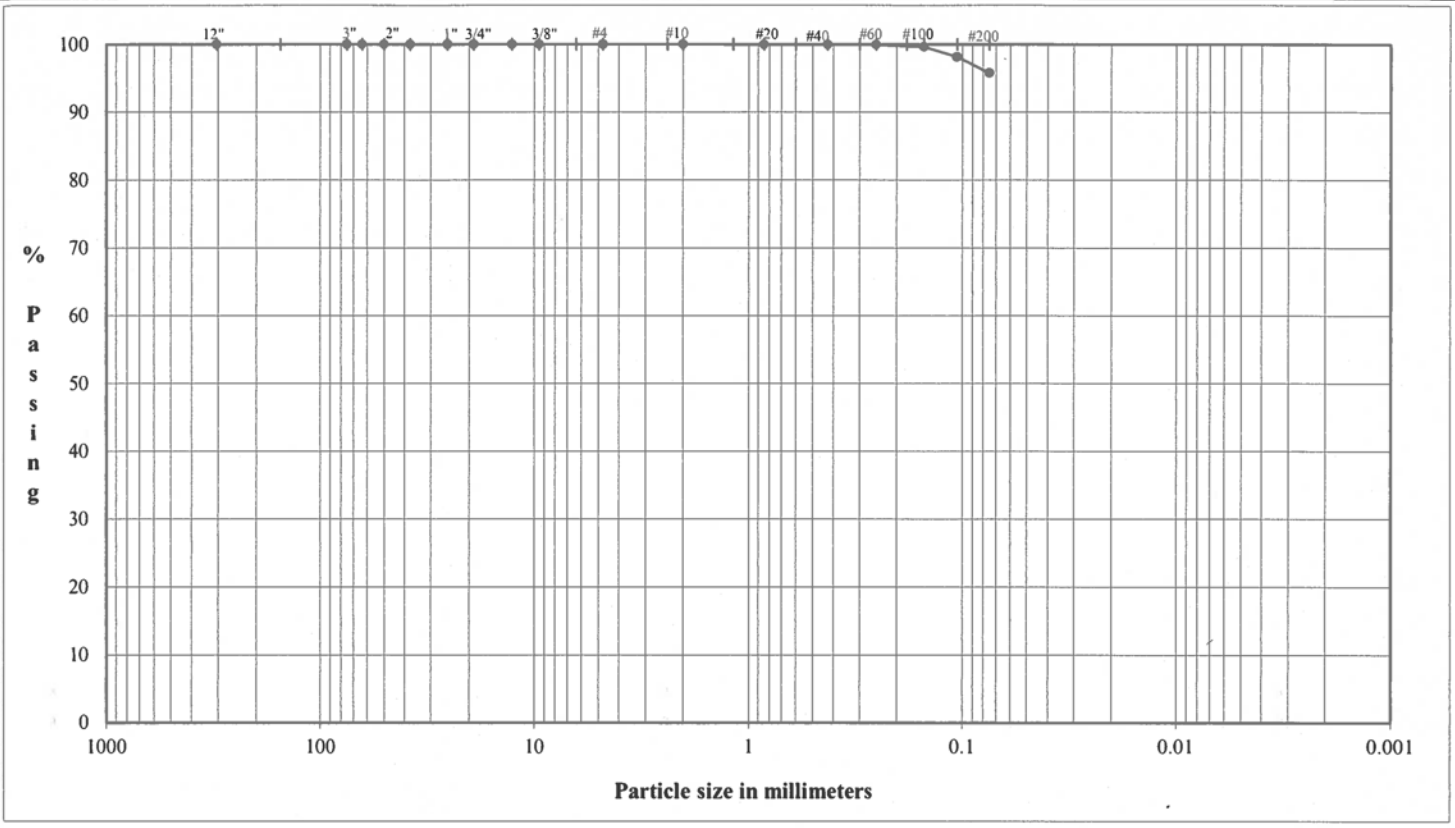
DATE	10/7/25
CHECK	DA
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SEPTEMBER 2025 US-0048676.8029

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D6913 & D4318

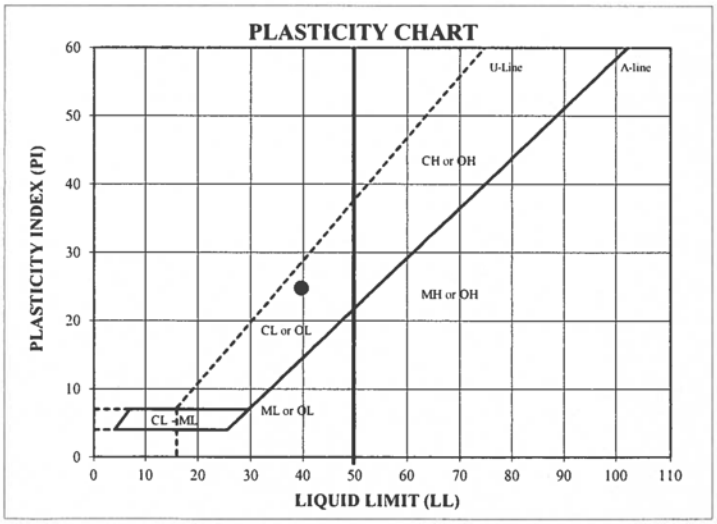
PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
SAMPLE ID: **C-7** Depth: -
TYPE: **Bulk**



COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.0	**100.0**	Coarse Sand	**0.0**
#20	0.85	**100.0**		
#40	0.43	**100.0**	Medium Sand	**0.0**
#60	0.25	**100.0**		
#100	0.15	**99.7**		
#140	0.11	**98.1**		
#200	0.08	**95.8**	Fine Sand	**4.2**
			Fines	**95.8**



ATTERBERG LIMITS
Method - B (Dry preparation)

M_c	LL	PL	PI	LI
20.7	**40**	**15**	**25**	**0.22**

DESCRIPTION: SILTY CLAY, trace sand; light gray.

USCS: CL

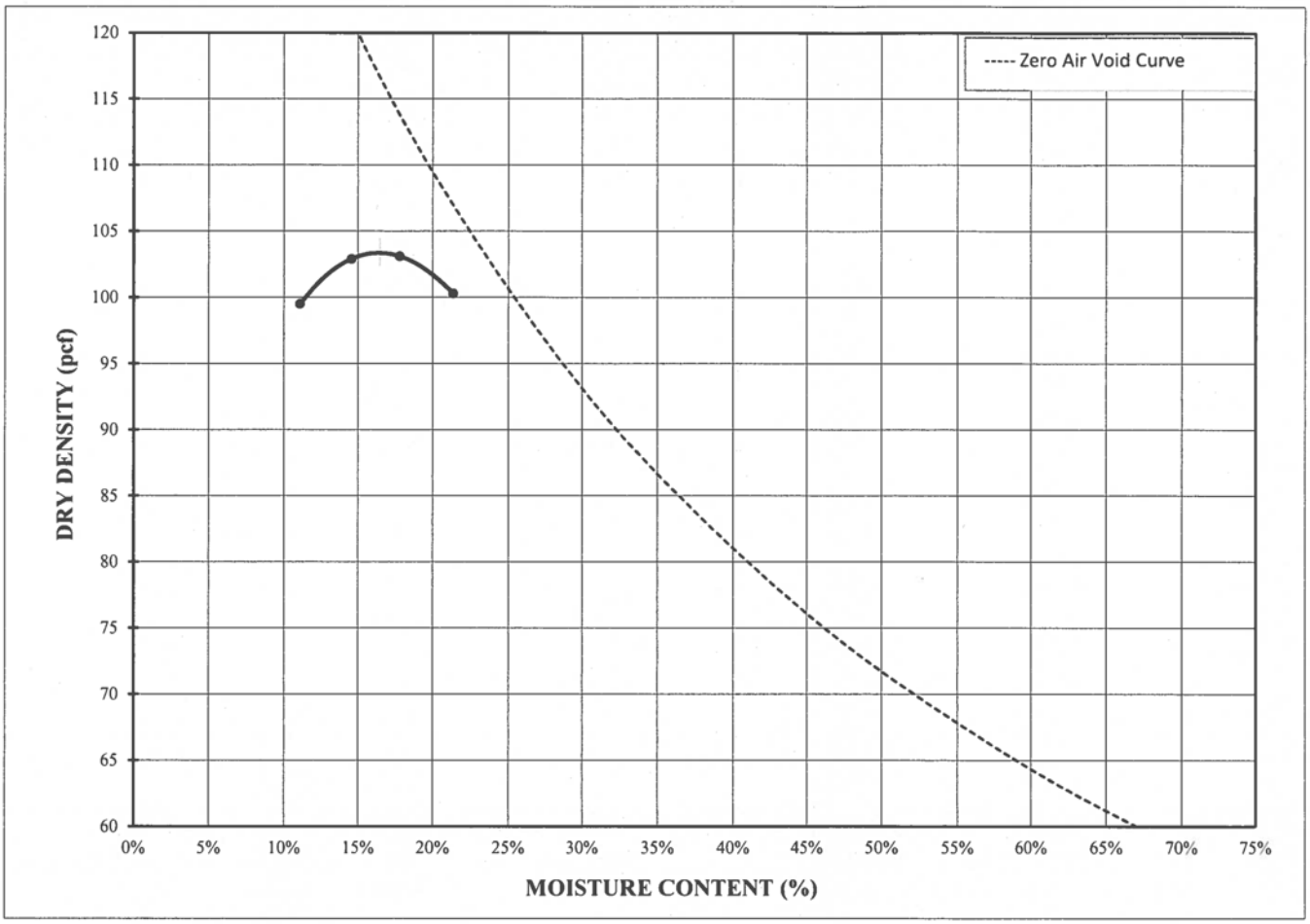
LL (oven-dried) / < 0.75 = ORGANIC (OL OH)

TECH	TB/JC/EK
DATE	9/8/25
CHECK	
REVIEW	
APPROVE	

MOISTURE / DRY DENSITY CURVE
ASTM D698 Method A

Mechanical	Standard	Dry Method

PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
PROJECT NUMBER: **US-0048676.8029**
SAMPLE ID: **C-7** DEPTH: **-** SAMPLE TYPE: **Bulk**



COMPACTION POINTS		
Specimen Number	Dry Density (pcf)	Moisture Content (%)
1	99.5	11.1%
2	102.9	14.6%
3	103.1	17.8%
4	100.3	21.3%

Maximum Dry Density (pcf)	**103.4**
Optimum Moisture (%)	**16.5**
Corrected Maximum Dry Density (pcf)	
Corrected Optimum Moisture (%)	
As-Received Moisture Content	**20.7%**
% Retained on # 4 sieve	
% Retained on 3/8" sieve	
% Retained on 3/4" sieve	
Specific Gravity (assumed)	**2.7**

DESCRIPTION SILTY CLAY, trace sand; light gray.

USCS CL

CHECK DA
REVIEW
APPROVE

FLEXIBLE WALL PERMEABILITY
ASTM D5084
METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	3	COMMENTS: The sample was remolded to 96.7% of the Maximum Dry Density and OPTM + 3.8% (using ASTM D698).
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	C-7	-	Flow Pump Speed	11	
SAMPLE TYPE	Bulk		Technician	DA	

Sample Data - Initial

Height (in)	2.963	B-Value, f	0.98
Diameter (in)	2.790	Cell Pres.	90.0
Area (cm^2)	39.44	Bot. Pres.	80.0
Volume (cm^3)	296.85	Top Pres.	80.0
Mass (g)	571.95	Tot. B.P.	80.0
Moisture Content (%)	20.3	Head, max.	116.06
Dry Density (pcf)	99.9	Head, min.	116.06
Spec. Gravity(assumed)	2.700	Max. Grad.	15.24
Volume Solids (cm^3)	176.04	Min. Grad.	15.24
Volume Voids (cm^3)	120.80		
Void Ratio	0.69		
Saturation (%)	80%		

Sample Data- Final

Height (in)	2.998
Diameter (in)	2.786
Area (cm^2)	39.33
Volume (cm^3)	299.49
Mass (g)	591.22
Moisture Content (%)	24.4
Dry Density (pcf)	99.0
Volume Solids (cm^3)	176.04
Volume Voids (cm^3)	123.45
Void Ratio	0.70
Saturation (%)	94%

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare - I	g	571.95	599.57
Wt Soil & Tare - F	g	475.32	483.70
Wt Tare	g	0.00	8.51
Wt Moisture Lost	g	96.63	115.87
Wt Dry Soil	g	475.32	475.19
Water Content	%	20.3%	24.4%

DESCRIPTION: SILTY CLAY, trace sand; light gray.

Flow Pump Rate: 1.11E-05 cm^3/sec

PERMEANT: Deaired Tap Water

USCS: CL

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
10/07/25	45937	12	50	20.4	0	0	0	0	1.65	116.06	15.24	1.8E-08	
10/07/25	45937	12	55	20.4	5	5	300	300	1.65	116.06	15.24	1.8E-08	
10/07/25	45937	13	0	20.4	5	10	300	600	1.65	116.06	15.24	1.8E-08	
10/07/25	45937	13	5	20.4	5	15	300	900	1.65	116.06	15.24	1.8E-08	*
10/07/25	45937	13	10	20.4	5	20	300	1200	1.65	116.06	15.24	1.8E-08	*
10/07/25	45937	13	15	20.4	5	25	300	1500	1.65	116.06	15.24	1.8E-08	*
10/07/25	45937	13	20	20.4	5	30	300	1800	1.65	116.06	15.24	1.8E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 1.8E-08 cm/sec **

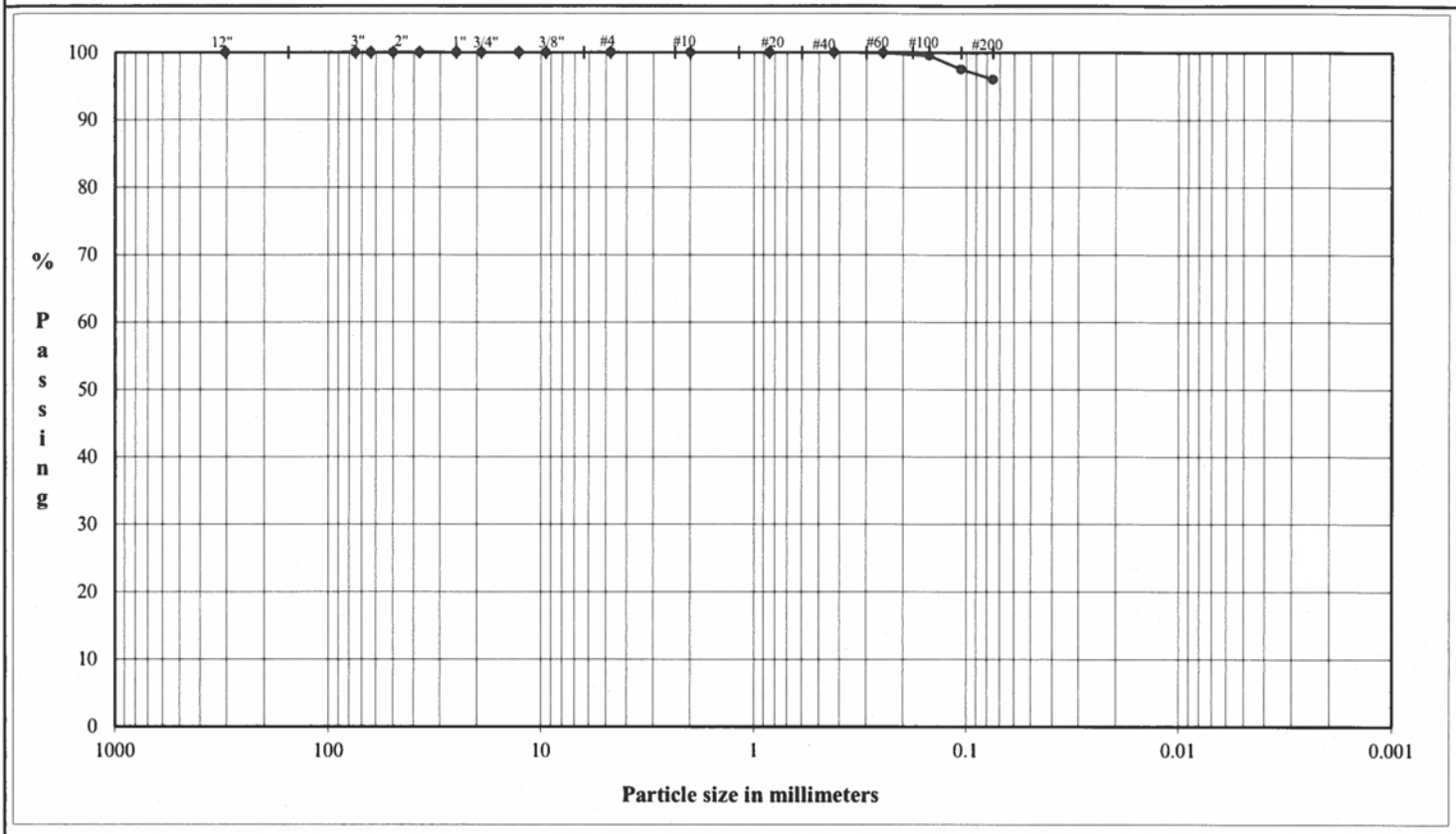
DATE	10/7/25
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REVIEW	
APPROVE	

SEPTEMBER 2025 US-0048676.8029

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D6913 & D4318

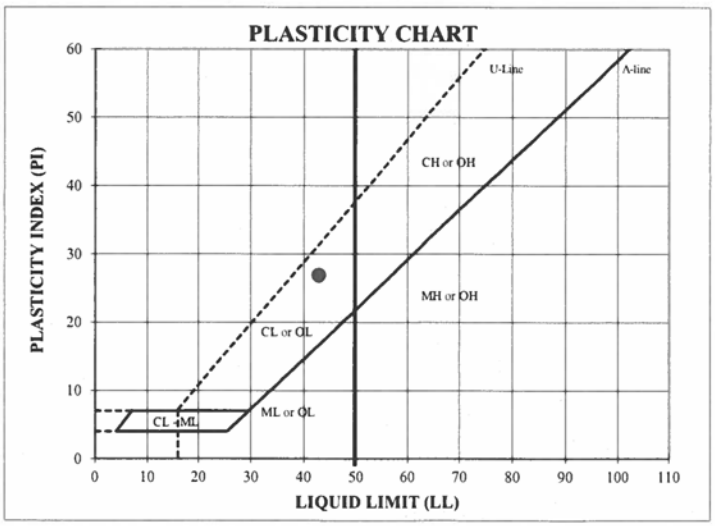
PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
SAMPLE ID: **C-8** Depth: -
TYPE: **Bulk**



COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Particle Size Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.0	**100.0**	Coarse Sand	**0.0**
#20	0.85	**100.0**		
#40	0.43	**100.0**	Medium Sand	**0.0**
#60	0.25	**100.0**		
#100	0.15	**99.6**		
#140	0.11	**97.5**		
#200	0.08	**96.0**	Fine Sand	**4.0**
			Fines	**96.0**



ATTERBERG LIMITS

Method - B (Dry preparation)

M_c	LL	PL	PI	LI
22.6	**43**	**16**	**27**	**0.26**

DESCRIPTION: SILTY CLAY, trace sand; gray.

USCS: CL

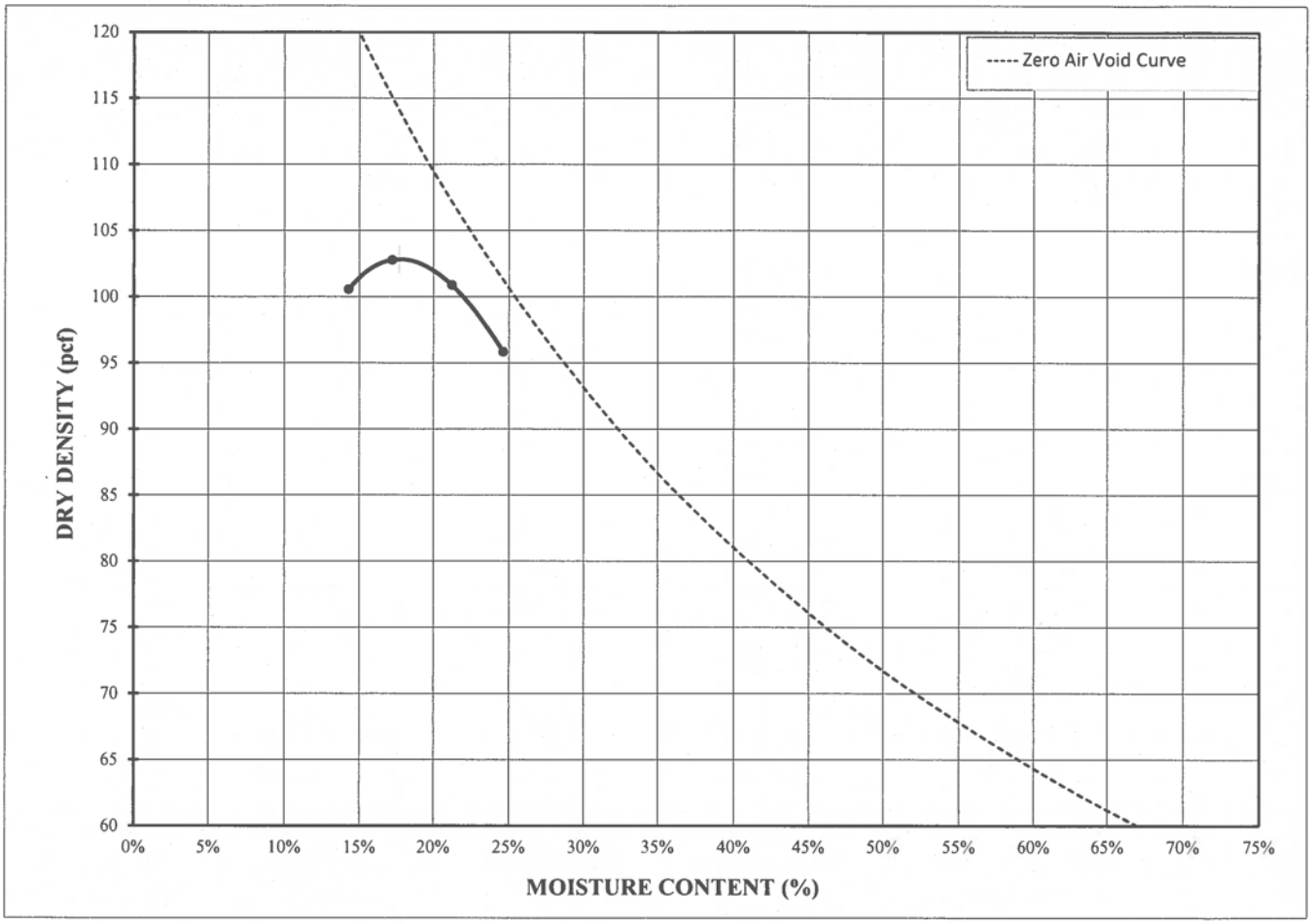
LL (oven-dried) / < 0.75 = ORGANIC (OL OH)

TECH	TB/JC/EK
DATE	9/8/25
CHECK	
REVIEW	
APPROVE	

MOISTURE / DRY DENSITY CURVE
ASTM D698 Method A

Mechanical	Standard	Dry Method

PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
PROJECT NUMBER: **US-0048676.8029**
SAMPLE ID: **C-8** DEPTH: **-** SAMPLE TYPE: **Bulk**



COMPACTION POINTS		
Specimen Number	Dry Density (pcf)	Moisture Content (%)
1	100.5	14.3%
2	102.8	17.2%
3	100.9	21.2%
4	95.8	24.6%

Maximum Dry Density (pcf)	**102.8**
Optimum Moisture (%)	**17.7**
Corrected Maximum Dry Density (pcf)	
Corrected Optimum Moisture (%)	
As-Received Moisture Content	**22.6%**
% Retained on # 4 sieve	
% Retained on 3/8" sieve	
% Retained on 3/4" sieve	
Specific Gravity (assumed)	**2.7**

DESCRIPTION SILTY CLAY, trace sand; gray.

USCS CL

CHECK DA
REVIEW
APPROVE

FLEXIBLE WALL PERMEABILITY
ASTM D5084
METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	4	COMMENTS: The sample was remolded to 96.1% of the Maximum Dry Density and OPTM + 4.4% (using ASTM D698).
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	C-8	-	Flow Pump Speed	10	
SAMPLE TYPE	Bulk		Technician	DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.975	B-Value, f	1.00	Height (in)	3.001
Diameter (in)	2.790	Cell Pres.	90.0	Diameter (in)	2.797
Area (cm²)	39.44	Bot. Pres.	80.0	Area (cm²)	39.64
Volume (cm³)	298.05	Top Pres.	80.0	Volume (cm³)	302.16
Mass (g)	575.64	Tot. B.P.	80.0	Mass (g)	591.26
Moisture Content (%)	22.1	Head, max.	75.97	Moisture Content (%)	25.4
Dry Density (pcf)	98.7	Head, min.	75.97	Dry Density (pcf)	97.4
Spec. Gravity(assumed)	2.700	Max. Grad.	9.97	Volume Solids (cm³)	174.66
Volume Solids (cm³)	174.66	Min. Grad.	9.97	Volume Voids (cm³)	127.50
Volume Voids (cm³)	123.39			Void Ratio	0.73
Void Ratio	0.71			Saturation (%)	94%
Saturation (%)	84%				

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare - I	g	575.64	599.55
Wt Soil & Tare - F	g	471.59	479.92
Wt Tare	g	0.00	8.51
Wt Moisture Lost	g	104.05	119.63
Wt Dry Soil	g	471.59	471.41
Water Content	%	22.1%	25.4%

DESCRIPTION: SILTY CLAY, trace sand; gray.

Flow Pump Rate: 2.19E-05 cm³/sec

PERMEANT: Deaired Tap Water

USCS: CL

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
10/07/25	45937	14	50	20.4	0	0	0	0	1.08	75.97	9.97	5.5E-08
10/07/25	45937	14	55	20.4	5	5	300	300	1.08	75.97	9.97	5.5E-08
10/07/25	45937	15	0	20.4	5	10	300	600	1.08	75.97	9.97	5.5E-08
10/07/25	45937	15	5	20.4	5	15	300	900	1.08	75.97	9.97	5.5E-08 *
10/07/25	45937	15	10	20.4	5	20	300	1200	1.08	75.97	9.97	5.5E-08 *
10/07/25	45937	15	15	20.4	5	25	300	1500	1.08	75.97	9.97	5.5E-08 *
10/07/25	45937	15	20	20.4	5	30	300	1800	1.08	75.97	9.97	5.5E-08 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 5.5E-08 cm/sec **

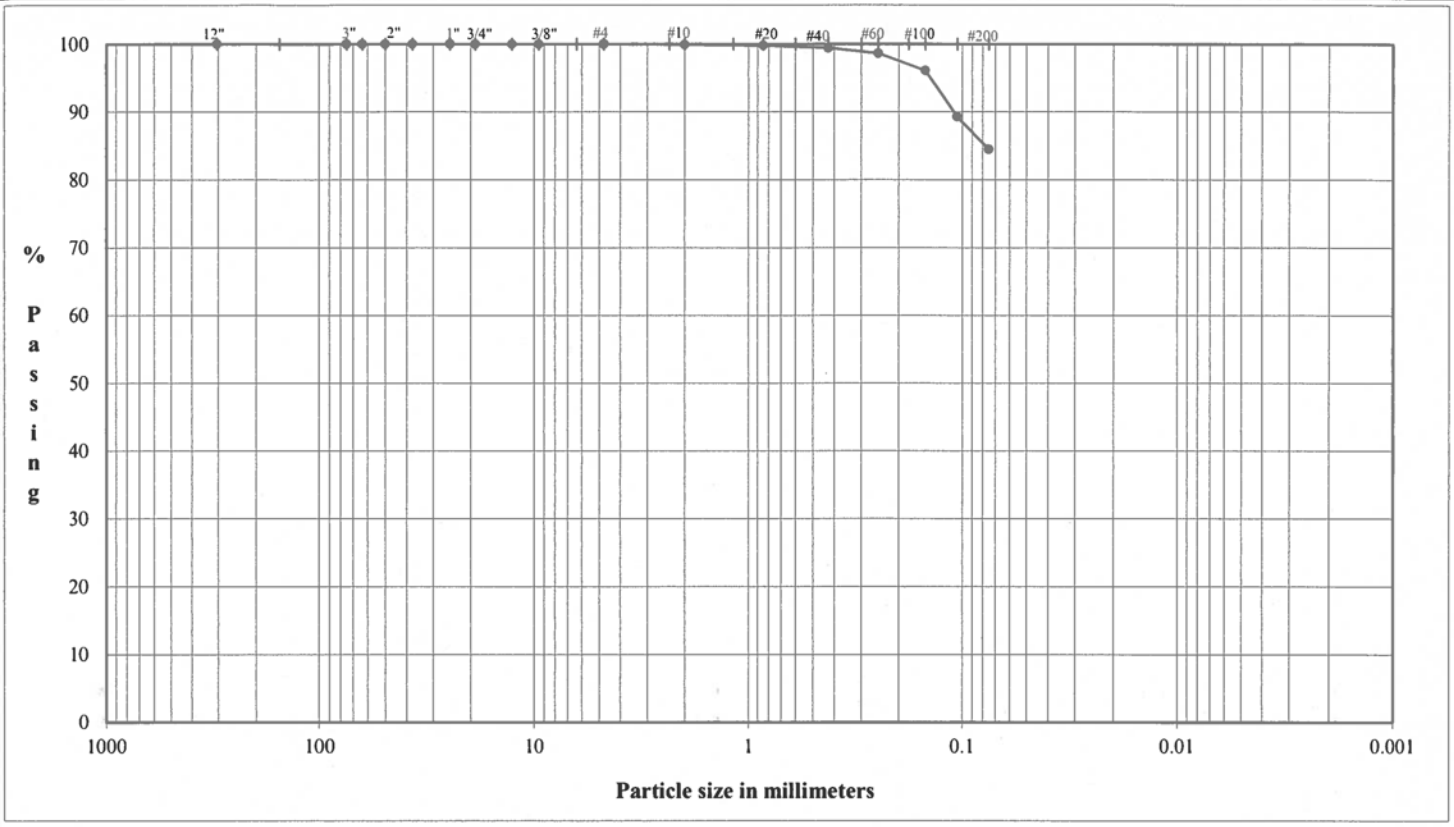
DATE	10/7/25
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REVIEW	
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SEPTEMBER 2025 US-0048676.8029

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D6913 & D4318

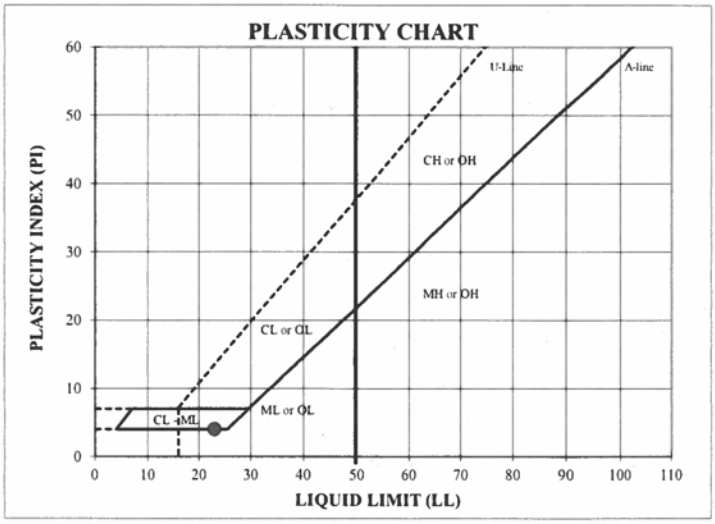
PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
SAMPLE ID: **C-9** Depth: -
TYPE: **Bulk**



COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Particle Size Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.0	**99.9**	Coarse Sand	**0.1**
#20	0.85	**99.9**		
#40	0.43	**99.4**	Medium Sand	**0.5**
#60	0.25	**98.6**		
#100	0.15	**96.1**		
#140	0.11	**89.3**		
#200	0.08	**84.5**	Fine Sand	**14.9**
			Fines	**84.5**



ATTERBERG LIMITS
Method - B (Dry preparation)

M_c	LL	PL	PI	LI
13.0	**23**	**19**	**4**	**-1.60**

DESCRIPTION: sandy SILTY CLAY to CLAYEY SILT; light brownish gray.

USCS: CL-ML

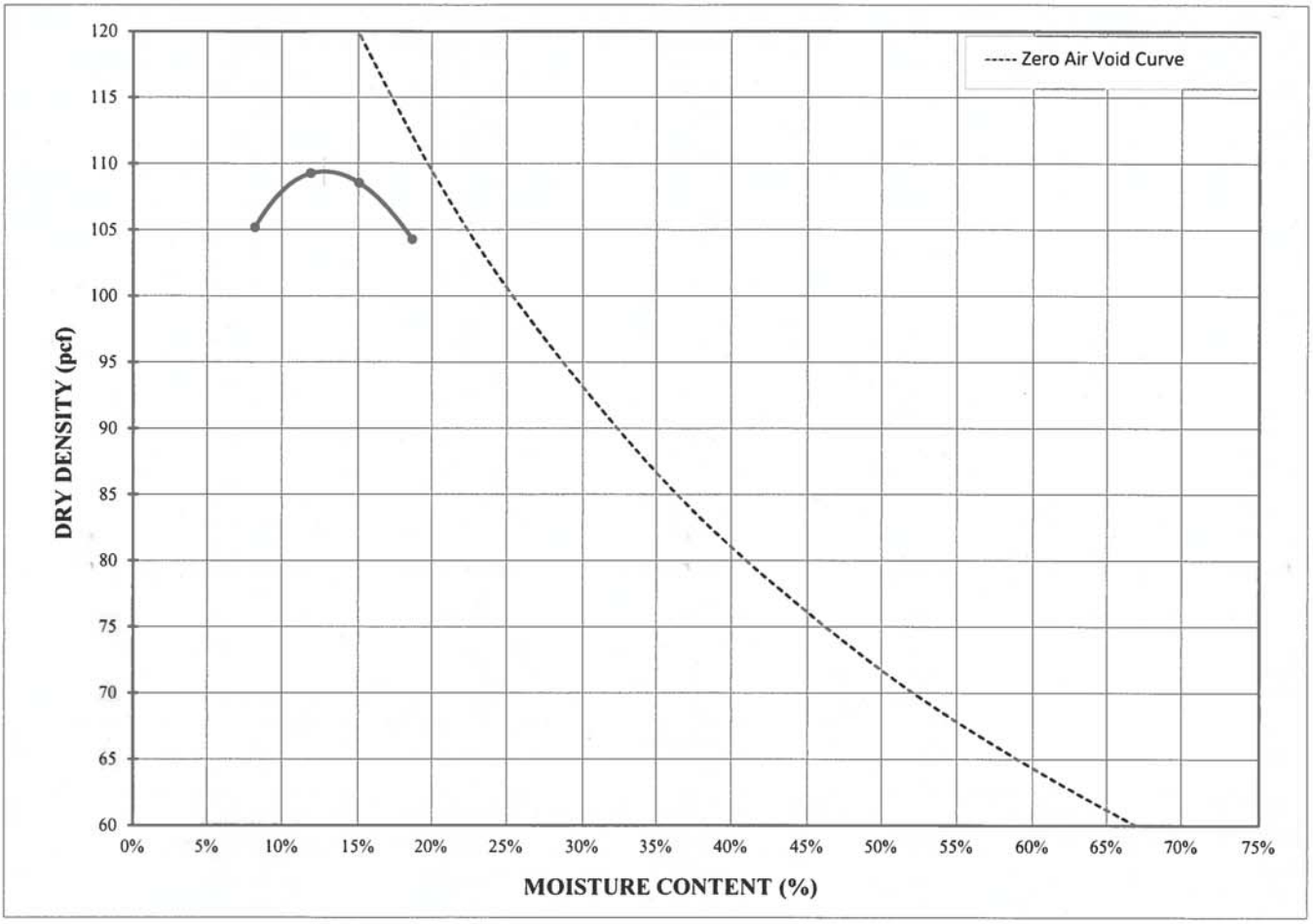
LL (oven-dried) / < 0.75 = ORGANIC (OL OH)

TECH	JC/EK
DATE	9/8/25
CHECK	
REVIEW	
APPROVE	

MOISTURE / DRY DENSITY CURVE
ASTM D698 Method A

Mechanical	Standard	Dry Method

PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
PROJECT NUMBER: **US-0048676.8029**
SAMPLE ID: **C-9** DEPTH: **-** SAMPLE TYPE: **Bulk**



COMPACTION POINTS		
Specimen Number	Dry Density (pcf)	Moisture Content (%)
1	105.2	8.2%
2	109.2	11.9%
3	108.5	15.1%
4	104.3	18.7%

Maximum Dry Density (pcf)	**109.4**
Optimum Moisture (%)	**12.8**
Corrected Maximum Dry Density (pcf)	
Corrected Optimum Moisture (%)	
As-Received Moisture Content	**13.0%**
% Retained on # 4 sieve	
% Retained on 3/8" sieve	
% Retained on 3/4" sieve	
Specific Gravity (assumed)	**2.7**

DESCRIPTION sandy SILTY CLAY to CLAYEY SILT; light brownish gray.

USCS CL-ML

CHECK DA
REVIEW
APPROVE

FLEXIBLE WALL PERMEABILITY
ASTM D5084
METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	5	COMMENTS: The sample was remolded to 95.8% of the Maximum Dry Density and OPTM + 4.6% (using ASTM D698).
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	C-9	-	Flow Pump Speed	10	
SAMPLE TYPE	Bulk		Technician	DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.975	B-Value, f	1.00	Height (in)	2.954
Diameter (in)	2.790	Cell Pres.	90.0	Diameter (in)	2.771
Area (cm²)	39.44	Bot. Pres.	80.0	Area (cm²)	38.91
Volume (cm^3)	298.05	Top Pres.	80.0	Volume (cm^3)	291.93
Mass (g)	587.62	Tot. B.P.	80.0	Mass (g)	602.75
Moisture Content (%)	17.4	Head, max.	105.51	Moisture Content (%)	20.5
Dry Density (pcf)	104.8	Head, min.	105.51	Dry Density (pcf)	106.9
Spec. Gravity(assumed)	2.700	Max. Grad.	14.06	Volume Solids (cm^3)	185.31
Volume Solids (cm^3)	185.31	Min. Grad.	14.06	Volume Voids (cm^3)	106.62
Volume Voids (cm^3)	112.74			Void Ratio	0.58
Void Ratio	0.61			Saturation (%)	96%
Saturation (%)	77%				

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare - I	g	587.62	610.79
Wt Soil & Tare - F	g	500.34	508.45
Wt Tare	g	0.00	8.45
Wt Moisture Lost	g	87.28	102.34
Wt Dry Soil	g	500.34	500.00
Water Content	%	17.4%	20.5%

DESCRIPTION: sandy SILTY CLAY to CLAYEY SILT; light brownish gray.

Flow Pump Rate: 2.19E-05 cm^3/sec

PERMEANT: Deaired Tap Water

USCS: CL-ML

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
10/07/25	45937	13	55	20.4	0	0	0	0	1.50	105.51	14.06	4.0E-08
10/07/25	45937	14	0	20.4	5	5	300	300	1.50	105.51	14.06	4.0E-08
10/07/25	45937	14	5	20.4	5	10	300	600	1.50	105.51	14.06	4.0E-08
10/07/25	45937	14	10	20.4	5	15	300	900	1.50	105.51	14.06	4.0E-08 *
10/07/25	45937	14	15	20.4	5	20	300	1200	1.50	105.51	14.06	4.0E-08 *
10/07/25	45937	14	20	20.4	5	25	300	1500	1.50	105.51	14.06	4.0E-08 *
10/07/25	45937	14	25	20.4	5	30	300	1800	1.50	105.51	14.06	4.0E-08 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 4.0E-08 cm/sec **

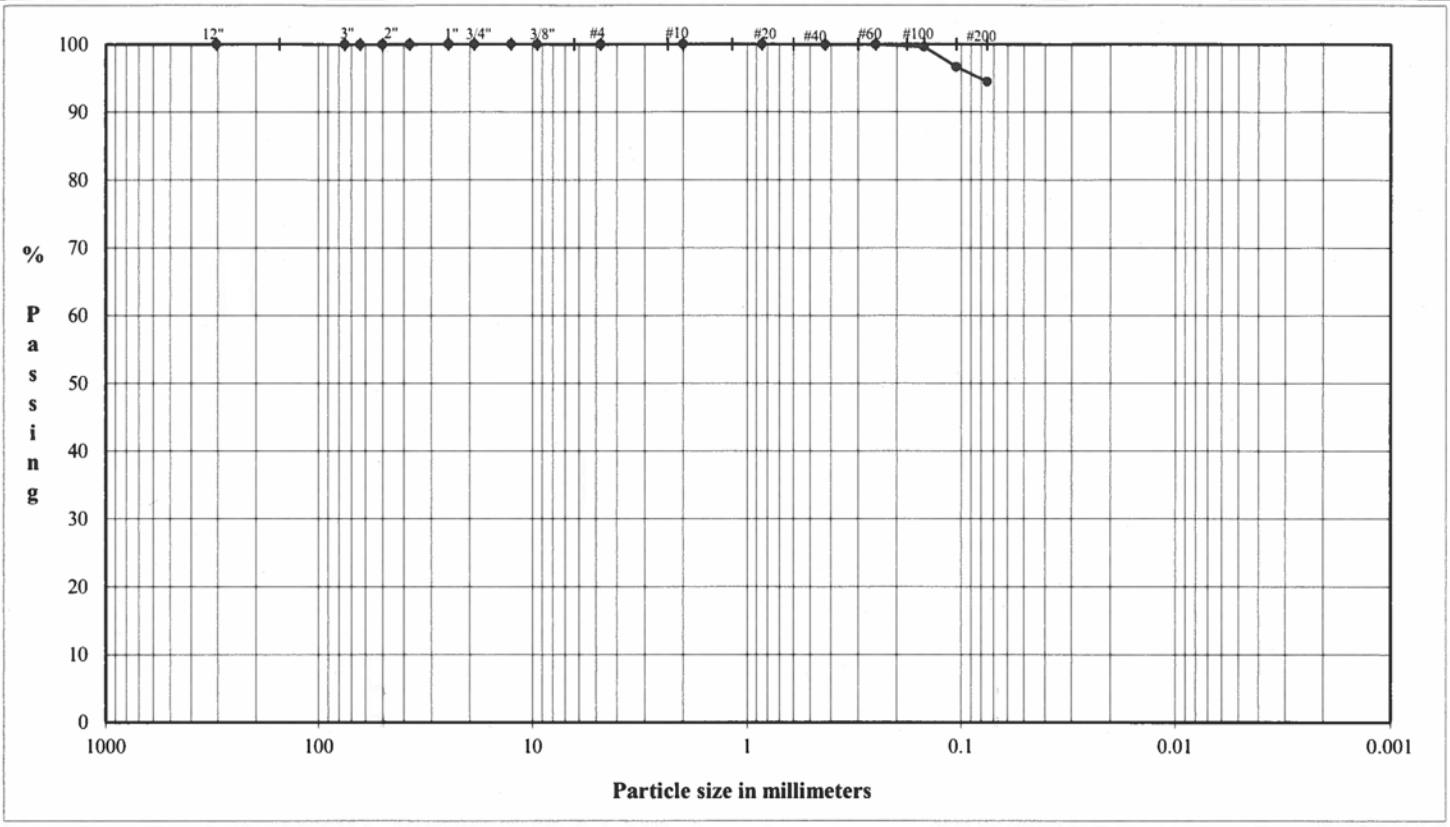
DATE	10/7/25
CHECK	DA
REVIEW	
APPROVE	

SEPTEMBER 2025 US-0048676.8029

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D6913 & D4318

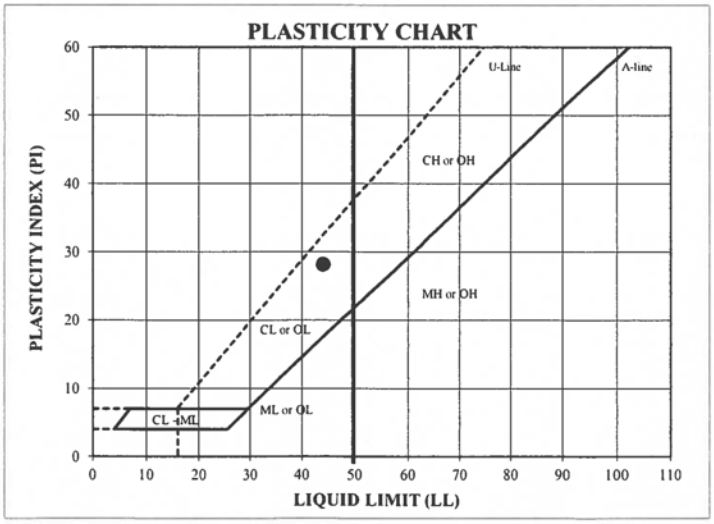
PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
SAMPLE ID: **C-10** Depth: -
TYPE: **Bulk**



COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**100.0**		
1.0"	25.0	**100.0**		
0.75"	19.0	**100.0**	Coarse Gravel	**0.0**
0.50"	12.7	**100.0**		
0.375"	9.5	**100.0**		
#4	4.8	**100.0**	Fine Gravel	**0.0**
#10	2.0	**100.0**	Coarse Sand	**0.0**
#20	0.85	**100.0**		
#40	0.43	**100.0**	Medium Sand	**0.0**
#60	0.25	**99.9**		
#100	0.15	**99.6**		
#140	0.11	**96.7**		
#200	0.08	**94.5**	Fine Sand	**5.5**
			Fines	**94.5**



ATTERBERG LIMITS
Method - B (Dry preparation)

M_c	LL	PL	PI	LI
19.6	**44**	**16**	**28**	**0.11**

DESCRIPTION: SILTY CLAY, some sand; gray.

USCS: CL

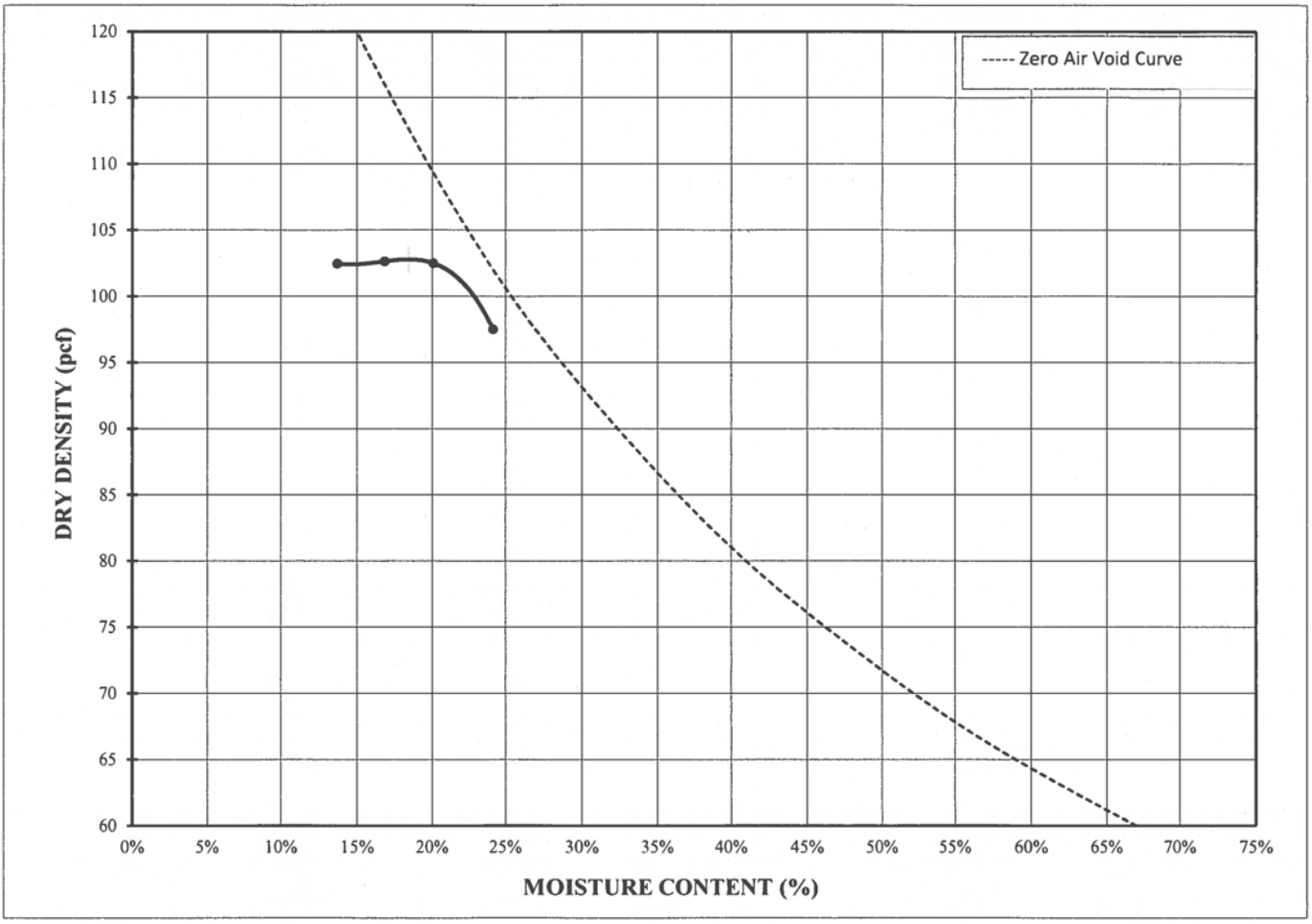
LL (oven-dried) / < 0.75 = ORGANIC (OL OH)

TECH	JC/EK
DATE	9/8/25
CHECK	
REVIEW	
APPROVE	

MOISTURE / DRY DENSITY CURVE
ASTM D698 Method A

Mechanical	Standard	Dry Method

PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
PROJECT NUMBER: **US-0048676.8029**
SAMPLE ID: **C-10** DEPTH: **-** SAMPLE TYPE: **Bulk**



COMPACTION POINTS		
Specimen Number	Dry Density (pcf)	Moisture Content (%)
1	102.5	13.8%
2	102.6	16.8%
3	102.5	20.1%
4	97.5	24.2%

Maximum Dry Density (pcf)	**102.8**
Optimum Moisture (%)	**18.4**
Corrected Maximum Dry Density (pcf)	
Corrected Optimum Moisture (%)	
As-Received Moisture Content	**19.6%**
% Retained on # 4 sieve	
% Retained on 3/8" sieve	
% Retained on 3/4" sieve	
Specific Gravity (assumed)	**2.7**

DESCRIPTION SILTY CLAY, some sand; gray.

USCS CL

CHECK DA
REVIEW
APPROVE

FLEXIBLE WALL PERMEABILITY
ASTM D5084
METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	12	COMMENTS: The sample was remolded to 96.2% of the Maximum Dry Density and OPTM + 4.5% (using ASTM D698).
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	C-10	-	Flow Pump Speed	11	
SAMPLE TYPE	Bulk		Technician	DA	

Sample Data - Initial

Height (in)	2.979	B-Value, f	0.99
Diameter (in)	2.790	Cell Pres.	90.0
Area (cm²)	39.44	Bot. Pres.	80.0
Volume (cm^3)	298.45	Top Pres.	80.0
Mass (g)	581.25	Tot. B.P.	80.0
Moisture Content (%)	22.9	Head, max.	166.71
Dry Density (pcf)	98.9	Head, min.	166.71
Spec. Gravity(assumed)	2.700	Max. Grad.	21.94
Volume Solids (cm^3)	175.13	Min. Grad.	21.94
Volume Voids (cm^3)	123.32		
Void Ratio	0.70		
Saturation (%)	88%		

Sample Data- Final

Height (in)	2.991
Diameter (in)	2.777
Area (cm²)	39.08
Volume (cm^3)	296.87
Mass (g)	590.14
Moisture Content (%)	24.8
Dry Density (pcf)	99.4
Volume Solids (cm^3)	175.13
Volume Voids (cm^3)	121.74
Void Ratio	0.70
Saturation (%)	96%

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare - I	g	581.25	598.34
Wt Soil & Tare - F	g	472.85	481.09
Wt Tare	g	0.00	8.40
Wt Moisture Lost	g	108.40	117.25
Wt Dry Soil	g	472.85	472.69
Water Content	%	22.9%	24.8%

DESCRIPTION: SILTY CLAY, some sand; gray.

Flow Pump Rate: 1.11E-05 cm^3/sec

PERMEANT: Deaired Tap Water

USCS: CL

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
10/08/25	45938	8	50	20.3	0	0	0	0	2.37	166.71	21.94	1.3E-08
10/08/25	45938	8	55	20.3	5	5	300	300	2.37	166.71	21.94	1.3E-08
10/08/25	45938	9	0	20.3	5	10	300	600	2.37	166.71	21.94	1.3E-08
10/08/25	45938	9	5	20.3	5	15	300	900	2.37	166.71	21.94	1.3E-08 *
10/08/25	45938	9	10	20.3	5	20	300	1200	2.37	166.71	21.94	1.3E-08 *
10/08/25	45938	9	15	20.3	5	25	300	1500	2.37	166.71	21.94	1.3E-08 *
10/08/25	45938	9	20	20.3	5	30	300	1800	2.37	166.71	21.94	1.3E-08 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 1.3E-08 cm/sec **

DATE	10/8/25
CHECK	
REVIEW	
APPROVE	

APPENDIX H
CLAY LINER – FIELD TESTING RESULTS

NUCLEAR DENSITY AND MOISTURE TEST SUMMARY

Project Name: **CCSWDA Legacy LF Cell 5**

Project Location: **Jonesboro, AR**

Olsson Project Number: **025-04399**

Description of Area Tested and General Remarks: **Clay Liner - Lift 1**

Proctor Number		Maximum Dry Density (pcf)	OMC (%)
PCL-2	1	106.2	16.8
PCL-3	2	103.8	18.2
C-3	3	102.8	17.1
C-7	4	103.4	16.5
C-8	5	102.8	17.7
C-10	6	102.8	18.4

Test Number	Date Tested	Test Location	Proctor Number	Depth Tested	Dry Density (pcf)		Compaction (%)		Water Content (%)			Pass or Fail	Olsson QC Rep
					Field	Max.	Field	Req'd	Field	OMC	Req'd		
D-1-1	9/5/25	See Drawing	1	6"	101.0	106.2	95.1%	95.0%	18.4	16.8	> OMC	P	JM
D-1-2	9/5/25	See Drawing	1	6"	104.3	106.2	98.2%	95.0%	18.0	16.8	> OMC	P	JM
D-1-3	9/5/25	See Drawing	3	6"	98.8	102.8	96.1%	95.0%	18.7	17.1	> OMC	P	JM
D-1-4	9/5/25	See Drawing	5	6"	98.5	102.8	95.8%	95.0%	23.4	17.7	> OMC	P	JM
D-1-5	9/5/25	See Drawing	5	6"	102.6	102.8	99.8%	95.0%	22.9	17.7	> OMC	P	JM
D-1-6	9/5/25	See Drawing	2	6"	100.8	103.8	97.1%	95.0%	19.2	18.2	> OMC	P	JM
D-1-7	9/5/25	See Drawing	1	6"	106.4	106.2	100.2%	95.0%	18.9	16.8	> OMC	P	JM
D-1-8	9/5/25	See Drawing	1	6"	104.9	106.2	98.8%	95.0%	20.1	16.8	> OMC	P	JM
D-1-9	9/5/25	See Drawing	1	6"	106.3	106.2	100.1%	95.0%	18.2	16.8	> OMC	P	JM
D-1-10	9/5/25	See Drawing	1	6"	107.4	106.2	101.1%	95.0%	19.1	16.8	> OMC	P	JM
D-1-11	9/5/25	See Drawing	3	6"	100.0	102.8	97.3%	95.0%	18.7	17.1	> OMC	P	JM
D-1-12	9/5/25	See Drawing	1	6"	106.6	106.2	100.4%	95.0%	17.9	16.8	> OMC	P	JM
D-1-13	9/5/25	See Drawing	3	6"	99.3	102.8	96.6%	95.0%	18.9	17.1	> OMC	P	JM
D-1-14	9/5/25	See Drawing	4	6"	102.8	103.4	99.4%	95.0%	18.0	16.5	> OMC	P	JM
D-1-15	9/5/25	See Drawing	1	6"	103.1	106.2	97.1%	95.0%	19.2	16.8	> OMC	P	JM
D-1-16	9/5/25	See Drawing	3	6"	99.6	102.8	96.9%	95.0%	18.2	17.1	> OMC	P	JM
D-1-17	9/5/25	See Drawing	5	6"	98.6	102.8	95.9%	95.0%	23.7	17.7	> OMC	P	JM
D-1-18	9/5/25	See Drawing	1	6"	102.8	106.2	96.8%	95.0%	19.1	16.8	> OMC	P	JM
D-1-19	9/5/25	See Drawing	4	6"	100.7	103.4	97.4%	95.0%	18.0	16.5	> OMC	P	JM
D-1-20	9/5/25	See Drawing	1	6"	106.2	106.2	100.0%	95.0%	20.3	16.8	> OMC	P	JM
D-1-21	9/5/25	See Drawing	4	6"	102.2	103.4	98.8%	95.0%	17.9	16.5	> OMC	P	JM
D-1-22	9/5/25	See Drawing	4	6"	101.3	103.4	98.0%	95.0%	18.0	16.5	> OMC	P	JM
D-1-23	9/5/25	See Drawing	4	6"	102.1	103.4	98.7%	95.0%	18.7	16.5	> OMC	P	JM
D-1-24	9/5/25	See Drawing	5	6"	98.8	102.8	96.1%	95.0%	23.0	17.7	> OMC	P	JM
D-1-25	9/5/25	See Drawing	4	6"	102.6	103.4	99.2%	95.0%	19.6	16.5	> OMC	P	JM
D-1-26	9/5/25	See Drawing	1	6"	104.5	106.2	98.4%	95.0%	18.2	16.8	> OMC	P	JM
D-1-27	9/5/25	See Drawing	1	6"	105.1	106.2	99.0%	95.0%	18.8	16.8	> OMC	P	JM
D-1-28	9/5/25	See Drawing	1	6"	103.5	106.2	97.5%	95.0%	20.9	16.8	> OMC	P	JM
D-1-29	9/5/25	See Drawing	4	6"	102.4	103.4	99.0%	95.0%	18.2	16.5	> OMC	P	JM
D-1-30	9/5/25	See Drawing	1	6"	104.8	106.2	98.7%	95.0%	19.6	16.8	> OMC	P	JM

NUCLEAR DENSITY AND MOISTURE TEST SUMMARY

Project Name: **CCSWDA Legacy LF Cell 5**

Project Location: **Jonesboro, AR**

Olsson Project Number: **025-04399**

Description of Area Tested and General Remarks: **Clay Liner - Lift 1**

Proctor Number		Maximum Dry Density (pcf)	OMC (%)
PCL-2	1	106.2	16.8
PCL-3	2	103.8	18.2
C-3	3	102.8	17.1
C-7	4	103.4	16.5
C-8	5	102.8	17.7
C-10	6	102.8	18.4

Test Number	Date Tested	Test Location	Proctor Number	Depth Tested	Dry Density (pcf)		Compaction (%)		Water Content (%)			Pass or Fail	Olsson QC Rep
					Field	Max.	Field	Req'd	Field	OMC	Req'd		
D-1-31	9/8/25	See Drawing	3	6"	102.4	102.8	99.6%	95.0%	24.7	17.1	> OMC	P	JM
D-1-32	9/8/25	See Drawing	5	6"	99.6	102.8	96.9%	95.0%	21.0	17.7	> OMC	P	JM
D-1-33	9/8/25	See Drawing	5	6"	100.5	102.8	97.8%	95.0%	18.4	17.7	> OMC	P	JM
D-1-34	9/8/25	See Drawing	4	6"	102.9	103.4	99.5%	95.0%	21.8	16.5	> OMC	P	JM
D-1-35	9/8/25	See Drawing	5	6"	101.4	102.8	98.6%	95.0%	20.5	17.7	> OMC	P	JM
D-1-36	9/8/25	See Drawing	1	6"	105.0	106.2	98.9%	95.0%	17.9	16.8	> OMC	P	JM
D-1-37	9/8/25	See Drawing	1	6"	107.0	106.2	100.8%	95.0%	17.9	16.8	> OMC	P	JM
D-1-38	9/8/25	See Drawing	5	6"	100.6	102.8	97.9%	95.0%	20.3	17.7	> OMC	P	JM
D-1-39	9/8/25	See Drawing	5	6"	102.3	102.8	99.5%	95.0%	17.9	17.7	> OMC	P	JM
D-1-40	9/8/25	See Drawing	1	6"	105.3	106.2	99.2%	95.0%	17.9	16.8	> OMC	P	JM
D-1-41	9/8/25	See Drawing	5	6"	101.4	102.8	98.6%	95.0%	19.0	17.7	> OMC	P	JM
D-1-42	9/8/25	See Drawing	3	6"	98.4	102.8	95.7%	95.0%	21.0	17.1	> OMC	P	JM
D-1-43	9/8/25	See Drawing	1	6"	108.5	106.2	102.2%	95.0%	18.1	16.8	> OMC	P	JM
D-1-44	9/8/25	See Drawing	1	6"	106.7	106.2	100.5%	95.0%	17.9	16.8	> OMC	P	JM
D-1-45	9/8/25	See Drawing	1	6"	105.1	106.2	99.0%	95.0%	19.7	16.8	> OMC	P	JM
D-1-46	9/8/25	See Drawing	3	6"	99.3	102.8	96.6%	95.0%	22.9	17.1	> OMC	P	JM
D-1-47	9/8/25	See Drawing	5	6"	101.8	102.8	99.0%	95.0%	21.3	17.7	> OMC	P	JM
D-1-48	9/8/25	See Drawing	5	6"	100.4	102.8	97.7%	95.0%	20.0	17.7	> OMC	P	JM
D-1-49	9/8/25	See Drawing	3	6"	100.1	102.8	97.4%	95.0%	23.8	17.1	> OMC	P	JM
D-1-50	9/8/25	See Drawing	3	6"	99.1	102.8	96.4%	95.0%	20.1	17.1	> OMC	P	JM
D-1-51	9/8/25	See Drawing	5	6"	100.6	102.8	97.9%	95.0%	19.7	17.7	> OMC	P	JM
D-1-52	9/8/25	See Drawing	4	6"	102.9	103.4	99.5%	95.0%	17.9	16.5	> OMC	P	JM
D-1-53	9/8/25	See Drawing	4	6"	100.7	103.4	97.4%	95.0%	18.7	16.5	> OMC	P	JM
D-1-54	9/8/25	See Drawing	1	6"	102.4	106.2	96.4%	95.0%	18.8	16.8	> OMC	P	JM
D-1-55	9/8/25	See Drawing	5	6"	99.2	102.8	96.5%	95.0%	23.0	17.7	> OMC	P	JM
D-1-56	9/8/25	See Drawing	1	6"	105.6	106.2	99.4%	95.0%	18.3	16.8	> OMC	P	JM
D-1-57	9/8/25	See Drawing	3	6"	99.7	102.8	97.0%	95.0%	17.9	17.1	> OMC	P	JM
D-1-58	9/8/25	See Drawing	3	6"	98.5	102.8	95.8%	95.0%	18.8	17.1	> OMC	P	JM
D-1-59	9/8/25	See Drawing	1	6"	106.9	106.2	100.7%	95.0%	17.9	16.8	> OMC	P	JM
D-1-60	9/8/25	See Drawing	5	6"	99.6	102.8	96.9%	95.0%	19.0	17.7	> OMC	P	JM

NUCLEAR DENSITY AND MOISTURE TEST SUMMARY

Project Name: **CCSWDA Legacy LF Cell 5**

Project Location: **Jonesboro, AR**

Olsson Project Number: **025-04399**

Description of Area Tested and General Remarks: **Clay Liner - Lift 1**

Proctor Number		Maximum Dry Density (pcf)	OMC (%)
PCL-2	1	106.2	16.8
PCL-3	2	103.8	18.2
C-3	3	102.8	17.1
C-7	4	103.4	16.5
C-8	5	102.8	17.7
C-10	6	102.8	18.4

Test Number	Date Tested	Test Location	Proctor Number	Depth Tested	Dry Density (pcf)		Compaction (%)		Water Content (%)			Pass or Fail	Olsson QC Rep
					Field	Max.	Field	Req'd	Field	OMC	Req'd		
D-1-61	9/8/25	See Drawing	5	6"	99.5	102.8	96.8%	95.0%	20.5	17.7	> OMC	P	JM
D-1-62	9/8/25	See Drawing	3	6"	100.8	102.8	98.1%	95.0%	19.3	17.1	> OMC	P	JM
D-1-63	9/8/25	See Drawing	4	6"	102.1	103.4	98.7%	95.0%	18.2	16.5	> OMC	P	JM

NUCLEAR DENSITY AND MOISTURE TEST SUMMARY

Project Name: **CCSWDA Legacy LF Cell 5**

Project Location: **Jonesboro, AR**

Olsson Project Number: **025-04399**

Description of Area Tested and General Remarks: **Clay Liner - Lift 2**

Proctor Number		Maximum Dry Density (pcf)	OMC (%)
PCL-2	1	106.2	16.8
PCL-3	2	103.8	18.2
C-3	3	102.8	17.1
C-7	4	103.4	16.5
C-8	5	102.8	17.7
C-10	6	102.8	18.4

Test Number	Date Tested	Test Location	Proctor Number	Depth Tested	Dry Density (pcf)		Compaction (%)		Water Content (%)			Pass or Fail	Olsson QC Rep
					Field	Max.	Field	Req'd	Field	OMC	Req'd		
D-2-1	9/9/25	See Drawing	1	6"	105.4	106.2	99.2%	95.0%	19.1	16.8	> OMC	P	JM
D-2-2	9/9/25	See Drawing	1	6"	106.5	106.2	100.3%	95.0%	17.9	16.8	> OMC	P	JM
D-2-3	9/9/25	See Drawing	3	6"	101.1	102.8	98.3%	95.0%	18.9	17.1	> OMC	P	JM
D-2-4	9/9/25	See Drawing	3	6"	100.4	102.8	97.7%	95.0%	18.9	17.1	> OMC	P	JM
D-2-5	9/9/25	See Drawing	4	6"	107.8	103.4	104.3%	95.0%	16.5	16.5	> OMC	P	JM
D-2-6	9/9/25	See Drawing	6	6"	110.4	102.8	107.4%	95.0%	20.1	18.4	> OMC	P	JM
D-2-7	9/9/25	See Drawing	4	6"	107.9	103.4	104.4%	95.0%	16.5	16.5	> OMC	P	JM
D-2-8	9/9/25	See Drawing	4	6"	105.6	103.4	102.1%	95.0%	16.8	16.5	> OMC	P	JM
D-2-9	9/9/25	See Drawing	4	6"	107.4	103.4	103.9%	95.0%	17.1	16.5	> OMC	P	JM
D-2-10	9/9/25	See Drawing	4	6"	110.2	103.4	106.6%	95.0%	16.6	16.5	> OMC	P	JM
D-2-11	9/9/25	See Drawing	4	6"	103.7	103.4	100.3%	95.0%	16.9	16.5	> OMC	P	JM
D-2-12	9/9/25	See Drawing	4	6"	105.4	103.4	101.9%	95.0%	16.9	16.5	> OMC	P	JM
D-2-13	9/9/25	See Drawing	4	6"	107.8	103.4	104.3%	95.0%	16.5	16.5	> OMC	P	JM
D-2-14	9/9/25	See Drawing	4	6"	110.0	103.4	106.4%	95.0%	16.7	16.5	> OMC	P	JM
D-2-15	9/9/25	See Drawing	4	6"	112.7	103.4	109.0%	95.0%	16.5	16.5	> OMC	P	JM
D-2-16	9/9/25	See Drawing	1	6"	107.8	106.2	101.5%	95.0%	17.2	16.8	> OMC	P	JM
D-2-17	9/9/25	See Drawing	1	6"	107.2	106.2	100.9%	95.0%	16.9	16.8	> OMC	P	JM
D-2-18	9/9/25	See Drawing	5	6"	102.0	102.8	99.2%	95.0%	19.0	17.7	> OMC	P	JM
D-2-19	9/9/25	See Drawing	1	6"	104.0	106.2	97.9%	95.0%	19.2	16.8	> OMC	P	JM
D-2-20	9/9/25	See Drawing	4	6"	108.8	103.4	105.2%	95.0%	16.5	16.5	> OMC	P	JM
D-2-21	9/9/25	See Drawing	1	6"	105.6	106.2	99.4%	95.0%	18.6	16.8	> OMC	P	JM
D-2-22	9/9/25	See Drawing	1	6"	105.2	106.2	99.1%	95.0%	17.3	16.8	> OMC	P	JM
D-2-23	9/9/25	See Drawing	4	6"	106.9	103.4	103.4%	95.0%	16.5	16.5	> OMC	P	JM
D-2-24	9/9/25	See Drawing	1	6"	109.0	106.2	102.6%	95.0%	16.8	16.8	> OMC	P	JM
D-2-25	9/9/25	See Drawing	1	6"	110.5	106.2	104.0%	95.0%	16.8	16.8	> OMC	P	JM
D-2-26	9/9/25	See Drawing	1	6"	112.2	106.2	105.6%	95.0%	16.8	16.8	> OMC	P	JM
D-2-27	9/9/25	See Drawing	4	6"	110.3	103.4	106.7%	95.0%	16.8	16.5	> OMC	P	JM
D-2-28	9/9/25	See Drawing	4	6"	101.4	103.4	98.1%	95.0%	16.6	16.5	> OMC	P	JM
D-2-29	9/9/25	See Drawing	1	6"	111.0	106.2	104.5%	95.0%	16.9	16.8	> OMC	P	JM
D-2-30	9/9/25	See Drawing	1	6"	110.0	106.2	103.6%	95.0%	16.8	16.8	> OMC	P	JM

NUCLEAR DENSITY AND MOISTURE TEST SUMMARY

Project Name: **CCSWDA Legacy LF Cell 5**

Project Location: **Jonesboro, AR**

Olsson Project Number: **025-04399**

Description of Area Tested and General Remarks: **Clay Liner - Lift 2**

Proctor Number		Maximum Dry Density (pcf)	OMC (%)
PCL-2	1	106.2	16.8
PCL-3	2	103.8	18.2
C-3	3	102.8	17.1
C-7	4	103.4	16.5
C-8	5	102.8	17.7
C-10	6	102.8	18.4

Test Number	Date Tested	Test Location	Proctor Number	Depth Tested	Dry Density (pcf)		Compaction (%)		Water Content (%)			Pass or Fail	Olsson QC Rep
					Field	Max.	Field	Req'd	Field	OMC	Req'd		
D-2-31	9/9/25	See Drawing	4	6"	106.0	103.4	102.5%	95.0%	16.5	16.5	> OMC	P	JM
D-2-32	9/10/25	See Drawing	1	6"	110.4	106.2	104.0%	95.0%	17.1	16.8	> OMC	P	JM
D-2-33	9/10/25	See Drawing	3	6"	99.8	102.8	97.1%	95.0%	17.7	17.1	> OMC	P	JM
D-2-34	9/10/25	See Drawing	3	6"	99.1	102.8	96.4%	95.0%	17.7	17.1	> OMC	P	JM
D-2-35	9/10/25	See Drawing	5	6"	99.0	102.8	96.3%	95.0%	21.1	17.7	> OMC	P	JM
D-2-36	9/10/25	See Drawing	1	6"	104.1	106.2	98.0%	95.0%	18.3	16.8	> OMC	P	JM
D-2-37	9/10/25	See Drawing	1	6"	103.8	106.2	97.7%	95.0%	19.5	16.8	> OMC	P	JM
D-2-38	9/10/25	See Drawing	1	6"	105.0	106.2	98.9%	95.0%	20.5	16.8	> OMC	P	JM
D-2-39	9/10/25	See Drawing	1	6"	103.6	106.2	97.6%	95.0%	20.1	16.8	> OMC	P	JM
D-2-40	9/10/25	See Drawing	6	6"	107.2	102.8	104.3%	95.0%	19.2	18.4	> OMC	P	JM
D-2-41	9/10/25	See Drawing	2	6"	100.4	103.8	96.7%	95.0%	19.5	18.2	> OMC	P	JM
D-2-42	9/10/25	See Drawing	2	6"	102.5	103.8	98.7%	95.0%	21.2	18.2	> OMC	P	JM
D-2-43	9/10/25	See Drawing	1	6"	105.5	106.2	99.3%	95.0%	20.0	16.8	> OMC	P	JM
D-2-44	9/10/25	See Drawing	3	6"	100.0	102.8	97.3%	95.0%	19.5	17.1	> OMC	P	JM
D-2-45	9/10/25	See Drawing	4	6"	109.9	103.4	106.3%	95.0%	16.5	16.5	> OMC	P	JM
D-2-46	9/10/25	See Drawing	4	6"	106.5	103.4	103.0%	95.0%	17.1	16.5	> OMC	P	JM
D-2-47	9/10/25	See Drawing	4	6"	105.4	103.4	101.9%	95.0%	17.5	16.5	> OMC	P	JM
D-2-48	9/10/25	See Drawing	4	6"	106.4	103.4	102.9%	95.0%	17.3	16.5	> OMC	P	JM
D-2-49	9/10/25	See Drawing	4	6"	108.4	103.4	104.8%	95.0%	16.9	16.5	> OMC	P	JM
D-2-50	9/10/25	See Drawing	1	6"	105.0	106.2	98.9%	95.0%	18.3	16.8	> OMC	P	JM
D-2-51	9/10/25	See Drawing	1	6"	104.8	106.2	98.7%	95.0%	17.4	16.8	> OMC	P	JM
D-2-52	9/10/25	See Drawing	4	6"	106.6	103.4	103.1%	95.0%	16.7	16.5	> OMC	P	JM
D-2-53	9/10/25	See Drawing	1	6"	103.7	106.2	97.6%	95.0%	18.5	16.8	> OMC	P	JM
D-2-54	9/10/25	See Drawing	1	6"	104.7	106.2	98.6%	95.0%	19.2	16.8	> OMC	P	JM
D-2-55	9/10/25	See Drawing	4	6"	106.5	103.4	103.0%	95.0%	16.5	16.5	> OMC	P	JM
D-2-56	9/10/25	See Drawing	4	6"	105.4	103.4	101.9%	95.0%	16.5	16.5	> OMC	P	JM
D-2-57	9/10/25	See Drawing	1	6"	103.7	106.2	97.6%	95.0%	17.5	16.8	> OMC	P	JM
D-2-58	9/10/25	See Drawing	1	6"	105.0	106.2	98.9%	95.0%	17.4	16.8	> OMC	P	JM
D-2-59	9/10/25	See Drawing	4	6"	104.2	103.4	100.8%	95.0%	16.6	16.5	> OMC	P	JM
D-2-60	9/10/25	See Drawing	1	6"	105.7	106.2	99.5%	95.0%	19.1	16.8	> OMC	P	JM

NUCLEAR DENSITY AND MOISTURE TEST SUMMARY

Project Name: **CCSWDA Legacy LF Cell 5**

Project Location: **Jonesboro, AR**

Olsson Project Number: **025-04399**

Description of Area Tested and General Remarks: **Clay Liner - Lift 2**

Proctor Number		Maximum Dry Density (pcf)	OMC (%)
PCL-2	1	106.2	16.8
PCL-3	2	103.8	18.2
C-3	3	102.8	17.1
C-7	4	103.4	16.5
C-8	5	102.8	17.7
C-10	6	102.8	18.4

Test Number	Date Tested	Test Location	Proctor Number	Depth Tested	Dry Density (pcf)		Compaction (%)		Water Content (%)			Pass or Fail	Olsson QC Rep
					Field	Max.	Field	Req'd	Field	OMC	Req'd		
D-2-61	9/10/25	See Drawing	4	6"	105.6	103.4	102.1%	95.0%	16.5	16.5	> OMC	P	JM
D-2-62	9/10/25	See Drawing	4	6"	104.8	103.4	101.4%	95.0%	16.5	16.5	> OMC	P	JM
D-2-63	9/10/25	See Drawing	4	6"	105.5	103.4	102.0%	95.0%	16.5	16.5	> OMC	P	JM

NUCLEAR DENSITY AND MOISTURE TEST SUMMARY

Project Name: **CCSWDA Legacy LF Cell 5**

Project Location: **Jonesboro, AR**

Olsson Project Number: **025-04399**

Description of Area Tested and General Remarks: **Clay Liner - Lift 3**

Proctor Number		Maximum Dry Density (pcf)	OMC (%)
PCL-2	1	106.2	16.8
PCL-3	2	103.8	18.2
C-3	3	102.8	17.1
C-7	4	103.4	16.5
C-8	5	102.8	17.7
C-10	6	102.8	18.4

Test Number	Date Tested	Test Location	Proctor Number	Depth Tested	Dry Density (pcf)		Compaction (%)		Water Content (%)			Pass or Fail	Olsson QC Rep
					Field	Max.	Field	Req'd	Field	OMC	Req'd		
D-3-1	9/11/25	See Drawing	2	6"	103.2	103.8	99.4%	95.0%	21.6	18.2	> OMC	P	JM
D-3-2	9/11/25	See Drawing	1	6"	104.4	106.2	98.3%	95.0%	20.5	16.8	> OMC	P	JM
D-3-3	9/11/25	See Drawing	2	6"	103.0	103.8	99.2%	95.0%	21.5	18.2	> OMC	P	JM
D-3-4	9/11/25	See Drawing	3	6"	101.1	102.8	98.3%	95.0%	21.0	17.1	> OMC	P	JM
D-3-5	9/11/25	See Drawing	1	6"	104.7	106.2	98.6%	95.0%	17.9	16.8	> OMC	P	JM
D-3-6	9/11/25	See Drawing	1	6"	106.9	106.2	100.7%	95.0%	18.2	16.8	> OMC	P	JM
D-3-7	9/11/25	See Drawing	1	6"	104.7	106.2	98.6%	95.0%	18.3	16.8	> OMC	P	JM
D-3-8	9/11/25	See Drawing	5	6"	98.8	102.8	96.1%	95.0%	20.9	17.7	> OMC	P	JM
D-3-9	9/11/25	See Drawing	1	6"	103.6	106.2	97.6%	95.0%	19.2	16.8	> OMC	P	JM
D-3-10	9/11/25	See Drawing	1	6"	103.5	106.2	97.5%	95.0%	21.2	16.8	> OMC	P	JM
D-3-11	9/11/25	See Drawing	1	6"	104.6	106.2	98.5%	95.0%	22.2	16.8	> OMC	P	JM
D-3-12	9/11/25	See Drawing	1	6"	103.2	106.2	97.2%	95.0%	19.8	16.8	> OMC	P	JM
D-3-13	9/11/25	See Drawing	4	6"	102.8	103.4	99.4%	95.0%	17.9	16.5	> OMC	P	JM
D-3-14	9/11/25	See Drawing	1	6"	107.0	106.2	100.8%	95.0%	18.9	16.8	> OMC	P	JM
D-3-15	9/11/25	See Drawing	1	6"	107.6	106.2	101.3%	95.0%	19.8	16.8	> OMC	P	JM
D-3-16	9/11/25	See Drawing	1	6"	106.7	106.2	100.5%	95.0%	21.2	16.8	> OMC	P	JM
D-3-17	9/11/25	See Drawing	1	6"	104.5	106.2	98.4%	95.0%	17.9	16.8	> OMC	P	JM
D-3-18	9/11/25	See Drawing	1	6"	104.9	106.2	98.8%	95.0%	19.7	16.8	> OMC	P	JM
D-3-19	9/11/25	See Drawing	1	6"	103.9	106.2	97.8%	95.0%	20.5	16.8	> OMC	P	JM
D-3-20	9/11/25	See Drawing	1	6"	104.8	106.2	98.7%	95.0%	20.3	16.8	> OMC	P	JM
D-3-21	9/11/25	See Drawing	1	6"	105.8	106.2	99.6%	95.0%	19.7	16.8	> OMC	P	JM
D-3-22	9/11/25	See Drawing	1	6"	104.3	106.2	98.2%	95.0%	18.1	16.8	> OMC	P	JM
D-3-23	9/11/25	See Drawing	4	6"	99.9	103.4	96.6%	95.0%	17.9	16.5	> OMC	P	JM
D-3-24	9/11/25	See Drawing	4	6"	100.3	103.4	97.0%	95.0%	19.9	16.5	> OMC	P	JM
D-3-25	9/11/25	See Drawing	1	6"	104.7	106.2	98.6%	95.0%	19.7	16.8	> OMC	P	JM
D-3-26	9/11/25	See Drawing	1	6"	105.8	106.2	99.6%	95.0%	19.3	16.8	> OMC	P	JM
D-3-27	9/11/25	See Drawing	1	6"	105.1	106.2	99.0%	95.0%	18.9	16.8	> OMC	P	JM
D-3-28	9/11/25	See Drawing	5	6"	99.6	102.8	96.9%	95.0%	23.3	17.7	> OMC	P	JM
D-3-29	9/11/25	See Drawing	1	6"	104.4	106.2	98.3%	95.0%	18.3	16.8	> OMC	P	JM
D-3-30	9/11/25	See Drawing	1	6"	106.8	106.2	100.6%	95.0%	18.0	16.8	> OMC	P	JM

NUCLEAR DENSITY AND MOISTURE TEST SUMMARY

Project Name: **CCSWDA Legacy LF Cell 5**

Project Location: **Jonesboro, AR**

Olsson Project Number: **025-04399**

Description of Area Tested and General Remarks: **Clay Liner - Lift 3**

Proctor Number		Maximum Dry Density (pcf)	OMC (%)
PCL-2	1	106.2	16.8
PCL-3	2	103.8	18.2
C-3	3	102.8	17.1
C-7	4	103.4	16.5
C-8	5	102.8	17.7
C-10	6	102.8	18.4

Test Number	Date Tested	Test Location	Proctor Number	Depth Tested	Dry Density (pcf)		Compaction (%)		Water Content (%)			Pass or Fail	Olsson QC Rep
					Field	Max.	Field	Req'd	Field	OMC	Req'd		
D-3-31	9/11/25	See Drawing	1	6"	104.5	106.2	98.4%	95.0%	18.5	16.8	> OMC	P	JM
D-3-32	9/11/25	See Drawing	1	6"	104.6	106.2	98.5%	95.0%	21.3	16.8	> OMC	P	JM
D-3-33	9/12/25	See Drawing	1	6"	108.7	106.2	102.4%	95.0%	17.0	16.8	> OMC	P	JM
D-3-34	9/12/25	See Drawing	4	6"	105.6	103.4	102.1%	95.0%	16.6	16.5	> OMC	P	JM
D-3-35	9/12/25	See Drawing	1	6"	107.2	106.2	100.9%	95.0%	17.5	16.8	> OMC	P	JM
D-3-36	9/12/25	See Drawing	4	6"	110.1	103.4	106.5%	95.0%	16.5	16.5	> OMC	P	JM
D-3-37	9/12/25	See Drawing	1	6"	106.0	106.2	99.8%	95.0%	18.6	16.8	> OMC	P	JM
D-3-38	9/12/25	See Drawing	4	6"	108.4	103.4	104.8%	95.0%	16.5	16.5	> OMC	P	JM
D-3-39	9/12/25	See Drawing	4	6"	113.1	103.4	109.4%	95.0%	16.5	16.5	> OMC	P	JM
D-3-40	9/12/25	See Drawing	1	6"	107.4	106.2	101.1%	95.0%	20.7	16.8	> OMC	P	JM
D-3-41	9/12/25	See Drawing	4	6"	107.6	103.4	104.1%	95.0%	16.6	16.5	> OMC	P	JM
D-3-42	9/12/25	See Drawing	1	6"	112.9	106.2	106.3%	95.0%	16.8	16.8	> OMC	P	JM
D-3-43	9/12/25	See Drawing	1	6"	111.1	106.2	104.6%	95.0%	18.3	16.8	> OMC	P	JM
D-3-44	9/12/25	See Drawing	4	6"	113.6	103.4	109.9%	95.0%	16.5	16.5	> OMC	P	JM
D-3-45	9/12/25	See Drawing	1	6"	107.8	106.2	101.5%	95.0%	19.7	16.8	> OMC	P	JM
D-3-46	9/12/25	See Drawing	1	6"	107.2	106.2	100.9%	95.0%	17.0	16.8	> OMC	P	JM
D-3-47	9/12/25	See Drawing	1	6"	109.1	106.2	102.7%	95.0%	17.8	16.8	> OMC	P	JM
D-3-48	9/12/25	See Drawing	1	6"	105.7	106.2	99.5%	95.0%	16.8	16.8	> OMC	P	JM
D-3-49	9/12/25	See Drawing	1	6"	113.7	106.2	107.1%	95.0%	17.0	16.8	> OMC	P	JM
D-3-50	9/12/25	See Drawing	1	6"	107.8	106.2	101.5%	95.0%	18.1	16.8	> OMC	P	JM
D-3-51	9/12/25	See Drawing	1	6"	109.6	106.2	103.2%	95.0%	16.8	16.8	> OMC	P	JM
D-3-52	9/12/25	See Drawing	1	6"	104.1	106.2	98.0%	95.0%	19.1	16.8	> OMC	P	JM
D-3-53	9/12/25	See Drawing	1	6"	104.3	106.2	98.2%	95.0%	18.2	16.8	> OMC	P	JM
D-3-54	9/12/25	See Drawing	1	6"	107.7	106.2	101.4%	95.0%	17.6	16.8	> OMC	P	JM
D-3-55	9/12/25	See Drawing	1	6"	103.6	106.2	97.6%	95.0%	17.9	16.8	> OMC	P	JM
D-3-56	9/12/25	See Drawing	6	6"	106.9	102.8	104.0%	95.0%	19.2	18.4	> OMC	P	JM
D-3-57	9/12/25	See Drawing	4	6"	104.3	103.4	100.9%	95.0%	16.5	16.5	> OMC	P	JM
D-3-58	9/12/25	See Drawing	1	6"	105.9	106.2	99.7%	95.0%	18.8	16.8	> OMC	P	JM
D-3-59	9/12/25	See Drawing	6	6"	108.3	102.8	105.4%	95.0%	18.6	18.4	> OMC	P	JM
D-3-60	9/12/25	See Drawing	4	6"	106.3	103.4	102.8%	95.0%	16.5	16.5	> OMC	P	JM

NUCLEAR DENSITY AND MOISTURE TEST SUMMARY

Project Name: **CCSWDA Legacy LF Cell 5**

Project Location: **Jonesboro, AR**

Olsson Project Number: **025-04399**

Description of Area Tested and General Remarks: **Clay Liner - Lift 3**

Proctor Number		Maximum Dry Density (pcf)	OMC (%)
PCL-2	1	106.2	16.8
PCL-3	2	103.8	18.2
C-3	3	102.8	17.1
C-7	4	103.4	16.5
C-8	5	102.8	17.7
C-10	6	102.8	18.4

Test Number	Date Tested	Test Location	Proctor Number	Depth Tested	Dry Density (pcf)		Compaction (%)		Water Content (%)			Pass or Fail	Olsson QC Rep
					Field	Max.	Field	Req'd	Field	OMC	Req'd		
D-3-61	9/12/25	See Drawing	1	6"	109.4	106.2	103.0%	95.0%	19.1	16.8	> OMC	P	JM
D-3-62	9/12/25	See Drawing	1	6"	107.0	106.2	100.8%	95.0%	17.5	16.8	> OMC	P	JM
D-3-63	9/12/25	See Drawing	6	6"	107.7	102.8	104.8%	95.0%	18.9	18.4	> OMC	P	JM

NUCLEAR DENSITY AND MOISTURE TEST SUMMARY

Project Name: **CCSWDA Legacy LF Cell 5**

Project Location: **Jonesboro, AR**

Olsson Project Number: **025-04399**

Description of Area Tested and General Remarks: **Clay Liner - Lift 4**

Proctor Number		Maximum Dry Density (pcf)	OMC (%)
PCL-2	1	106.2	16.8
PCL-3	2	103.8	18.2
C-3	3	102.8	17.1
C-7	4	103.4	16.5
C-8	5	102.8	17.7
C-10	6	102.8	18.4

Test Number	Date Tested	Test Location	Proctor Number	Depth Tested	Dry Density (pcf)		Compaction (%)		Water Content (%)			Pass or Fail	Olsson QC Rep
					Field	Max.	Field	Req'd	Field	OMC	Req'd		
D-4-1	9/13/25	See Drawing	2	6"	102.7	103.8	98.9%	95.0%	19.4	18.2	> OMC	P	JM
D-4-2	9/13/25	See Drawing	5	6"	100.6	102.8	97.9%	95.0%	18.7	17.7	> OMC	P	JM
D-4-3	9/13/25	See Drawing	2	6"	101.2	103.8	97.5%	95.0%	23.2	18.2	> OMC	P	JM
D-4-4	9/13/25	See Drawing	1	6"	106.0	106.2	99.8%	95.0%	17.9	16.8	> OMC	P	JM
D-4-5	9/13/25	See Drawing	1	6"	104.8	106.2	98.7%	95.0%	19.6	16.8	> OMC	P	JM
D-4-6	9/13/25	See Drawing	1	6"	104.5	106.2	98.4%	95.0%	18.9	16.8	> OMC	P	JM
D-4-7	9/13/25	See Drawing	2	6"	101.4	103.8	97.7%	95.0%	20.4	18.2	> OMC	P	JM
D-4-8	9/13/25	See Drawing	4	6"	102.9	103.4	99.5%	95.0%	18.3	16.5	> OMC	P	JM
D-4-9	9/13/25	See Drawing	3	6"	99.5	102.8	96.8%	95.0%	18.8	17.1	> OMC	P	JM
D-4-10	9/13/25	See Drawing	4	6"	104.5	103.4	101.1%	95.0%	16.6	16.5	> OMC	P	JM
D-4-11	9/13/25	See Drawing	1	6"	105.8	106.2	99.6%	95.0%	17.4	16.8	> OMC	P	JM
D-4-12	9/13/25	See Drawing	4	6"	106.6	103.4	103.1%	95.0%	16.6	16.5	> OMC	P	JM
D-4-13	9/13/25	See Drawing	1	6"	107.5	106.2	101.2%	95.0%	17.3	16.8	> OMC	P	JM
D-4-14	9/13/25	See Drawing	1	6"	103.9	106.2	97.8%	95.0%	20.2	16.8	> OMC	P	JM
D-4-15	9/13/25	See Drawing	3	6"	101.3	102.8	98.5%	95.0%	19.5	17.1	> OMC	P	JM
D-4-16	9/13/25	See Drawing	4	6"	102.4	103.4	99.0%	95.0%	18.1	16.5	> OMC	P	JM
D-4-17	9/13/25	See Drawing	1	6"	107.9	106.2	101.6%	95.0%	18.5	16.8	> OMC	P	JM
D-4-18	9/13/25	See Drawing	1	6"	103.7	106.2	97.6%	95.0%	19.1	16.8	> OMC	P	JM
D-4-19	9/13/25	See Drawing	4	6"	103.4	103.4	100.0%	95.0%	16.5	16.5	> OMC	P	JM
D-4-20	9/13/25	See Drawing	1	6"	107.6	106.2	101.3%	95.0%	18.3	16.8	> OMC	P	JM
D-4-21	9/13/25	See Drawing	6	6"	107.6	102.8	104.7%	95.0%	18.6	18.4	> OMC	P	JM
D-4-22	9/13/25	See Drawing	1	6"	105.4	106.2	99.2%	95.0%	18.7	16.8	> OMC	P	JM
D-4-23	9/13/25	See Drawing	1	6"	105.2	106.2	99.1%	95.0%	20.1	16.8	> OMC	P	JM
D-4-24	9/13/25	See Drawing	1	6"	106.9	106.2	100.7%	95.0%	19.1	16.8	> OMC	P	JM
D-4-25	9/13/25	See Drawing	4	6"	101.2	103.4	97.9%	95.0%	16.7	16.5	> OMC	P	JM
D-4-26	9/13/25	See Drawing	4	6"	103.0	103.4	99.6%	95.0%	16.9	16.5	> OMC	P	JM

NUCLEAR DENSITY AND MOISTURE TEST SUMMARY

Project Name: **CCSWDA Legacy LF Cell 5**

Project Location: **Jonesboro, AR**

Olsson Project Number: **025-04399**

Description of Area Tested and General Remarks: **Clay Liner - Lift 4**

Proctor Number		Maximum Dry Density (pcf)	OMC (%)
PCL-2	1	106.2	16.8
PCL-3	2	103.8	18.2
C-3	3	102.8	17.1
C-7	4	103.4	16.5
C-8	5	102.8	17.7
C-10	6	102.8	18.4

Test Number	Date Tested	Test Location	Proctor Number	Depth Tested	Dry Density (pcf)		Compaction (%)		Water Content (%)			Pass or Fail	Olsson QC Rep
					Field	Max.	Field	Req'd	Field	OMC	Req'd		
D-4-27	9/13/25	See Drawing	4	6"	103.0	103.4	99.6%	95.0%	18.8	16.5	> OMC	P	JM
D-4-28	9/13/25	See Drawing	1	6"	106.0	106.2	99.8%	95.0%	19.4	16.8	> OMC	P	JM
D-4-29	9/13/25	See Drawing	4	6"	103.5	103.4	100.1%	95.0%	20.5	16.5	> OMC	P	JM
D-4-30	9/13/25	See Drawing	4	6"	104.6	103.4	101.2%	95.0%	16.7	16.5	> OMC	P	JM
D-4-31	9/13/25	See Drawing	1	6"	105.9	106.2	99.7%	95.0%	17.3	16.8	> OMC	P	JM
D-4-32	9/13/25	See Drawing	2	6"	103.7	103.8	99.9%	95.0%	19.7	18.2	> OMC	P	JM
D-4-33	9/13/25	See Drawing	4	6"	101.4	103.4	98.1%	95.0%	19.7	16.5	> OMC	P	JM
D-4-34	9/15/25	See Drawing	1	6"	105.1	106.2	99.0%	95.0%	18.0	16.8	> OMC	P	JM
D-4-35	9/15/25	See Drawing	1	6"	105.2	106.2	99.1%	95.0%	19.0	16.8	> OMC	P	JM
D-4-36	9/15/25	See Drawing	4	6"	101.9	103.4	98.5%	95.0%	16.5	16.5	> OMC	P	JM
D-4-37	9/15/25	See Drawing	1	6"	105.4	106.2	99.2%	95.0%	17.4	16.8	> OMC	P	JM
D-4-38	9/15/25	See Drawing	1	6"	103.8	106.2	97.7%	95.0%	17.3	16.8	> OMC	P	JM
D-4-39	9/15/25	See Drawing	5	6"	99.1	102.8	96.4%	95.0%	19.0	17.7	> OMC	P	JM
D-4-40	9/15/25	See Drawing	4	6"	103.5	103.4	100.1%	95.0%	16.5	16.5	> OMC	P	JM
D-4-41	9/16/25	See Drawing	3	6"	100.5	102.8	97.8%	95.0%	18.2	17.1	> OMC	P	JM
D-4-42	9/16/25	See Drawing	1	6"	103.8	106.2	97.7%	95.0%	17.1	16.8	> OMC	P	JM
D-4-43	9/16/25	See Drawing	1	6"	107.3	106.2	101.0%	95.0%	16.9	16.8	> OMC	P	JM
D-4-44	9/16/25	See Drawing	1	6"	108.2	106.2	101.9%	95.0%	17.2	16.8	> OMC	P	JM
D-4-45	9/16/25	See Drawing	4	6"	110.3	103.4	106.7%	95.0%	16.6	16.5	> OMC	P	JM
D-4-46	9/16/25	See Drawing	1	6"	110.4	106.2	104.0%	95.0%	17.0	16.8	> OMC	P	JM
D-4-47	9/16/25	See Drawing	1	6"	104.3	106.2	98.2%	95.0%	19.4	16.8	> OMC	P	JM
D-4-48	9/16/25	See Drawing	1	6"	106.7	106.2	100.5%	95.0%	18.3	16.8	> OMC	P	JM
D-4-49	9/16/25	See Drawing	2	6"	102.9	103.8	99.1%	95.0%	20.1	18.2	> OMC	P	JM
D-4-50	9/16/25	See Drawing	3	6"	99.6	102.8	96.9%	95.0%	18.1	17.1	> OMC	P	JM
D-4-51	9/16/25	See Drawing	4	6"	103.0	103.4	99.6%	95.0%	18.9	16.5	> OMC	P	JM
D-4-52	9/16/25	See Drawing	6	6"	107.5	102.8	104.6%	95.0%	19.0	18.4	> OMC	P	JM

NUCLEAR DENSITY AND MOISTURE TEST SUMMARY

Project Name: **CCSWDA Legacy LF Cell 5**

Project Location: **Jonesboro, AR**

Olsson Project Number: **025-04399**

Description of Area Tested and General Remarks: **Clay Liner - Lift 4**

Proctor Number		Maximum Dry Density (pcf)	OMC (%)
PCL-2	1	106.2	16.8
PCL-3	2	103.8	18.2
C-3	3	102.8	17.1
C-7	4	103.4	16.5
C-8	5	102.8	17.7
C-10	6	102.8	18.4

Test Number	Date Tested	Test Location	Proctor Number	Depth Tested	Dry Density (pcf)		Compaction (%)		Water Content (%)			Pass or Fail	Olsson QC Rep
					Field	Max.	Field	Req'd	Field	OMC	Req'd		
D-4-53	9/16/25	See Drawing	1	6"	104.4	106.2	98.3%	95.0%	17.1	16.8	> OMC	P	JM
D-4-54	9/16/25	See Drawing	1	6"	106.2	106.2	100.0%	95.0%	18.4	16.8	> OMC	P	JM
D-4-55	9/16/25	See Drawing	1	6"	105.8	106.2	99.6%	95.0%	17.0	16.8	> OMC	P	JM
D-4-56	9/16/25	See Drawing	4	6"	101.1	103.4	97.8%	95.0%	16.5	16.5	> OMC	P	JM
D-4-57	9/15/25	See Drawing	4	6"	105.7	103.4	102.2%	95.0%	16.6	16.5	> OMC	P	JM
D-4-58	9/15/25	See Drawing	4	6"	100.0	103.4	96.7%	95.0%	16.5	16.5	> OMC	P	JM
D-4-59	9/15/25	See Drawing	1	6"	103.6	106.2	97.6%	95.0%	17.0	16.8	> OMC	P	JM
D-4-60	9/15/25	See Drawing	4	6"	98.7	103.4	95.5%	95.0%	16.8	16.5	> OMC	P	JM
D-4-61	9/15/25	See Drawing	1	6"	107.0	106.2	100.8%	95.0%	17.1	16.8	> OMC	P	JM
D-4-62	9/15/25	See Drawing	4	6"	100.7	103.4	97.4%	95.0%	16.5	16.5	> OMC	P	JM
D-4-63	9/15/25	See Drawing	4	6"	105.1	103.4	101.6%	95.0%	16.5	16.5	> OMC	P	JM

APPENDIX I
CLAY LINER – PERFORMANCE TESTING RESULTS

FLEXIBLE WALL PERMEABILITY
ASTM D5084
METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	1	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-1-1A	-	Flow Pump Speed	9	
SAMPLE TYPE	UD		Technician	FT	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.424	B-Value, f	1.00	Height (in)	2.483
Diameter (in)	2.843	Cell Pres.	90.0	Diameter (in)	2.858
Area (cm²)	40.96	Bot. Pres.	80.0	Area (cm²)	41.39
Volume (cm^3)	252.16	Top Pres.	80.0	Volume (cm^3)	261.03
Mass (g)	492.72	Tot. B.P.	80.0	Mass (g)	520.05
Moisture Content (%)	17.7	Head, max.	126.61	Moisture Content (%)	24.2
Dry Density (pcf)	103.6	Head, min.	126.61	Dry Density (pcf)	100.1
Spec. Gravity(assumed)	2.70	Max. Grad.	20.08	Volume Solids (cm^3)	155.10
Volume Solids (cm^3)	155.10	Min. Grad.	20.08	Volume Voids (cm^3)	105.93
Volume Voids (cm^3)	97.06			Void Ratio	0.68
Void Ratio	0.63			Saturation	96%
Saturation	76%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	492.72	528.26
Wt. Dry Soil & Tare (g)	418.77	427.00
Wt. Tare (g)	0.00	8.32
Wt. Water (g)	73.95	101.26
Wt. Dry Soil (g)	418.77	418.68
Moisture Content	17.7%	24.2%

DESCRIPTION -

Flow Pump Rate 4.38E-05 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/09/25	45909	10	0	20.3	0	0	0	0	1.80	126.61	20.08	5.2E-08	
09/09/25	45909	10	5	20.3	5	5	300	300	1.80	126.61	20.08	5.2E-08	
09/09/25	45909	10	10	20.3	5	10	300	600	1.80	126.61	20.08	5.2E-08	
09/09/25	45909	10	15	20.3	5	15	300	900	1.80	126.61	20.08	5.2E-08	*
09/09/25	45909	10	20	20.3	5	20	300	1200	1.80	126.61	20.08	5.2E-08	*
09/09/25	45909	10	25	20.3	5	25	300	1500	1.80	126.61	20.08	5.2E-08	*
09/09/25	45909	10	30	20.3	5	30	300	1800	1.80	126.61	20.08	5.2E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 5.2E-08 cm/sec

DATE	9/9/25
CHECK	CO
REVIEW	DA
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	12	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-1-2B	-	Flow Pump Speed	10	
SAMPLE TYPE	UD		Technician	FT	

Sample Data - Initial			
Height (in)	2.869	B-Value, f	0.95
Diameter (in)	2.852	Cell Pres.	90.0
Area (cm²)	41.22	Bot. Pres.	80.0
Volume (cm^3)	300.35	Top Pres.	80.0
Mass (g)	609.03	Tot. B.P.	80.0
Moisture Content (%)	18.8	Head, max.	130.83
Dry Density (pcf)	106.5	Head, min.	130.83
Spec. Gravity(assumed)	2.70	Max. Grad.	17.65
Volume Solids (cm^3)	189.81	Min. Grad.	17.65
Volume Voids (cm^3)	110.53		
Void Ratio	0.58		
Saturation	87%		

Sample Data- Final	
Height (in)	2.919
Diameter (in)	2.903
Area (cm²)	42.70
Volume (cm^3)	316.61
Mass (g)	631.05
Moisture Content (%)	23.1
Dry Density (pcf)	101.0
Volume Solids (cm^3)	189.81
Volume Voids (cm^3)	126.79
Void Ratio	0.67
Saturation	94%

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	609.03	639.41
Wt. Dry Soil & Tare (g)	512.49	520.88
Wt. Tare (g)	0.00	8.52
Wt. Water (g)	96.54	118.53
Wt. Dry Soil (g)	512.49	512.36
Moisture Content	18.8%	23.1%

DESCRIPTION -

Flow Pump Rate 2.19E-05 cm^3/sec

PERMEANT: Deaired Tap Water

USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/11/25	45911	9	0	20.7	0	0	0	0	1.86	130.83	17.65	2.9E-08	
09/11/25	45911	9	5	20.7	5	5	300	300	1.86	130.83	17.65	2.9E-08	
09/11/25	45911	9	10	20.7	5	10	300	600	1.86	130.83	17.65	2.9E-08	
09/11/25	45911	9	15	20.7	5	15	300	900	1.86	130.83	17.65	2.9E-08	*
09/11/25	45911	9	20	20.7	5	20	300	1200	1.86	130.83	17.65	2.9E-08	*
09/11/25	45911	9	25	20.7	5	25	300	1500	1.86	130.83	17.65	2.9E-08	*
09/11/25	45911	9	30	20.7	5	30	300	1800	1.86	130.83	17.65	2.9E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS 2.9E-08 cm/sec

DATE	9/11/25
CHECK	[illegible]
REVIEW	DA
APPROVE	

FLEXIBLE WALL PERMEABILITY
ASTM D5084
METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	3	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-1-3A	-	Flow Pump Speed	10	
SAMPLE TYPE	UD		Technician	FT	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.844	B-Value, f	0.98	Height (in)	2.894
Diameter (in)	2.858	Cell Pres.	90.0	Diameter (in)	2.906
Area (cm^2)	41.39	Bot. Pres.	80.0	Area (cm^2)	42.79
Volume (cm^3)	298.98	Top Pres.	80.0	Volume (cm^3)	314.54
Mass (g)	576.17	Tot. B.P.	80.0	Mass (g)	611.01
Moisture Content (%)	17.9	Head, max.	109.03	Moisture Content (%)	25.0
Dry Density (pcf)	102.0	Head, min.	109.03	Dry Density (pcf)	97.0
Spec. Gravity(assumed)	2.70	Max. Grad.	14.83	Volume Solids (cm^3)	181.05
Volume Solids (cm^3)	181.05	Min. Grad.	14.83	Volume Voids (cm^3)	133.49
Volume Voids (cm^3)	117.93			Void Ratio	0.74
Void Ratio	0.65			Saturation	92%
Saturation	74%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	576.17	619.15
Wt. Dry Soil & Tare (g)	488.83	497.03
Wt. Tare (g)	0.00	8.42
Wt. Water (g)	87.34	122.12
Wt. Dry Soil (g)	488.83	488.61
Moisture Content	17.9%	25.0%

DESCRIPTION -

Flow Pump Rate 2.19E-05 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/09/25	45909	11	30	20.3	0	0	0	0	1.55	109.03	14.83	3.4E-08	
09/09/25	45909	11	35	20.3	5	5	300	300	1.55	109.03	14.83	3.4E-08	
09/09/25	45909	11	40	20.3	5	10	300	600	1.55	109.03	14.83	3.4E-08	
09/09/25	45909	11	45	20.3	5	15	300	900	1.55	109.03	14.83	3.4E-08	*
09/09/25	45909	11	50	20.3	5	20	300	1200	1.55	109.03	14.83	3.4E-08	*
09/09/25	45909	11	55	20.3	5	25	300	1500	1.55	109.03	14.83	3.4E-08	*
09/09/25	45909	12	0	20.3	5	30	300	1800	1.55	109.03	14.83	3.4E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 3.4E-08 cm/sec

DATE	9/9/25
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	5	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-1-4A	-	Flow Pump Speed	12	
SAMPLE TYPE	UD		Technician	FT	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.863	B-Value, f	0.97	Height (in)	2.914
Diameter (in)	2.872	Cell Pres.	90.0	Diameter (in)	2.806
Area (cm²)	41.80	Bot. Pres.	80.0	Area (cm²)	39.90
Volume (cm^3)	303.94	Top Pres.	80.0	Volume (cm^3)	295.29
Mass (g)	614.65	Tot. B.P.	80.0	Mass (g)	623.67
Moisture Content (%)	21.4	Head, max.	129.43	Moisture Content (%)	23.2
Dry Density (pcf)	103.9	Head, min.	129.43	Dry Density (pcf)	107.0
Spec. Gravity(assumed)	2.70	Max. Grad.	17.49	Volume Solids (cm^3)	187.49
Volume Solids (cm^3)	187.49	Min. Grad.	17.49	Volume Voids (cm^3)	107.80
Volume Voids (cm^3)	116.44			Void Ratio	0.57
Void Ratio	0.62			Saturation	109%
Saturation	93%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	614.65	631.78
Wt. Dry Soil & Tare (g)	506.23	514.37
Wt. Tare (g)	0.00	8.25
Wt. Water (g)	108.42	117.41
Wt. Dry Soil (g)	506.23	506.12
Moisture Content	21.4%	23.2%

DESCRIPTION -

Flow Pump Rate 4.46E-06 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/09/25	45909	14	0	20.3	0	0	0	0	1.84	129.43	17.49	6.4E-09	
09/09/25	45909	14	5	20.3	5	5	300	300	1.84	129.43	17.49	6.4E-09	
09/09/25	45909	14	10	20.3	5	10	300	600	1.84	129.43	17.49	6.4E-09	
09/09/25	45909	14	15	20.3	5	15	300	900	1.84	129.43	17.49	6.4E-09	*
09/09/25	45909	14	20	20.3	5	20	300	1200	1.84	129.43	17.49	6.4E-09	*
09/09/25	45909	14	25	20.3	5	25	300	1500	1.84	129.43	17.49	6.4E-09	*
09/09/25	45909	14	30	20.3	5	30	300	1800	1.84	129.43	17.49	6.4E-09	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 6.4E-09 cm/sec

DATE	9/9/25
CHECK	CS
REVIEW	JA
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	2	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-1-5A	-	Flow Pump Speed	11	
SAMPLE TYPE	UD		Technician	FT	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.863	B-Value, f	1.00	Height (in)	2.884
Diameter (in)	2.874	Cell Pres.	90.0	Diameter (in)	2.880
Area (cm^2)	41.85	Bot. Pres.	80.0	Area (cm^2)	42.03
Volume (cm^3)	304.36	Top Pres.	80.0	Volume (cm^3)	307.87
Mass (g)	617.03	Tot. B.P.	80.0	Mass (g)	624.71
Moisture Content (%)	21.5	Head, max.	173.04	Moisture Content (%)	23.0
Dry Density (pcf)	104.1	Head, min.	173.04	Dry Density (pcf)	102.9
Spec. Gravity(assumed)	2.70	Max. Grad.	23.62	Volume Solids (cm^3)	188.06
Volume Solids (cm^3)	188.06	Min. Grad.	23.62	Volume Voids (cm^3)	119.81
Volume Voids (cm^3)	116.30			Void Ratio	0.64
Void Ratio	0.62			Saturation	98%
Saturation	94%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	617.03	633.15
Wt. Dry Soil & Tare (g)	507.77	516.23
Wt. Tare (g)	0.00	8.55
Wt. Water (g)	109.26	116.92
Wt. Dry Soil (g)	507.77	507.68
Moisture Content	21.5%	23.0%

DESCRIPTION -

Flow Pump Rate 1.11E-05 cm^3/sec

PERMEANT: Deaired Tap Water

USCS -

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
09/10/25	45910	9	0	20.3	0	0	0	0	2.46	173.04	23.62	1.1E-08
09/10/25	45910	9	5	20.3	5	5	300	300	2.46	173.04	23.62	1.1E-08
09/10/25	45910	9	10	20.3	5	10	300	600	2.46	173.04	23.62	1.1E-08
09/10/25	45910	9	15	20.3	5	15	300	900	2.46	173.04	23.62	1.1E-08 *
09/10/25	45910	9	20	20.3	5	20	300	1200	2.46	173.04	23.62	1.1E-08 *
09/10/25	45910	9	25	20.3	5	25	300	1500	2.46	173.04	23.62	1.1E-08 *
09/10/25	45910	9	30	20.3	5	30	300	1800	2.46	173.04	23.62	1.1E-08 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS 1.1E-08 cm/sec

DATE	9/10/25
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	6	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-1-6B	-	Flow Pump Speed	11	
SAMPLE TYPE	UD		Technician	DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.601	B-Value, f	0.99	Height (in)	2.651
Diameter (in)	2.847	Cell Pres.	90.0	Diameter (in)	2.875
Area (cm^2)	41.07	Bot. Pres.	80.0	Area (cm^2)	41.88
Volume (cm^3)	271.34	Top Pres.	80.0	Volume (cm^3)	282.02
Mass (g)	522.36	Tot. B.P.	80.0	Mass (g)	558.13
Moisture Content (%)	17.1	Head, max.	123.10	Moisture Content (%)	25.1
Dry Density (pcf)	102.6	Head, min.	123.10	Dry Density (pcf)	98.7
Spec. Gravity(assumed)	2.70	Max. Grad.	18.28	Volume Solids (cm^3)	165.22
Volume Solids (cm^3)	165.22	Min. Grad.	18.28	Volume Voids (cm^3)	116.80
Volume Voids (cm^3)	106.12			Void Ratio	0.71
Void Ratio	0.64			Saturation	96%
Saturation	72%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	522.36	565.88
Wt. Dry Soil & Tare (g)	446.09	454.00
Wt. Tare (g)	0.00	8.57
Wt. Water (g)	76.27	111.88
Wt. Dry Soil (g)	446.09	445.43
Moisture Content	17.1%	25.1%

DESCRIPTION -

Flow Pump Rate 1.11E-05 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
09/13/25	45913	17	10	19.1	0	0	0	0	1.75	123.10	18.28	1.5E-08
09/13/25	45913	17	15	19.1	5	5	300	300	1.75	123.10	18.28	1.5E-08
09/13/25	45913	17	20	19.1	5	10	300	600	1.75	123.10	18.28	1.5E-08
09/13/25	45913	17	25	19.1	5	15	300	900	1.75	123.10	18.28	1.5E-08 *
09/13/25	45913	17	30	19.1	5	20	300	1200	1.75	123.10	18.28	1.5E-08 *
09/13/25	45913	17	35	19.1	5	25	300	1500	1.75	123.10	18.28	1.5E-08 *
09/13/25	45913	17	40	19.1	5	30	300	1800	1.75	123.10	18.28	1.5E-08 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 1.5E-08 cm/sec

DATE	9/13/25
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	14	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-1-7A	-	Flow Pump Speed	11	
SAMPLE TYPE	UD		Technician	FT/DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.748	B-Value, f	0.99	Height (in)	2.760
Diameter (in)	2.850	Cell Pres.	90.0	Diameter (in)	2.871
Area (cm²)	41.16	Bot. Pres.	80.0	Area (cm²)	41.77
Volume (cm^3)	287.27	Top Pres.	80.0	Volume (cm^3)	292.80
Mass (g)	592.21	Tot. B.P.	80.0	Mass (g)	603.53
Moisture Content (%)	19.4	Head, max.	140.68	Moisture Content (%)	21.6
Dry Density (pcf)	107.8	Head, min.	140.68	Dry Density (pcf)	105.7
Spec. Gravity(assumed)	2.70	Max. Grad.	20.07	Volume Solids (cm^3)	183.77
Volume Solids (cm^3)	183.77	Min. Grad.	20.07	Volume Voids (cm^3)	109.02
Volume Voids (cm^3)	103.50			Void Ratio	0.59
Void Ratio	0.56			Saturation	98%
Saturation	93%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	592.21	611.67
Wt. Dry Soil & Tare (g)	496.19	504.38
Wt. Tare (g)	0.00	8.42
Wt. Water (g)	96.02	107.29
Wt. Dry Soil (g)	496.19	495.96
Moisture Content	19.4%	21.6%

DESCRIPTION -

Flow Pump Rate 1.11E-05 cm^3/sec

PERMEANT: Deaired Tap Water

USCS -

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
09/11/25	45911	12	0	20.0	0	0	0	0	2.00	140.68	20.07	1.3E-08
09/11/25	45911	12	5	20.0	5	5	300	300	2.00	140.68	20.07	1.3E-08
09/11/25	45911	12	10	20.0	5	10	300	600	2.00	140.68	20.07	1.3E-08
09/11/25	45911	12	15	20.0	5	15	300	900	2.00	140.68	20.07	1.3E-08 *
09/11/25	45911	12	20	20.0	5	20	300	1200	2.00	140.68	20.07	1.3E-08 *
09/11/25	45911	12	25	20.0	5	25	300	1500	2.00	140.68	20.07	1.3E-08 *
09/11/25	45911	12	30	20.0	5	30	300	1800	2.00	140.68	20.07	1.3E-08 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS 1.3E-08 cm/sec

DATE	9/11/25
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	13	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-1-8A	-	Flow Pump Speed	11	
SAMPLE TYPE	UD		Technician	FT	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.058	B-Value, f	0.99	Height (in)	2.106
Diameter (in)	2.857	Cell Pres.	90.0	Diameter (in)	2.898
Area (cm²)	41.36	Bot. Pres.	80.0	Area (cm²)	42.56
Volume (cm^3)	216.20	Top Pres.	80.0	Volume (cm^3)	227.64
Mass (g)	444.03	Tot. B.P.	80.0	Mass (g)	462.35
Moisture Content (%)	18.1	Head, max.	194.14	Moisture Content (%)	22.9
Dry Density (pcf)	108.5	Head, min.	194.14	Dry Density (pcf)	103.1
Spec. Gravity(assumed)	2.70	Max. Grad.	36.29	Volume Solids (cm^3)	139.28
Volume Solids (cm^3)	139.28	Min. Grad.	36.29	Volume Voids (cm^3)	88.36
Volume Voids (cm^3)	76.92			Void Ratio	0.63
Void Ratio	0.55			Saturation	98%
Saturation	88%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	444.03	470.62
Wt. Dry Soil & Tare (g)	376.05	384.36
Wt. Tare (g)	0.00	8.46
Wt. Water (g)	67.98	86.26
Wt. Dry Soil (g)	376.05	375.90
Moisture Content	18.1%	22.9%

DESCRIPTION -

Flow Pump Rate 1.11E-05 cm^3/sec

PERMEANT: Deaired Tap Water

USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/11/25	45911	9	0	20.7	0	0	0	0	2.76	194.14	36.29	7.0E-09	
09/11/25	45911	9	5	20.7	5	5	300	300	2.76	194.14	36.29	7.0E-09	
09/11/25	45911	9	10	20.7	5	10	300	600	2.76	194.14	36.29	7.0E-09	
09/11/25	45911	9	15	20.7	5	15	300	900	2.76	194.14	36.29	7.0E-09	*
09/11/25	45911	9	20	20.7	5	20	300	1200	2.76	194.14	36.29	7.0E-09	*
09/11/25	45911	9	25	20.7	5	25	300	1500	2.76	194.14	36.29	7.0E-09	*
09/11/25	45911	12	30	20.7	185	210	11100	12600	2.76	194.14	36.29	7.0E-09	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS 7.0E-09 cm/sec

DATE	9/11/25
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	3	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-1-9A	-	Flow Pump Speed	11	
SAMPLE TYPE	UD		Technician	FT	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.584	B-Value, f	0.99	Height (in)	2.606
Diameter (in)	2.858	Cell Pres.	90.0	Diameter (in)	2.874
Area (cm^2)	41.39	Bot. Pres.	80.0	Area (cm^2)	41.85
Volume (cm^3)	271.65	Top Pres.	80.0	Volume (cm^3)	277.04
Mass (g)	524.40	Tot. B.P.	80.0	Mass (g)	548.63
Moisture Content (%)	18.2	Head, max.	194.14	Moisture Content (%)	23.7
Dry Density (pcf)	101.9	Head, min.	194.14	Dry Density (pcf)	99.9
Spec. Gravity(assumed)	2.70	Max. Grad.	29.33	Volume Solids (cm^3)	164.30
Volume Solids (cm^3)	164.30	Min. Grad.	29.33	Volume Voids (cm^3)	112.74
Volume Voids (cm^3)	107.35			Void Ratio	0.69
Void Ratio	0.65			Saturation	93%
Saturation	75%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	524.40	556.77
Wt. Dry Soil & Tare (g)	443.60	451.80
Wt. Tare (g)	0.00	8.44
Wt. Water (g)	80.80	104.97
Wt. Dry Soil (g)	443.60	443.36
Moisture Content	18.2%	23.7%

DESCRIPTION -

Flow Pump Rate 1.11E-05 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
09/12/25	45912	10	0	20.2	0	0	0	0	2.76	194.14	29.33	9.0E-09
09/12/25	45912	10	5	20.2	5	5	300	300	2.76	194.14	29.33	9.0E-09
09/12/25	45912	10	10	20.2	5	10	300	600	2.76	194.14	29.33	9.0E-09
09/12/25	45912	10	15	20.2	5	15	300	900	2.76	194.14	29.33	9.0E-09 *
09/12/25	45912	10	20	20.2	5	20	300	1200	2.76	194.14	29.33	9.0E-09 *
09/12/25	45912	10	25	20.2	5	25	300	1500	2.76	194.14	29.33	9.0E-09 *
09/12/25	45912	10	30	20.2	5	30	300	1800	2.76	194.14	29.33	9.0E-09 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 9.0E-09 cm/sec

DATE	9/12/25
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	5	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-1-10B	-	Flow Pump Speed	12	
SAMPLE TYPE	UD		Technician	CJ	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.481	B-Value, f	0.98	Height (in)	2.567
Diameter (in)	2.852	Cell Pres.	90.0	Diameter (in)	2.917
Area (cm²)	41.22	Bot. Pres.	80.0	Area (cm²)	43.12
Volume (cm^3)	259.73	Top Pres.	80.0	Volume (cm^3)	281.12
Mass (g)	499.58	Tot. B.P.	80.0	Mass (g)	535.77
Moisture Content (%)	18.0	Head, max.	196.25	Moisture Content (%)	26.6
Dry Density (pcf)	101.7	Head, min.	196.25	Dry Density (pcf)	94.0
Spec. Gravity(assumed)	2.70	Max. Grad.	30.10	Volume Solids (cm^3)	156.79
Volume Solids (cm^3)	156.79	Min. Grad.	30.10	Volume Voids (cm^3)	124.33
Volume Voids (cm^3)	102.94			Void Ratio	0.79
Void Ratio	0.66			Saturation	90%
Saturation	74%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	499.58	543.75
Wt. Dry Soil & Tare (g)	423.34	431.41
Wt. Tare (g)	0.00	8.43
Wt. Water (g)	76.24	112.34
Wt. Dry Soil (g)	423.34	422.98
Moisture Content	18.0%	26.6%

DESCRIPTION -

Flow Pump Rate 4.46E-06 cm^3/sec

PERMEANT: Deaired Tap Water

USCS -

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
09/15/25	45915	13	0	20.4	0	0	0	0	2.79	196.25	30.10	3.4E-09
09/15/25	45915	13	5	20.4	5	5	300	300	2.79	196.25	30.10	3.4E-09
09/15/25	45915	13	10	20.4	5	10	300	600	2.79	196.25	30.10	3.4E-09
09/15/25	45915	13	15	20.4	5	15	300	900	2.79	196.25	30.10	3.4E-09 *
09/15/25	45915	13	20	20.4	5	20	300	1200	2.79	196.25	30.10	3.4E-09 *
09/15/25	45915	13	25	20.4	5	25	300	1500	2.79	196.25	30.10	3.4E-09 *
09/15/25	45915	13	30	20.4	5	30	300	1800	2.79	196.25	30.10	3.4E-09 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS 3.4E-09 cm/sec

DATE	9/15/25
CHECK	CO
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	6	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-1-11A	-	Flow Pump Speed	10	
SAMPLE TYPE	UD		Technician	FT	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.860	B-Value, f	0.98	Height (in)	2.886
Diameter (in)	2.876	Cell Pres.	90.0	Diameter (in)	2.878
Area (cm²)	41.91	Bot. Pres.	80.0	Area (cm²)	41.97
Volume (cm^3)	304.46	Top Pres.	80.0	Volume (cm^3)	307.66
Mass (g)	607.11	Tot. B.P.	80.0	Mass (g)	623.10
Moisture Content (%)	19.4	Head, max.	49.24	Moisture Content (%)	22.6
Dry Density (pcf)	104.2	Head, min.	49.24	Dry Density (pcf)	103.1
Spec. Gravity(assumed)	2.70	Max. Grad.	6.72	Volume Solids (cm^3)	188.31
Volume Solids (cm^3)	188.31	Min. Grad.	6.72	Volume Voids (cm^3)	119.35
Volume Voids (cm^3)	116.15			Void Ratio	0.63
Void Ratio	0.62			Saturation	96%
Saturation	85%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	607.11	631.02
Wt. Dry Soil & Tare (g)	508.43	516.45
Wt. Tare (g)	0.00	8.45
Wt. Water (g)	98.68	114.57
Wt. Dry Soil (g)	508.43	508.00
Moisture Content	19.4%	22.6%

DESCRIPTION -

Flow Pump Rate 2.19E-05 cm^3/sec

PERMEANT: Deaired Tap Water

USCS -

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
09/11/25	45911	14	0	20.7	0	0	0	0	0.70	49.24	6.72	7.6E-08
09/11/25	45911	14	5	20.7	5	5	300	300	0.70	49.24	6.72	7.6E-08
09/11/25	45911	14	10	20.7	5	10	300	600	0.70	49.24	6.72	7.6E-08
09/11/25	45911	14	15	20.7	5	15	300	900	0.70	49.24	6.72	7.6E-08 *
09/11/25	45911	14	20	20.7	5	20	300	1200	0.70	49.24	6.72	7.6E-08 *
09/11/25	45911	14	25	20.7	5	25	300	1500	0.70	49.24	6.72	7.6E-08 *
09/11/25	45911	12	30	20.7	-115	-90	-6900	-5400	0.70	49.24	6.72	7.6E-08 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS 7.6E-08 cm/sec

DATE	9/11/25
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	2	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-1-12A	-	Flow Pump Speed	12	
SAMPLE TYPE	UD		Technician	FT/DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.612	B-Value, f	1.00	Height (in)	2.685
Diameter (in)	2.854	Cell Pres.	90.0	Diameter (in)	2.882
Area (cm²)	41.27	Bot. Pres.	80.0	Area (cm²)	42.09
Volume (cm^3)	273.82	Top Pres.	80.0	Volume (cm^3)	287.03
Mass (g)	505.03	Tot. B.P.	80.0	Mass (g)	553.27
Moisture Content (%)	15.4	Head, max.	206.80	Moisture Content (%)	26.4
Dry Density (pcf)	99.8	Head, min.	206.80	Dry Density (pcf)	95.2
Spec. Gravity(assumed)	2.70	Max. Grad.	30.32	Volume Solids (cm^3)	162.13
Volume Solids (cm^3)	162.13	Min. Grad.	30.32	Volume Voids (cm^3)	124.90
Volume Voids (cm^3)	111.69			Void Ratio	0.77
Void Ratio	0.69			Saturation	92%
Saturation	60%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	505.03	561.10
Wt. Dry Soil & Tare (g)	437.75	445.70
Wt. Tare (g)	0.00	8.40
Wt. Water (g)	67.28	115.40
Wt. Dry Soil (g)	437.75	437.30
Moisture Content	15.4%	26.4%

DESCRIPTION -

Flow Pump Rate 4.46E-06 cm^3/sec

PERMEANT: Deaired Tap Water

USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/12/25	45912	10	45	18.7	0	0	0	0	2.94	206.80	30.32	3.6E-09	
09/12/25	45912	10	50	18.7	5	5	300	300	2.94	206.80	30.32	3.6E-09	
09/12/25	45912	10	55	18.7	5	10	300	600	2.94	206.80	30.32	3.6E-09	
09/12/25	45912	11	0	18.7	5	15	300	900	2.94	206.80	30.32	3.6E-09	*
09/12/25	45912	11	5	18.7	5	20	300	1200	2.94	206.80	30.32	3.6E-09	*
09/12/25	45912	11	10	18.7	5	25	300	1500	2.94	206.80	30.32	3.6E-09	*
09/12/25	45912	11	15	18.7	5	30	300	1800	2.94	206.80	30.32	3.6E-09	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS 3.6E-09 cm/sec

DATE	9/12/25
CHECK	JT
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY
ASTM D5084
METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	12	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-1-13A	-	Flow Pump Speed	11	
SAMPLE TYPE	UD		Technician	DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.054	B-Value, f	0.98	Height (in)	2.115
Diameter (in)	2.863	Cell Pres.	90.0	Diameter (in)	2.876
Area (cm^2)	41.53	Bot. Pres.	80.0	Area (cm^2)	41.91
Volume (cm^3)	216.69	Top Pres.	80.0	Volume (cm^3)	225.15
Mass (g)	414.88	Tot. B.P.	80.0	Mass (g)	443.37
Moisture Content (%)	18.0	Head, max.	100.59	Moisture Content (%)	26.1
Dry Density (pcf)	101.3	Head, min.	100.59	Dry Density (pcf)	97.5
Spec. Gravity(assumed)	2.70	Max. Grad.	18.72	Volume Solids (cm^3)	130.24
Volume Solids (cm^3)	130.24	Min. Grad.	18.72	Volume Voids (cm^3)	94.92
Volume Voids (cm^3)	86.45			Void Ratio	0.73
Void Ratio	0.66			Saturation	97%
Saturation	73%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	414.88	451.36
Wt. Dry Soil & Tare (g)	351.64	359.73
Wt. Tare (g)	0.00	8.49
Wt. Water (g)	63.24	91.63
Wt. Dry Soil (g)	351.64	351.24
Moisture Content	18.0%	26.1%

DESCRIPTION -

Flow Pump Rate 1.11E-05 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/14/25	45914	14	45	19.1	0	0	0	0	1.43	100.59	18.72	1.4E-08	
09/14/25	45914	14	50	19.1	5	5	300	300	1.43	100.59	18.72	1.4E-08	
09/14/25	45914	14	55	19.1	5	10	300	600	1.43	100.59	18.72	1.4E-08	
09/14/25	45914	15	0	19.1	5	15	300	900	1.43	100.59	18.72	1.4E-08	*
09/14/25	45914	15	5	19.1	5	20	300	1200	1.43	100.59	18.72	1.4E-08	*
09/14/25	45914	15	10	19.1	5	25	300	1500	1.43	100.59	18.72	1.4E-08	*
09/14/25	45914	15	15	19.1	5	30	300	1800	1.43	100.59	18.72	1.4E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 1.4E-08 cm/sec

DATE	9/14/25
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	13	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-1-14A	-	Flow Pump Speed	11	
SAMPLE TYPE	UD		Technician	DA	

Sample Data - Initial			
Height (in)	2.178	B-Value, f	0.97
Diameter (in)	2.856	Cell Pres.	90.0
Area (cm²)	41.33	Bot. Pres.	80.0
Volume (cm³)	228.65	Top Pres.	80.0
Mass (g)	460.41	Tot. B.P.	80.0
Moisture Content (%)	17.6	Head, max.	145.60
Dry Density (pcf)	106.8	Head, min.	145.60
Spec. Gravity(assumed)	2.70	Max. Grad.	25.85
Volume Solids (cm³)	145.00	Min. Grad.	25.85
Volume Voids (cm³)	83.64		
Void Ratio	0.58		
Saturation	82%		

Sample Data- Final	
Height (in)	2.218
Diameter (in)	2.888
Area (cm²)	42.26
Volume (cm³)	238.09
Mass (g)	483.45
Moisture Content (%)	23.5
Dry Density (pcf)	102.6
Volume Solids (cm³)	145.00
Volume Voids (cm³)	93.09
Void Ratio	0.64
Saturation	99%

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	460.41	491.62
Wt. Dry Soil & Tare (g)	391.51	399.72
Wt. Tare (g)	0.00	8.37
Wt. Water (g)	68.90	91.90
Wt. Dry Soil (g)	391.51	391.35
Moisture Content	17.6%	23.5%

DESCRIPTION -

Flow Pump Rate 1.11E-05 cm³/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/14/25	45914	15	30	19.1	0	0	0	0	2.07	145.60	25.85	1.0E-08	
09/14/25	45914	15	35	19.1	5	5	300	300	2.07	145.60	25.85	1.0E-08	
09/14/25	45914	15	40	19.1	5	10	300	600	2.07	145.60	25.85	1.0E-08	
09/14/25	45914	15	45	19.1	5	15	300	900	2.07	145.60	25.85	1.0E-08	*
09/14/25	45914	15	50	19.1	5	20	300	1200	2.07	145.60	25.85	1.0E-08	*
09/14/25	45914	15	55	19.1	5	25	300	1500	2.07	145.60	25.85	1.0E-08	*
09/14/25	45914	16	0	19.1	5	30	300	1800	2.07	145.60	25.85	1.0E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 1.0E-08 cm/sec

DATE	9/14/25
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	14	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-1-15A	-	Flow Pump Speed	11	
SAMPLE TYPE	UD		Technician	DA	

Sample Data - Initial			
Height (in)	2.849	B-Value, f	0.97
Diameter (in)	2.850	Cell Pres.	90.0
Area (cm²)	41.16	Bot. Pres.	80.0
Volume (cm^3)	297.83	Top Pres.	80.0
Mass (g)	589.47	Tot. B.P.	80.0
Moisture Content (%)	20.1	Head, max.	75.26
Dry Density (pcf)	102.8	Head, min.	75.26
Spec. Gravity(assumed)	2.70	Max. Grad.	10.32
Volume Solids (cm^3)	181.77	Min. Grad.	10.32
Volume Voids (cm^3)	116.06		
Void Ratio	0.64		
Saturation	85%		

Sample Data- Final	
Height (in)	2.872
Diameter (in)	2.865
Area (cm^3)	41.59
Volume (cm^3)	303.41
Mass (g)	608.41
Moisture Content (%)	24.0
Dry Density (pcf)	100.9
Volume Solids (cm^3)	181.77
Volume Voids (cm^3)	121.63
Void Ratio	0.67
Saturation	97%

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	589.47	616.44
Wt. Dry Soil & Tare (g)	490.79	498.89
Wt. Tare (g)	0.00	8.39
Wt. Water (g)	98.68	117.55
Wt. Dry Soil (g)	490.79	490.50
Moisture Content	20.1%	24.0%

DESCRIPTION -

Flow Pump Rate 1.11E-05 cm^3/sec

PERMEANT: Deaired Tap Water

USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/14/25	45914	16	45	19.1	0	0	0	0	1.07	75.26	10.32	2.6E-08	
09/14/25	45914	16	50	19.1	5	5	300	300	1.07	75.26	10.32	2.6E-08	
09/14/25	45914	16	55	19.1	5	10	300	600	1.07	75.26	10.32	2.6E-08	
09/14/25	45914	17	0	19.1	5	15	300	900	1.07	75.26	10.32	2.6E-08	*
09/14/25	45914	17	5	19.1	5	20	300	1200	1.07	75.26	10.32	2.6E-08	*
09/14/25	45914	17	10	19.1	5	25	300	1500	1.07	75.26	10.32	2.6E-08	*
09/14/25	45914	17	15	19.1	5	30	300	1800	1.07	75.26	10.32	2.6E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS 2.6E-08 cm/sec

DATE	9/14/25
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY
ASTM D5084
METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	2	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-1-16A	-	Flow Pump Speed	11	
SAMPLE TYPE	UD		Technician	FT/DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.858	B-Value, f	0.98	Height (in)	2.887
Diameter (in)	2.873	Cell Pres.	90.0	Diameter (in)	2.909
Area (cm^2)	41.82	Bot. Pres.	80.0	Area (cm^2)	42.88
Volume (cm^3)	303.62	Top Pres.	80.0	Volume (cm^3)	314.43
Mass (g)	635.65	Tot. B.P.	80.0	Mass (g)	653.08
Moisture Content (%)	17.6	Head, max.	79.48	Moisture Content (%)	20.9
Dry Density (pcf)	111.1	Head, min.	79.48	Dry Density (pcf)	107.2
Spec. Gravity(assumed)	2.70	Max. Grad.	10.84	Volume Solids (cm^3)	200.14
Volume Solids (cm^3)	200.14	Min. Grad.	10.84	Volume Voids (cm^3)	114.29
Volume Voids (cm^3)	103.47			Void Ratio	0.57
Void Ratio	0.52			Saturation	99%
Saturation	92%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	635.65	661.46
Wt. Dry Soil & Tare (g)	540.39	548.80
Wt. Tare (g)	0.00	8.57
Wt. Water (g)	95.26	112.66
Wt. Dry Soil (g)	540.39	540.23
Moisture Content	17.6%	20.9%

DESCRIPTION -

Flow Pump Rate 1.11E-05 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
10/02/25	45932	10	0	20.6	0	0	0	0	1.13	79.48	10.84	2.3E-08
10/02/25	45932	10	5	20.6	5	5	300	300	1.13	79.48	10.84	2.3E-08
10/02/25	45932	10	10	20.6	5	10	300	600	1.13	79.48	10.84	2.3E-08
10/02/25	45932	10	15	20.6	5	15	300	900	1.13	79.48	10.84	2.3E-08 *
10/02/25	45932	10	20	20.6	5	20	300	1200	1.13	79.48	10.84	2.3E-08 *
10/02/25	45932	10	25	20.6	5	25	300	1500	1.13	79.48	10.84	2.3E-08 *
10/02/25	45932	10	30	20.6	5	30	300	1800	1.13	79.48	10.84	2.3E-08 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 2.3E-08 cm/sec

DATE	10/2/25
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REVIEW	JT
APPROVE	

FLEXIBLE WALL PERMEABILITY
ASTM D5084
METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	1	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-2-1A	-	Flow Pump Speed	11	
SAMPLE TYPE	UD		Technician	DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.853	B-Value, f	1.00	Height (in)	2.893
Diameter (in)	2.857	Cell Pres.	90.0	Diameter (in)	2.871
Area (cm²)	41.36	Bot. Pres.	80.0	Area (cm²)	41.77
Volume (cm^3)	299.72	Top Pres.	80.0	Volume (cm^3)	306.91
Mass (g)	569.20	Tot. B.P.	80.0	Mass (g)	601.35
Moisture Content (%)	18.0	Head, max.	111.14	Moisture Content (%)	24.6
Dry Density (pcf)	100.4	Head, min.	111.14	Dry Density (pcf)	98.1
Spec. Gravity(assumed)	2.70	Max. Grad.	15.12	Volume Solids (cm^3)	178.68
Volume Solids (cm^3)	178.68	Min. Grad.	15.12	Volume Voids (cm^3)	128.22
Volume Voids (cm^3)	121.03			Void Ratio	0.72
Void Ratio	0.68			Saturation	93%
Saturation	72%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	569.20	609.44
Wt. Dry Soil & Tare (g)	482.45	490.61
Wt. Tare (g)	0.00	8.46
Wt. Water (g)	86.75	118.83
Wt. Dry Soil (g)	482.45	482.15
Moisture Content	18.0%	24.6%

DESCRIPTION -

Flow Pump Rate 1.11E-05 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/13/25	45913	14	50	19.1	0	0	0	0	1.58	111.14	15.12	1.8E-08	
09/13/25	45913	14	55	19.1	5	5	300	300	1.58	111.14	15.12	1.8E-08	
09/13/25	45913	15	0	19.1	5	10	300	600	1.58	111.14	15.12	1.8E-08	
09/13/25	45913	15	5	19.1	5	15	300	900	1.58	111.14	15.12	1.8E-08	*
09/13/25	45913	15	10	19.1	5	20	300	1200	1.58	111.14	15.12	1.8E-08	*
09/13/25	45913	15	15	19.1	5	25	300	1500	1.58	111.14	15.12	1.8E-08	*
09/13/25	45913	15	20	19.1	5	30	300	1800	1.58	111.14	15.12	1.8E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 1.8E-08 cm/sec

DATE	9/13/25
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	2	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-2-2A	-	Flow Pump Speed	10	
SAMPLE TYPE	UD		Technician	CJ	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.855	B-Value, f	1.00	Height (in)	2.876
Diameter (in)	2.863	Cell Pres.	90.0	Diameter (in)	2.888
Area (cm^2)	41.53	Bot. Pres.	80.0	Area (cm^2)	42.26
Volume (cm^3)	301.19	Top Pres.	80.0	Volume (cm^3)	308.73
Mass (g)	603.72	Tot. B.P.	80.0	Mass (g)	615.86
Moisture Content (%)	21.7	Head, max.	69.64	Moisture Content (%)	24.1
Dry Density (pcf)	102.8	Head, min.	69.64	Dry Density (pcf)	100.3
Spec. Gravity(assumed)	2.70	Max. Grad.	9.53	Volume Solids (cm^3)	183.80
Volume Solids (cm^3)	183.80	Min. Grad.	9.53	Volume Voids (cm^3)	124.93
Volume Voids (cm^3)	117.39			Void Ratio	0.68
Void Ratio	0.64			Saturation	96%
Saturation	92%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	603.72	624.05
Wt. Dry Soil & Tare (g)	496.25	504.49
Wt. Tare (g)	0.00	8.44
Wt. Water (g)	107.47	119.56
Wt. Dry Soil (g)	496.25	496.05
Moisture Content	21.7%	24.1%

DESCRIPTION -

Flow Pump Rate 2.19E-05 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
09/15/25	45915	11	0	20.0	0	0	0	0	0.99	69.64	9.53	5.4E-08
09/15/25	45915	11	5	20.0	5	5	300	300	0.99	69.64	9.53	5.4E-08
09/15/25	45915	11	10	20.0	5	10	300	600	0.99	69.64	9.53	5.4E-08
09/15/25	45915	11	15	20.0	5	15	300	900	0.99	69.64	9.53	5.4E-08 *
09/15/25	45915	11	20	20.0	5	20	300	1200	0.99	69.64	9.53	5.4E-08 *
09/15/25	45915	11	25	20.0	5	25	300	1500	0.99	69.64	9.53	5.4E-08 *
09/15/25	45915	11	30	20.0	5	30	300	1800	0.99	69.64	9.53	5.4E-08 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 5.4E-08 cm/sec

DATE	9/15/25
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	2	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-2-3A	-	Flow Pump Speed	11	
SAMPLE TYPE	UD		Technician	FT	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.699	B-Value, f	0.98	Height (in)	2.743
Diameter (in)	2.788	Cell Pres.	90.0	Diameter (in)	2.848
Area (cm^2)	39.39	Bot. Pres.	80.0	Area (cm^2)	41.10
Volume (cm^3)	270.01	Top Pres.	80.0	Volume (cm^3)	286.35
Mass (g)	558.88	Tot. B.P.	80.0	Mass (g)	573.17
Moisture Content (%)	20.2	Head, max.	64.01	Moisture Content (%)	23.3
Dry Density (pcf)	107.5	Head, min.	64.01	Dry Density (pcf)	101.3
Spec. Gravity(assumed)	2.70	Max. Grad.	9.19	Volume Solids (cm^3)	172.22
Volume Solids (cm^3)	172.22	Min. Grad.	9.19	Volume Voids (cm^3)	114.13
Volume Voids (cm^3)	97.79			Void Ratio	0.66
Void Ratio	0.57			Saturation	95%
Saturation	96%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	558.88	581.33
Wt. Dry Soil & Tare (g)	464.98	473.20
Wt. Tare (g)	0.00	8.46
Wt. Water (g)	93.90	108.13
Wt. Dry Soil (g)	464.98	464.74
Moisture Content	20.2%	23.3%

DESCRIPTION -

Flow Pump Rate 1.11E-05 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
09/16/25	45916	9	0	20.2	0	0	0	0	0.91	64.01	9.19	2.9E-08
09/16/25	45916	9	5	20.2	5	5	300	300	0.91	64.01	9.19	2.9E-08
09/16/25	45916	9	10	20.2	5	10	300	600	0.91	64.01	9.19	2.9E-08
09/16/25	45916	9	15	20.2	5	15	300	900	0.91	64.01	9.19	2.9E-08 *
09/16/25	45916	9	20	20.2	5	20	300	1200	0.91	64.01	9.19	2.9E-08 *
09/16/25	45916	9	25	20.2	5	25	300	1500	0.91	64.01	9.19	2.9E-08 *
09/16/25	45916	9	30	20.2	5	30	300	1800	0.91	64.01	9.19	2.9E-08 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 2.9E-08 cm/sec

DATE	9/16/25
CHECK	DA
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	5	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-2-4A	-	Flow Pump Speed	10	
SAMPLE TYPE	UD		Technician	FT	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.563	B-Value, f	1.00	Height (in)	2.594
Diameter (in)	2.840	Cell Pres.	90.0	Diameter (in)	2.833
Area (cm^2)	40.87	Bot. Pres.	80.0	Area (cm^2)	40.67
Volume (cm^3)	266.06	Top Pres.	80.0	Volume (cm^3)	267.95
Mass (g)	507.30	Tot. B.P.	80.0	Mass (g)	529.89
Moisture Content (%)	20.1	Head, max.	177.26	Moisture Content (%)	25.4
Dry Density (pcf)	99.1	Head, min.	177.26	Dry Density (pcf)	98.4
Spec. Gravity(assumed)	2.70	Max. Grad.	26.90	Volume Solids (cm^3)	156.46
Volume Solids (cm^3)	156.46	Min. Grad.	26.90	Volume Voids (cm^3)	111.49
Volume Voids (cm^3)	109.59			Void Ratio	0.71
Void Ratio	0.70			Saturation	96%
Saturation	77%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	507.30	538.12
Wt. Dry Soil & Tare (g)	422.45	430.73
Wt. Tare (g)	0.00	8.47
Wt. Water (g)	84.85	107.39
Wt. Dry Soil (g)	422.45	422.26
Moisture Content	20.1%	25.4%

DESCRIPTION -

Flow Pump Rate 2.19E-05 cm^3/sec

PERMEANT: Deaired Tap Water

USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/16/25	45916	8	0	20.2	0	0	0	0	2.52	177.26	26.90	2.0E-08	
09/16/25	45916	8	5	20.2	5	5	300	300	2.52	177.26	26.90	2.0E-08	
09/16/25	45916	8	10	20.2	5	10	300	600	2.52	177.26	26.90	2.0E-08	
09/16/25	45916	8	15	20.2	5	15	300	900	2.52	177.26	26.90	2.0E-08	*
09/16/25	45916	8	20	20.2	5	20	300	1200	2.52	177.26	26.90	2.0E-08	*
09/16/25	45916	8	25	20.2	5	25	300	1500	2.52	177.26	26.90	2.0E-08	*
09/16/25	45916	8	30	20.2	5	30	300	1800	2.52	177.26	26.90	2.0E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS 2.0E-08 cm/sec

DATE	9/16/25
CHECK	DA
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	3	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-2-5A	-	Flow Pump Speed	9	
SAMPLE TYPE	UD		Technician	FT	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.859	B-Value, f	1.00	Height (in)	2.889
Diameter (in)	2.854	Cell Pres.	90.0	Diameter (in)	2.871
Area (cm^2)	41.27	Bot. Pres.	80.0	Area (cm^2)	41.77
Volume (cm^3)	299.72	Top Pres.	80.0	Volume (cm^3)	306.48
Mass (g)	594.92	Tot. B.P.	80.0	Mass (g)	615.75
Moisture Content (%)	18.7	Head, max.	135.76	Moisture Content (%)	22.9
Dry Density (pcf)	104.3	Head, min.	135.76	Dry Density (pcf)	102.0
Spec. Gravity(assumed)	2.70	Max. Grad.	18.50	Volume Solids (cm^3)	185.59
Volume Solids (cm^3)	185.59	Min. Grad.	18.50	Volume Voids (cm^3)	120.89
Volume Voids (cm^3)	114.13			Void Ratio	0.65
Void Ratio	0.61			Saturation	95%
Saturation	82%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	594.92	624.05
Wt. Dry Soil & Tare (g)	501.09	509.42
Wt. Tare (g)	0.00	8.45
Wt. Water (g)	93.83	114.63
Wt. Dry Soil (g)	501.09	500.97
Moisture Content	18.7%	22.9%

DESCRIPTION -

Flow Pump Rate 4.38E-05 cm^3/sec

PERMEANT: Deaired Tap Water

USCS -

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
09/16/25	45916	11	0	20.2	0	0	0	0	1.93	135.76	18.50	5.6E-08
09/16/25	45916	11	5	20.2	5	5	300	300	1.93	135.76	18.50	5.6E-08
09/16/25	45916	11	10	20.2	5	10	300	600	1.93	135.76	18.50	5.6E-08
09/16/25	45916	11	15	20.2	5	15	300	900	1.93	135.76	18.50	5.6E-08 *
09/16/25	45916	11	20	20.2	5	20	300	1200	1.93	135.76	18.50	5.6E-08 *
09/16/25	45916	11	25	20.2	5	25	300	1500	1.93	135.76	18.50	5.6E-08 *
09/16/25	45916	11	30	20.2	5	30	300	1800	1.93	135.76	18.50	5.6E-08 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS 5.6E-08 cm/sec

DATE	9/16/25
CHECK	DP
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	6	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-2-6A	-	Flow Pump Speed	10	
SAMPLE TYPE	UD		Technician	FT	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.565	B-Value, f	0.97	Height (in)	2.603
Diameter (in)	2.857	Cell Pres.	90.0	Diameter (in)	2.853
Area (cm^2)	41.36	Bot. Pres.	80.0	Area (cm^2)	41.24
Volume (cm^3)	269.46	Top Pres.	80.0	Volume (cm^3)	272.69
Mass (g)	513.59	Tot. B.P.	80.0	Mass (g)	535.27
Moisture Content (%)	18.0	Head, max.	80.19	Moisture Content (%)	23.0
Dry Density (pcf)	100.8	Head, min.	80.19	Dry Density (pcf)	99.6
Spec. Gravity(assumed)	2.70	Max. Grad.	12.13	Volume Solids (cm^3)	161.17
Volume Solids (cm^3)	161.17	Min. Grad.	12.13	Volume Voids (cm^3)	111.52
Volume Voids (cm^3)	108.29			Void Ratio	0.69
Void Ratio	0.67			Saturation	90%
Saturation	72%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	513.59	543.65
Wt. Dry Soil & Tare (g)	435.16	443.56
Wt. Tare (g)	0.00	8.51
Wt. Water (g)	78.43	100.09
Wt. Dry Soil (g)	435.16	435.05
Moisture Content	18.0%	23.0%

DESCRIPTION -

Flow Pump Rate 2.19E-05 cm^3/sec

PERMEANT: Deaired Tap Water

USCS -

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
09/16/25	45916	12	0	20.2	0	0	0	0	1.14	80.19	12.13	4.4E-08
09/16/25	45916	12	5	20.2	5	5	300	300	1.14	80.19	12.13	4.4E-08
09/16/25	45916	12	10	20.2	5	10	300	600	1.14	80.19	12.13	4.4E-08
09/16/25	45916	12	15	20.2	5	15	300	900	1.14	80.19	12.13	4.4E-08 *
09/16/25	45916	12	20	20.2	5	20	300	1200	1.14	80.19	12.13	4.4E-08 *
09/16/25	45916	12	25	20.2	5	25	300	1500	1.14	80.19	12.13	4.4E-08 *
09/16/25	45916	12	30	20.2	5	30	300	1800	1.14	80.19	12.13	4.4E-08 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS 4.4E-08 cm/sec

DATE	9/16/25
CHECK	DAP
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	3	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-2-7A	-	Flow Pump Speed	11	
SAMPLE TYPE	UD		Technician	FT	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.867	B-Value, f	1.00	Height (in)	2.889
Diameter (in)	2.850	Cell Pres.	90.0	Diameter (in)	2.859
Area (cm^2)	41.16	Bot. Pres.	80.0	Area (cm^2)	41.42
Volume (cm^3)	299.71	Top Pres.	80.0	Volume (cm^3)	303.93
Mass (g)	612.64	Tot. B.P.	80.0	Mass (g)	623.87
Moisture Content (%)	19.5	Head, max.	40.80	Moisture Content (%)	21.7
Dry Density (pcf)	106.7	Head, min.	40.80	Dry Density (pcf)	105.3
Spec. Gravity(assumed)	2.70	Max. Grad.	5.56	Volume Solids (cm^3)	189.89
Volume Solids (cm^3)	189.89	Min. Grad.	5.56	Volume Voids (cm^3)	114.03
Volume Voids (cm^3)	109.82			Void Ratio	0.60
Void Ratio	0.58			Saturation	97%
Saturation	91%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	612.64	632.29
Wt. Dry Soil & Tare (g)	512.71	521.15
Wt. Tare (g)	0.00	8.51
Wt. Water (g)	99.93	111.14
Wt. Dry Soil (g)	512.71	512.64
Moisture Content	19.5%	21.7%

DESCRIPTION -

Flow Pump Rate 1.11E-05 cm^3/sec

PERMEANT: Deaired Tap Water

USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/17/25	45917	12	0	20.2	0	0	0	0	0.58	40.80	5.56	4.8E-08	
09/17/25	45917	12	5	20.2	5	5	300	300	0.58	40.80	5.56	4.8E-08	
09/17/25	45917	12	10	20.2	5	10	300	600	0.58	40.80	5.56	4.8E-08	
09/17/25	45917	12	15	20.2	5	15	300	900	0.58	40.80	5.56	4.8E-08	*
09/17/25	45917	12	20	20.2	5	20	300	1200	0.58	40.80	5.56	4.8E-08	*
09/17/25	45917	12	25	20.2	5	25	300	1500	0.58	40.80	5.56	4.8E-08	*
09/17/25	45917	12	30	20.2	5	30	300	1800	0.58	40.80	5.56	4.8E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS 4.8E-08 cm/sec

DATE	9/17/25
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	5	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-2-8A	-	Flow Pump Speed	10	
SAMPLE TYPE	UD		Technician	FT	

Sample Data - Initial			
Height (in)	2.859	B-Value, f	0.96
Diameter (in)	2.856	Cell Pres.	90.0
Area (cm²)	41.33	Bot. Pres.	80.0
Volume (cm^3)	300.14	Top Pres.	80.0
Mass (g)	604.73	Tot. B.P.	80.0
Moisture Content (%)	20.1	Head, max.	80.19
Dry Density (pcf)	104.7	Head, min.	80.19
Spec. Gravity(assumed)	2.70	Max. Grad.	10.95
Volume Solids (cm^3)	186.48	Min. Grad.	10.95
Volume Voids (cm^3)	113.66		
Void Ratio	0.61		
Saturation	89%		

Sample Data- Final	
Height (in)	2.882
Diameter (in)	2.874
Area (cm²)	41.85
Volume (cm^3)	306.38
Mass (g)	617.06
Moisture Content (%)	22.6
Dry Density (pcf)	102.5
Volume Solids (cm^3)	186.48
Volume Voids (cm^3)	119.90
Void Ratio	0.64
Saturation	95%

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	604.73	625.43
Wt. Dry Soil & Tare (g)	503.50	511.88
Wt. Tare (g)	0.00	8.43
Wt. Water (g)	101.23	113.55
Wt. Dry Soil (g)	503.50	503.45
Moisture Content	20.1%	22.6%

DESCRIPTION -

Flow Pump Rate 2.19E-05 cm^3/sec

PERMEANT: Deaired Tap Water

USCS -

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
09/18/25	45918	9	0	20.2	0	0	0	0	1.14	80.19	10.95	4.8E-08
09/18/25	45918	9	5	20.2	5	5	300	300	1.14	80.19	10.95	4.8E-08
09/18/25	45918	9	10	20.2	5	10	300	600	1.14	80.19	10.95	4.8E-08
09/18/25	45918	9	15	20.2	5	15	300	900	1.14	80.19	10.95	4.8E-08 *
09/18/25	45918	9	20	20.2	5	20	300	1200	1.14	80.19	10.95	4.8E-08 *
09/18/25	45918	9	25	20.2	5	25	300	1500	1.14	80.19	10.95	4.8E-08 *
09/18/25	45918	9	30	20.2	5	30	300	1800	1.14	80.19	10.95	4.8E-08 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS 4.8E-08 cm/sec

DATE	9/18/25
CHECK	JM
REVIEW	DJA
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	2	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-2-9A	-	Flow Pump Speed	11	
SAMPLE TYPE	UD		Technician	FT	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.569	B-Value, f	1.00	Height (in)	2.589
Diameter (in)	2.851	Cell Pres.	90.0	Diameter (in)	2.863
Area (cm^2)	41.19	Bot. Pres.	80.0	Area (cm^2)	41.53
Volume (cm^3)	268.75	Top Pres.	80.0	Volume (cm^3)	273.13
Mass (g)	510.81	Tot. B.P.	80.0	Mass (g)	533.57
Moisture Content (%)	20.0	Head, max.	96.37	Moisture Content (%)	25.3
Dry Density (pcf)	98.9	Head, min.	96.37	Dry Density (pcf)	97.3
Spec. Gravity(assumed)	2.70	Max. Grad.	14.65	Volume Solids (cm^3)	157.69
Volume Solids (cm^3)	157.69	Min. Grad.	14.65	Volume Voids (cm^3)	115.44
Volume Voids (cm^3)	111.06			Void Ratio	0.73
Void Ratio	0.70			Saturation	93%
Saturation	77%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	510.81	542.08
Wt. Dry Soil & Tare (g)	425.76	434.28
Wt. Tare (g)	0.00	8.58
Wt. Water (g)	85.05	107.80
Wt. Dry Soil (g)	425.76	425.70
Moisture Content	20.0%	25.3%

DESCRIPTION -

Flow Pump Rate 1.11E-05 cm^3/sec

PERMEANT: Deaired Tap Water

USCS -

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
09/17/25	45917	10	0	20.2	0	0	0	0	1.37	96.37	14.65	1.8E-08
09/17/25	45917	10	5	20.2	5	5	300	300	1.37	96.37	14.65	1.8E-08
09/17/25	45917	10	10	20.2	5	10	300	600	1.37	96.37	14.65	1.8E-08
09/17/25	45917	10	15	20.2	5	15	300	900	1.37	96.37	14.65	1.8E-08 *
09/17/25	45917	10	20	20.2	5	20	300	1200	1.37	96.37	14.65	1.8E-08 *
09/17/25	45917	10	25	20.2	5	25	300	1500	1.37	96.37	14.65	1.8E-08 *
09/17/25	45917	10	30	20.2	5	30	300	1800	1.37	96.37	14.65	1.8E-08 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS 1.8E-08 cm/sec

DATE	9/17/25
CHECK	D.A
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	6	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-2-10A	-	Flow Pump Speed	11	
SAMPLE TYPE	UD		Technician	FT	

Sample Data - Initial				Sample Data- Final	
Height (in)	1.832	B-Value, f	1.00	Height (in)	1.857
Diameter (in)	2.848	Cell Pres.	90.0	Diameter (in)	2.854
Area (cm^2)	41.10	Bot. Pres.	80.0	Area (cm^2)	41.27
Volume (cm^3)	191.25	Top Pres.	80.0	Volume (cm^3)	194.68
Mass (g)	366.86	Tot. B.P.	80.0	Mass (g)	385.84
Moisture Content (%)	17.7	Head, max.	80.19	Moisture Content (%)	23.8
Dry Density (pcf)	101.7	Head, min.	80.19	Dry Density (pcf)	99.9
Spec. Gravity(assumed)	2.70	Max. Grad.	17.00	Volume Solids (cm^3)	115.45
Volume Solids (cm^3)	115.45	Min. Grad.	17.00	Volume Voids (cm^3)	79.22
Volume Voids (cm^3)	75.79			Void Ratio	0.69
Void Ratio	0.66			Saturation	94%
Saturation	73%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	366.86	394.24
Wt. Dry Soil & Tare (g)	311.73	320.14
Wt. Tare (g)	0.00	8.46
Wt. Water (g)	55.13	74.10
Wt. Dry Soil (g)	311.73	311.68
Moisture Content	17.7%	23.8%

DESCRIPTION -

Flow Pump Rate 1.11E-05 cm^3/sec

PERMEANT: Deaired Tap Water

USCS -

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (^oC)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
09/18/25	45918	12	0	20.2	0	0	0	0	1.14	80.19	17.00	1.6E-08
09/18/25	45918	12	5	20.2	5	5	300	300	1.14	80.19	17.00	1.6E-08
09/18/25	45918	12	10	20.2	5	10	300	600	1.14	80.19	17.00	1.6E-08
09/18/25	45918	12	15	20.2	5	15	300	900	1.14	80.19	17.00	1.6E-08 *
09/18/25	45918	12	20	20.2	5	20	300	1200	1.14	80.19	17.00	1.6E-08 *
09/18/25	45918	12	25	20.2	5	25	300	1500	1.14	80.19	17.00	1.6E-08 *
09/18/25	45918	12	30	20.2	5	30	300	1800	1.14	80.19	17.00	1.6E-08 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS 1.6E-08 cm/sec

DATE	9/18/25	9/17/25
CHECK	49	DA
REVIEW	DA	
APPROVE		

FLEXIBLE WALL PERMEABILITY
ASTM D5084
METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	1	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-2-11A	-	Flow Pump Speed	10	
SAMPLE TYPE	UD		Technician	FT	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.368	B-Value, f	0.98	Height (in)	2.368
Diameter (in)	2.873	Cell Pres.	90.0	Diameter (in)	2.873
Area (cm²)	41.82	Bot. Pres.	80.0	Area (cm²)	41.82
Volume (cm^3)	251.56	Top Pres.	80.0	Volume (cm^3)	251.56
Mass (g)	510.21	Tot. B.P.	80.0	Mass (g)	525.73
Moisture Content (%)	19.4	Head, max.	127.32	Moisture Content (%)	23.0
Dry Density (pcf)	106.0	Head, min.	127.32	Dry Density (pcf)	106.0
Spec. Gravity(assumed)	2.70	Max. Grad.	21.17	Volume Solids (cm^3)	158.28
Volume Solids (cm^3)	158.28	Min. Grad.	21.17	Volume Voids (cm^3)	93.29
Volume Voids (cm^3)	93.29			Void Ratio	0.59
Void Ratio	0.59			Saturation	105%
Saturation	89%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	510.21	534.04
Wt. Dry Soil & Tare (g)	427.35	435.67
Wt. Tare (g)	0.00	8.39
Wt. Water (g)	82.86	98.37
Wt. Dry Soil (g)	427.35	427.28
Moisture Content	19.4%	23.0%

DESCRIPTION -

Flow Pump Rate 2.19E-05 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
09/17/25	45917	8	30	20.4	0	0	0	0	1.81	127.32	21.17	2.5E-08
09/17/25	45917	8	35	20.4	5	5	300	300	1.81	127.32	21.17	2.5E-08
09/17/25	45917	8	40	20.4	5	10	300	600	1.81	127.32	21.17	2.5E-08
09/17/25	45917	8	45	20.4	5	15	300	900	1.81	127.32	21.17	2.5E-08 *
09/17/25	45917	8	50	20.4	5	20	300	1200	1.81	127.32	21.17	2.5E-08 *
09/17/25	45917	8	55	20.4	5	25	300	1500	1.81	127.32	21.17	2.5E-08 *
09/17/25	45917	9	0	20.4	5	30	300	1800	1.81	127.32	21.17	2.5E-08 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 2.5E-08 cm/sec

DATE	9/17/25
CHECK	DA
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	14	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-2-12A	-	Flow Pump Speed	11	
SAMPLE TYPE	UD		Technician	FT	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.371	B-Value, f	0.97	Height (in)	2.396
Diameter (in)	2.861	Cell Pres.	90.0	Diameter (in)	2.890
Area (cm^2)	41.48	Bot. Pres.	80.0	Area (cm^2)	42.32
Volume (cm^3)	249.78	Top Pres.	80.0	Volume (cm^3)	257.56
Mass (g)	502.89	Tot. B.P.	80.0	Mass (g)	520.51
Moisture Content (%)	18.5	Head, max.	95.66	Moisture Content (%)	22.7
Dry Density (pcf)	106.0	Head, min.	95.66	Dry Density (pcf)	102.8
Spec. Gravity(assumed)	2.70	Max. Grad.	15.72	Volume Solids (cm^3)	157.12
Volume Solids (cm^3)	157.12	Min. Grad.	15.72	Volume Voids (cm^3)	100.44
Volume Voids (cm^3)	92.66			Void Ratio	0.64
Void Ratio	0.59			Saturation	96%
Saturation	85%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	502.89	528.79
Wt. Dry Soil & Tare (g)	424.22	432.54
Wt. Tare (g)	0.00	8.49
Wt. Water (g)	78.67	96.25
Wt. Dry Soil (g)	424.22	424.05
Moisture Content	18.5%	22.7%

DESCRIPTION -

Flow Pump Rate 1.11E-05 cm^3/sec

PERMEANT: Deaired Tap Water

USCS -

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
09/19/25	45919	11	0	20.4	0	0	0	0	1.36	95.66	15.72	1.6E-08
09/19/25	45919	11	5	20.4	5	5	300	300	1.36	95.66	15.72	1.6E-08
09/19/25	45919	11	10	20.4	5	10	300	600	1.36	95.66	15.72	1.6E-08
09/19/25	45919	11	15	20.4	5	15	300	900	1.36	95.66	15.72	1.6E-08 *
09/19/25	45919	11	20	20.4	5	20	300	1200	1.36	95.66	15.72	1.6E-08 *
09/19/25	45919	11	25	20.4	5	25	300	1500	1.36	95.66	15.72	1.6E-08 *
09/19/25	45919	11	30	20.4	5	30	300	1800	1.36	95.66	15.72	1.6E-08 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS 1.6E-08 cm/sec

DATE	9/19/25
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	12	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-2-13A	-	Flow Pump Speed	11	
SAMPLE TYPE	UD		Technician	FT/DA	

Sample Data - Initial			
Height (in)	2.856	B-Value, f	0.98
Diameter (in)	2.865	Cell Pres.	90.0
Area (cm²)	41.59	Bot. Pres.	80.0
Volume (cm^3)	301.72	Top Pres.	80.0
Mass (g)	596.67	Tot. B.P.	80.0
Moisture Content (%)	20.9	Head, max.	68.93
Dry Density (pcf)	102.1	Head, min.	68.93
Spec. Gravity(assumed)	2.70	Max. Grad.	9.41
Volume Solids (cm^3)	182.83	Min. Grad.	9.41
Volume Voids (cm^3)	118.89		
Void Ratio	0.65		
Saturation	87%		

Sample Data- Final	
Height (in)	2.885
Diameter (in)	2.876
Area (cm²)	41.91
Volume (cm^3)	307.12
Mass (g)	617.70
Moisture Content (%)	25.1
Dry Density (pcf)	100.3
Volume Solids (cm^3)	182.83
Volume Voids (cm^3)	124.30
Void Ratio	0.68
Saturation	100%

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	596.67	757.02
Wt. Dry Soil & Tare (g)	493.63	632.97
Wt. Tare (g)	0.00	139.42
Wt. Water (g)	103.04	124.05
Wt. Dry Soil (g)	493.63	493.55
Moisture Content	20.9%	25.1%

DESCRIPTION -

Flow Pump Rate 1.11E-05 cm^3/sec

PERMEANT: Deaired Tap Water

USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/19/25	45919	8	0	20.2	0	0	0	0	0.98	68.93	9.41	2.8E-08	
09/19/25	45919	8	5	20.2	5	5	300	300	0.98	68.93	9.41	2.8E-08	
09/19/25	45919	8	10	20.2	5	10	300	600	0.98	68.93	9.41	2.8E-08	
09/19/25	45919	8	15	20.2	5	15	300	900	0.98	68.93	9.41	2.8E-08	*
09/19/25	45919	8	20	20.2	5	20	300	1200	0.98	68.93	9.41	2.8E-08	*
09/19/25	45919	8	25	20.2	5	25	300	1500	0.98	68.93	9.41	2.8E-08	*
09/19/25	45919	8	30	20.2	5	30	300	1800	0.98	68.93	9.41	2.8E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS 2.8E-08 cm/sec

DATE	9/19/25
CHECK	CG
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	11	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-2-14A	-	Flow Pump Speed	10	
SAMPLE TYPE	UD		Technician	FT	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.695	B-Value, f	1.00	Height (in)	2.719
Diameter (in)	2.864	Cell Pres.	90.0	Diameter (in)	2.883
Area (cm^2)	41.56	Bot. Pres.	80.0	Area (cm^2)	42.12
Volume (cm^3)	284.51	Top Pres.	80.0	Volume (cm^3)	290.86
Mass (g)	569.87	Tot. B.P.	80.0	Mass (g)	588.77
Moisture Content (%)	19.7	Head, max.	169.52	Moisture Content (%)	23.6
Dry Density (pcf)	104.5	Head, min.	169.52	Dry Density (pcf)	102.2
Spec. Gravity(assumed)	2.70	Max. Grad.	24.55	Volume Solids (cm^3)	176.40
Volume Solids (cm^3)	176.40	Min. Grad.	24.55	Volume Voids (cm^3)	114.46
Volume Voids (cm^3)	108.11			Void Ratio	0.65
Void Ratio	0.61			Saturation	98%
Saturation	87%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	569.87	596.72
Wt. Dry Soil & Tare (g)	476.28	484.32
Wt. Tare (g)	0.00	8.43
Wt. Water (g)	93.59	112.40
Wt. Dry Soil (g)	476.28	475.89
Moisture Content	19.7%	23.6%

DESCRIPTION -

Flow Pump Rate 2.19E-05 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
09/19/25	45919	8	0	20.4	0	0	0	0	2.41	169.52	24.55	2.1E-08
09/19/25	45919	8	5	20.4	5	5	300	300	2.41	169.52	24.55	2.1E-08
09/19/25	45919	8	10	20.4	5	10	300	600	2.41	169.52	24.55	2.1E-08
09/19/25	45919	8	15	20.4	5	15	300	900	2.41	169.52	24.55	2.1E-08 *
09/19/25	45919	8	20	20.4	5	20	300	1200	2.41	169.52	24.55	2.1E-08 *
09/19/25	45919	8	25	20.4	5	25	300	1500	2.41	169.52	24.55	2.1E-08 *
09/19/25	45919	8	30	20.4	5	30	300	1800	2.41	169.52	24.55	2.1E-08 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 2.1E-08 cm/sec

DATE	9/19/25
CHECK	CO
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	13	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-2-15A	-	Flow Pump Speed	11	
SAMPLE TYPE	UD		Technician	FT/DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.861	B-Value, f	0.95	Height (in)	2.838
Diameter (in)	2.859	Cell Pres.	90.0	Diameter (in)	2.855
Area (cm^2)	41.42	Bot. Pres.	80.0	Area (cm^2)	41.30
Volume (cm^3)	300.98	Top Pres.	80.0	Volume (cm^3)	297.73
Mass (g)	583.48	Tot. B.P.	80.0	Mass (g)	604.99
Moisture Content (%)	19.8	Head, max.	40.09	Moisture Content (%)	24.2
Dry Density (pcf)	101.0	Head, min.	40.09	Dry Density (pcf)	102.1
Spec. Gravity(assumed)	2.70	Max. Grad.	5.56	Volume Solids (cm^3)	180.40
Volume Solids (cm^3)	180.40	Min. Grad.	5.56	Volume Voids (cm^3)	117.33
Volume Voids (cm^3)	120.58			Void Ratio	0.65
Void Ratio	0.67			Saturation	101%
Saturation	80%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	583.48	613.17
Wt. Dry Soil & Tare (g)	487.07	495.29
Wt. Tare (g)	0.00	8.38
Wt. Water (g)	96.41	117.88
Wt. Dry Soil (g)	487.07	486.91
Moisture Content	19.8%	24.2%

DESCRIPTION -

Flow Pump Rate 1.11E-05 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/19/25	45919	14	25	20.5	0	0	0	0	0.57	40.09	5.56	4.8E-08	
09/19/25	45919	14	30	20.5	5	5	300	300	0.57	40.09	5.56	4.8E-08	
09/19/25	45919	14	35	20.5	5	10	300	600	0.57	40.09	5.56	4.8E-08	
09/19/25	45919	14	40	20.5	5	15	300	900	0.57	40.09	5.56	4.8E-08	*
09/19/25	45919	14	45	20.5	5	20	300	1200	0.57	40.09	5.56	4.8E-08	*
09/19/25	45919	14	50	20.5	5	25	300	1500	0.57	40.09	5.56	4.8E-08	*
09/19/25	45919	14	55	20.5	5	30	300	1800	0.57	40.09	5.56	4.8E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 4.8E-08 cm/sec

DATE	9/19/25
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	5	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-2-16A	-	Flow Pump Speed	12	
SAMPLE TYPE	UD		Technician	DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.867	B-Value, f	0.98	Height (in)	2.876
Diameter (in)	2.867	Cell Pres.	90.0	Diameter (in)	2.864
Area (cm^2)	41.65	Bot. Pres.	80.0	Area (cm^2)	41.56
Volume (cm^3)	303.30	Top Pres.	80.0	Volume (cm^3)	303.62
Mass (g)	608.22	Tot. B.P.	80.0	Mass (g)	620.26
Moisture Content (%)	23.2	Head, max.	179.37	Moisture Content (%)	25.6
Dry Density (pcf)	101.6	Head, min.	179.37	Dry Density (pcf)	101.5
Spec. Gravity(assumed)	2.70	Max. Grad.	24.55	Volume Solids (cm^3)	182.87
Volume Solids (cm^3)	182.87	Min. Grad.	24.55	Volume Voids (cm^3)	120.75
Volume Voids (cm^3)	120.43			Void Ratio	0.66
Void Ratio	0.66			Saturation	105%
Saturation	95%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	608.22	628.55
Wt. Dry Soil & Tare (g)	493.75	502.07
Wt. Tare (g)	0.00	8.45
Wt. Water (g)	114.47	126.48
Wt. Dry Soil (g)	493.75	493.62
Moisture Content	23.2%	25.6%

DESCRIPTION -

Flow Pump Rate 4.46E-06 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
10/03/25	45933	11	15	20.2	0	0	0	0	2.55	179.37	24.55	4.4E-09	
10/03/25	45933	11	20	20.2	5	5	300	300	2.55	179.37	24.55	4.4E-09	
10/03/25	45933	11	25	20.2	5	10	300	600	2.55	179.37	24.55	4.4E-09	
10/03/25	45933	11	30	20.2	5	15	300	900	2.55	179.37	24.55	4.4E-09	*
10/03/25	45933	11	35	20.2	5	20	300	1200	2.55	179.37	24.55	4.4E-09	*
10/03/25	45933	11	40	20.2	5	25	300	1500	2.55	179.37	24.55	4.4E-09	*
10/03/25	45933	11	45	20.2	5	30	300	1800	2.55	179.37	24.55	4.4E-09	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 4.4E-09 cm/sec

DATE	10/3/25
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	12	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-3-1A	-	Flow Pump Speed	10	
SAMPLE TYPE	UD		Technician	DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.856	B-Value, f	0.97	Height (in)	2.884
Diameter (in)	2.857	Cell Pres.	90.0	Diameter (in)	2.874
Area (cm²)	41.36	Bot. Pres.	80.0	Area (cm²)	41.85
Volume (cm³)	300.03	Top Pres.	80.0	Volume (cm³)	306.59
Mass (g)	589.85	Tot. B.P.	80.0	Mass (g)	619.61
Moisture Content (%)	16.9	Head, max.	116.06	Moisture Content (%)	22.8
Dry Density (pcf)	104.9	Head, min.	116.06	Dry Density (pcf)	102.7
Spec. Gravity(assumed)	2.70	Max. Grad.	15.84	Volume Solids (cm³)	186.83
Volume Solids (cm³)	186.83	Min. Grad.	15.84	Volume Voids (cm³)	119.76
Volume Voids (cm³)	113.20			Void Ratio	0.64
Void Ratio	0.61			Saturation	96%
Saturation	75%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	589.85	627.74
Wt. Dry Soil & Tare (g)	504.45	512.63
Wt. Tare (g)	0.00	8.41
Wt. Water (g)	85.40	115.11
Wt. Dry Soil (g)	504.45	504.22
Moisture Content	16.9%	22.8%

DESCRIPTION -

Flow Pump Rate 2.19E-05 cm³/sec

PERMEANT: Deaired Tap Water

USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/23/25	45923	12	10	20.4	0	0	0	0	1.65	116.06	15.84	3.3E-08	
09/23/25	45923	12	15	20.4	5	5	300	300	1.65	116.06	15.84	3.3E-08	
09/23/25	45923	12	20	20.4	5	10	300	600	1.65	116.06	15.84	3.3E-08	
09/23/25	45923	12	25	20.4	5	15	300	900	1.65	116.06	15.84	3.3E-08	*
09/23/25	45923	12	30	20.4	5	20	300	1200	1.65	116.06	15.84	3.3E-08	*
09/23/25	45923	12	35	20.4	5	25	300	1500	1.65	116.06	15.84	3.3E-08	*
09/23/25	45923	12	40	20.4	5	30	300	1800	1.65	116.06	15.84	3.3E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS 3.3E-08 cm/sec

DATE	9/23/25
CHECK	DA
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY
ASTM D5084
METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	2	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-3-2A	-	Flow Pump Speed	11	
SAMPLE TYPE	UD		Technician	CJ	

Sample Data - Initial			
Height (in)	2.854	B-Value, f	1.00
Diameter (in)	2.862	Cell Pres.	90.0
Area (cm²)	41.50	Bot. Pres.	80.0
Volume (cm³)	300.87	Top Pres.	80.0
Mass (g)	604.55	Tot. B.P.	80.0
Moisture Content (%)	20.3	Head, max.	133.65
Dry Density (pcf)	104.3	Head, min.	133.65
Spec. Gravity(assumed)	2.70	Max. Grad.	18.12
Volume Solids (cm³)	186.18	Min. Grad.	18.12
Volume Voids (cm³)	114.69		
Void Ratio	0.62		
Saturation	89%		

Sample Data- Final	
Height (in)	2.903
Diameter (in)	2.899
Area (cm²)	42.58
Volume (cm³)	314.00
Mass (g)	625.57
Moisture Content (%)	24.4
Dry Density (pcf)	99.9
Volume Solids (cm³)	186.18
Volume Voids (cm³)	127.82
Void Ratio	0.69
Saturation	96%

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	604.55	633.85
Wt. Dry Soil & Tare (g)	502.69	511.00
Wt. Tare (g)	0.00	8.41
Wt. Water (g)	101.86	122.85
Wt. Dry Soil (g)	502.69	502.59
Moisture Content	20.3%	24.4%

DESCRIPTION -

Flow Pump Rate 1.11E-05 cm³/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/22/25	45922	14	0	20.2	0	0	0	0	1.90	133.65	18.12	1.4E-08	
09/22/25	45922	14	5	20.2	5	5	300	300	1.90	133.65	18.12	1.4E-08	
09/22/25	45922	14	10	20.2	5	10	300	600	1.90	133.65	18.12	1.4E-08	
09/22/25	45922	14	15	20.2	5	15	300	900	1.90	133.65	18.12	1.4E-08	*
09/22/25	45922	14	20	20.2	5	20	300	1200	1.90	133.65	18.12	1.4E-08	*
09/22/25	45922	14	25	20.2	5	25	300	1500	1.90	133.65	18.12	1.4E-08	*
09/22/25	45922	14	30	20.2	5	30	300	1800	1.90	133.65	18.12	1.4E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 1.4E-08 cm/sec

DATE	9/22/25
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	11	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-3-3A	-	Flow Pump Speed	10	
SAMPLE TYPE	UD		Technician	DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.858	B-Value, f	0.98	Height (in)	2.876
Diameter (in)	2.867	Cell Pres.	90.0	Diameter (in)	2.878
Area (cm²)	41.65	Bot. Pres.	80.0	Area (cm²)	41.97
Volume (cm^3)	302.35	Top Pres.	80.0	Volume (cm^3)	306.59
Mass (g)	616.15	Tot. B.P.	80.0	Mass (g)	634.80
Moisture Content (%)	17.9	Head, max.	158.97	Moisture Content (%)	21.5
Dry Density (pcf)	107.8	Head, min.	158.97	Dry Density (pcf)	106.3
Spec. Gravity(assumed)	2.70	Max. Grad.	21.76	Volume Solids (cm^3)	193.51
Volume Solids (cm^3)	193.51	Min. Grad.	21.76	Volume Voids (cm^3)	113.08
Volume Voids (cm^3)	108.84			Void Ratio	0.58
Void Ratio	0.56			Saturation	99%
Saturation	86%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	616.15	643.05
Wt. Dry Soil & Tare (g)	522.48	530.77
Wt. Tare (g)	0.00	8.50
Wt. Water (g)	93.67	112.28
Wt. Dry Soil (g)	522.48	522.27
Moisture Content	17.9%	21.5%

DESCRIPTION -

Flow Pump Rate 2.19E-05 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/23/25	45923	11	20	20.4	0	0	0	0	2.26	158.97	21.76	2.4E-08	
09/23/25	45923	11	25	20.4	5	5	300	300	2.26	158.97	21.76	2.4E-08	
09/23/25	45923	11	30	20.4	5	10	300	600	2.26	158.97	21.76	2.4E-08	
09/23/25	45923	11	35	20.4	5	15	300	900	2.26	158.97	21.76	2.4E-08	*
09/23/25	45923	11	40	20.4	5	20	300	1200	2.26	158.97	21.76	2.4E-08	*
09/23/25	45923	11	45	20.4	5	25	300	1500	2.26	158.97	21.76	2.4E-08	*
09/23/25	45923	11	50	20.4	5	30	300	1800	2.26	158.97	21.76	2.4E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 2.4E-08 cm/sec

DATE	9/23/25
CHECK	DA
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY
ASTM D5084
METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	6	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-3-4A	-	Flow Pump Speed	10	
SAMPLE TYPE	UD		Technician	DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.083	B-Value, f	0.97	Height (in)	2.111
Diameter (in)	2.849	Cell Pres.	90.0	Diameter (in)	2.870
Area (cm²)	41.13	Bot. Pres.	80.0	Area (cm²)	41.74
Volume (cm^3)	217.60	Top Pres.	80.0	Volume (cm^3)	223.79
Mass (g)	413.91	Tot. B.P.	80.0	Mass (g)	441.85
Moisture Content (%)	18.1	Head, max.	139.27	Moisture Content (%)	26.1
Dry Density (pcf)	100.5	Head, min.	139.27	Dry Density (pcf)	97.7
Spec. Gravity(assumed)	2.70	Max. Grad.	25.97	Volume Solids (cm^3)	129.78
Volume Solids (cm^3)	129.78	Min. Grad.	25.97	Volume Voids (cm^3)	94.01
Volume Voids (cm^3)	87.82			Void Ratio	0.72
Void Ratio	0.68			Saturation	97%
Saturation	72%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	413.91	449.35
Wt. Dry Soil & Tare (g)	350.42	358.03
Wt. Tare (g)	0.00	8.04
Wt. Water (g)	63.49	91.32
Wt. Dry Soil (g)	350.42	349.99
Moisture Content	18.1%	26.1%

DESCRIPTION -

Flow Pump Rate 2.19E-05 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/23/25	45923	10	40	20.3	0	0	0	0	1.98	139.27	25.97	2.0E-08	
09/23/25	45923	10	45	20.3	5	5	300	300	1.98	139.27	25.97	2.0E-08	
09/23/25	45923	10	50	20.3	5	10	300	600	1.98	139.27	25.97	2.0E-08	
09/23/25	45923	10	55	20.3	5	15	300	900	1.98	139.27	25.97	2.0E-08	*
09/23/25	45923	11	0	20.3	5	20	300	1200	1.98	139.27	25.97	2.0E-08	*
09/23/25	45923	11	5	20.3	5	25	300	1500	1.98	139.27	25.97	2.0E-08	*
09/23/25	45923	11	10	20.3	5	30	300	1800	1.98	139.27	25.97	2.0E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 2.0E-08 cm/sec

DATE	9/23/25
CHECK	DJS
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	3	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-3-5A	-	Flow Pump Speed	12	
SAMPLE TYPE	UD		Technician	FT/DA	

Sample Data - Initial			
Height (in)	2.208	B-Value, f	0.98
Diameter (in)	2.849	Cell Pres.	90.0
Area (cm²)	41.13	Bot. Pres.	80.0
Volume (cm^3)	230.66	Top Pres.	80.0
Mass (g)	461.23	Tot. B.P.	80.0
Moisture Content (%)	19.2	Head, max.	99.88
Dry Density (pcf)	104.7	Head, min.	99.88
Spec. Gravity(assumed)	2.70	Max. Grad.	17.80
Volume Solids (cm^3)	143.30	Min. Grad.	17.80
Volume Voids (cm^3)	87.36		
Void Ratio	0.61		
Saturation	85%		

Sample Data- Final	
Height (in)	2.209
Diameter (in)	2.869
Area (cm²)	41.71
Volume (cm^3)	234.02
Mass (g)	475.63
Moisture Content (%)	22.9
Dry Density (pcf)	103.2
Volume Solids (cm^3)	143.30
Volume Voids (cm^3)	90.72
Void Ratio	0.63
Saturation	98%

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	461.23	483.88
Wt. Dry Soil & Tare (g)	386.91	395.20
Wt. Tare (g)	0.00	8.44
Wt. Water (g)	74.32	88.68
Wt. Dry Soil (g)	386.91	386.76
Moisture Content	19.2%	22.9%

DESCRIPTION -

Flow Pump Rate 4.46E-06 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/23/25	45923	9	45	20.3	0	0	0	0	1.42	99.88	17.80	6.0E-09	
09/23/25	45923	9	50	20.3	5	5	300	300	1.42	99.88	17.80	6.0E-09	
09/23/25	45923	9	55	20.3	5	10	300	600	1.42	99.88	17.80	6.0E-09	
09/23/25	45923	10	0	20.3	5	15	300	900	1.42	99.88	17.80	6.0E-09	*
09/23/25	45923	10	5	20.3	5	20	300	1200	1.42	99.88	17.80	6.0E-09	*
09/23/25	45923	10	10	20.3	5	25	300	1500	1.42	99.88	17.80	6.0E-09	*
09/23/25	45923	10	15	20.3	5	30	300	1800	1.42	99.88	17.80	6.0E-09	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 6.0E-09 cm/sec

DATE	9/23/25
CHECK	DA
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	14	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-3-6A	-	Flow Pump Speed	11	
SAMPLE TYPE	UD		Technician	DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.852	B-Value, f	0.98	Height (in)	2.881
Diameter (in)	2.843	Cell Pres.	90.0	Diameter (in)	2.880
Area (cm^2)	40.96	Bot. Pres.	80.0	Area (cm^2)	42.03
Volume (cm^3)	296.68	Top Pres.	80.0	Volume (cm^3)	307.55
Mass (g)	621.57	Tot. B.P.	80.0	Mass (g)	636.36
Moisture Content (%)	18.3	Head, max.	109.03	Moisture Content (%)	21.1
Dry Density (pcf)	110.5	Head, min.	109.03	Dry Density (pcf)	106.6
Spec. Gravity(assumed)	2.70	Max. Grad.	14.90	Volume Solids (cm^3)	194.61
Volume Solids (cm^3)	194.61	Min. Grad.	14.90	Volume Voids (cm^3)	112.94
Volume Voids (cm^3)	102.07			Void Ratio	0.58
Void Ratio	0.52			Saturation	98%
Saturation	94%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	621.57	644.41
Wt. Dry Soil & Tare (g)	525.45	533.55
Wt. Tare (g)	0.00	8.34
Wt. Water (g)	96.12	110.86
Wt. Dry Soil (g)	525.45	525.21
Moisture Content	18.3%	21.1%

DESCRIPTION -

Flow Pump Rate 1.11E-05 cm^3/sec

PERMEANT: Deaired Tap Water

USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/24/25	45924	11	25	20.3	0	0	0	0	1.55	109.03	14.90	1.8E-08	
09/24/25	45924	11	30	20.3	5	5	300	300	1.55	109.03	14.90	1.8E-08	
09/24/25	45924	11	35	20.3	5	10	300	600	1.55	109.03	14.90	1.8E-08	
09/24/25	45924	11	40	20.3	5	15	300	900	1.55	109.03	14.90	1.8E-08	*
09/24/25	45924	11	45	20.3	5	20	300	1200	1.55	109.03	14.90	1.8E-08	*
09/24/25	45924	11	50	20.3	5	25	300	1500	1.55	109.03	14.90	1.8E-08	*
09/24/25	45924	11	55	20.3	5	30	300	1800	1.55	109.03	14.90	1.8E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS 1.8E-08 cm/sec

DATE	9/24/25
CHECK	DA
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	13	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-3-7A	-	Flow Pump Speed	10	
SAMPLE TYPE	UD		Technician	FT/DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	1.799	B-Value, f	1.00	Height (in)	1.805
Diameter (in)	2.839	Cell Pres.	90.0	Diameter (in)	2.835
Area (cm²)	40.84	Bot. Pres.	80.0	Area (cm²)	40.73
Volume (cm^3)	186.62	Top Pres.	80.0	Volume (cm^3)	186.71
Mass (g)	357.05	Tot. B.P.	80.0	Mass (g)	375.78
Moisture Content (%)	20.0	Head, max.	295.43	Moisture Content (%)	26.3
Dry Density (pcf)	99.5	Head, min.	295.43	Dry Density (pcf)	99.4
Spec. Gravity(assumed)	2.70	Max. Grad.	64.44	Volume Solids (cm^3)	110.18
Volume Solids (cm^3)	110.18	Min. Grad.	64.44	Volume Voids (cm^3)	76.53
Volume Voids (cm^3)	76.43			Void Ratio	0.69
Void Ratio	0.69			Saturation	102%
Saturation	78%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	357.05	384.16
Wt. Dry Soil & Tare (g)	297.50	305.90
Wt. Tare (g)	0.00	8.50
Wt. Water (g)	59.55	78.26
Wt. Dry Soil (g)	297.50	297.40
Moisture Content	20.0%	26.3%

DESCRIPTION -

Flow Pump Rate 2.19E-05 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/24/25	45924	8	45	20.2	0	0	0	0	4.20	295.43	64.44	8.3E-09	
09/24/25	45924	8	50	20.2	5	5	300	300	4.20	295.43	64.44	8.3E-09	
09/24/25	45924	8	55	20.2	5	10	300	600	4.20	295.43	64.44	8.3E-09	
09/24/25	45924	9	0	20.2	5	15	300	900	4.20	295.43	64.44	8.3E-09	*
09/24/25	45924	9	5	20.2	5	20	300	1200	4.20	295.43	64.44	8.3E-09	*
09/24/25	45924	9	10	20.2	5	25	300	1500	4.20	295.43	64.44	8.3E-09	*
09/24/25	45924	9	15	20.2	5	30	300	1800	4.20	295.43	64.44	8.3E-09	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 8.3E-09 cm/sec

DATE	9/24/25
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	11	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-3-8A	-	Flow Pump Speed	9	
SAMPLE TYPE	UD		Technician	DA	

Sample Data - Initial

Height (in)	2.859	B-Value, f	0.98
Diameter (in)	2.861	Cell Pres.	90.0
Area (cm²)	41.48	Bot. Pres.	80.0
Volume (cm³)	301.19	Top Pres.	80.0
Mass (g)	599.17	Tot. B.P.	80.0
Moisture Content (%)	21.3	Head, max.	133.65
Dry Density (pcf)	102.3	Head, min.	133.65
Spec. Gravity(assumed)	2.70	Max. Grad.	18.31
Volume Solids (cm³)	182.95	Min. Grad.	18.31
Volume Voids (cm³)	118.24		
Void Ratio	0.65		
Saturation	89%		

Sample Data- Final

Height (in)	2.874
Diameter (in)	2.878
Area (cm²)	41.97
Volume (cm³)	306.38
Mass (g)	610.88
Moisture Content (%)	23.7
Dry Density (pcf)	100.6
Volume Solids (cm³)	182.95
Volume Voids (cm³)	123.43
Void Ratio	0.67
Saturation	95%

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	599.17	618.67
Wt. Dry Soil & Tare (g)	493.97	501.81
Wt. Tare (g)	0.00	8.04
Wt. Water (g)	105.20	116.86
Wt. Dry Soil (g)	493.97	493.77
Moisture Content	21.3%	23.7%

DESCRIPTION -

Flow Pump Rate 4.38E-05 cm³/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/24/25	45924	12	25	20.3	0	0	0	0	1.90	133.65	18.31	5.7E-08	
09/24/25	45924	12	30	20.3	5	5	300	300	1.90	133.65	18.31	5.7E-08	
09/24/25	45924	12	35	20.3	5	10	300	600	1.90	133.65	18.31	5.7E-08	
09/24/25	45924	12	40	20.3	5	15	300	900	1.90	133.65	18.31	5.7E-08	*
09/24/25	45924	12	45	20.3	5	20	300	1200	1.90	133.65	18.31	5.7E-08	*
09/24/25	45924	12	50	20.3	5	25	300	1500	1.90	133.65	18.31	5.7E-08	*
09/24/25	45924	12	55	20.3	5	30	300	1800	1.90	133.65	18.31	5.7E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 5.7E-08 cm/sec

DATE	9/24/25
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	6	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-3-9A	-	Flow Pump Speed	10	
SAMPLE TYPE	UD		Technician	DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.859	B-Value, f	0.99	Height (in)	2.874
Diameter (in)	2.850	Cell Pres.	90.0	Diameter (in)	2.864
Area (cm^2)	41.16	Bot. Pres.	80.0	Area (cm^2)	41.56
Volume (cm^3)	298.88	Top Pres.	80.0	Volume (cm^3)	303.41
Mass (g)	606.33	Tot. B.P.	80.0	Mass (g)	614.64
Moisture Content (%)	20.8	Head, max.	170.22	Moisture Content (%)	22.4
Dry Density (pcf)	104.8	Head, min.	170.22	Dry Density (pcf)	103.3
Spec. Gravity(assumed)	2.70	Max. Grad.	23.32	Volume Solids (cm^3)	185.96
Volume Solids (cm^3)	185.96	Min. Grad.	23.32	Volume Voids (cm^3)	117.45
Volume Voids (cm^3)	112.92			Void Ratio	0.63
Void Ratio	0.61			Saturation	96%
Saturation	92%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	606.33	622.59
Wt. Dry Soil & Tare (g)	502.09	510.12
Wt. Tare (g)	0.00	8.39
Wt. Water (g)	104.24	112.47
Wt. Dry Soil (g)	502.09	501.73
Moisture Content	20.8%	22.4%

DESCRIPTION -

Flow Pump Rate 2.19E-05 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
09/24/25	45924	13	5	20.3	0	0	0	0	2.42	170.22	23.32	2.2E-08
09/24/25	45924	13	10	20.3	5	5	300	300	2.42	170.22	23.32	2.2E-08
09/24/25	45924	13	15	20.3	5	10	300	600	2.42	170.22	23.32	2.2E-08
09/24/25	45924	13	20	20.3	5	15	300	900	2.42	170.22	23.32	2.2E-08 *
09/24/25	45924	13	25	20.3	5	20	300	1200	2.42	170.22	23.32	2.2E-08 *
09/24/25	45924	13	30	20.3	5	25	300	1500	2.42	170.22	23.32	2.2E-08 *
09/24/25	45924	13	35	20.3	5	30	300	1800	2.42	170.22	23.32	2.2E-08 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS 2.2E-08 cm/sec

DATE	9/24/25
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REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	3	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-3-10A	-	Flow Pump Speed	9	
SAMPLE TYPE	UD		Technician	DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.854	B-Value, f	0.97	Height (in)	2.876
Diameter (in)	2.840	Cell Pres.	90.0	Diameter (in)	2.862
Area (cm²)	40.87	Bot. Pres.	80.0	Area (cm²)	41.50
Volume (cm^3)	296.27	Top Pres.	80.0	Volume (cm^3)	303.19
Mass (g)	592.58	Tot. B.P.	80.0	Mass (g)	605.82
Moisture Content (%)	21.9	Head, max.	170.22	Moisture Content (%)	24.7
Dry Density (pcf)	102.4	Head, min.	170.22	Dry Density (pcf)	100.0
Spec. Gravity(assumed)	2.70	Max. Grad.	23.30	Volume Solids (cm^3)	179.98
Volume Solids (cm^3)	179.98	Min. Grad.	23.30	Volume Voids (cm^3)	123.21
Volume Voids (cm^3)	116.28			Void Ratio	0.68
Void Ratio	0.65			Saturation	97%
Saturation	92%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	592.58	614.02
Wt. Dry Soil & Tare (g)	485.95	494.20
Wt. Tare (g)	0.00	8.46
Wt. Water (g)	106.63	119.82
Wt. Dry Soil (g)	485.95	485.74
Moisture Content	21.9%	24.7%

DESCRIPTION -

Flow Pump Rate 4.38E-05 cm^3/sec

PERMEANT: Deaired Tap Water

USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/24/25	45924	14	10	20.3	0	0	0	0	2.42	170.22	23.30	4.5E-08	
09/24/25	45924	14	15	20.3	5	5	300	300	2.42	170.22	23.30	4.5E-08	
09/24/25	45924	14	20	20.3	5	10	300	600	2.42	170.22	23.30	4.5E-08	
09/24/25	45924	14	25	20.3	5	15	300	900	2.42	170.22	23.30	4.5E-08	*
09/24/25	45924	14	30	20.3	5	20	300	1200	2.42	170.22	23.30	4.5E-08	*
09/24/25	45924	14	35	20.3	5	25	300	1500	2.42	170.22	23.30	4.5E-08	*
09/24/25	45924	14	40	20.3	5	30	300	1800	2.42	170.22	23.30	4.5E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS 4.5E-08 cm/sec

DATE	9/24/25
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY
ASTM D5084
METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	13	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-3-11A	-	Flow Pump Speed	9	
SAMPLE TYPE	UD		Technician	FT/DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.848	B-Value, f	0.98	Height (in)	2.873
Diameter (in)	2.847	Cell Pres.	90.0	Diameter (in)	2.870
Area (cm²)	41.07	Bot. Pres.	80.0	Area (cm²)	41.74
Volume (cm³)	297.10	Top Pres.	80.0	Volume (cm³)	304.57
Mass (g)	590.74	Tot. B.P.	80.0	Mass (g)	610.30
Moisture Content (%)	19.8	Head, max.	126.61	Moisture Content (%)	23.8
Dry Density (pcf)	103.5	Head, min.	126.61	Dry Density (pcf)	101.0
Spec. Gravity(assumed)	2.70	Max. Grad.	17.35	Volume Solids (cm³)	182.56
Volume Solids (cm³)	182.56	Min. Grad.	17.35	Volume Voids (cm³)	122.02
Volume Voids (cm³)	114.55			Void Ratio	0.67
Void Ratio	0.63			Saturation	96%
Saturation	85%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	590.74	618.24
Wt. Dry Soil & Tare (g)	492.90	500.95
Wt. Tare (g)	0.00	8.50
Wt. Water (g)	97.84	117.29
Wt. Dry Soil (g)	492.90	492.45
Moisture Content	19.8%	23.8%

DESCRIPTION -

Flow Pump Rate 4.38E-05 cm³/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/25/25	45925	11	45	20.3	0	0	0	0	1.80	126.61	17.35	6.0E-08	
09/25/25	45925	11	50	20.3	5	5	300	300	1.80	126.61	17.35	6.0E-08	
09/25/25	45925	11	55	20.3	5	10	300	600	1.80	126.61	17.35	6.0E-08	
09/25/25	45925	12	0	20.3	5	15	300	900	1.80	126.61	17.35	6.0E-08	*
09/25/25	45925	12	5	20.3	5	20	300	1200	1.80	126.61	17.35	6.0E-08	*
09/25/25	45925	12	10	20.3	5	25	300	1500	1.80	126.61	17.35	6.0E-08	*
09/25/25	45925	12	15	20.3	5	30	300	1800	1.80	126.61	17.35	6.0E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 6.0E-08 cm/sec

DATE	9/25/25
CHECK	DA
REVIEW	41
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	12	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-3-12A	-	Flow Pump Speed	10	
SAMPLE TYPE	UD		Technician	DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.862	B-Value, f	1.00	Height (in)	2.892
Diameter (in)	2.815	Cell Pres.	90.0	Diameter (in)	2.852
Area (cm^2)	40.15	Bot. Pres.	80.0	Area (cm^2)	41.22
Volume (cm^3)	291.89	Top Pres.	80.0	Volume (cm^3)	302.75
Mass (g)	613.73	Tot. B.P.	80.0	Mass (g)	625.57
Moisture Content (%)	19.8	Head, max.	111.14	Moisture Content (%)	22.1
Dry Density (pcf)	109.5	Head, min.	111.14	Dry Density (pcf)	105.6
Spec. Gravity(assumed)	2.70	Max. Grad.	15.13	Volume Solids (cm^3)	189.73
Volume Solids (cm^3)	189.73	Min. Grad.	15.13	Volume Voids (cm^3)	113.02
Volume Voids (cm^3)	102.16			Void Ratio	0.60
Void Ratio	0.54			Saturation	100%
Saturation	99%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	613.73	633.55
Wt. Dry Soil & Tare (g)	512.27	520.33
Wt. Tare (g)	0.00	8.40
Wt. Water (g)	101.46	113.22
Wt. Dry Soil (g)	512.27	511.93
Moisture Content	19.8%	22.1%

DESCRIPTION -

Flow Pump Rate 2.19E-05 cm^3/sec

PERMEANT: Deaired Tap Water

USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/25/25	45925	9	50	20.2	0	0	0	0	1.58	111.14	15.13	3.5E-08	
09/25/25	45925	9	55	20.2	5	5	300	300	1.58	111.14	15.13	3.5E-08	
09/25/25	45925	10	0	20.2	5	10	300	600	1.58	111.14	15.13	3.5E-08	
09/25/25	45925	10	5	20.2	5	15	300	900	1.58	111.14	15.13	3.5E-08	*
09/25/25	45925	10	10	20.2	5	20	300	1200	1.58	111.14	15.13	3.5E-08	*
09/25/25	45925	10	15	20.2	5	25	300	1500	1.58	111.14	15.13	3.5E-08	*
09/25/25	45925	10	20	20.2	5	30	300	1800	1.58	111.14	15.13	3.5E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS 3.5E-08 cm/sec

DATE	9/25/25
CHECK	DA
REVIEW	AJ
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	11	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-3-13A	-	Flow Pump Speed	11	
SAMPLE TYPE	UD		Technician	DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.861	B-Value, f	1.00	Height (in)	2.868
Diameter (in)	2.858	Cell Pres.	90.0	Diameter (in)	2.874
Area (cm²)	41.39	Bot. Pres.	80.0	Area (cm²)	41.85
Volume (cm^3)	300.77	Top Pres.	80.0	Volume (cm^3)	304.89
Mass (g)	630.68	Tot. B.P.	80.0	Mass (g)	638.62
Moisture Content (%)	19.2	Head, max.	92.15	Moisture Content (%)	19.9
Dry Density (pcf)	109.7	Head, min.	92.15	Dry Density (pcf)	109.0
Spec. Gravity(assumed)	2.70	Max. Grad.	12.65	Volume Solids (cm^3)	197.29
Volume Solids (cm^3)	195.90	Min. Grad.	12.65	Volume Voids (cm^3)	107.60
Volume Voids (cm^3)	104.87			Void Ratio	0.55
Void Ratio	0.54			Saturation	98%
Saturation	97%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	273.04	646.81
Wt. Dry Soil & Tare (g)	237.39	540.93
Wt. Tare (g)	52.08	8.60
Wt. Water (g)	35.65	105.88
Wt. Dry Soil (g)	185.31	532.33
Moisture Content	19.2%	19.9%

DESCRIPTION -

Flow Pump Rate 1.11E-05 cm^3/sec

PERMEANT: Deaired Tap Water

USCS -

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
09/25/25	45925	10	55	20.2	0	0	0	0	1.31	92.15	12.65	2.1E-08
09/25/25	45925	11	0	20.2	5	5	300	300	1.31	92.15	12.65	2.1E-08
09/25/25	45925	11	5	20.2	5	10	300	600	1.31	92.15	12.65	2.1E-08
09/25/25	45925	11	10	20.2	5	15	300	900	1.31	92.15	12.65	2.1E-08 *
09/25/25	45925	11	15	20.2	5	20	300	1200	1.31	92.15	12.65	2.1E-08 *
09/25/25	45925	11	20	20.2	5	25	300	1500	1.31	92.15	12.65	2.1E-08 *
09/25/25	45925	11	25	20.2	5	30	300	1800	1.31	92.15	12.65	2.1E-08 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS 2.1E-08 cm/sec

DATE	9/25/25
CHECK	DA
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	14	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-3-14A	-	Flow Pump Speed	11	
SAMPLE TYPE	UD		Technician	DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	1.840	B-Value, f	1.00	Height (in)	1.889
Diameter (in)	2.865	Cell Pres.	90.0	Diameter (in)	2.912
Area (cm^2)	41.59	Bot. Pres.	80.0	Area (cm^2)	42.97
Volume (cm^3)	194.38	Top Pres.	80.0	Volume (cm^3)	206.16
Mass (g)	392.00	Tot. B.P.	80.0	Mass (g)	407.53
Moisture Content (%)	18.7	Head, max.	155.45	Moisture Content (%)	24.9
Dry Density (pcf)	106.0	Head, min.	155.45	Dry Density (pcf)	98.7
Spec. Gravity(assumed)	2.70	Max. Grad.	32.40	Volume Solids (cm^3)	120.83
Volume Solids (cm^3)	122.32	Min. Grad.	32.40	Volume Voids (cm^3)	85.33
Volume Voids (cm^3)	72.06			Void Ratio	0.71
Void Ratio	0.59			Saturation	95%
Saturation	86%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	295.80	415.94
Wt. Dry Soil & Tare (g)	257.31	334.67
Wt. Tare (g)	51.40	8.56
Wt. Water (g)	38.49	81.27
Wt. Dry Soil (g)	205.91	326.11
Moisture Content	18.7%	24.9%

DESCRIPTION -

Flow Pump Rate 1.11E-05 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/26/25	45926	12	0	20.3	0	0	0	0	2.21	155.45	32.40	7.9E-09	
09/26/25	45926	12	5	20.3	5	5	300	300	2.21	155.45	32.40	7.9E-09	
09/26/25	45926	12	10	20.3	5	10	300	600	2.21	155.45	32.40	7.9E-09	
09/26/25	45926	12	15	20.3	5	15	300	900	2.21	155.45	32.40	7.9E-09	*
09/26/25	45926	12	20	20.3	5	20	300	1200	2.21	155.45	32.40	7.9E-09	*
09/26/25	45926	12	25	20.3	5	25	300	1500	2.21	155.45	32.40	7.9E-09	*
09/26/25	45926	12	30	20.3	5	30	300	1800	2.21	155.45	32.40	7.9E-09	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 7.9E-09 cm/sec

DATE	9/26/25
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	6	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-3-15A	-	Flow Pump Speed	11	
SAMPLE TYPE	UD		Technician	DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.857	B-Value, f	0.98	Height (in)	2.904
Diameter (in)	2.850	Cell Pres.	90.0	Diameter (in)	2.862
Area (cm^2)	41.16	Bot. Pres.	80.0	Area (cm^2)	41.50
Volume (cm^3)	298.67	Top Pres.	80.0	Volume (cm^3)	306.14
Mass (g)	580.02	Tot. B.P.	80.0	Mass (g)	605.52
Moisture Content (%)	18.1	Head, max.	129.43	Moisture Content (%)	25.9
Dry Density (pcf)	102.6	Head, min.	129.43	Dry Density (pcf)	98.0
Spec. Gravity(assumed)	2.70	Max. Grad.	17.55	Volume Solids (cm^3)	178.14
Volume Solids (cm^3)	181.86	Min. Grad.	17.55	Volume Voids (cm^3)	128.01
Volume Voids (cm^3)	116.81			Void Ratio	0.72
Void Ratio	0.64			Saturation	97%
Saturation	76%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	248.72	613.88
Wt. Dry Soil & Tare (g)	218.55	489.35
Wt. Tare (g)	52.09	8.47
Wt. Water (g)	30.17	124.53
Wt. Dry Soil (g)	166.46	480.88
Moisture Content	18.1%	25.9%

DESCRIPTION -

Flow Pump Rate 1.11E-05 cm^3/sec

PERMEANT: Deaired Tap Water

USCS -

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
09/26/25	45926	10	45	20.3	0	0	0	0	1.84	129.43	17.55	1.5E-08
09/26/25	45926	10	50	20.3	5	5	300	300	1.84	129.43	17.55	1.5E-08
09/26/25	45926	10	55	20.3	5	10	300	600	1.84	129.43	17.55	1.5E-08
09/26/25	45926	11	0	20.3	5	15	300	900	1.84	129.43	17.55	1.5E-08 *
09/26/25	45926	11	5	20.3	5	20	300	1200	1.84	129.43	17.55	1.5E-08 *
09/26/25	45926	11	10	20.3	5	25	300	1500	1.84	129.43	17.55	1.5E-08 *
09/26/25	45926	11	15	20.3	5	30	300	1800	1.84	129.43	17.55	1.5E-08 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS 1.5E-08 cm/sec

DATE	9/26/25
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	3	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-3-16A	-	Flow Pump Speed	10	
SAMPLE TYPE	UD		Technician	DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.873	B-Value, f	1.00	Height (in)	2.922
Diameter (in)	2.873	Cell Pres.	90.0	Diameter (in)	2.906
Area (cm²)	41.82	Bot. Pres.	80.0	Area (cm²)	42.79
Volume (cm^3)	305.21	Top Pres.	80.0	Volume (cm^3)	317.59
Mass (g)	633.56	Tot. B.P.	80.0	Mass (g)	652.23
Moisture Content (%)	17.2	Head, max.	113.95	Moisture Content (%)	20.6
Dry Density (pcf)	110.6	Head, min.	113.95	Dry Density (pcf)	106.3
Spec. Gravity(assumed)	2.70	Max. Grad.	15.35	Volume Solids (cm^3)	200.29
Volume Solids (cm^3)	200.29	Min. Grad.	15.35	Volume Voids (cm^3)	117.29
Volume Voids (cm^3)	104.92			Void Ratio	0.59
Void Ratio	0.52			Saturation	95%
Saturation	88%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	633.56	660.63
Wt. Dry Soil & Tare (g)	540.79	549.21
Wt. Tare (g)	0.00	8.51
Wt. Water (g)	92.77	111.42
Wt. Dry Soil (g)	540.79	540.70
Moisture Content	17.2%	20.6%

DESCRIPTION -

Flow Pump Rate 2.19E-05 cm^3/sec

PERMEANT: Deaired Tap Water

USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
10/02/25	45932	10	45	20.6	0	0	0	0	1.62	113.95	15.35	3.3E-08	
10/02/25	45932	10	50	20.6	5	5	300	300	1.62	113.95	15.35	3.3E-08	
10/02/25	45932	10	55	20.6	5	10	300	600	1.62	113.95	15.35	3.3E-08	
10/02/25	45932	11	0	20.6	5	15	300	900	1.62	113.95	15.35	3.3E-08	*
10/02/25	45932	11	5	20.6	5	20	300	1200	1.62	113.95	15.35	3.3E-08	*
10/02/25	45932	11	10	20.6	5	25	300	1500	1.62	113.95	15.35	3.3E-08	*
10/02/25	45932	11	15	20.6	5	30	300	1800	1.62	113.95	15.35	3.3E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS 3.3E-08 cm/sec

DATE	10/2/25
CHECK	DA
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	12	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-4-1A	-	Flow Pump Speed	10	
SAMPLE TYPE	UD		Technician	DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.857	B-Value, f	0.99	Height (in)	2.885
Diameter (in)	2.873	Cell Pres.	90.0	Diameter (in)	2.882
Area (cm^2)	41.82	Bot. Pres.	80.0	Area (cm^2)	42.09
Volume (cm^3)	303.51	Top Pres.	80.0	Volume (cm^3)	308.41
Mass (g)	604.80	Tot. B.P.	80.0	Mass (g)	619.51
Moisture Content (%)	21.8	Head, max.	132.24	Moisture Content (%)	24.8
Dry Density (pcf)	102.1	Head, min.	132.24	Dry Density (pcf)	100.4
Spec. Gravity(assumed)	2.70	Max. Grad.	18.05	Volume Solids (cm^3)	183.85
Volume Solids (cm^3)	183.85	Min. Grad.	18.05	Volume Voids (cm^3)	124.56
Volume Voids (cm^3)	119.66			Void Ratio	0.68
Void Ratio	0.65			Saturation	99%
Saturation	91%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	604.80	627.49
Wt. Dry Soil & Tare (g)	496.39	504.47
Wt. Tare (g)	0.00	8.46
Wt. Water (g)	108.41	123.02
Wt. Dry Soil (g)	496.39	496.01
Moisture Content	21.8%	24.8%

DESCRIPTION -

Flow Pump Rate 2.19E-05 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/26/25	45926	12	40	20.3	0	0	0	0	1.88	132.24	18.05	2.9E-08	
09/26/25	45926	12	45	20.3	5	5	300	300	1.88	132.24	18.05	2.9E-08	
09/26/25	45926	12	50	20.3	5	10	300	600	1.88	132.24	18.05	2.9E-08	
09/26/25	45926	12	55	20.3	5	15	300	900	1.88	132.24	18.05	2.9E-08	*
09/26/25	45926	13	0	20.3	5	20	300	1200	1.88	132.24	18.05	2.9E-08	*
09/26/25	45926	13	5	20.3	5	25	300	1500	1.88	132.24	18.05	2.9E-08	*
09/26/25	45926	13	10	20.3	5	30	300	1800	1.88	132.24	18.05	2.9E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 2.9E-08 cm/sec

DATE	9/26/25
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY
ASTM D5084
METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	4	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-4-2A	-	Flow Pump Speed	10	
SAMPLE TYPE	UD		Technician	FT/DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.865	B-Value, f	1.00	Height (in)	2.892
Diameter (in)	2.860	Cell Pres.	90.0	Diameter (in)	2.883
Area (cm²)	41.45	Bot. Pres.	80.0	Area (cm²)	42.12
Volume (cm³)	301.61	Top Pres.	80.0	Volume (cm³)	309.37
Mass (g)	581.11	Tot. B.P.	80.0	Mass (g)	608.27
Moisture Content (%)	20.5	Head, max.	182.88	Moisture Content (%)	26.1
Dry Density (pcf)	99.8	Head, min.	182.88	Dry Density (pcf)	97.3
Spec. Gravity(assumed)	2.70	Max. Grad.	24.90	Volume Solids (cm³)	178.63
Volume Solids (cm³)	178.63	Min. Grad.	24.90	Volume Voids (cm³)	130.74
Volume Voids (cm³)	122.99			Void Ratio	0.73
Void Ratio	0.69			Saturation	96%
Saturation	80%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	581.11	616.24
Wt. Dry Soil & Tare (g)	482.29	490.37
Wt. Tare (g)	0.00	8.50
Wt. Water (g)	98.82	125.87
Wt. Dry Soil (g)	482.29	481.87
Moisture Content	20.5%	26.1%

DESCRIPTION -

Flow Pump Rate 2.19E-05 cm³/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/26/25	45926	9	45	20.3	0	0	0	0	2.60	182.88	24.90	2.1E-08	
09/26/25	45926	9	50	20.3	5	5	300	300	2.60	182.88	24.90	2.1E-08	
09/26/25	45926	9	55	20.3	5	10	300	600	2.60	182.88	24.90	2.1E-08	
09/26/25	45926	10	0	20.3	5	15	300	900	2.60	182.88	24.90	2.1E-08	*
09/26/25	45926	10	5	20.3	5	20	300	1200	2.60	182.88	24.90	2.1E-08	*
09/26/25	45926	10	10	20.3	5	25	300	1500	2.60	182.88	24.90	2.1E-08	*
09/26/25	45926	10	15	20.3	5	30	300	1800	2.60	182.88	24.90	2.1E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 2.1E-08 cm/sec

DATE	9/26/25
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY
ASTM D5084
METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	13	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-4-3A	-	Flow Pump Speed	10	
SAMPLE TYPE	UD		Technician	DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.848	B-Value, f	1.00	Height (in)	2.867
Diameter (in)	2.842	Cell Pres.	90.0	Diameter (in)	2.855
Area (cm²)	40.93	Bot. Pres.	80.0	Area (cm²)	41.30
Volume (cm^3)	296.06	Top Pres.	80.0	Volume (cm^3)	300.77
Mass (g)	571.84	Tot. B.P.	80.0	Mass (g)	581.69
Moisture Content (%)	24.2	Head, max.	164.60	Moisture Content (%)	26.4
Dry Density (pcf)	97.0	Head, min.	164.60	Dry Density (pcf)	95.5
Spec. Gravity(assumed)	2.70	Max. Grad.	22.60	Volume Solids (cm^3)	170.47
Volume Solids (cm^3)	170.47	Min. Grad.	22.60	Volume Voids (cm^3)	130.30
Volume Voids (cm^3)	125.59			Void Ratio	0.76
Void Ratio	0.74			Saturation	93%
Saturation	89%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	571.84	589.97
Wt. Dry Soil & Tare (g)	460.27	468.57
Wt. Tare (g)	0.00	8.38
Wt. Water (g)	111.57	121.40
Wt. Dry Soil (g)	460.27	460.19
Moisture Content	24.2%	26.4%

DESCRIPTION -

Flow Pump Rate 2.19E-05 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/26/25	45926	13	30	20.3	0	0	0	0	2.34	164.60	22.60	2.3E-08	
09/26/25	45926	13	35	20.3	5	5	300	300	2.34	164.60	22.60	2.3E-08	
09/26/25	45926	13	40	20.3	5	10	300	600	2.34	164.60	22.60	2.3E-08	
09/26/25	45926	13	45	20.3	5	15	300	900	2.34	164.60	22.60	2.3E-08	*
09/26/25	45926	13	50	20.3	5	20	300	1200	2.34	164.60	22.60	2.3E-08	*
09/26/25	45926	13	55	20.3	5	25	300	1500	2.34	164.60	22.60	2.3E-08	*
09/26/25	45926	14	0	20.3	5	30	300	1800	2.34	164.60	22.60	2.3E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 2.3E-08 cm/sec

DATE	9/26/25
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FLEXIBLE WALL PERMEABILITY
ASTM D5084
METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	11	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-4-4A	-	Flow Pump Speed	11	
SAMPLE TYPE	UD		Technician	DA	

Sample Data - Initial			
Height (in)	2.858	B-Value, f	1.00
Diameter (in)	2.843	Cell Pres.	90.0
Area (cm²)	40.96	Bot. Pres.	80.0
Volume (cm³)	297.31	Top Pres.	80.0
Mass (g)	583.47	Tot. B.P.	80.0
Moisture Content (%)	18.7	Head, max.	121.69
Dry Density (pcf)	103.2	Head, min.	121.69
Spec. Gravity(assumed)	2.70	Max. Grad.	16.58
Volume Solids (cm³)	182.05	Min. Grad.	16.58
Volume Voids (cm³)	115.26		
Void Ratio	0.63		
Saturation	80%		

Sample Data- Final	
Height (in)	2.889
Diameter (in)	2.883
Area (cm²)	42.12
Volume (cm³)	309.05
Mass (g)	614.76
Moisture Content (%)	25.1
Dry Density (pcf)	99.2
Volume Solids (cm³)	182.05
Volume Voids (cm³)	127.00
Void Ratio	0.70
Saturation	97%

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	583.47	622.93
Wt. Dry Soil & Tare (g)	491.53	499.75
Wt. Tare (g)	0.00	8.44
Wt. Water (g)	91.94	123.18
Wt. Dry Soil (g)	491.53	491.31
Moisture Content	18.7%	25.1%

DESCRIPTION -

Flow Pump Rate 1.11E-05 cm³/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
09/27/25	45927	16	0	19.6	0	0	0	0	1.73	121.69	16.58	1.6E-08
09/27/25	45927	16	5	19.6	5	5	300	300	1.73	121.69	16.58	1.6E-08
09/27/25	45927	16	10	19.6	5	10	300	600	1.73	121.69	16.58	1.6E-08
09/27/25	45927	16	15	19.6	5	15	300	900	1.73	121.69	16.58	1.6E-08 *
09/27/25	45927	16	20	19.6	5	20	300	1200	1.73	121.69	16.58	1.6E-08 *
09/27/25	45927	16	25	19.6	5	25	300	1500	1.73	121.69	16.58	1.6E-08 *
09/27/25	45927	16	30	19.6	5	30	300	1800	1.73	121.69	16.58	1.6E-08 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 1.6E-08 cm/sec

DATE	9/27/25
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY
ASTM D5084
METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	3	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-4-5A	-	Flow Pump Speed	10	
SAMPLE TYPE	UD		Technician	DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.851	B-Value, f	1.00	Height (in)	2.901
Diameter (in)	2.856	Cell Pres.	90.0	Diameter (in)	2.889
Area (cm^2)	41.33	Bot. Pres.	80.0	Area (cm^2)	42.29
Volume (cm^3)	299.30	Top Pres.	80.0	Volume (cm^3)	311.63
Mass (g)	608.85	Tot. B.P.	80.0	Mass (g)	627.56
Moisture Content (%)	20.1	Head, max.	154.04	Moisture Content (%)	23.8
Dry Density (pcf)	105.7	Head, min.	154.04	Dry Density (pcf)	101.5
Spec. Gravity(assumed)	2.70	Max. Grad.	20.91	Volume Solids (cm^3)	187.77
Volume Solids (cm^3)	187.77	Min. Grad.	20.91	Volume Voids (cm^3)	123.86
Volume Voids (cm^3)	111.53			Void Ratio	0.66
Void Ratio	0.59			Saturation	97%
Saturation	91%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	608.85	635.78
Wt. Dry Soil & Tare (g)	506.97	515.23
Wt. Tare (g)	0.00	8.41
Wt. Water (g)	101.88	120.55
Wt. Dry Soil (g)	506.97	506.82
Moisture Content	20.1%	23.8%

DESCRIPTION -

Flow Pump Rate 2.19E-05 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/27/25	45927	14	15	19.5	0	0	0	0	2.19	154.04	20.91	2.5E-08	
09/27/25	45927	14	20	19.5	5	5	300	300	2.19	154.04	20.91	2.5E-08	
09/27/25	45927	14	25	19.5	5	10	300	600	2.19	154.04	20.91	2.5E-08	
09/27/25	45927	14	30	19.5	5	15	300	900	2.19	154.04	20.91	2.5E-08	*
09/27/25	45927	14	35	19.5	5	20	300	1200	2.19	154.04	20.91	2.5E-08	*
09/27/25	45927	14	40	19.5	5	25	300	1500	2.19	154.04	20.91	2.5E-08	*
09/27/25	45927	14	45	19.5	5	30	300	1800	2.19	154.04	20.91	2.5E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 2.5E-08 cm/sec

DATE	9/27/25
CHECK	
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	14	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-4-6A	-	Flow Pump Speed	11	
SAMPLE TYPE	UD		Technician	CJ	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.860	B-Value, f	0.98	Height (in)	2.890
Diameter (in)	2.867	Cell Pres.	90.0	Diameter (in)	2.898
Area (cm^2)	41.65	Bot. Pres.	80.0	Area (cm^2)	42.56
Volume (cm^3)	302.56	Top Pres.	80.0	Volume (cm^3)	312.38
Mass (g)	599.71	Tot. B.P.	80.0	Mass (g)	618.13
Moisture Content (%)	22.0	Head, max.	168.82	Moisture Content (%)	25.8
Dry Density (pcf)	101.4	Head, min.	168.82	Dry Density (pcf)	98.2
Spec. Gravity(assumed)	2.70	Max. Grad.	23.00	Volume Solids (cm^3)	182.02
Volume Solids (cm^3)	182.02	Min. Grad.	23.00	Volume Voids (cm^3)	130.36
Volume Voids (cm^3)	120.54			Void Ratio	0.72
Void Ratio	0.66			Saturation	97%
Saturation	90%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	599.71	626.31
Wt. Dry Soil & Tare (g)	491.46	499.69
Wt. Tare (g)	0.00	8.43
Wt. Water (g)	108.25	126.62
Wt. Dry Soil (g)	491.46	491.26
Moisture Content	22.0%	25.8%

DESCRIPTION -

Flow Pump Rate 1.11E-05 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/29/25	45929	16	0	20.3	0	0	0	0	2.40	168.82	23.00	1.1E-08	
09/29/25	45929	16	5	20.3	5	5	300	300	2.40	168.82	23.00	1.1E-08	
09/29/25	45929	16	10	20.3	5	10	300	600	2.40	168.82	23.00	1.1E-08	
09/29/25	45929	16	15	20.3	5	15	300	900	2.40	168.82	23.00	1.1E-08	*
09/29/25	45929	16	20	20.3	5	20	300	1200	2.40	168.82	23.00	1.1E-08	*
09/29/25	45929	16	25	20.3	5	25	300	1500	2.40	168.82	23.00	1.1E-08	*
09/29/25	45929	16	30	20.3	5	30	300	1800	2.40	168.82	23.00	1.1E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 1.1E-08 cm/sec

DATE	9/29/25
CHECK	CO
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	4	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-4-7A	-	Flow Pump Speed	10	
SAMPLE TYPE	UD		Technician	DA	

Sample Data - Initial			
Height (in)	2.270	B-Value, f	0.99
Diameter (in)	2.843	Cell Pres.	90.0
Area (cm²)	40.96	Bot. Pres.	80.0
Volume (cm^3)	236.14	Top Pres.	80.0
Mass (g)	482.20	Tot. B.P.	80.0
Moisture Content (%)	17.7	Head, max.	80.89
Dry Density (pcf)	108.2	Head, min.	80.89
Spec. Gravity(assumed)	2.70	Max. Grad.	13.73
Volume Solids (cm^3)	151.68	Min. Grad.	13.73
Volume Voids (cm^3)	84.46		
Void Ratio	0.56		
Saturation	86%		

Sample Data- Final	
Height (in)	2.319
Diameter (in)	2.879
Area (cm^3)	42.00
Volume (cm^3)	247.39
Mass (g)	502.51
Moisture Content (%)	22.7
Dry Density (pcf)	103.3
Volume Solids (cm^3)	151.68
Volume Voids (cm^3)	95.71
Void Ratio	0.63
Saturation	97%

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	482.20	510.68
Wt. Dry Soil & Tare (g)	409.53	417.74
Wt. Tare (g)	0.00	8.39
Wt. Water (g)	72.67	92.94
Wt. Dry Soil (g)	409.53	409.35
Moisture Content	17.7%	22.7%

DESCRIPTION -

Flow Pump Rate 2.19E-05 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/28/25	45928	14	55	19.5	0	0	0	0	1.15	80.89	13.73	3.8E-08	
09/28/25	45928	15	0	19.5	5	5	300	300	1.15	80.89	13.73	3.8E-08	
09/28/25	45928	15	5	19.5	5	10	300	600	1.15	80.89	13.73	3.8E-08	
09/28/25	45928	15	10	19.5	5	15	300	900	1.15	80.89	13.73	3.8E-08	*
09/28/25	45928	15	15	19.5	5	20	300	1200	1.15	80.89	13.73	3.8E-08	*
09/28/25	45928	15	20	19.5	5	25	300	1500	1.15	80.89	13.73	3.8E-08	*
09/28/25	45928	15	25	19.5	5	30	300	1800	1.15	80.89	13.73	3.8E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 3.8E-08 cm/sec

DATE	9/28/25
CHECK	
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APPROVE	

FLEXIBLE WALL PERMEABILITY
ASTM D5084
METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	12	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-4-8A	-	Flow Pump Speed	11	
SAMPLE TYPE	UD		Technician	FT	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.458	B-Value, f	0.98	Height (in)	2.466
Diameter (in)	2.856	Cell Pres.	90.0	Diameter (in)	2.894
Area (cm^2)	41.33	Bot. Pres.	80.0	Area (cm^2)	42.44
Volume (cm^3)	258.04	Top Pres.	80.0	Volume (cm^3)	265.82
Mass (g)	508.97	Tot. B.P.	80.0	Mass (g)	529.89
Moisture Content (%)	20.3	Head, max.	182.88	Moisture Content (%)	25.2
Dry Density (pcf)	102.3	Head, min.	182.88	Dry Density (pcf)	99.4
Spec. Gravity(assumed)	2.70	Max. Grad.	29.20	Volume Solids (cm^3)	156.75
Volume Solids (cm^3)	156.75	Min. Grad.	29.20	Volume Voids (cm^3)	109.07
Volume Voids (cm^3)	101.29			Void Ratio	0.70
Void Ratio	0.65			Saturation	98%
Saturation	85%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	508.97	538.11
Wt. Dry Soil & Tare (g)	423.22	431.49
Wt. Tare (g)	0.00	8.47
Wt. Water (g)	85.75	106.62
Wt. Dry Soil (g)	423.22	423.02
Moisture Content	20.3%	25.2%

DESCRIPTION -

Flow Pump Rate 1.11E-05 cm^3/sec PERMEANT: Dealred Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/29/25	45929	11	0	20.1	0	0	0	0	2.60	182.88	29.20	8.9E-09	
09/29/25	45929	11	5	20.1	5	5	300	300	2.60	182.88	29.20	8.9E-09	
09/29/25	45929	11	10	20.1	5	10	300	600	2.60	182.88	29.20	8.9E-09	
09/29/25	45929	11	15	20.1	5	15	300	900	2.60	182.88	29.20	8.9E-09	*
09/29/25	45929	11	20	20.1	5	20	300	1200	2.60	182.88	29.20	8.9E-09	*
09/29/25	45929	11	25	20.1	5	25	300	1500	2.60	182.88	29.20	8.9E-09	*
09/29/25	45929	11	30	20.1	5	30	300	1800	2.60	182.88	29.20	8.9E-09	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 8.9E-09 cm/sec

DATE	9/29/25
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FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	3	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-4-9A	-	Flow Pump Speed	11	
SAMPLE TYPE	UD		Technician	CJ	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.858	B-Value, f	1.00	Height (in)	2.905
Diameter (in)	2.858	Cell Pres.	90.0	Diameter (in)	2.898
Area (cm^2)	41.39	Bot. Pres.	80.0	Area (cm^2)	42.56
Volume (cm^3)	300.45	Top Pres.	80.0	Volume (cm^3)	314.00
Mass (g)	607.24	Tot. B.P.	80.0	Mass (g)	628.57
Moisture Content (%)	20.3	Head, max.	86.52	Moisture Content (%)	24.5
Dry Density (pcf)	104.8	Head, min.	86.52	Dry Density (pcf)	100.3
Spec. Gravity(assumed)	2.70	Max. Grad.	11.73	Volume Solids (cm^3)	186.96
Volume Solids (cm^3)	186.96	Min. Grad.	11.73	Volume Voids (cm^3)	127.04
Volume Voids (cm^3)	113.49			Void Ratio	0.68
Void Ratio	0.61			Saturation	97%
Saturation	90%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	607.24	636.79
Wt. Dry Soil & Tare (g)	504.79	513.06
Wt. Tare (g)	0.00	8.47
Wt. Water (g)	102.45	123.73
Wt. Dry Soil (g)	504.79	504.59
Moisture Content	20.3%	24.5%

DESCRIPTION -

Flow Pump Rate 1.11E-05 cm^3/sec

PERMEANT: Deaired Tap Water

USCS -

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
09/30/25	45930	12	0	20.3	0	0	0	0	1.23	86.52	11.73	2.2E-08
09/30/25	45930	12	5	20.3	5	5	300	300	1.23	86.52	11.73	2.2E-08
09/30/25	45930	12	10	20.3	5	10	300	600	1.23	86.52	11.73	2.2E-08
09/30/25	45930	12	15	20.3	5	15	300	900	1.23	86.52	11.73	2.2E-08 *
09/30/25	45930	12	20	20.3	5	20	300	1200	1.23	86.52	11.73	2.2E-08 *
09/30/25	45930	12	25	20.3	5	25	300	1500	1.23	86.52	11.73	2.2E-08 *
09/30/25	45930	12	30	20.3	5	30	300	1800	1.23	86.52	11.73	2.2E-08 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS 2.2E-08 cm/sec

DATE	9/30/25
CHECK	
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APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	6	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-4-10A	-	Flow Pump Speed	10	
SAMPLE TYPE	UD		Technician	DA	

Sample Data - Initial			
Height (in)	2.854	B-Value, f	0.98
Diameter (in)	2.876	Cell Pres.	90.0
Area (cm^2)	41.91	Bot. Pres.	80.0
Volume (cm^3)	303.82	Top Pres.	80.0
Mass (g)	612.31	Tot. B.P.	80.0
Moisture Content (%)	19.7	Head, max.	104.81
Dry Density (pcf)	105.1	Head, min.	104.81
Spec. Gravity(assumed)	2.70	Max. Grad.	14.21
Volume Solids (cm^3)	189.48	Min. Grad.	14.21
Volume Voids (cm^3)	114.35		
Void Ratio	0.60		
Saturation	88%		

Sample Data- Final	
Height (in)	2.903
Diameter (in)	2.902
Area (cm^2)	42.67
Volume (cm^3)	314.65
Mass (g)	637.93
Moisture Content (%)	24.7
Dry Density (pcf)	101.5
Volume Solids (cm^3)	189.48
Volume Voids (cm^3)	125.17
Void Ratio	0.66
Saturation	101%

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	612.31	646.02
Wt. Dry Soil & Tare (g)	511.59	519.76
Wt. Tare (g)	0.00	8.48
Wt. Water (g)	100.72	126.26
Wt. Dry Soil (g)	511.59	511.28
Moisture Content	19.7%	24.7%

DESCRIPTION -

Flow Pump Rate 2.19E-05 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (^oC)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/28/25	45928	16	0	19.5	0	0	0	0	1.49	104.81	14.21	3.7E-08	
09/28/25	45928	16	5	19.5	5	5	300	300	1.49	104.81	14.21	3.7E-08	
09/28/25	45928	16	10	19.5	5	10	300	600	1.49	104.81	14.21	3.7E-08	
09/28/25	45928	16	15	19.5	5	15	300	900	1.49	104.81	14.21	3.7E-08	*
09/28/25	45928	16	20	19.5	5	20	300	1200	1.49	104.81	14.21	3.7E-08	*
09/28/25	45928	16	25	19.5	5	25	300	1500	1.49	104.81	14.21	3.7E-08	*
09/28/25	45928	16	30	19.5	5	30	300	1800	1.49	104.81	14.21	3.7E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 3.7E-08 cm/sec

DATE	9/28/25
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FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	4	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-4-11A	-	Flow Pump Speed	12	
SAMPLE TYPE	UD		Technician	CJ	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.854	B-Value, f	1.00	Height (in)	2.885
Diameter (in)	2.869	Cell Pres.	90.0	Diameter (in)	2.905
Area (cm^2)	41.71	Bot. Pres.	80.0	Area (cm^2)	42.76
Volume (cm^3)	302.35	Top Pres.	80.0	Volume (cm^3)	313.35
Mass (g)	605.85	Tot. B.P.	80.0	Mass (g)	622.70
Moisture Content (%)	21.2	Head, max.	144.90	Moisture Content (%)	24.5
Dry Density (pcf)	103.2	Head, min.	144.90	Dry Density (pcf)	99.6
Spec. Gravity(assumed)	2.70	Max. Grad.	19.77	Volume Solids (cm^3)	185.18
Volume Solids (cm^3)	185.18	Min. Grad.	19.77	Volume Voids (cm^3)	128.17
Volume Voids (cm^3)	117.16			Void Ratio	0.69
Void Ratio	0.63			Saturation	96%
Saturation	90%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	605.85	630.88
Wt. Dry Soil & Tare (g)	499.99	508.22
Wt. Tare (g)	0.00	8.41
Wt. Water (g)	105.86	122.66
Wt. Dry Soil (g)	499.99	499.81
Moisture Content	21.2%	24.5%

DESCRIPTION -

Flow Pump Rate 4.46E-06 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
09/30/25	45930	14	0	20.4	0	0	0	0	2.06	144.90	19.77	5.2E-09
09/30/25	45930	14	5	20.4	5	5	300	300	2.06	144.90	19.77	5.2E-09
09/30/25	45930	14	10	20.4	5	10	300	600	2.06	144.90	19.77	5.2E-09
09/30/25	45930	14	15	20.4	5	15	300	900	2.06	144.90	19.77	5.2E-09 *
09/30/25	45930	14	20	20.4	5	20	300	1200	2.06	144.90	19.77	5.2E-09 *
09/30/25	45930	14	25	20.4	5	25	300	1500	2.06	144.90	19.77	5.2E-09 *
09/30/25	45930	14	30	20.4	5	30	300	1800	2.06	144.90	19.77	5.2E-09 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 5.2E-09 cm/sec

DATE	9/30/25
CHECK	CJ
REVIEW	
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FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	5	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-4-12A	-	Flow Pump Speed	11	
SAMPLE TYPE	UD		Technician	CJ	

Sample Data - Initial			
Height (in)	2.670	B-Value, f	0.99
Diameter (in)	2.865	Cell Pres.	90.0
Area (cm^2)	41.59	Bot. Pres.	80.0
Volume (cm^3)	282.07	Top Pres.	80.0
Mass (g)	548.91	Tot. B.P.	80.0
Moisture Content (%)	21.2	Head, max.	129.43
Dry Density (pcf)	100.2	Head, min.	129.43
Spec. Gravity(assumed)	2.70	Max. Grad.	18.77
Volume Solids (cm^3)	167.68	Min. Grad.	18.77
Volume Voids (cm^3)	114.39		
Void Ratio	0.68		
Saturation	84%		

Sample Data- Final	
Height (in)	2.714
Diameter (in)	2.894
Area (cm^2)	42.44
Volume (cm^3)	292.55
Mass (g)	571.16
Moisture Content (%)	26.2
Dry Density (pcf)	96.6
Volume Solids (cm^3)	167.68
Volume Voids (cm^3)	124.87
Void Ratio	0.74
Saturation	95%

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	548.91	579.57
Wt. Dry Soil & Tare (g)	452.73	461.18
Wt. Tare (g)	0.00	8.59
Wt. Water (g)	96.18	118.39
Wt. Dry Soil (g)	452.73	452.59
Moisture Content	21.2%	26.2%

DESCRIPTION -

Flow Pump Rate 1.11E-05 cm^3/sec PERMEANT: Dealred Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/30/25	45930	15	0	20.6	0	0	0	0	1.84	129.43	18.77	1.4E-08	
09/30/25	45930	15	5	20.6	5	5	300	300	1.84	129.43	18.77	1.4E-08	
09/30/25	45930	15	10	20.6	5	10	300	600	1.84	129.43	18.77	1.4E-08	
09/30/25	45930	15	15	20.6	5	15	300	900	1.84	129.43	18.77	1.4E-08	*
09/30/25	45930	15	20	20.6	5	20	300	1200	1.84	129.43	18.77	1.4E-08	*
09/30/25	45930	15	25	20.6	5	25	300	1500	1.84	129.43	18.77	1.4E-08	*
09/30/25	45930	15	30	20.6	5	30	300	1800	1.84	129.43	18.77	1.4E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 1.4E-08 cm/sec

DATE	9/30/25
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APPROVE	

FLEXIBLE WALL PERMEABILITY
ASTM D5084
METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	13	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-4-13A	-	Flow Pump Speed	10	
SAMPLE TYPE	UD		Technician	FT	

Sample Data - Initial			
Height (in)	2.421	B-Value, f	0.99
Diameter (in)	2.857	Cell Pres.	90.0
Area (cm^2)	41.36	Bot. Pres.	80.0
Volume (cm^3)	254.34	Top Pres.	80.0
Mass (g)	503.73	Tot. B.P.	80.0
Moisture Content (%)	20.6	Head, max.	184.99
Dry Density (pcf)	102.5	Head, min.	184.99
Spec. Gravity(assumed)	2.70	Max. Grad.	29.89
Volume Solids (cm^3)	154.67	Min. Grad.	29.89
Volume Voids (cm^3)	99.66		
Void Ratio	0.64		
Saturation	86%		

Sample Data- Final	
Height (in)	2.437
Diameter (in)	2.855
Area (cm^2)	41.30
Volume (cm^3)	255.66
Mass (g)	527.18
Moisture Content (%)	26.2
Dry Density (pcf)	101.9
Volume Solids (cm^3)	154.67
Volume Voids (cm^3)	100.99
Void Ratio	0.65
Saturation	108%

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	503.73	535.50
Wt. Dry Soil & Tare (g)	417.61	425.97
Wt. Tare (g)	0.00	8.50
Wt. Water (g)	86.12	109.53
Wt. Dry Soil (g)	417.61	417.47
Moisture Content	20.6%	26.2%

DESCRIPTION -

Flow Pump Rate 2.19E-05 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
09/29/25	45929	12	0	20.1	0	0	0	0	2.63	184.99	29.89	1.8E-08
09/29/25	45929	12	5	20.1	5	5	300	300	2.63	184.99	29.89	1.8E-08
09/29/25	45929	12	10	20.1	5	10	300	600	2.63	184.99	29.89	1.8E-08
09/29/25	45929	12	15	20.1	5	15	300	900	2.63	184.99	29.89	1.8E-08 *
09/29/25	45929	12	20	20.1	5	20	300	1200	2.63	184.99	29.89	1.8E-08 *
09/29/25	45929	12	25	20.1	5	25	300	1500	2.63	184.99	29.89	1.8E-08 *
09/29/25	45929	12	30	20.1	5	30	300	1800	2.63	184.99	29.89	1.8E-08 *

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 1.8E-08 cm/sec

DATE	9/29/25
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APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	6	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-4-14A	-	Flow Pump Speed	10	
SAMPLE TYPE	UD		Technician	CJ/DA	

Sample Data - Initial				Sample Data- Final	
Height (in)	2.855	B-Value, f	0.97	Height (in)	2.887
Diameter (in)	2.855	Cell Pres.	90.0	Diameter (in)	2.878
Area (cm^2)	41.30	Bot. Pres.	80.0	Area (cm^2)	41.97
Volume (cm^3)	299.51	Top Pres.	80.0	Volume (cm^3)	307.77
Mass (g)	604.24	Tot. B.P.	80.0	Mass (g)	619.64
Moisture Content (%)	21.9	Head, max.	132.24	Moisture Content (%)	25.0
Dry Density (pcf)	103.2	Head, min.	132.24	Dry Density (pcf)	100.5
Spec. Gravity(assumed)	2.70	Max. Grad.	18.03	Volume Solids (cm^3)	183.53
Volume Solids (cm^3)	183.53	Min. Grad.	18.03	Volume Voids (cm^3)	124.24
Volume Voids (cm^3)	115.98			Void Ratio	0.68
Void Ratio	0.63			Saturation	100%
Saturation	94%				

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	604.24	627.96
Wt. Dry Soil & Tare (g)	495.53	503.87
Wt. Tare (g)	0.00	8.43
Wt. Water (g)	108.71	124.09
Wt. Dry Soil (g)	495.53	495.44
Moisture Content	21.9%	25.0%

DESCRIPTION -

Flow Pump Rate 2.19E-05 cm^3/sec

PERMEANT: Deaired Tap Water

USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/30/25	45930	16	0	20.6	0	0	0	0	1.88	132.24	18.03	2.9E-08	
09/30/25	45930	16	5	20.6	5	5	300	300	1.88	132.24	18.03	2.9E-08	
09/30/25	45930	16	10	20.6	5	10	300	600	1.88	132.24	18.03	2.9E-08	
09/30/25	45930	16	15	20.6	5	15	300	900	1.88	132.24	18.03	2.9E-08	*
09/30/25	45930	16	20	20.6	5	20	300	1200	1.88	132.24	18.03	2.9E-08	*
09/30/25	45930	16	25	20.6	5	25	300	1500	1.88	132.24	18.03	2.9E-08	*
09/30/25	45930	16	30	20.6	5	30	300	1800	1.88	132.24	18.03	2.9E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS 2.9E-08 cm/sec

DATE	9/30/25
CHECK	CJ
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	2	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-4-15A	-	Flow Pump Speed	10	
SAMPLE TYPE	UD		Technician	CJ	

Sample Data - Initial			
Height (in)	2.107	B-Value, f	0.98
Diameter (in)	2.851	Cell Pres.	90.0
Area (cm^2)	41.19	Bot. Pres.	80.0
Volume (cm^3)	220.42	Top Pres.	80.0
Mass (g)	445.85	Tot. B.P.	80.0
Moisture Content (%)	17.1	Head, max.	72.45
Dry Density (pcf)	107.7	Head, min.	72.45
Spec. Gravity(assumed)	2.70	Max. Grad.	13.32
Volume Solids (cm^3)	140.96	Min. Grad.	13.32
Volume Voids (cm^3)	79.46		
Void Ratio	0.56		
Saturation	82%		

Sample Data- Final	
Height (in)	2.141
Diameter (in)	2.887
Area (cm^2)	42.23
Volume (cm^3)	229.67
Mass (g)	463.76
Moisture Content (%)	21.9
Dry Density (pcf)	103.4
Volume Solids (cm^3)	140.96
Volume Voids (cm^3)	88.71
Void Ratio	0.63
Saturation	94%

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	445.85	472.13
Wt. Dry Soil & Tare (g)	380.59	388.99
Wt. Tare (g)	0.00	8.53
Wt. Water (g)	65.26	83.14
Wt. Dry Soil (g)	380.59	380.46
Moisture Content	17.1%	21.9%

DESCRIPTION -

Flow Pump Rate 2.19E-05 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
09/30/25	45930	9	0	20.2	0	0	0	0	1.03	72.45	13.32	3.9E-08	
09/30/25	45930	9	5	20.2	5	5	300	300	1.03	72.45	13.32	3.9E-08	
09/30/25	45930	9	10	20.2	5	10	300	600	1.03	72.45	13.32	3.9E-08	
09/30/25	45930	9	15	20.2	5	15	300	900	1.03	72.45	13.32	3.9E-08	*
09/30/25	45930	9	20	20.2	5	20	300	1200	1.03	72.45	13.32	3.9E-08	*
09/30/25	45930	9	25	20.2	5	25	300	1500	1.03	72.45	13.32	3.9E-08	*
09/30/25	45930	9	30	20.2	5	30	300	1800	1.03	72.45	13.32	3.9E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 3.9E-08 cm/sec

DATE	9/30/25
CHECK	CJ
REVIEW	
APPROVE	

FLEXIBLE WALL PERMEABILITY

ASTM D5084

METHOD D - CONSTANT RATE OF FLOW

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR		Board #	4	COMMENTS
PROJECT NUMBER	US-0048676.8029		Flow Pump	2	
SAMPLE ID	P-4-16A	-	Flow Pump Speed	10	
SAMPLE TYPE	UD		Technician	DA	

Sample Data - Initial			
Height (in)	1.825	B-Value, f	0.98
Diameter (in)	2.865	Cell Pres.	90.0
Area (cm^2)	41.59	Bot. Pres.	80.0
Volume (cm^3)	192.80	Top Pres.	80.0
Mass (g)	393.70	Tot. B.P.	80.0
Moisture Content (%)	16.8	Head, max.	165.30
Dry Density (pcf)	109.1	Head, min.	165.30
Spec. Gravity(assumed)	2.70	Max. Grad.	34.25
Volume Solids (cm^3)	124.88	Min. Grad.	34.25
Volume Voids (cm^3)	67.92		
Void Ratio	0.54		
Saturation	83%		

Sample Data- Final	
Height (in)	1.900
Diameter (in)	2.937
Area (cm^2)	43.71
Volume (cm^3)	210.94
Mass (g)	415.57
Moisture Content (%)	23.2
Dry Density (pcf)	99.7
Volume Solids (cm^3)	124.88
Volume Voids (cm^3)	86.05
Void Ratio	0.69
Saturation	91%

MOISTURE CONTENTS	Sample Initial	Sample Final
Wt. Wet Soil & Tare (g)	393.70	423.93
Wt. Dry Soil & Tare (g)	337.18	345.57
Wt. Tare (g)	0.00	8.51
Wt. Water (g)	56.52	78.36
Wt. Dry Soil (g)	337.18	337.06
Moisture Content	16.8%	23.2%

DESCRIPTION -

Flow Pump Rate 2.19E-05 cm^3/sec PERMEANT: Deaired Tap Water USCS -

TIME FUNCTIONS, SECONDS								dP					
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)	
10/02/25	45932	11	30	20.6	0	0	0	0	2.35	165.30	34.25	1.4E-08	
10/02/25	45932	11	35	20.6	5	5	300	300	2.35	165.30	34.25	1.4E-08	
10/02/25	45932	11	40	20.6	5	10	300	600	2.35	165.30	34.25	1.4E-08	
10/02/25	45932	11	45	20.6	5	15	300	900	2.35	165.30	34.25	1.4E-08	*
10/02/25	45932	11	50	20.6	5	20	300	1200	2.35	165.30	34.25	1.4E-08	*
10/02/25	45932	11	55	20.6	5	25	300	1500	2.35	165.30	34.25	1.4E-08	*
10/02/25	45932	12	0	20.6	5	30	300	1800	2.35	165.30	34.25	1.4E-08	*

TRANSCRIBED FROM ORIGINAL DATA SHEETS PERMEABILITY REPORTED AS 1.4E-08 cm/sec

DATE	10/2/25
CHECK	DA
REVIEW	
APPROVE	

APPENDIX J
GEOMEMBRANE – INSTALLATION COMPANY QUALIFICATIONS

PATRIOT ENVIRONMENTAL
AN ESI COMPANY

220 West Carl Hubbell Blvd., #671
TEL (405) 279–6052

To:	Dumey Contracting	Date:	9/18/25
Address:	6554 Hwy 77	Job Name:	Legacy Landfill Cell 5
	Benton, MO 63736		Jonesboro, AR
Phone:		Transmittal Number:	03
Attention:	Tom Jansen	Project Number:	
Email:	tjansen@dumeycontracting.com	Submitted By:	Barrett Sawatzky

We are sending you: [X] Attached [ ] Under Separate Cover Via _____ the following items:

[ ] Shop Drawings [ ] Prints [ ] Plans [ ] Samples [ ] Specifications

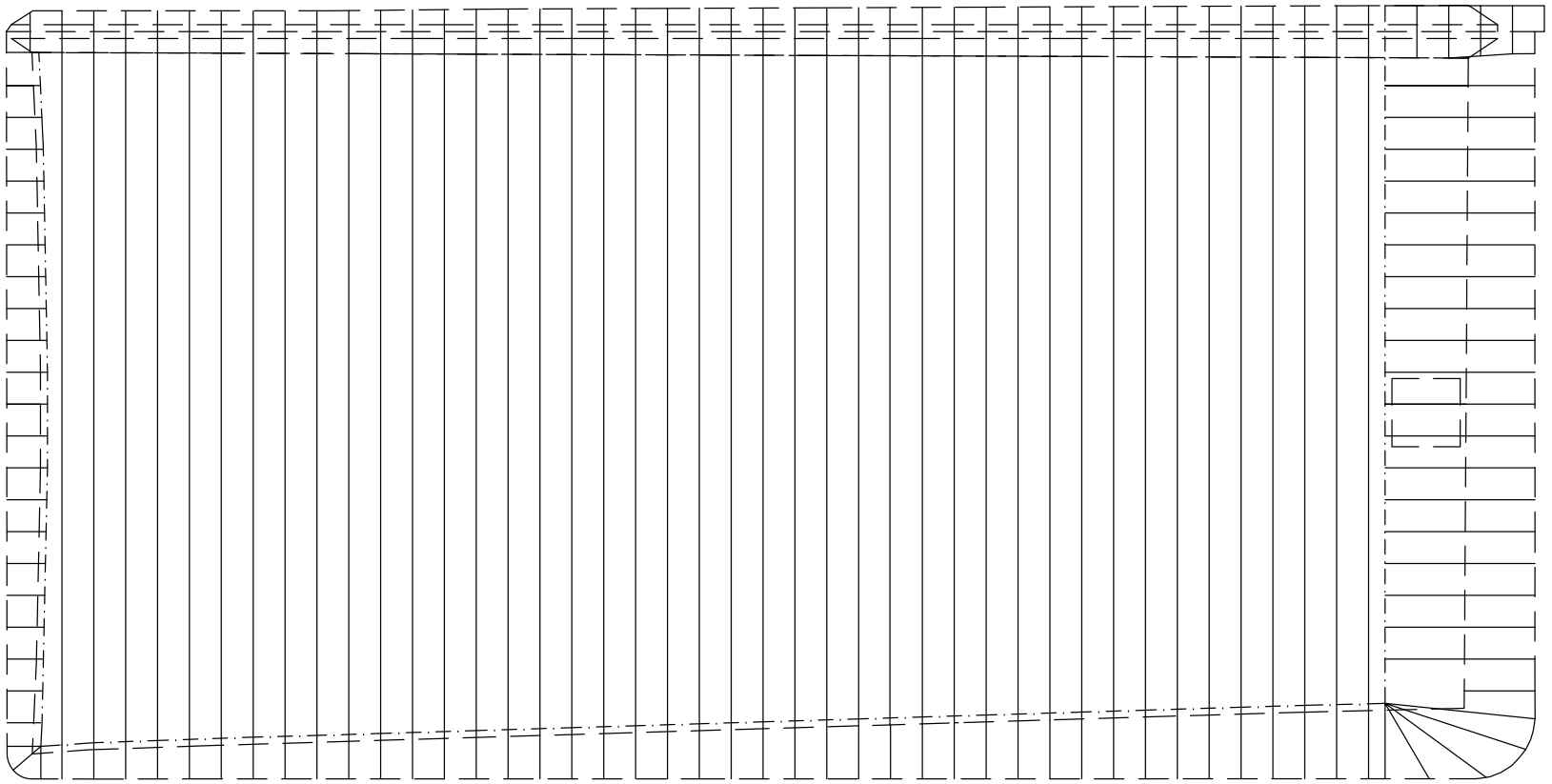
[ ] Copy of Letter [ ] Change Order [ ] _____

Copies	Date	Submittal #	REV	Description	Action
1	9/18/25			Patriot - Proposed Panel Layout	For Approval
1	9/18/25			Patriot - Project Experience	For Approval
1	9/18/25			Patriot - Crew Resumes	For Approval

Sent Via:

[X] E-Mail [ ] US Mail [ ] Overnight [ ] Hand Delivered [ ] Other _____

If enclosures are not as noted, please notify us at once……..



NOTES:

1. PROPOSED PANEL LAYOUT IS FOR SCHEMATIC PURPOSES ONLY. LAYOUT MAY CHANGE DUE TO VARIATIONS IN FIELD CONDITIONS.
2. GEOMEMBRANE TO BE PROVIDED IN 24 FOOT WIDE MASTER ROLLS.

LEGEND

- CELL OUTLINE
- PANEL OUTLINE
- TRANSITION EXT WELD (Smooth to Textured)

DRAWN BY: Barrett S. DATE: 09/17/25
CHKD BY: DATE:
SCALE: NTS
JOB #: EST #:

NO.	REVISION DESCRIPTION	DATE	BY

PATRIOT ENVIRONMENTAL, LLC.
317 S DAWSON STREET
MEEKER, OK 74855
www.PELiners.com

PROJECT INFORMATION:

60-Mil HDPE SMOOTH & TEXTURED
PROPOSED PANEL LAYOUT / RECORD DRAWING
LEGACY LANDFILL CELL 5
JONESBORO, AR (CRAIGHEAD COUNTY)

DRAWING 1

PATRIOT ENVIRONMENTAL
AN ESI COMPANY

SOLID WASTE PROJECT REFERENCE LIST

Project Name	Date	Location	Customer	Owner	HDPE Liner (SF)	Geocomposite (SF)	GCL (SF)	Geotextile (SF)	Market
Wishbone Disposal Cell D1	2019-08	Stanton, TX	R360	R360	946,110	934,430			Solid Waste
Fredericksburg Landfill Cell 8	2020-03	Fredericksckburg, TX	City of Fredericksburg	City of Fredericksburg	297,900	278,008	279,000	31,500	Solid Waste
North Texas Water District Landfill Sector 5D	2020-07	Melissa, TX	North TX MWD	North TX MWD	583,704	583,704			Solid Waste
North Texas Municipal Cell	2020-07	Melissa, TX	North TX MWD	North TX MWD	713,925	649,066	144,000		Solid Waste
Republic San Angelo Landfill Cell 12A	2020-08	San Angelo, TX	Republic	Republic	82,448	446,227	89,436		Solid Waste
Butte Silverbow Landfill Cell 4	2020-08	Butte, MT	Intermountain	City of Butte	743,079	35,239	672,668	672,668	Solid Waste
Republic Southwest Landfill	2020-10	Canyon, TX	Republic	Republic	459,749	470,372			Solid Waste
Abilene Landfill	2021-03	Abilene, TX	Republic	Republic	357,594	344,544			Solid Waste
Pitkin County Landfill North Exp Cell	2021-10	Aspen, CO	Johnson Construction	Pitkin County	686,345	175,000	680,000	638,550	Solid Waste
Altus Landfill Lateral Expansion	2021-11	Altus, OK	City of Altus	City of Altus	307,389	293,625			Solid Waste
Edinburg Landfill	2022-02	Edinburg, TX	City of Edinburg	City of Edinburg	430,560	429,780	409,500		Solid Waste
Republic Blue Ridge Landfill	2022-08	Fresno, TX	Republic	Republic	273,290	200,970			Solid Waste
Eastern Laramie Landfill	2022-09	Burns, WY	Eastern Laramie County Solid Waste Dept	Eastern Laramie County Solid Waste Dept	240,350	240,120	231,750	10,350	Solid Waste
Oak Grove Landfill	2022-11	Arcadia, KS	GFL	GFL	309,372	309,372			Solid Waste
Blue Ridge Landfill	2022-11	Fresno, TX	Republic	Republic	165,475	167,600			Solid Waste
South Shelby Landfill	2022-11	Memphis, TN	Republic	Republic	273,211	273,211			Solid Waste
Los Reales Landfill	2023-04	Tucson, AZ	Rummel Construction		1,008,000		987,450		Solid Waste
Pauls Valley Landfill Downchutes	2023-07	Pauls Valley, OK	GFL	GFL	304,060	303,050			Solid Waste
Central Missouri Landfill	2023-07	Sedalia, MO	GFL	GFL	353,800	199,800		310,400	Solid Waste
WCS Andrews Landfill Phase 2A	2023-08	Andrews, TX	Northstar	Waste Control Systems	170,354	84,825		27,540	Solid Waste
Socorro Landfill Cells 3 & 4	2023-08	Socorro, NM	City of Socorro	City of Socorro	454,000		454,000		Solid Waste
Republic Charter Landfill	2023-08	Odessa, TX	Republic	Republic	475,206	167,995	475,206	113,870	Solid Waste
West Kentucky Landfill	2023-09	Mayfield, KY	GFL	GFL	412,902	279,769	412,902	129,099	Solid Waste
North Texas Water District Landfill Sector 6A	2023-09	Melissa, TX	North TX MWD	North TX MWD	453,055	453,055	453,055		Solid Waste
Safefill Pecos Disposal Cell	2023-10	Pecos, TX	Safefill Pecos	Safefill Pecos	1,123,476	1,006,114	569,075	8,797	Solid Waste
Red Bluff Landfill Cell	2023-11	Orla, TX	Waste Connections	Waste Connections	940,600	834,100			Solid Waste
Pauls Valley Landfill Downchutes	2023-11	Pauls Valley, OK	GFL	GFL	17,000				Solid Waste
Western Regional Landfill	2023-11	Huachuca City, AZ	Rummel Construction		492,000	482,487	467,625	10,350	Solid Waste
Desert Reclamation Disposal Cell	2023-11	Orla, TX	Desert Reclamation	Desert Reclamation	892,072	842,500	210,850	166,300	Solid Waste
Northeast Landfill Raintarp	2024-03	Spencer, OK	GFL	GFL	10,000				Solid Waste
Cinder Lake Landfill Cell D	2024-08	Flagstaff, AZ	Rummel Construction	Flagstaff Public Works	362,325	152,252	362,325	572,398	Solid Waste
Upper SW Arkansas Landfill Cell 3	2024-08	Nashville, AR	C&T Excavating	Solid Waste Mgmt Division	242,400	235,263			Solid Waste
Park County Landfill Phase 2 Cell	2024-10	Cody, WY	Park County Public Works	Park County Public Works	350,400	680,340	351,000		Solid Waste
									Total:
					14,932,151	**11,552,818**	**7,249,842**	**2,691,822**	**36,426,633**

PATRIOT ENVIRONMENTAL, LLC

Work Experience RESUME

Name: **Bounthanh Billy Xaysana**

Position: **Master Seamer/ Crew**

Billy has 28 years of experience in installation and seaming of a variety of synthetic liners and components. A Master Seamer qualification requires a minimum of five million square feet of actual hands on geomembrane welding experience, he has been installing roughly 15 million sqaure ft. of liner a year since 1996. Billy is familiar with all currently utilized welding techniques, welder set up / maintenance, safety and installation procedures. He is also familiar with and has experience with detail work including pipe boots, sumps, batten seals, and other miscellaneous appurtenances. He is also qualified to assist in the training of Geomembrane Welders.

Company Name	Employment Dates	MATERIAL Installed
National Seal Company	1996-1998	10oz Geo,20 mil, 30 mil,40mil,Geonet,60mil
NorthWest Ling	1998-2000	10oz Geo,20 mil, 30 mil,40mil,Geonet,60mil
GSE	2001-2003	10oz Geo,20 mil, 30 mil,40mil,Geonet,60mil
GSI	2004-2005	10oz Geo,20 mil, 30 mil,40mil,Geonet,60mil
CAAW	2005-2013	10oz Geo,20 mil, 30 mil,40mil,Geonet,60mil
AGE	2013-2014	10oz Geo,20 mil, 30 mil,40mil,Geonet,60mil
Extrem Plus	2015-2016	10oz Geo,20 mil, 30 mil,40mil,Geonet,60mil
ESI	2016-2017	10oz Geo,20 mil, 30 mil,40mil,Geonet,60mil
Mustang	2017-2021	10oz Geo,20 mil, 30 mil,40mil,Geonet,60mil
Patriot Environmental, LLC	2022- Current	10oz Geo,20 mil, 30 mil,40mil,Geonet,60mil

PATRIOT ENVIRONMENTAL, LLC

Work Experience RESUME

Name: **Saignanh Chaluensavangvong**

Position: **Master Seamer**

Saignanh has 5 years of experience in installation and seaming of a variety of synthetic liners and components. A Master Seamer qualification requires a minimum of five million square feet of actual hands on geomembrane welding experience, He has been installing roughly 15 million sqaure ft. of liner a year since 2017. Saignanh is familiar with all currently utilized welding techniques, welder set up / maintenance, safety and installation procedures. He is also familiar with and has experience with detail work including pipe boots, sumps, batten seals, and other miscellaneous appurtenances. He is also qualified to assist in the training of Geomembrane Welders.

Company Name	Employment Dates	MATERIAL Installed
IEC	2017-2018	10oz Geo,20 mil, 30 mil,40mil,Geonet,60mil
MUSTANG	2019-2020	10oz Geo,20 mil, 30 mil,40mil,Geonet,60mil
Patriot Environmental, LLC	2021-CURRENT	10oz Geo,20 mil, 30 mil,40mil,Geonet,60mil

PATRIOT ENVIRONMENTAL, LLC

Work Experience RESUME

Name: **Moon Kala**

Position: **Master Seamer**

Moon Kala has 17 years of experience in installation and seaming of a variety of synthetic liners and components. A Master Seamer qualification requires a minimum of five million square feet of actual hands on geomembrane welding experience, he has been installing roughly 15 million sqaure ft. of liner a year since 2006. Moon is familiar with all currently utilized welding techniques, welder set up / maintenance, safety and installation procedures. He is also familiar with and has experience with detail work including pipe boots, sumps, batten seals, and other miscellaneous appurtenances. He is also qualified to assist in the training of Geomembrane Welders.

Company Name	Employment Dates	MATERIAL Installed
CAAW	2006-2014	10oz Geo,20 mil, 30 mil,40mil,Geonet,60mil
Extrem Plastic Plus	2015	10oz Geo,20 mil, 30 mil,40mil,Geonet,60mil
IEC	2016	10oz Geo,20 mil, 30 mil,40mil,Geonet,60mil
Mustang Energy	2017-2019	10oz Geo,20 mil, 30 mil,40mil,Geonet,60mil
Patriot Environmental LLC	2019-Current	10oz Geo,20 mil, 30 mil,40mil,Geonet,60mil

PATRIOT ENVIRONMENTAL, LLC

Work Experience RESUME

Name: **Lokey Vienthong**

Position: **Master Seamer**

Lokey has 25 years of experience in installation and seaming of a variety of synthetic liners and components. A Master Seamer qualification requires a minimum of five million square feet of actual hands on geomembrane welding experience, he has been installing roughly 15 million sqaure ft. of liner a year. Lokey is familiar with all currently utilized welding techniques, welder set up / maintenance, safety and installation procedures. He is also familiar with and has experience with detail work including pipe boots, sumps, batten seals, and other miscellaneous appurtenances. He is also qualified to assist in the training of Geomembrane Welders.

Company Name	Employment	MATERIAL Installed
Extrem Plastic	**3 Years**	**10oz Geo,20 mil, 30 mil,40mil,Geonet,60mil**
GSI	**5 Years**	**10oz Geo,20 mil, 30 mil,40mil,Geonet,60mil**
GSE	**5 Years**	**10oz Geo,20 mil, 30 mil,40mil,Geonet,60mil**
RTD Enterprises	**3 Years**	**10oz Geo,20 mil, 30 mil,40mil,Geonet,60mil**
Patriot Environmental, LLC	**CURRENT**	**10oz Geo,20 mil, 30 mil,40mil,Geonet,60mil**

PATRIOT ENVIRONMENTAL, LLC

Work Experience RESUME

Name: **Saignanh Chaluensavangvong**

Position: **Master Seamer**

Saignanh has 5 years of experience in installation and seaming of a variety of synthetic liners and components. A Master Seamer qualification requires a minimum of five million square feet of actual hands on geomembrane welding experience, he has been installing roughly 15 million sqaure ft. of liner a year since 2017. Saignanh is familiar with all currently utilized welding techniques, welder set up / maintenance, safety and installation procedures. He is also familiar with and has experience with detail work including pipe boots, sumps, batten seals, and other miscellaneous appurtenances. He is also qualified to assist in the training of Geomembrane Welders.

Company Name	Employment Dates	MATERIAL Installed
IEC	2017 - 2018	10oz Geo,20 mil, 30 mil,40mil,Geonet,60mil
Mustang	2019 - 2020	10oz Geo,20 mil, 30 mil,40mil,Geonet,60mil
Patriot Environmental, LLC	2021 - Current	10oz Geo,20 mil, 30 mil,40mil,Geonet,60mil

PATRIOT ENVIRONMENTAL, LLC

Work Experience RESUME

Name: Luis Ortega

Position: Quality Control

Knowledge of Geosynthetic Materials – Understanding geomembranes, geotextiles, GCLs, drainage nets, and their applications.

• Technical Expertise in Welding and Seaming – Familiarity with fusion welding, extrusion welding, patching, and testing requirements.

• Understanding of Standards and Specifications – Awareness of ASTM, GRI, ISO, and project-specific quality requirements.

• Field Inspection Skills – Ability to check panel deployment, seam alignment, overlaps, repairs, and anchoring.

• Testing Proficiency – Performing and reviewing air channel tests, vacuum box, spark testing, peel and shear tests (destructive tests), and trial seams.

• Documentation and Reporting – Keeping accurate QC logs, panel layouts, seam logs, repair records, and as-built drawings.

• Attention to Detail – Detecting wrinkles, bridging, contamination, or improper overlaps during installation.

• Problem-Solving under Field Conditions – Addressing nonconformities, weather-related issues, or equipment malfunctions effectively.

• Safety and Compliance Mindset – Ensuring proper PPE use and safe handling of materials during installation.

• Time and Productivity Awareness – Balancing inspection rigor with project deadlines.

• Team Collaboration – Working alongside installers, engineers, and client representatives to maintain quality and trust.

Company Name	Employment Dates	MATERIAL Installed
Patriot Enviromental, LLC	Current	Geonet, Geocomposite,40 mil, 60mil

APPENDIX K
GEOMEMBRANE – MANUFACTURER'S QC CERTIFICATES

PATRIOT ENVIRONMENTAL
AN ESI COMPANY

220 West Carl Hubbell Blvd., #671
TEL (405) 279–6052

To:	Dumey Contracting	Date:	9/12/25
Address:	6554 Hwy 77	Job Name:	Legacy Landfill Cell 5
	Benton, MO 63736		Jonesboro, AR
Phone:		Transmittal Number:	02
Attention:	Tom Jansen	Project Number:	
Email:	tjansen@dumeycontracting.com	Submitted By:	Barrett Sawatzky

We are sending you: [X] Attached [ ] Under Separate Cover Via _____ the following items:

[ ] Shop Drawings [ ] Prints [ ] Plans [ ] Samples [ ] Specifications

[ ] Copy of Letter [ ] Change Order [ ] _____

Copies	Date	Submittal #	REV	Description	Action
1	9/12/25			SKAPS - HD60S Geomembrane MQC	For Approval
1	9/12/25			SKAPS - HD60T2 Geomembrane MQC	For Approval

Sent Via:

[X] E-Mail [ ] US Mail [ ] Overnight [ ] Hand Delivered [ ] Other _____

If enclosures are not as noted, please notify us at once……..

Product: 60-HD-00-BLK-BLK-AVG-STD-24.00
Project : Legacy LF, AR
Customer: Patriot Environmental, LLC
Cust PO: P1785

QC'd By: Malkesh Patel
Date: September 12, 2025

We hereby certify the following test results for the above referenced product/project :

Count	Roll Number	Area (sq ft)	Gross Weight (lb)	Thickness MAV (mil)	Thickness MIN (mil)	Tensile at Yield (ppi)		Elong at Yield (%)		Tensile at Break (ppi)		Elong at Break (%)		Tear Resistance (lb)		Punct Resist (lb)	Density (g/cc)	Carbon Black (%)	CB Disp (Views in Cat 1 or 2)	Resin OIT (Minute)	Resin Lot #
				ASTM D 5199	ASTM D 5199	ASTM D 6693		ASTM D 6693		ASTM D 6693		ASTM D 6693		ASTM D 1004		ASTM D 4833	ASTM D 1505	ASTM D 4218	ASTM D 5596	ASTM D 3895	
						MD	TD	MD	TD	MD	TD	MD	TD	MD	TD						
01	3111029439	12,960.00	3960	62	58	160	169	19	19	293	311	842	940	50	55	147	0.948	2.6	10	241	25E1108
02	3111029440	12,960.00	3974	62	59	160	169	19	19	293	311	842	940	50	55	147	0.948	2.6	10	241	25E1108
03	3111029441	12,960.00	3970	61	59	158	168	20	20	288	274	827	858	50	55	147	0.948	2.6	10	241	25E1108
04	3111029442	12,960.00	3950	61	59	158	168	20	20	288	274	827	858	50	55	147	0.948	2.6	10	241	25E1108
05	3111029443	12,960.00	3948	61	59	158	168	20	20	288	274	827	858	50	55	147	0.948	2.6	10	241	25E1108
06	3111029444	12,960.00	3950	62	59	158	168	20	20	288	274	827	858	50	55	147	0.948	2.6	10	241	25E1108
07	3111029445	12,960.00	3956	61	59	158	168	20	20	288	274	827	858	50	55	147	0.948	2.6	10	241	25E1108
08	3111029446	12,960.00	3950	61	59	161	170	20	19	287	295	830	901	55	58	148	0.948	2.5	10	241	25E1108
09	3111029447	12,960.00	3948	61	59	161	170	20	19	287	295	830	901	55	58	148	0.948	2.5	10	241	25E1108
10	3111029448	12,960.00	3950	61	59	161	170	20	19	287	295	830	901	55	58	148	0.948	2.5	10	241	25E1108
11	3111029449	12,960.00	3952	61	59	161	170	20	19	287	295	830	901	55	58	148	0.948	2.5	10	241	25E1108
12	3111029450	12,960.00	3946	61	59	154	163	20	19	289	293	841	895	55	58	148	0.948	2.4	10	241	25E1108

SKAPS Industries
571 Industrial Parkway
Commerce, GA 30529

Phone: 706-336-7000
Fax: 706-336-7007
E-Mail:contact@skaps.com

Product: 60-HD-00-BLK-BLK-AVG-STD-24.00
Project : Legacy LF, AR
Customer: Patriot Environmental, LLC
Cust PO: P1785

QC'd By: Malkesh Patel
Date: September 12, 2025

We hereby certify the following test results for the above referenced product/project :

Count	Roll Number	Area (sq ft)	Gross Weight (lb)	Thickness MAV (mil)	Thickness MIN (mil)	Tensile at Yield (ppi)		Elong at Yield (%)		Tensile at Break (ppi)		Elong at Break (%)		Tear Resistance (lb)		Punct Resist (lb)	Density (g/cc)	Carbon Black (%)	CB Disp (Views in Cat 1 or 2)	Resin OIT (Minute)	Resin Lot #
				ASTM D 5199	ASTM D 5199	ASTM D 6693		ASTM D 6693		ASTM D 6693		ASTM D 6693		ASTM D 1004		ASTM D 4833	ASTM D 1505	ASTM D 4218	ASTM D 5596	ASTM D 3895	
						MD	TD	MD	TD	MD	TD	MD	TD	MD	TD						
13	3118010298	12,960.00	3930	62	58	161	171	20	19	287	307	807	925	51	54	149	0.946	2.7	10	247	25E1133
14	3118010299	12,960.00	3910	61	57	161	171	20	19	287	307	807	925	51	54	149	0.946	2.7	10	247	25E1133
15	3118010300	12,960.00	3922	62	60	161	171	20	19	287	307	807	925	51	54	149	0.946	2.7	10	247	25E1133
16	3118010301	12,960.00	3916	61	60	161	171	20	19	287	307	807	925	51	54	149	0.946	2.7	10	247	25E1133
17	3118010302	12,960.00	3954	61	57	161	171	20	19	287	307	807	925	51	54	149	0.946	2.7	10	247	25E1133
18	3118010303	12,960.00	3,954	61	58	161	174	19	19	284	289	805	861	51	56	150	0.947	2.4	10	247	25E1133
19	3118010304	12,960.00	3,926	61	57	161	174	19	19	284	289	805	861	51	56	150	0.947	2.4	10	247	25E1133
20	3118010305	12,960.00	3,940	61	59	161	174	19	19	284	289	805	861	51	56	150	0.947	2.4	10	247	25E1133
21	3118010306	12,960.00	3,940	61	58	161	174	19	19	284	289	805	861	51	56	150	0.947	2.4	10	247	25E1133
22	3118010307	12,960.00	3,946	62	57	155	161	20	19	295	289	842	884	51	56	150	0.947	2.6	10	247	25E1133
23	3118010308	12,960.00	3,946	62	59	155	161	20	19	295	289	842	884	51	56	150	0.947	2.6	10	247	25E1133
24	3118010309	12,960.00	3,946	62	59	155	161	20	19	295	289	842	884	51	56	150	0.947	2.6	10	247	25E1133

SKAPS Industries
571 Industrial Parkway
Commerce, GA 30529

Phone: 706-336-7000
Fax: 706-336-7007
E-Mail:contact@skaps.com

Product: 60-HD-00-BLK-BLK-AVG-STD-24.00
Project : Legacy LF, AR
Customer: Patriot Environmental, LLC
Cust PO: P1785

QC'd By: Malkesh Patel
Date: September 12, 2025

We hereby certify the following test results for the above referenced product/project :

Count	Roll Number	Area (sq ft)	Gross Weight (lb)	Thickness MAV (mil)	Thickness MIN (mil)	Tensile at Yield (ppi)		Elong at Yield (%)		Tensile at Break (ppi)		Elong at Break (%)		Tear Resistance (lb)		Punct Resist (lb)	Density (g/cc)	Carbon Black (%)	CB Disp (Views in Cat 1 or 2)	Resin OIT (Minute)	Resin Lot #
				ASTM D 5199	ASTM D 5199	ASTM D 6693		ASTM D 6693		ASTM D 6693		ASTM D 6693		ASTM D 1004		ASTM D 4833	ASTM D 1505	ASTM D 4218	ASTM D 5596	ASTM D 3895	
						MD	TD	MD	TD	MD	TD	MD	TD	MD	TD						
25	3118010310	12,960.00	3,948	61	58	155	161	20	19	295	289	842	884	51	56	150	0.947	2.6	10	247	25E1133
26	3118010311	12,960.00	3,936	62	59	155	161	20	19	295	289	842	884	51	56	150	0.947	2.6	10	247	25E1133
27	3118010312	12,960.00	3,926	62	60	156	166	21	19	277	300	774	906	52	55	149	0.946	2.3	10	247	25E1133
28	3118010313	12,960.00	3,946	60	55	156	166	21	19	277	300	774	906	52	55	149	0.946	2.3	10	247	25E1133
29	3118010314	12,960.00	3,928	60	55	156	166	21	19	277	300	774	906	52	55	149	0.946	2.3	10	247	25E1133
30	3118010315	12,960.00	3,916	61	57	156	166	21	19	277	300	774	906	52	55	149	0.946	2.3	10	247	25E1133
31	3118010316	12,960.00	3,920	61	55	166	171	20	19	304	318	841	934	52	55	149	0.946	2.4	10	247	25E1133
32	3118010317	12,960.00	3,898	60	59	166	171	20	19	304	318	841	934	52	55	149	0.946	2.4	10	247	25E1133
33	3118010318	12,960.00	3,914	61	57	166	171	20	19	304	318	841	934	52	55	149	0.946	2.4	10	247	25E1133
34	3118010319	12,960.00	3,916	62	59	166	171	20	19	304	318	841	934	52	55	149	0.946	2.4	10	247	25E1133
35	3118010320	12,960.00	3,896	61	57	166	171	20	19	304	318	841	934	52	55	149	0.946	2.4	10	247	25E1133
36	3118010321	12,960.00	3,918	61	56	161	171	19	19	288	300	808	911	55	58	151	0.947	2.5	10	247	25E1133

SKAPS Industries
571 Industrial Parkway
Commerce, GA 30529

Phone: 706-336-7000
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Product: 60-HD-00-BLK-BLK-AVG-STD-24.00
Project : Legacy LF, AR
Customer: Patriot Environmental, LLC
Cust PO: P1785

QC'd By: Malkesh Patel
Date: September 12, 2025

We hereby certify the following test results for the above referenced product/project :

Count	Roll Number	Area (sq ft)	Gross Weight (lb)	Thickness MAV (mil)	Thickness MIN (mil)	Tensile at Yield (ppi)		Elong at Yield (%)		Tensile at Break (ppi)		Elong at Break (%)		Tear Resistance (lb)		Punct Resist (lb)	Density (g/cc)	Carbon Black (%)	CB Disp (Views in Cat 1 or 2)	Resin OIT (Minute)	Resin Lot #
				ASTM D 5199	ASTM D 5199	ASTM D 6693		ASTM D 6693		ASTM D 6693		ASTM D 6693		ASTM D 1004		ASTM D 4833	ASTM D 1505	ASTM D 4218	ASTM D 5596	ASTM D 3895	
						MD	TD	MD	TD	MD	TD	MD	TD	MD	TD						
37	3118010322	12,960.00	3,924	61	58	161	171	19	19	288	300	808	911	55	58	151	0.947	2.5	10	247	25E1133
38	3118010323	12,960.00	3,930	61	56	161	171	19	19	288	300	808	911	55	58	151	0.947	2.5	10	247	25E1133
39	3118010324	12,960.00	3,910	61	57	161	171	19	19	288	300	808	911	55	58	151	0.947	2.5	10	247	25E1133
40	3118010325	12,960.00	3,900	61	56	154	162	21	19	282	300	799	914	55	58	151	0.947	2.5	10	247	25E1133
41	3118010326	12,960.00	3,924	61	58	154	162	21	19	282	300	799	914	55	58	151	0.947	2.5	10	247	25E1133
42	3118010327	12,960.00	3,916	61	57	154	162	21	19	282	300	799	914	55	58	151	0.947	2.5	10	247	25E1133
43	3118010328	12,960.00	3,952	62	57	154	162	21	19	282	300	799	914	55	58	151	0.947	2.5	10	247	25E1133
44	3118010329	12,960.00	3,890	61	60	154	162	21	19	282	300	799	914	55	58	151	0.947	2.5	10	247	25E1133
45	3118010330	12,960.00	3,918	61	59	158	166	20	19	289	302	812	900	55	54	150	0.947	2.7	10	247	25E1133
46	3118010331	12,960.00	3,910	61	59	158	166	20	19	289	302	812	900	55	54	150	0.947	2.7	10	247	25E1133
47	3118010332	12,960.00	3,900	62	59	158	166	20	19	289	302	812	900	55	54	150	0.947	2.7	10	247	25E1133

SKAPS Industries
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Fax: 706-336-7007
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Formosa Plastics

FORMOSA PLASTICS CORPORATION, TEXAS

201 FORMOSA DRIVE
PO BOX 700
POINT COMFORT TX 77978
PHONE:(888)FPCUSA3

Certificate of Analysis

(CONFIDENTAL)

CUSTOMER:SKAPS INC.
571 INDUSTRIAL PARKWAY

COMMERCE GA 30529

PRODUCT :FORMOLENE HL3812
RAILCAR FPAX219275
CLEANING/INSPECTION NO: 21925050925

S/O NO : E56A702
CUSTOMER PO : 30131250591
DATE SHIPPED: 7/14/25
LOT NO : 25E1108
WEIGHT (LB) : 193,600.00
CUSTID:FT04342 SPIDM1

DATE OF PROD: 5/10/25

Test	Method	Spec Min	Spec Max	Actual
Melt Index,g/10min	ASTM D1238	0	.1	.074
HLMI, g/10 min.	ASTM D1238	9	15	12.6
Density, g/cm3	ASTM D1505	.935	.939	.9390

Linda Kao

QC SUPERVISOR

Formosa Plastics

FORMOSA PLASTICS CORPORATION, TEXAS
201 FORMOSA DRIVE
PO BOX 700
POINT COMFORT TX 77978
PHONE:(888)FPCUSA3

Certificate of Analysis

(CONFIDENTAL)

CUSTOMER:SKAPS INC.
571 INDUSTRIAL PARKWAY
COMMERCE GA 30529
PRODUCT :FORMOLENE HL3812
RAILCAR UTCX049161
CLEANING/INSPECTION NO: 049161051125

S/O NO : E57A479
CUSTOMER PO : 30131250689
DATE SHIPPED: 8/04/25
LOT NO : 25E1133
WEIGHT (LB) : 186,750.00
CUSTID:FT04342 SPIDM1

DATE OF PROD: 5/12/25

Test	Method	Spec Min	Spec Max	Actual
Melt Index,g/10min	ASTM D1238	0	.1	.070
HLMI, g/10 min.	ASTM D1238	9	15	10.6
Density, g/cm3	ASTM D1505	.935	.939	.9389

Linda Kas

QC SUPERVISOR

Product: 60-HD-11-BLK-BLK-GRI-STD-24.00
Project : P1785
Customer: Patriot Environmental, LLC
Cust PO: Legacy LF, AR

QC'd By: Malkesh Patel
Date: September 12, 2025

We hereby certify the following test results for the above referenced product/project :

Count	Roll Number	Area (sq ft)	Gross Weight (lb)	Thickness MAV (mil)	Thickness MIN (mil)	Asperity Height (mil)		Tensile at Yield (ppi)		Elong at Yield (%)		Tensile at Break (ppi)		Elong at Break (%)		Tear Resistance (lb)		Punct Resist (lb)	Density (g/cc)	Carbon Black (%)	CB Disp (Views in Cat 1 or 2)	Resin OIT (Minute)	Resin Lot #
				ASTM D 5994	ASTM D 5994	ASTM D 7466		ASTM D 6693		ASTM D 6693		ASTM D 6693		ASTM D 6693		ASTM D 1004		ASTM D 4833	ASTM D 1505	ASTM D 4218	ASTM D 5596	ASTM D 3895	
						Side A	Side B	MD	TD	MD	TD	MD	TD	MD	TD	MD	TD						
01	3119010171	12,000.00	3930	60	57	23	21	162	173	17	17	205	152	528	388	54	58	152	0.948	2.5	10	250	25E1311
02	3119010172	12,000.00	3920	59	57	23	21	160	168	19	17	214	184	571	535	53	58	145	0.947	2.6	10	250	25E1311
03	3119010173	12,000.00	3930	59	55	23	20	160	168	19	17	214	184	571	535	53	58	145	0.947	2.6	10	250	25E1311
04	3119010174	12,000.00	3908	60	57	23	21	160	168	19	17	214	184	571	535	53	58	145	0.947	2.6	10	250	25E1311
05	3119010175	12,000.00	3870	58	55	21	22	160	168	19	17	214	184	571	535	53	58	145	0.947	2.6	10	250	25E1311
06	3119010176	12,000.00	3894	59	56	20	21	162	166	18	17	200	181	535	528	53	58	145	0.947	2.7	10	250	25E1311
07	3119010177	12,000.00	3890	61	59	23	23	162	166	18	17	200	181	535	528	53	58	145	0.947	2.7	10	250	25E1311
08	3119010178	12,000.00	3880	58	55	24	23	162	166	18	17	200	181	535	528	53	58	145	0.947	2.7	10	250	25E1311
09	3119010179	12,000.00	3866	58	55	22	22	162	166	18	17	200	181	535	528	53	58	145	0.947	2.7	10	250	25E1311
10	3119010180	12,000.00	3880	58	55	21	22	162	166	18	17	200	181	535	528	53	58	145	0.947	2.7	10	250	25E1311
11	3119010181	12,000.00	3880	58	54	23	21	161	168	18	17	195	170	519	497	55	57	149	0.948	2.4	10	250	25E1311
12	3119010182	12,000.00	3884	58	55	23	23	161	168	18	17	195	170	519	497	55	57	149	0.948	2.4	10	250	25E1311

SKAPS Industries
571 Industrial Parkway
Commerce, GA 30529

Phone: 706-336-7000
Fax: 706-336-7007
E-Mail:contact@skaps.com

Formosa Plastics

FORMOSA PLASTICS CORPORATION, TEXAS

201 FORMOSA DRIVE
PO BOX 700
POINT COMFORT TX 77978
PHONE:(888)FPCUSA3

Certificate of Analysis

(CONFIDENTAL)

CUSTOMER:SKAPS INC.
571 INDUSTRIAL PARKWAY

COMMERCE GA 30529

PRODUCT :FORMOLENE HL3812
RAILCAR FPAX201530
CLEANING/INSPECTION NO: 201530052625

S/O NO : E57A483
CUSTOMER PO : 30131250689
DATE SHIPPED: 8/04/25
LOT NO : 25E1311
WEIGHT (LB) : 192,950.00
CUSTID:FT04342 SPIDM1

DATE OF PROD: 5/27/25

Test	Method	Spec Min	Spec Max	Actual
Melt Index,g/10min	ASTM D1238	0	.1	.065
HLMI, g/10 min.	ASTM D1238	9	15	11.0
Density, g/cm3	ASTM D1505	.935	.939	.9378

Linda Kao

QC SUPERVISOR

APPENDIX L
GEOMEMBRANE – INVENTORY LISTING

PATRIOT ENVIRONMENTAL
AN ESI COMPANY

220 West Carl Hubbell Blvd., #671
TEL (405) 279–6052

To:	Dumey Contracting	Date:	9/12/25
Address:	6554 Hwy 77	Job Name:	Legacy Landfill Cell 5
	Benton, MO 63736		Jonesboro, AR
Phone:		Transmittal Number:	02
Attention:	Tom Jansen	Project Number:	
Email:	tjansen@dumeycontracting.com	Submitted By:	Barrett Sawatzky

We are sending you: [X] Attached [ ] Under Separate Cover Via _____ the following items:

[ ] Shop Drawings [ ] Prints [ ] Plans [ ] Samples [ ] Specifications

[ ] Copy of Letter [ ] Change Order [ ] _____

Copies	Date	Submittal #	REV	Description	Action
1	9/12/25			SKAPS - HD60S Geomembrane MQC	For Approval
1	9/12/25			SKAPS - HD60T2 Geomembrane MQC	For Approval

Sent Via:

[X] E-Mail [ ] US Mail [ ] Overnight [ ] Hand Delivered [ ] Other _____

If enclosures are not as noted, please notify us at once……..

Product: 60-HD-00-BLK-BLK-AVG-STD-24.00
Project : Legacy LF, AR
Customer: Patriot Environmental, LLC
Cust PO: P1785

QC'd By: Malkesh Patel
Date: September 12, 2025

We hereby certify the following test results for the above referenced product/project :

Count	Roll Number	Area (sq ft)	Gross Weight (lb)	Thickness MAV (mil)	Thickness MIN (mil)	Tensile at Yield (ppi)		Elong at Yield (%)		Tensile at Break (ppi)		Elong at Break (%)		Tear Resistance (lb)		Punct Resist (lb)	Density (g/cc)	Carbon Black (%)	CB Disp (Views in Cat 1 or 2)	Resin OIT (Minute)	Resin Lot #
				ASTM D 5199	ASTM D 5199	ASTM D 6693		ASTM D 6693		ASTM D 6693		ASTM D 6693		ASTM D 1004		ASTM D 4833	ASTM D 1505	ASTM D 4218	ASTM D 5596	ASTM D 3895	
						MD	TD	MD	TD	MD	TD	MD	TD	MD	TD						
01	3111029439	12,960.00	3960	62	58	160	169	19	19	293	311	842	940	50	55	147	0.948	2.6	10	241	25E1108
02	3111029440	12,960.00	3974	62	59	160	169	19	19	293	311	842	940	50	55	147	0.948	2.6	10	241	25E1108
03	3111029441	12,960.00	3970	61	59	158	168	20	20	288	274	827	858	50	55	147	0.948	2.6	10	241	25E1108
04	3111029442	12,960.00	3950	61	59	158	168	20	20	288	274	827	858	50	55	147	0.948	2.6	10	241	25E1108
05	3111029443	12,960.00	3948	61	59	158	168	20	20	288	274	827	858	50	55	147	0.948	2.6	10	241	25E1108
06	3111029444	12,960.00	3950	62	59	158	168	20	20	288	274	827	858	50	55	147	0.948	2.6	10	241	25E1108
07	3111029445	12,960.00	3956	61	59	158	168	20	20	288	274	827	858	50	55	147	0.948	2.6	10	241	25E1108
08	3111029446	12,960.00	3950	61	59	161	170	20	19	287	295	830	901	55	58	148	0.948	2.5	10	241	25E1108
09	3111029447	12,960.00	3948	61	59	161	170	20	19	287	295	830	901	55	58	148	0.948	2.5	10	241	25E1108
10	3111029448	12,960.00	3950	61	59	161	170	20	19	287	295	830	901	55	58	148	0.948	2.5	10	241	25E1108
11	3111029449	12,960.00	3952	61	59	161	170	20	19	287	295	830	901	55	58	148	0.948	2.5	10	241	25E1108
12	3111029450	12,960.00	3946	61	59	154	163	20	19	289	293	841	895	55	58	148	0.948	2.4	10	241	25E1108

SKAPS Industries
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Phone: 706-336-7000
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Product: 60-HD-00-BLK-BLK-AVG-STD-24.00
Project : Legacy LF, AR
Customer: Patriot Environmental, LLC
Cust PO: P1785

QC'd By: Malkesh Patel
Date: September 12, 2025

We hereby certify the following test results for the above referenced product/project :

Count	Roll Number	Area (sq ft)	Gross Weight (lb)	Thickness MAV (mil)	Thickness MIN (mil)	Tensile at Yield (ppi)		Elong at Yield (%)		Tensile at Break (ppi)		Elong at Break (%)		Tear Resistance (lb)		Punct Resist (lb)	Density (g/cc)	Carbon Black (%)	CB Disp (Views in Cat 1 or 2)	Resin OIT (Minute)	Resin Lot #
				ASTM D 5199	ASTM D 5199	ASTM D 6693		ASTM D 6693		ASTM D 6693		ASTM D 6693		ASTM D 1004		ASTM D 4833	ASTM D 1505	ASTM D 4218	ASTM D 5596	ASTM D 3895	
						MD	TD	MD	TD	MD	TD	MD	TD	MD	TD						
13	3118010298	12,960.00	3930	62	58	161	171	20	19	287	307	807	925	51	54	149	0.946	2.7	10	247	25E1133
14	3118010299	12,960.00	3910	61	57	161	171	20	19	287	307	807	925	51	54	149	0.946	2.7	10	247	25E1133
15	3118010300	12,960.00	3922	62	60	161	171	20	19	287	307	807	925	51	54	149	0.946	2.7	10	247	25E1133
16	3118010301	12,960.00	3916	61	60	161	171	20	19	287	307	807	925	51	54	149	0.946	2.7	10	247	25E1133
17	3118010302	12,960.00	3954	61	57	161	171	20	19	287	307	807	925	51	54	149	0.946	2.7	10	247	25E1133
18	3118010303	12,960.00	3,954	61	58	161	174	19	19	284	289	805	861	51	56	150	0.947	2.4	10	247	25E1133
19	3118010304	12,960.00	3,926	61	57	161	174	19	19	284	289	805	861	51	56	150	0.947	2.4	10	247	25E1133
20	3118010305	12,960.00	3,940	61	59	161	174	19	19	284	289	805	861	51	56	150	0.947	2.4	10	247	25E1133
21	3118010306	12,960.00	3,940	61	58	161	174	19	19	284	289	805	861	51	56	150	0.947	2.4	10	247	25E1133
22	3118010307	12,960.00	3,946	62	57	155	161	20	19	295	289	842	884	51	56	150	0.947	2.6	10	247	25E1133
23	3118010308	12,960.00	3,946	62	59	155	161	20	19	295	289	842	884	51	56	150	0.947	2.6	10	247	25E1133
24	3118010309	12,960.00	3,946	62	59	155	161	20	19	295	289	842	884	51	56	150	0.947	2.6	10	247	25E1133

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Product: 60-HD-00-BLK-BLK-AVG-STD-24.00
Project : Legacy LF, AR
Customer: Patriot Environmental, LLC
Cust PO: P1785

QC'd By: Malkesh Patel
Date: September 12, 2025

We hereby certify the following test results for the above referenced product/project :

Count	Roll Number	Area (sq ft)	Gross Weight (lb)	Thickness MAV (mil)	Thickness MIN (mil)	Tensile at Yield (ppi)		Elong at Yield (%)		Tensile at Break (ppi)		Elong at Break (%)		Tear Resistance (lb)		Punct Resist (lb)	Density (g/cc)	Carbon Black (%)	CB Disp (Views in Cat 1 or 2)	Resin OIT (Minute)	Resin Lot #
				ASTM D 5199	ASTM D 5199	ASTM D 6693		ASTM D 6693		ASTM D 6693		ASTM D 6693		ASTM D 1004		ASTM D 4833	ASTM D 1505	ASTM D 4218	ASTM D 5596	ASTM D 3895	
						MD	TD	MD	TD	MD	TD	MD	TD	MD	TD						
25	3118010310	12,960.00	3,948	61	58	155	161	20	19	295	289	842	884	51	56	150	0.947	2.6	10	247	25E1133
26	3118010311	12,960.00	3,936	62	59	155	161	20	19	295	289	842	884	51	56	150	0.947	2.6	10	247	25E1133
27	3118010312	12,960.00	3,926	62	60	156	166	21	19	277	300	774	906	52	55	149	0.946	2.3	10	247	25E1133
28	3118010313	12,960.00	3,946	60	55	156	166	21	19	277	300	774	906	52	55	149	0.946	2.3	10	247	25E1133
29	3118010314	12,960.00	3,928	60	55	156	166	21	19	277	300	774	906	52	55	149	0.946	2.3	10	247	25E1133
30	3118010315	12,960.00	3,916	61	57	156	166	21	19	277	300	774	906	52	55	149	0.946	2.3	10	247	25E1133
31	3118010316	12,960.00	3,920	61	55	166	171	20	19	304	318	841	934	52	55	149	0.946	2.4	10	247	25E1133
32	3118010317	12,960.00	3,898	60	59	166	171	20	19	304	318	841	934	52	55	149	0.946	2.4	10	247	25E1133
33	3118010318	12,960.00	3,914	61	57	166	171	20	19	304	318	841	934	52	55	149	0.946	2.4	10	247	25E1133
34	3118010319	12,960.00	3,916	62	59	166	171	20	19	304	318	841	934	52	55	149	0.946	2.4	10	247	25E1133
35	3118010320	12,960.00	3,896	61	57	166	171	20	19	304	318	841	934	52	55	149	0.946	2.4	10	247	25E1133
36	3118010321	12,960.00	3,918	61	56	161	171	19	19	288	300	808	911	55	58	151	0.947	2.5	10	247	25E1133

SKAPS Industries
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Commerce, GA 30529

Phone: 706-336-7000
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Product: 60-HD-00-BLK-BLK-AVG-STD-24.00
Project : Legacy LF, AR
Customer: Patriot Environmental, LLC
Cust PO: P1785

QC'd By: Malkesh Patel
Date: September 12, 2025

We hereby certify the following test results for the above referenced product/project :

Count	Roll Number	Area (sq ft)	Gross Weight (lb)	Thickness MAV (mil)	Thickness MIN (mil)	Tensile at Yield (ppi)		Elong at Yield (%)		Tensile at Break (ppi)		Elong at Break (%)		Tear Resistance (lb)		Punct Resist (lb)	Density (g/cc)	Carbon Black (%)	CB Disp (Views in Cat 1 or 2)	Resin OIT (Minute)	Resin Lot #
				ASTM D 5199	ASTM D 5199	ASTM D 6693		ASTM D 6693		ASTM D 6693		ASTM D 6693		ASTM D 1004		ASTM D 4833	ASTM D 1505	ASTM D 4218	ASTM D 5596	ASTM D 3895	
						MD	TD	MD	TD	MD	TD	MD	TD	MD	TD						
37	3118010322	12,960.00	3,924	61	58	161	171	19	19	288	300	808	911	55	58	151	0.947	2.5	10	247	25E1133
38	3118010323	12,960.00	3,930	61	56	161	171	19	19	288	300	808	911	55	58	151	0.947	2.5	10	247	25E1133
39	3118010324	12,960.00	3,910	61	57	161	171	19	19	288	300	808	911	55	58	151	0.947	2.5	10	247	25E1133
40	3118010325	12,960.00	3,900	61	56	154	162	21	19	282	300	799	914	55	58	151	0.947	2.5	10	247	25E1133
41	3118010326	12,960.00	3,924	61	58	154	162	21	19	282	300	799	914	55	58	151	0.947	2.5	10	247	25E1133
42	3118010327	12,960.00	3,916	61	57	154	162	21	19	282	300	799	914	55	58	151	0.947	2.5	10	247	25E1133
43	3118010328	12,960.00	3,952	62	57	154	162	21	19	282	300	799	914	55	58	151	0.947	2.5	10	247	25E1133
44	3118010329	12,960.00	3,890	61	60	154	162	21	19	282	300	799	914	55	58	151	0.947	2.5	10	247	25E1133
45	3118010330	12,960.00	3,918	61	59	158	166	20	19	289	302	812	900	55	54	150	0.947	2.7	10	247	25E1133
46	3118010331	12,960.00	3,910	61	59	158	166	20	19	289	302	812	900	55	54	150	0.947	2.7	10	247	25E1133
47	3118010332	12,960.00	3,900	62	59	158	166	20	19	289	302	812	900	55	54	150	0.947	2.7	10	247	25E1133

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Formosa Plastics

FORMOSA PLASTICS CORPORATION, TEXAS

201 FORMOSA DRIVE
PO BOX 700
POINT COMFORT TX 77978
PHONE:(888)FPCUSA3

Certificate of Analysis

(CONFIDENTAL)

CUSTOMER:SKAPS INC.
571 INDUSTRIAL PARKWAY

COMMERCE GA 30529

PRODUCT :FORMOLENE HL3812
RAILCAR FPAX219275
CLEANING/INSPECTION NO: 21925050925

S/O NO : E56A702
CUSTOMER PO : 30131250591
DATE SHIPPED: 7/14/25
LOT NO : 25E1108
WEIGHT (LB) : 193,600.00
CUSTID:FT04342 SPIDM1

DATE OF PROD: 5/10/25

Test	Method	Spec Min	Spec Max	Actual
Melt Index,g/10min	ASTM D1238	0	.1	.074
HLMI, g/10 min.	ASTM D1238	9	15	12.6
Density, g/cm3	ASTM D1505	.935	.939	.9390

Linda Kao

QC SUPERVISOR

Formosa Plastics

FORMOSA PLASTICS CORPORATION, TEXAS
201 FORMOSA DRIVE
PO BOX 700
POINT COMFORT TX 77978
PHONE:(888)FPCUSA3

Certificate of Analysis

(CONFIDENTAL)

CUSTOMER:SKAPS INC.
571 INDUSTRIAL PARKWAY
COMMERCE GA 30529
PRODUCT :FORMOLENE HL3812
RAILCAR UTCX049161
CLEANING/INSPECTION NO: 049161051125

S/O NO : E57A479
CUSTOMER PO : 30131250689
DATE SHIPPED: 8/04/25
LOT NO : 25E1133
WEIGHT (LB) : 186,750.00
CUSTID:FT04342 SPIDM1

DATE OF PROD: 5/12/25

Test	Method	Spec Min	Spec Max	Actual
Melt Index,g/10min	ASTM D1238	0	.1	.070
HLMI, g/10 min.	ASTM D1238	9	15	10.6
Density, g/cm3	ASTM D1505	.935	.939	.9389

Linda Kas

QC SUPERVISOR

Product: 60-HD-11-BLK-BLK-GRI-STD-24.00
Project : P1785
Customer: Patriot Environmental, LLC
Cust PO: Legacy LF, AR

QC'd By: Malkesh Patel
Date: September 12, 2025

We hereby certify the following test results for the above referenced product/project :

Count	Roll Number	Area (sq ft)	Gross Weight (lb)	Thickness MAV (mil)	Thickness MIN (mil)	Asperity Height (mil)		Tensile at Yield (ppi)		Elong at Yield (%)		Tensile at Break (ppi)		Elong at Break (%)		Tear Resistance (lb)		Punct Resist (lb)	Density (g/cc)	Carbon Black (%)	CB Disp (Views in Cat 1 or 2)	Resin OIT (Minute)	Resin Lot #
				ASTM D 5994	ASTM D 5994	ASTM D 7466		ASTM D 6693		ASTM D 6693		ASTM D 6693		ASTM D 6693		ASTM D 1004		ASTM D 4833	ASTM D 1505	ASTM D 4218	ASTM D 5596	ASTM D 3895	
						Side A	Side B	MD	TD	MD	TD	MD	TD	MD	TD	MD	TD						
01	3119010171	12,000.00	3930	60	57	23	21	162	173	17	17	205	152	528	388	54	58	152	0.948	2.5	10	250	25E1311
02	3119010172	12,000.00	3920	59	57	23	21	160	168	19	17	214	184	571	535	53	58	145	0.947	2.6	10	250	25E1311
03	3119010173	12,000.00	3930	59	55	23	20	160	168	19	17	214	184	571	535	53	58	145	0.947	2.6	10	250	25E1311
04	3119010174	12,000.00	3908	60	57	23	21	160	168	19	17	214	184	571	535	53	58	145	0.947	2.6	10	250	25E1311
05	3119010175	12,000.00	3870	58	55	21	22	160	168	19	17	214	184	571	535	53	58	145	0.947	2.6	10	250	25E1311
06	3119010176	12,000.00	3894	59	56	20	21	162	166	18	17	200	181	535	528	53	58	145	0.947	2.7	10	250	25E1311
07	3119010177	12,000.00	3890	61	59	23	23	162	166	18	17	200	181	535	528	53	58	145	0.947	2.7	10	250	25E1311
08	3119010178	12,000.00	3880	58	55	24	23	162	166	18	17	200	181	535	528	53	58	145	0.947	2.7	10	250	25E1311
09	3119010179	12,000.00	3866	58	55	22	22	162	166	18	17	200	181	535	528	53	58	145	0.947	2.7	10	250	25E1311
10	3119010180	12,000.00	3880	58	55	21	22	162	166	18	17	200	181	535	528	53	58	145	0.947	2.7	10	250	25E1311
11	3119010181	12,000.00	3880	58	54	23	21	161	168	18	17	195	170	519	497	55	57	149	0.948	2.4	10	250	25E1311
12	3119010182	12,000.00	3884	58	55	23	23	161	168	18	17	195	170	519	497	55	57	149	0.948	2.4	10	250	25E1311

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Certificate of Analysis

(CONFIDENTAL)

CUSTOMER:SKAPS INC.
571 INDUSTRIAL PARKWAY

COMMERCE GA 30529

PRODUCT :FORMOLENE HL3812
RAILCAR FPAX201530
CLEANING/INSPECTION NO: 201530052625

S/O NO : E57A483
CUSTOMER PO : 30131250689
DATE SHIPPED: 8/04/25
LOT NO : 25E1311
WEIGHT (LB) : 192,950.00
CUSTID:FT04342 SPIDM1

DATE OF PROD: 5/27/25

Test	Method	Spec Min	Spec Max	Actual
Melt Index,g/10min	ASTM D1238	0	.1	.065
HLMI, g/10 min.	ASTM D1238	9	15	11.0
Density, g/cm3	ASTM D1505	.935	.939	.9378

Linda Kao

QC SUPERVISOR

APPENDIX M
GEOMEMBRANE – CONFORMANCE TESTING RESULTS

SEPTEMBER 2025

US-0048676.8029

SUMMARY OF SMOOTH GEOMEMBRANE CONFORMANCE TEST RESULTS

OLSSON
CCSWDM LEGACY LF CELL 5
ARKANSAS

ROLL DESIGNATION	Reference Value	3118-010301	3118-010308	3118-010316	3118-010323	3118-010331	3111-029439	3111-029446	-	-	-
THICKNESS (mils) ASTM D5199	-	62	61	61	60	61	61	60	-	-	-
TEAR RESISTANCE (lbs)(MD/TD)(1)	-	56	55	54	54	55	55	54	-	-	-
ASTM D1004	-	52	52	52	51	52	52	52	-	-	-
CARBON BLACK DISPERSION (category)	-	1	1	1	1	1	1	1	-	-	-
(μm^2) ASTM D5596	-	93	101	153	144	132	178	145	-	-	-
DENSITY (g/cc) ASTM D792	-	0.951	0.951	0.951	0.951	0.952	0.952	0.951	-	-	-
CARBON BLACK CONTENT (%) ASTM D1603	-	2.57	2.59	2.57	2.56	2.55	2.55	2.57	-	-	-
STRENGTH AT YIELD (ppi)	-	166	157	160	164	173	173	168	-	-	-
MD/TD (1) ASTM D6693	-	169	171	168	172	177	175	174	-	-	-
STRENGTH AT BREAK (ppi)	-	278	260	261	260	271	258	255	-	-	-
MD/TD (1) ASTM D6693	-	279	274	277	266	284	275	270	-	-	-
ELONGATION AT YIELD (%)	-	17	17	17	17	16	17	17	-	-	-
MD/TD (1) ASTM D6693	-	15	15	15	16	15	16	15	-	-	-
ELONGATION AT BREAK (%)	-	741	722	733	717	737	709	720	-	-	-
MD/TD (1) ASTM D6693	-	797	796	813	779	823	794	795	-	-	-

(1) MD/TD corresponds to Machine Direction / Transverse Direction.

SEPTEMBER 2025

SUMMARY OF TEXTURED GEOMEMBRANE CONFORMANCE TEST RESULTS

OLSSON
CCSWDM LEGACY LF CELL 5
ARKANSAS

US-0048676.8029

ROLL DESIGNATION	Reference Value	3119-010171	3119-010179	-	-	-	-	-	-	-	-
THICKNESS											
(mils)	-	59	60	-	-	-	-	-	-	-	-
ASTM D5994											
TEAR RESISTANCE											
(lbs)(MD/TD)(1)	-	57	57	-	-	-	-	-	-	-	-
ASTM D1004	-	54	54	-	-	-	-	-	-	-	-
CARBON BLACK DISPERSION											
(category)	-	1	1	-	-	-	-	-	-	-	-
(μm^2)	-	111	131	-	-	-	-	-	-	-	-
ASTM D5596											
DENSITY											
(g/cc)	-	0.950	0.950	-	-	-	-	-	-	-	-
ASTM D792											
CARBON BLACK											
CONTENT (%)	-	2.70	2.55	-	-	-	-	-	-	-	-
ASTM D1603											
STRENGTH AT											
YIELD (ppi)	-	157	156	-	-	-	-	-	-	-	-
MD/TD (1)	-	163	165	-	-	-	-	-	-	-	-
ASTM D6693											
STRENGTH AT											
BREAK (ppi)	-	176	187	-	-	-	-	-	-	-	-
MD/TD (1)	-	142	154	-	-	-	-	-	-	-	-
ASTM D6693											
ELONGATION											
AT YIELD (%)	-	16	16	-	-	-	-	-	-	-	-
MD/TD (1)	-	14	14	-	-	-	-	-	-	-	-
ASTM D6693											
ELONGATION											
AT BREAK (%)	-	461	500	-	-	-	-	-	-	-	-
MD/TD (1)	-	265	362	-	-	-	-	-	-	-	-
ASTM D6693											

(1) MD/TD corresponds to Machine Direction / Transverse Direction.

SEPTEMBER 2025 US-0048676.8029

GEOMEMBRANE TEST RESULTS

PROJECT NAME: OLSSON/CCSWDA LEGACY LF CELL 5/AR
SAMPLE NUMBER: 3118010301

	THICKNESS (mils)	TEAR RESISTANCE (lbs) MD	TEAR RESISTANCE (lbs) TD	CARBON BLACK DISPERSION (category)	CARBON BLACK DISPERSION (µm²)
1.	62.2	54.7	52.2	1	78
2.	62.5	54.5	51.6	1	92
3.	60.9	56.8	53.5	1	78
4.	60.6	57.8	53.1	1	161
5.	63.1	57.3	54.6	1	136
6.	62.9	57.0	51.2	1	43
7.	61.5	53.3	51.9	1	81
8.	60.9	53.0	48.1	1	97
9.	62.4	56.5	52.3	1	56
10.	62.3	55.9	52.5	1	107
AVG	62	56	52	1	93

	DENSITY (g/cc)	CARBON BLACK CONTENT (%)
1.	0.951	2.58
2.	0.951	2.55
3.	0.951	
AVG	0.951	2.57

	YIELD STRENGTH (lb/in. width) MD	YIELD STRENGTH (lb/in. width) TD	ELONGATION AT YIELD (%) MD	ELONGATION AT YIELD (%) TD	BREAK STRENGTH (lb/in. width) MD	BREAK STRENGTH (lb/in. width) TD	ELONGATION AT BREAK (%) MD	ELONGATION AT BREAK (%) TD
1.	167.2	170.1	16.2	15.4	289.6	271.2	770.7	782.8
2.	166.1	172.2	17.2	15.6	271.2	285.6	728.2	813.0
3.	171.8	173.1	16.7	15.9	289.8	289.7	755.5	811.5
4.	163.1	161.1	16.9	14.6	275.2	270.9	749.5	790.3
5.	160.3	170.0	16.9	14.9	263.7	276.7	702.5	788.8
AVG	166	169	17	15	278	279	741	797

SEPTEMBER 2025 US-0048676.8029

GEOMEMBRANE TEST RESULTS

PROJECT NAME: OLSSON/CCSWDA LEGACY LF CELL 5/AR
SAMPLE NUMBER: 3118010308

	THICKNESS (mils)	TEAR RESISTANCE (lbs) MD	TEAR RESISTANCE (lbs) TD	CARBON BLACK DISPERSION (category)	CARBON BLACK DISPERSION (µm²)
1.	61.6	55.7	51.0	1	127
2.	60.7	56.9	52.4	1	158
3.	59.3	50.5	48.5	1	49
4.	57.5	51.0	52.4	1	89
5.	61.4	53.0	51.6	1	129
6.	64.2	52.8	53.3	1	101
7.	63.4	56.5	52.8	1	143
8.	61.6	56.5	53.5	1	57
9.	59.0	58.2	52.3	1	68
10.	62.7	58.0	51.6	1	89
AVG	61	55	52	1	101

	DENSITY (g/cc)	CARBON BLACK CONTENT (%)
1.	0.951	2.58
2.	0.951	2.60
3.	0.951	
AVG	0.951	2.59

	YIELD STRENGTH (lb/in. width) MD	YIELD STRENGTH (lb/in. width) TD	ELONGATION AT YIELD (%) MD	ELONGATION AT YIELD (%) TD	BREAK STRENGTH (lb/in. width) MD	BREAK STRENGTH (lb/in. width) TD	ELONGATION AT BREAK (%) MD	ELONGATION AT BREAK (%) TD
1.	157.6	173.1	18.0	15.1	269.2	278.7	749.5	810.0
2.	151.4	170.3	16.2	14.6	242.5	275.4	705.5	812.5
3.	164.8	173.3	15.9	14.9	270.4	290.3	724.0	820.7
4.	167.2	175.2	17.4	15.6	274.9	255.5	728.2	723.8
5.	145.3	160.7	17.2	15.4	243.5	270.1	704.0	811.5
AVG	157	171	17	15	260	274	722	796

WSP USA

SEPTEMBER 2025 US-0048676.8029

GEOMEMBRANE TEST RESULTS

PROJECT NAME: OLSSON/CCSWDA LEGACY LF CELL 5/AR
SAMPLE NUMBER: 3118010316

	THICKNESS (mils)	TEAR RESISTANCE (lbs) MD	TEAR RESISTANCE (lbs) TD	CARBON BLACK DISPERSION (category)	CARBON BLACK DISPERSION (µm²)
1.	61.1	54.1	50.4	1	200
2.	60.1	54.4	51.2	1	82
3.	61.0	49.4	51.1	1	96
4.	56.9	50.1	52.0	1	343
5.	62.1	53.2	49.4	1	98
6.	59.9	52.8	54.5	1	114
7.	62.6	57.4	52.8	1	69
8.	62.4	55.7	52.8	1	307
9.	60.8	58.0	53.7	1	97
10.	60.7	53.9	53.1	1	120
AVG	61	54	52	1	153

	DENSITY (g/cc)	CARBON BLACK CONTENT (%)
1.	0.951	2.58
2.	0.951	2.55
3.	0.951	
AVG	0.951	2.57

	YIELD STRENGTH (lb/in. width) MD	YIELD STRENGTH (lb/in. width) TD	ELONGATION AT YIELD (%) MD	ELONGATION AT YIELD (%) TD	BREAK STRENGTH (lb/in. width) MD	BREAK STRENGTH (lb/in. width) TD	ELONGATION AT BREAK (%) MD	ELONGATION AT BREAK (%) TD
1.	160.1	169.0	16.4	15.4	258.8	270.5	733.8	789.3
2.	152.4	159.3	16.2	15.6	257.4	263.5	763.8	812.0
3.	159.1	166.6	16.2	15.1	263.6	289.4	738.2	855.3
4.	163.6	176.2	16.9	15.9	271.6	284.6	736.0	797.3
5.	163.9	169.9	18.0	15.4	254.4	278.4	692.7	809.7
AVG	160	168	17	15	261	277	733	813

WSP USA

SEPTEMBER 2025 US-0048676.8029

GEOMEMBRANE TEST RESULTS

PROJECT NAME: OLSSON/CCSWDA LEGACY LF CELL 5/AR
SAMPLE NUMBER: 3118010323

	THICKNESS (mils)	TEAR RESISTANCE (lbs) MD	TEAR RESISTANCE (lbs) TD	CARBON BLACK DISPERSION (category)	CARBON BLACK DISPERSION (µm²)
1.	62.9	56.1	52.8	1	105
2.	63.1	56.5	53.0	1	168
3.	60.5	53.9	50.1	1	310
4.	59.2	54.9	51.3	1	184
5.	60.0	53.5	50.7	1	69
6.	60.3	53.2	50.0	1	245
7.	58.8	53.3	49.5	1	63
8.	58.7	53.0	49.2	1	67
9.	59.4	53.0	52.9	1	72
10.	59.0	52.9	50.3	1	154
AVG	60	54	51	1	144

	DENSITY (g/cc)	CARBON BLACK CONTENT (%)
1.	0.951	2.57
2.	0.951	2.54
3.	0.951	
AVG	0.951	2.56

	YIELD STRENGTH (lb/in. width) MD	YIELD STRENGTH (lb/in. width) TD	ELONGATION AT YIELD (%) MD	ELONGATION AT YIELD (%) TD	BREAK STRENGTH (lb/in. width) MD	BREAK STRENGTH (lb/in. width) TD	ELONGATION AT BREAK (%) MD	ELONGATION AT BREAK (%) TD
1.	170.4	179.4	17.2	15.6	278.4	272.8	749.3	776.7
2.	167.2	177.0	16.2	15.4	258.7	269.9	714.7	782.7
3.	163.3	169.6	16.7	15.4	240.6	263.6	664.7	772.2
4.	157.5	168.0	17.4	16.2	260.4	267.7	737.3	785.8
5.	161.2	163.9	17.2	16.2	262.0	258.4	720.7	775.2
AVG	164	172	17	16	260	266	717	779

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GEOMEMBRANE TEST RESULTS

PROJECT NAME: OLSSON/CCSWDA LEGACY LF CELL 5/AR
SAMPLE NUMBER: 3118010331

	THICKNESS (mils)	TEAR RESISTANCE (lbs) MD	TEAR RESISTANCE (lbs) TD	CARBON BLACK DISPERSION (category)	CARBON BLACK DISPERSION (µm²)
1.	63.5	58.6	53.9	1	145
2.	63.3	58.4	52.4	1	118
3.	60.2	53.4	52.0	1	87
4.	62.1	54.4	52.7	1	155
5.	61.5	54.6	52.5	1	199
6.	61.2	54.3	50.7	1	200
7.	60.0	52.1	49.5	1	95
8.	58.9	51.3	50.0	1	67
9.	60.1	56.8	53.6	1	115
10.	60.8	55.2	50.8	1	140
AVG	61	55	52	1	132

	DENSITY (g/cc)	CARBON BLACK CONTENT (%)
1.	0.952	2.56
2.	0.952	2.54
3.	0.951	
AVG	0.952	2.55

	YIELD STRENGTH (lb/in. width) MD	YIELD STRENGTH (lb/in. width) TD	ELONGATION AT YIELD (%) MD	ELONGATION AT YIELD (%) TD	BREAK STRENGTH (lb/in. width) MD	BREAK STRENGTH (lb/in. width) TD	ELONGATION AT BREAK (%) MD	ELONGATION AT BREAK (%) TD
1.	180.1	186.8	15.9	14.9	277.1	281.9	731.3	798.3
2.	172.7	177.6	18.0	14.6	277.4	278.0	755.5	809.7
3.	171.9	180.2	15.9	15.1	264.9	281.4	720.7	804.8
4.	169.4	166.4	15.6	14.1	263.4	281.5	725.3	838.5
5.	169.0	174.8	15.9	15.4	273.7	294.8	752.5	865.7
AVG	173	177	16	15	271	284	737	823

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GEOMEMBRANE TEST RESULTS

PROJECT NAME: OLSSON/CCSWDA LEGACY LF CELL 5/AR
SAMPLE NUMBER: 3111029439

	THICKNESS (mils)	TEAR RESISTANCE (lbs) MD	TEAR RESISTANCE (lbs) TD	CARBON BLACK DISPERSION (category)	CARBON BLACK DISPERSION (µm²)
1.	63.6	57.0	53.8	1	364
2.	62.3	58.2	52.6	1	146
3.	61.0	53.0	52.8	1	75
4.	60.4	54.3	52.5	1	206
5.	61.3	55.4	54.2	1	106
6.	61.0	53.6	51.5	1	176
7.	59.4	52.7	50.2	1	324
8.	59.4	52.4	50.4	1	70
9.	60.5	56.1	50.8	1	189
10.	60.7	56.5	52.2	1	128
AVG	61	55	52	1	178

	DENSITY (g/cc)	CARBON BLACK CONTENT (%)
1.	0.952	2.55
2.	0.952	2.54
3.	0.951	
AVG	0.952	2.55

	YIELD STRENGTH (lb/in. width) MD	YIELD STRENGTH (lb/in. width) TD	ELONGATION AT YIELD (%) MD	ELONGATION AT YIELD (%) TD	BREAK STRENGTH (lb/in. width) MD	BREAK STRENGTH (lb/in. width) TD	ELONGATION AT BREAK (%) MD	ELONGATION AT BREAK (%) TD
1.	178.0	179.0	16.2	14.9	288.7	286.5	773.7	810.8
2.	173.3	176.6	16.2	16.2	268.2	278.8	728.2	809.2
3.	171.8	175.7	16.7	16.2	244.6	272.5	678.3	785.2
4.	168.9	171.8	17.2	15.4	254.2	262.5	716.8	767.7
5.	170.9	171.4	17.4	16.2	232.9	273.0	645.7	796.5
AVG	173	175	17	16	258	275	709	794

WSP USA

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GEOMEMBRANE TEST RESULTS

PROJECT NAME: OLSSON/CCSWDA LEGACY LF CELL 5/AR
SAMPLE NUMBER: 3111029446

	THICKNESS (mils)	TEAR RESISTANCE (lbs) MD	TEAR RESISTANCE (lbs) TD	CARBON BLACK DISPERSION (category)	CARBON BLACK DISPERSION (µm²)
1.	62.6	56.7	52.4	1	180
2.	62.8	56.9	51.8	1	84
3.	60.8	51.5	51.4	1	133
4.	60.5	52.9	52.3	1	264
5.	60.2	53.9	53.4	1	173
6.	60.8	53.2	52.4	1	108
7.	59.9	51.4	51.8	1	162
8.	56.5	52.2	51.4	1	94
9.	57.9	56.5	52.3	1	142
10.	60.7	55.6	53.4	1	111
AVG	60	54	52	1	145

	DENSITY (g/cc)	CARBON BLACK CONTENT (%)
1.	0.952	2.57
2.	0.951	2.56
3.	0.951	
AVG	0.951	2.57

	YIELD STRENGTH (lb/in. width) MD	YIELD STRENGTH (lb/in. width) TD	ELONGATION AT YIELD (%) MD	ELONGATION AT YIELD (%) TD	BREAK STRENGTH (lb/in. width) MD	BREAK STRENGTH (lb/in. width) TD	ELONGATION AT BREAK (%) MD	ELONGATION AT BREAK (%) TD
1.	175.0	181.8	16.7	14.9	278.6	292.0	759.5	830.0
2.	169.1	173.1	16.7	14.4	268.4	258.9	751.0	770.8
3.	167.6	172.7	16.7	14.6	264.4	269.4	746.7	796.5
4.	162.7	170.3	17.2	15.4	251.4	263.6	724.3	782.0
5.	163.7	170.7	17.7	15.9	212.0	268.1	618.7	793.2
AVG	168	174	17	15	255	270	720	795

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GEOMEMBRANE TEST RESULTS

PROJECT NAME: OLSSON/CCSWDA LEGACY LF CELL 5/AR
SAMPLE NUMBER: 3119010171

	THICKNESS (mils)	TEAR RESISTANCE (lbs) MD	TEAR RESISTANCE (lbs) TD	CARBON BLACK DISPERSION (category)	CARBON BLACK DISPERSION (µm²)
1.	57.0	57.2	53.8	1	168
2.	58.1	54.7	53.5	1	168
3.	60.1	55.9	53.5	1	50
4.	59.6	59.1	53.7	1	90
5.	60.6	54.9	51.3	1	178
6.	59.9	57.4	52.5	1	106
7.	57.6	57.1	54.9	1	99
8.	60.1	58.0	55.3	1	114
9.	59.0	58.0	54.7	1	71
10.	58.1	55.3	53.2	1	62
AVG	59	57	54	1	111

	DENSITY (g/cc)	CARBON BLACK CONTENT (%)
1.	0.950	2.70
2.	0.951	2.70
3.	0.950	
AVG	0.950	2.70

	YIELD STRENGTH (lb/in. width) MD	YIELD STRENGTH (lb/in. width) TD	ELONGATION AT YIELD (%) MD	ELONGATION AT YIELD (%) TD	BREAK STRENGTH (lb/in. width) MD	BREAK STRENGTH (lb/in. width) TD	ELONGATION AT BREAK (%) MD	ELONGATION AT BREAK (%) TD
1.	155.0	160.0	15.8	14.2	171.0	130.0	423.3	195.1
2.	154.0	178.0	15.1	13.3	207.0	168.0	562.3	482.7
3.	147.0	157.0	16.5	12.9	150.0	169.0	410.2	476.5
4.	161.0	159.0	17.0	14.2	150.0	126.0	382.9	126.2
5.	166.0	161.0	16.5	15.1	202.0	117.0	528.7	42.0
AVG	157	163	16	14	176	142	461	265

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GEOMEMBRANE TEST RESULTS

PROJECT NAME: OLSSON/CCSWDA LEGACY LF CELL 5/AR
SAMPLE NUMBER: 3119010179

	THICKNESS (mils)	TEAR RESISTANCE (lbs) MD	TEAR RESISTANCE (lbs) TD	CARBON BLACK DISPERSION (category)	CARBON BLACK DISPERSION (µm²)
1.	59.3	54.6	55.2	1	125
2.	60.5	58.7	56.6	1	118
3.	59.8	58.2	56.9	1	70
4.	60.7	63.2	55.9	1	197
5.	60.5	58.5	54.7	1	84
6.	58.1	53.3	53.5	1	71
7.	59.1	54.5	53.1	1	125
8.	59.7	57.2	51.6	1	393
9.	59.9	54.5	54.4	1	46
10.	60.1	55.1	53.0	1	77
AVG	60	57	54	1	131

	DENSITY (g/cc)	CARBON BLACK CONTENT (%)
1.	0.950	2.56
2.	0.950	2.54
3.	0.951	
AVG	0.950	2.55

	YIELD STRENGTH (lb/in. width) MD	YIELD STRENGTH (lb/in. width) TD	ELONGATION AT YIELD (%) MD	ELONGATION AT YIELD (%) TD	BREAK STRENGTH (lb/in. width) MD	BREAK STRENGTH (lb/in. width) TD	ELONGATION AT BREAK (%) MD	ELONGATION AT BREAK (%) TD
1.	158.0	166.0	16.3	14.7	181.0	131.0	457.3	94.1
2.	159.0	156.0	16.4	14.4	226.0	141.0	607.2	237.9
3.	154.0	164.0	15.5	14.5	188.0	184.0	501.6	519.7
4.	153.0	169.0	15.2	14.4	165.0	184.0	484.1	539.3
5.	154.0	171.0	15.2	14.2	173.0	128.0	448.3	417.2
AVG	156	165	16	14	187	154	500	362

SEPTEMBER 2025

SUMMARY OF GEOTEXTILE CONFORMANCE TEST RESULTS

OLSSON
CCSWDA LEGACY LF CELL 5
ARKANSAS

US-0048676.8029

ROLL DESIGNATION	REFERENCE VALUE	015866-1010001A	015866-1010024A	015866-1010047A	015866-1010070A	015866-1010093A	015866-1010116A	015866-1010139A	015866-1010162A	-	-
MASS PER UNIT AREA (oz/yd^2) ASTM D5261	>=6.0	7.3	7.3	7.3	7.3	7.7	7.3	8.3	7.8	-	-
PUNCTURE STRENGTH (lbs) ASTM D4833	>=85	129	135	126	118	142	119	133	139	-	-
APPARENT OPENING SIZE (mm)	-	0.150	0.146	0.157	0.143	0.133	0.157	0.144	0.130	-	-
(U.S. SIEVE NO.) ASTM D4751	>=70	100	100	80	100	100	80	100	100	-	-
PERMITTIVITY (sec-1)	>=1.3	1.7	1.9	2.0	1.8	1.9	2.0	1.9	1.7	-	-
PERMEABILITY (cm/sec) (2)	-	0.51	0.55	0.57	0.56	0.56	0.55	0.56	0.56	-	-
FLOW RATE ($gal/min/ft^2$) ASTM D4491	-	130.6	143.7	150.3	135.8	141.3	146.5	142.7	130.3	-	-
GRAB STRENGTH (lbs)	>=160	193	211	205	204	217	194	245	235	-	-
MD/TD (1) ASTM D4632	>=160	207	220	215	206	227	195	221	241	-	-
GRAB ELONGATION (%)	>=50	64	69	70	72	72	70	73	76	-	-
MD/TD (1) ASTM D4632	>=50	76	81	83	81	79	83	79	80	-	-
TRAPEZOIDAL TEAR STRENGTH	>=65	92	91	90	92	96	82	94	92	-	-
(lbs) MD/TD (1) ASTM D4533	>=65	95	113	102	103	108	93	108	109	-	-

(1) MD/TD corresponds to Machine Direction / Transverse Direction.
(2) Permeability calculated by multiplying measured thickness by permittivity.

TEXTSUM.XLS

SEPTEMBER 2025 **US-0048676.8029**

GEOTEXTILE TEST RESULTS

PROJECT NAME: OLSSON/CCSWDA LEGACY LF CELL 5/AR
ROLL DESIGNATION: 0158661010001 A

	MASS PER UNIT AREA (oz/yd²)	PUNCTURE STRENGTH (pounds)	APPARENT OPENING SIZE (mm)	PERMITTIVITY (sec-1)
1.	6.67	116.2	0.126	1.69
2.	5.77	118.7	0.169	2.06
3.	7.10	122.5	0.148	1.81
4.	8.09	118.3	0.163	1.42
5.	8.79	169.0	0.143	
			0.150	1.7

			EQUIVALENT SIEVE SIZE	PERMEABILITY (cm/sec)	FLOW RATE (gal/min/ft^2)
AVG	7.3	129	100	0.51	130.6

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)	
	MD	TD	MD	TD	MD	TD
1.	244.2	246.2	57.3	84.7	124.7	87.0
2.	208.2	173.5	67.3	77.7	80.8	80.0
3.	129.5	189.0	53.3	78.3	83.8	83.0
4.	174.5	207.0	67.3	73.0	89.8	97.5
5.	182.5	219.2	68.0	69.7	94.8	100.5
6.	162.5	168.7	59.3	71.7	62.3	98.0
7.	185.5	165.0	67.7	71.7	84.5	92.3
8.	184.0	206.5	60.3	72.0	108.5	100.7
9.	227.5	252.7	73.3	78.7	91.8	104.7
10.	231.0	244.0	62.0	83.0	102.2	101.5
AVG	193	207	64	76	92	95

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GEOTEXTILE TEST RESULTS

PROJECT NAME: OLSSON/CCSWDA LEGACY LF CELL 5/AR
ROLL DESIGNATION: 0158661010024 A

	MASS PER UNIT AREA (oz/yd²)	PUNCTURE STRENGTH (pounds)	APPARENT OPENING SIZE (mm)	PERMITTIVITY (sec-1)
1.	6.92	132.0	0.150	1.96
2.	7.17	142.2	0.145	1.90
3.	7.69	144.2	0.128	2.03
4.	6.62	106.0	0.171	1.79
5.	8.20	152.2	0.137	
			0.146	1.9
			EQUIVALENT SIEVE SIZE	
AVG	7.3	135	100	

	PERMEABILITY (cm/sec)	FLOW RATE (gal/min/ft^2)
AVG	0.55	143.7

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)	
	MD	TD	MD	TD	MD	TD
1.	208.0	220.7	65.3	85.7	87.3	108.7
2.	234.2	238.5	77.0	84.3	94.0	130.0
3.	218.5	203.7	76.0	77.0	108.5	107.5
4.	196.7	240.0	73.7	83.3	85.8	135.0
5.	195.0	208.7	67.0	79.0	74.5	89.5
6.	206.5	227.0	82.3	74.7	87.5	123.2
7.	194.7	241.2	71.7	80.3	85.8	134.7
8.	191.7	209.5	59.0	82.3	79.8	102.7
9.	201.7	189.7	64.3	78.0	94.8	100.2
10.	266.7	219.7	57.7	89.3	115.7	96.5
AVG	211	220	69	81	91	113

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GEOTEXTILE TEST RESULTS

PROJECT NAME: OLSSON/CCSWDA LEGACY LF CELL 5/AR
ROLL DESIGNATION: 0158661010047 A

	MASS PER UNIT AREA (oz/yd²)	PUNCTURE STRENGTH (pounds)	APPARENT OPENING SIZE (mm)	PERMITTIVITY (sec-1)
1.	7.70	117.8	0.140	1.92
2.	7.22	120.5	0.147	2.09
3.	6.48	120.7	0.174	2.06
4.	6.85	118.0	0.177	1.97
5.	8.15	153.2	0.149	
			0.157	2.0
			EQUIVALENT SIEVE SIZE	
AVG	7.3	126	80	

	PERMEABILITY (cm/sec)	FLOW RATE (gal/min/ft²)
AVG	0.57	150.3

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)	
	MD	TD	MD	TD	MD	TD
1.	257.5	247.0	68.7	89.3	97.5	109.5
2.	226.2	221.5	70.0	77.3	80.5	109.0
3.	187.0	225.0	68.3	79.7	93.3	125.7
4.	212.0	243.0	77.7	86.3	93.5	105.7
5.	188.0	253.2	69.0	78.0	74.8	107.7
6.	199.7	202.5	76.7	77.7	82.8	72.0
7.	141.7	204.2	93.3	86.7	76.0	100.7
8.	204.7	174.2	67.3	78.0	89.3	85.0
9.	183.2	189.5	60.3	85.0	112.2	98.5
10.	249.5	193.5	51.7	89.0	104.5	102.0
AVG	205	215	70	83	90	102

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GEOTEXTILE TEST RESULTS

PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
ROLL DESIGNATION: **0158661010070 A**

	MASS PER UNIT AREA (oz/yd²)	PUNCTURE STRENGTH (pounds)	APPARENT OPENING SIZE (mm)	PERMITTIVITY (sec-1)
1.	7.75	122.7	0.122	1.86
2.	6.36	128.5	0.148	1.74
3.	7.98	110.5	0.148	1.75
4.	6.92	102.5	0.147	1.92
5.	7.28	123.7	0.149	
			0.143	1.8

			EQUIVALENT SIEVE SIZE	PERMEABILITY (cm/sec)	FLOW RATE (gal/min/ft^2)
AVG	7.3	118	100	0.56	135.8

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)	
	MD	TD	MD	TD	MD	TD
1.	265.7	190.0	58.7	89.7	97.3	112.5
2.	210.7	238.5	74.7	84.3	90.0	101.0
3.	208.5	184.7	68.0	83.7	99.3	91.5
4.	153.0	177.5	86.3	78.7	79.8	95.0
5.	208.0	213.7	74.7	72.3	94.3	111.5
6.	202.7	187.5	72.0	76.3	86.3	85.0
7.	165.5	210.0	74.3	77.0	86.8	104.7
8.	200.0	198.5	85.7	76.7	101.5	112.5
9.	201.0	243.2	63.7	82.3	95.5	135.0
10.	227.0	217.7	63.3	86.0	93.5	86.0
AVG	204	206	72	81	92	103

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GEOTEXTILE TEST RESULTS

PROJECT NAME: OLSSON/CCSWDA LEGACY LF CELL 5/AR
ROLL DESIGNATION: 0158661010093 A

	MASS PER UNIT AREA (oz/yd²)	PUNCTURE STRENGTH (pounds)	APPARENT OPENING SIZE (mm)	PERMITTIVITY (sec-1)
1.	8.41	146.2	0.131	1.79
2.	8.26	153.7	0.125	1.79
3.	6.53	148.0	0.135	2.36
4.	7.05	124.5	0.143	1.61
5.	8.25	136.7	0.133	
			0.133	1.9

			EQUIVALENT SIEVE SIZE	PERMEABILITY (cm/sec)	FLOW RATE (gal/min/ft^2)
AVG	7.7	142	100	0.56	141.3

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)	
	MD	TD	MD	TD	MD	TD
1.	243.0	243.0	65.3	89.3	102.2	109.7
2.	237.7	216.5	75.3	75.7	95.5	112.7
3.	176.7	207.2	66.7	72.7	79.0	115.2
4.	189.0	237.2	73.7	81.0	92.8	115.7
5.	170.0	191.7	65.0	72.0	92.5	103.0
6.	203.0	234.7	92.7	78.3	96.8	93.5
7.	238.0	236.2	82.3	74.3	104.7	124.2
8.	200.5	234.0	68.7	81.3	82.5	102.7
9.	231.2	257.0	69.7	80.7	95.5	99.5
10.	283.0	209.7	65.0	85.7	120.2	100.0
AVG	217	227	72	79	96	108

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GEOTEXTILE TEST RESULTS

PROJECT NAME: OLSSON/CCSWDA LEGACY LF CELL 5/AR
ROLL DESIGNATION: 0158661010116 A

	MASS PER UNIT AREA (oz/yd²)	PUNCTURE STRENGTH (pounds)	APPARENT OPENING SIZE (mm)	PERMITTIVITY (sec-1)
1.	8.61	118.0	0.154	1.72
2.	7.23	134.2	0.154	2.16
3.	6.86	119.7	0.165	2.09
4.	6.97	114.0	0.166	1.87
5.	7.07	110.2	0.148	
			0.157	2.0

			EQUIVALENT SIEVE SIZE	PERMEABILITY (cm/sec)	FLOW RATE (gal/min/ft^2)
AVG	7.3	119	80	0.55	146.5

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)	
	MD	TD	MD	TD	MD	TD
1.	242.0	220.0	65.3	94.3	96.3	95.0
2.	187.5	228.2	67.0	86.7	80.8	85.5
3.	168.2	184.2	64.7	88.7	72.8	92.3
4.	203.0	181.0	83.0	84.0	65.3	72.0
5.	176.7	160.5	82.7	72.0	65.8	97.3
6.	208.7	209.2	77.3	71.7	77.0	103.7
7.	164.0	183.0	71.0	78.3	80.5	100.7
8.	179.0	198.7	63.0	82.3	76.5	101.5
9.	187.0	193.5	70.3	79.3	87.8	91.3
10.	221.0	187.7	56.0	93.0	117.0	91.8
AVG	194	195	70	83	82	93

SEPTEMBER 2025 **US-0048676.8029**

GEOTEXTILE TEST RESULTS

PROJECT NAME: OLSSON/CCSWDA LEGACY LF CELL 5/AR
ROLL DESIGNATION: 0158661010139 A

	MASS PER UNIT AREA (oz/yd²)	PUNCTURE STRENGTH (pounds)	APPARENT OPENING SIZE (mm)	PERMITTIVITY (sec-1)
1.	6.39	115.0	0.144	1.71
2.	8.65	126.5	0.147	1.98
3.	7.83	104.2	0.150	2.22
4.	8.79	140.5	0.148	1.72
5.	9.87	178.2	0.131	
			0.144	1.9
			EQUIVALENT SIEVE SIZE	
AVG	8.3	133	100	

	PERMEABILITY (cm/sec)	FLOW RATE (gal/min/ft²)
AVG	0.56	142.7

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)	
	MD	TD	MD	TD	MD	TD
1.	261.7	218.5	56.7	94.7	100.2	89.8
2.	244.7	205.0	67.7	81.7	83.8	139.2
3.	244.5	232.7	72.0	82.7	83.0	90.5
4.	205.2	192.2	69.3	75.3	90.8	93.8
5.	177.2	201.2	83.3	73.7	71.0	96.5
6.	229.5	205.7	77.3	73.3	89.0	98.0
7.	276.7	235.0	84.7	78.0	103.5	103.7
8.	239.7	252.5	77.3	76.7	111.5	143.7
9.	292.7	216.7	73.3	72.0	98.0	111.7
10.	277.5	252.5	67.0	84.3	105.7	113.5
AVG	245	221	73	79	94	108

SEPTEMBER 2025 **US-0048676.8029**

GEOTEXTILE TEST RESULTS

PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
ROLL DESIGNATION: **0158661010162 A**

	MASS PER UNIT AREA (oz/yd²)	PUNCTURE STRENGTH (pounds)	APPARENT OPENING SIZE (mm)	PERMITTIVITY (sec-1)
1.	9.06	162.7	0.120	1.39
2.	7.73	123.7	0.137	1.96
3.	7.10	118.5	0.117	1.87
4.	6.74	159.0	0.148	1.74
5.	8.47	130.2	0.130	
			0.130	1.7

			EQUIVALENT SIEVE SIZE	PERMEABILITY (cm/sec)	FLOW RATE (gal/min/ft^2)
AVG	7.8	139	100	0.56	130.3

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)	
	MD	TD	MD	TD	MD	TD
1.	267.0	287.7	70.7	91.3	96.8	122.7
2.	257.7	308.7	79.0	86.0	97.0	106.0
3.	250.0	270.5	77.0	78.0	84.3	125.5
4.	217.5	245.0	78.7	77.7	83.3	122.0
5.	252.5	239.0	78.7	73.0	72.0	102.5
6.	172.0	220.5	67.7	77.7	87.3	92.8
7.	191.7	204.5	94.3	77.7	88.8	106.5
8.	201.2	201.7	69.3	78.3	94.0	97.3
9.	219.7	214.0	73.7	79.7	93.0	114.0
10.	318.2	220.5	68.0	84.3	120.2	100.2
AVG	235	241	76	80	92	109

APPENDIX N
GEOMEMBRANE – SUBGRADE ACCEPTANCE CERTIFICATES

Certificate of Acceptance of Soil Subgrade

Geosynthetic Installer Information:

Name Patriot Environmental

Address 317 S. Dawson St
Meeker OK 74855

Facility Information

Name Legacy Landfill

Location Jonesboro AK

Owner / Operator Craighead County Solid Waste Disposal

I, the Undersigned, the duly authorized representative of Patriot Environmental, LLC do hereby accept the soil subgrade surface bounded by Dumey Contracting as an acceptable surface on which to install and shall be responsible for maintaining its integrity and suitability in accordance with the project specifications from this date to the completion of the installation.

Name	Signature	Title	Date
Billy Xaysana		Supervisor	9/27/25

Certificate Accepted by QA/QC Manager:

Name	Signature	Title	Date
JAMES MCKEOWN		CQA INSPECTOR	9/27/2025

Certificate Accepted by Facility Owner/Operator:

Name	Signature	Title	Date
Angela Sparks	Angela Sparks	CEO	9/29/2025

APPENDIX O
GEOMEMBRANE – DEPLOYMENT LOGS

GEOMEMBRANE DEPLOYMENT LOG

Project Name: **CCSWDA Legacy Landfill Cell 5**

Project Location: **Craighead County, AR**

Olsson Project Number: **025-04399**

Date	Panel ID	Roll Number	Weather Conditions		Material Type	Approximate Panel Dimensions		Panel Visually Inspected (Y or N)	CQA Monitor
			Ambient Temp (F)	Weather Conditions/ Wind		Width (Feet)	Length (Feet)		
09/27/25	P-1	10179	75	No Wind	60T	24	40	YES	JWM
09/27/25	P-2	10179	75	No Wind	60T	24	38	YES	JWM
09/27/25	P-3	10179	75	No Wind	60T	24	40	YES	JWM
09/27/25	P-4	10179	75	No Wind	60T	24	38	YES	JWM
09/27/25	P-5	10179	75	No Wind	60T	24	37	YES	JWM
09/27/25	P-6	10179	75	No Wind	60T	24	39	YES	JWM
09/27/25	P-7	10179	75	No Wind	60T	24	39	YES	JWM
09/27/25	P-8	10179	75	No Wind	60T	24	37	YES	JWM
09/27/25	P-9	10179	75	No Wind	60T	24	38	YES	JWM
09/27/25	P-10	10179	75	No Wind	60T	24	42	YES	JWM
09/27/25	P-11	10179	75	No Wind	60T	24	43	YES	JWM
09/27/25	P-12	10179	76	No Wind	60T	24	40	YES	JWM
09/27/25	P-13	10173	76	No Wind	60T	24	39	YES	JWM
09/27/25	P-14	10173	76	No Wind	60T	24	38	YES	JWM
09/27/25	P-15	10173	77	No Wind	60T	24	40	YES	JWM
09/27/25	P-16	10173	77	No Wind	60T	24	40	YES	JWM
09/27/25	P-17	10173	77	No Wind	60T	24	40	YES	JWM
09/27/25	P-18	10173	77	No Wind	60T	24	39	YES	JWM
09/27/25	P-19	10173	77	No Wind	60T	24	40	YES	JWM
09/27/25	P-20	10173	77	No Wind	60T	24	40	YES	JWM
09/27/25	P-21	10173	78	No Wind	60T	24	41	YES	JWM

Material Type Legend:

60S - 60-Mil Smooth LLDPE Geomembrane
60T - 60-Mil Textured LLDPE Geomembrane
40S - 40-Mil Smooth LLDPE Geomembrane
40T - 40-Mil Textured LLDPE Geomembrane

GEOMEMBRANE DEPLOYMENT LOG

Project Name: **CCSWDA Legacy Landfill Cell 5**

Project Location: **Craighead County, AR**

Olsson Project Number: **025-04399**

Date	Panel ID	Roll Number	Weather Conditions		Material Type	Approximate Panel Dimensions		Panel Visually Inspected (Y or N)	CQA Monitor
			Ambient Temp (F)	Weather Conditions/ Wind		Width (Feet)	Length (Feet)		
09/27/25	P-22	10173	77	No Wind	60T	24	40	YES	JWM
09/27/25	P-23	10173	77	No Wind	60T	18	34	YES	JWM
09/27/25	P-24	10182	80	No Wind	60T	24	40	YES	JWM
09/27/25	P-25	10182	81	No Wind	60T	24	40	YES	JWM
09/27/25	P-26	10182	82	No Wind	60T	24	39	YES	JWM
09/27/25	P-27	10182	82	No Wind	60T	24	40	YES	JWM
09/27/25	P-28	10182	82	No Wind	60T	24	42	YES	JWM
09/27/25	P-29	10182	83	No Wind	60T	24	41	YES	JWM
09/27/25	P-30	10182	83	No Wind	60T	24	42	YES	JWM
09/27/25	P-31	10182	83	No Wind	60T	24	40	YES	JWM
09/27/25	P-32	10182	83	No Wind	60T	24	40	YES	JWM
09/27/25	P-33	10182	83	No Wind	60T	24	46	YES	JWM
09/27/25	P-34	10182	83	No Wind	60T	24	46	YES	JWM
09/27/25	P-35	10180	83	No Wind	60T	24	41	YES	JWM
09/27/25	P-36	10180	83	No Wind	60T	24	45	YES	JWM
09/27/25	P-37	10180	83	No Wind	60T	24	45	YES	JWM
09/27/25	P-38	10180	83	No Wind	60T	24	47	YES	JWM
09/27/25	P-39	10180	83	No Wind	60T	24	50	YES	JWM
09/27/25	P-40	10180	83	No Wind	60T	24	50	YES	JWM
09/27/25	P-41	10180	83	No Wind	60T	24	50	YES	JWM
09/27/25	P-42	10180	83	No Wind	60T	24	52	YES	JWM

Material Type Legend:

60S - 60-Mil Smooth LLDPE Geomembrane
60T - 60-Mil Textured LLDPE Geomembrane
40S - 40-Mil Smooth LLDPE Geomembrane
40T - 40-Mil Textured LLDPE Geomembrane

GEOMEMBRANE DEPLOYMENT LOG

Project Name: **CCSWDA Legacy Landfill Cell 5**

Project Location: **Craighead County, AR**

Olsson Project Number: **025-04399**

Date	Panel ID	Roll Number	Weather Conditions		Material Type	Approximate Panel Dimensions		Panel Visually Inspected (Y or N)	CQA Monitor
			Ambient Temp (F)	Weather Conditions/ Wind		Width (Feet)	Length (Feet)		
09/27/25	P-43	10180	85	No Wind	60T	24	50	YES	JWM
09/27/25	P-44	10180	85	No Wind	60T	24	42	YES	JWM
09/27/25	P-45	10171	85	No Wind	60T	24	9	YES	JWM
09/27/25	P-46	10171	85	No Wind	60T	24	51	YES	JWM
09/27/25	P-47	10171	85	No Wind	60T	24	51	YES	JWM
09/27/25	P-48	10171	85	No Wind	60T	24	54	YES	JWM
09/27/25	P-49	10171	85	No Wind	60T	24	56	YES	JWM
09/27/25	P-50	10171	85	No Wind	60T	24	58	YES	JWM
09/27/25	P-51	10171	85	No Wind	60T	24	59	YES	JWM
09/27/25	P-52	10171	85	No Wind	60T	24	59	YES	JWM
09/27/25	P-53	10171	85	No Wind	60T	24	60	YES	JWM
09/27/25	P-54	10181	85	No Wind	60T	24	39	YES	JWM
09/27/25	P-55	10181	85	No Wind	60T	24	39	YES	JWM
09/28/25	P-56	10317	85	No Wind	60S	24	540	YES	JWM
09/28/25	P-57	10300	85	No Wind	60S	24	540	YES	JWM
09/28/25	P-58	10329	85	No Wind	60S	24	540	YES	JWM
09/28/25	P-59	10328	85	No Wind	60S	24	540	YES	JWM
09/28/25	P-60	10310	85	No Wind	60S	24	540	YES	JWM
09/28/25	P-61	10313	85	No Wind	60S	24	540	YES	JWM
09/28/25	P-62	10321	85	No Wind	60S	24	540	YES	JWM
09/28/25	P-63	10312	85	No Wind	60S	24	540	YES	JWM

Material Type Legend:

60S - 60-Mil Smooth LLDPE Geomembrane
60T - 60-Mil Textured LLDPE Geomembrane
40S - 40-Mil Smooth LLDPE Geomembrane
40T - 40-Mil Textured LLDPE Geomembrane

GEOMEMBRANE DEPLOYMENT LOG

Project Name: **CCSWDA Legacy Landfill Cell 5**

Project Location: **Craighead County, AR**

Olsson Project Number: **025-04399**

Date	Panel ID	Roll Number	Weather Conditions		Material Type	Approximate Panel Dimensions		Panel Visually Inspected (Y or N)	CQA Monitor
			Ambient Temp (F)	Weather Conditions/ Wind		Width (Feet)	Length (Feet)		
09/28/25	P-64	10316	86	No Wind	60S	24	540	YES	JWM
09/28/25	P-65	10309	86	No Wind	60S	24	540	YES	JWM
09/29/25	P-66	29446	65	No Wind	60S	24	540	YES	JWM
09/29/25	P-67	29440	65	No Wind	60S	24	540	YES	JWM
09/29/25	P-68	29449	65	No Wind	60S	24	540	YES	JWM
09/29/25	P-69	10299	68	No Wind	60S	24	540	YES	JWM
09/29/25	P-70	29439	78	No Wind	60S	24	540	YES	JWM
09/29/25	P-71	29447	78	No Wind	60S	24	540	YES	JWM
09/29/25	P-72	10327	85	No Wind	60S	24	540	YES	JWM
09/29/25	P-73	29441	86	No Wind	60S	24	540	YES	JWM
09/29/25	P-74	29443	86	No Wind	60S	24	540	YES	JWM
09/29/25	P-75	10298	86	No Wind	60S	24	540	YES	JWM
09/29/25	P-76	10308	86	No Wind	60S	24	530	YES	JWM
09/29/25	P-77	10314	86	No Wind	60S	24	540	YES	JWM
09/29/25	P-78	10311	86	No Wind	60S	24	540	YES	JWM
09/29/25	P-79	29450	86	No Wind	60S	24	540	YES	JWM
09/30/25	P-80	10331	78	No Wind	60S	24	533	YES	JWM
09/30/25	P-81	10324	76	No Wind	60S	24	533	YES	JWM
09/30/25	P-82	10325	76	No Wind	60S	24	533	YES	JWM
09/30/25	P-83	10305	77	No Wind	60S	24	533	YES	JWM
09/30/25	P-84	10302	77	No Wind	60S	24	533	YES	JWM

Material Type Legend:

60S - 60-Mil Smooth LLDPE Geomembrane
60T - 60-Mil Textured LLDPE Geomembrane
40S - 40-Mil Smooth LLDPE Geomembrane
40T - 40-Mil Textured LLDPE Geomembrane

GEOMEMBRANE DEPLOYMENT LOG

Project Name: **CCSWDA Legacy Landfill Cell 5**

Project Location: **Craighead County, AR**

Olsson Project Number: **025-04399**

Date	Panel ID	Roll Number	Weather Conditions		Material Type	Approximate Panel Dimensions		Panel Visually Inspected (Y or N)	CQA Monitor
			Ambient Temp (F)	Weather Conditions/ Wind		Width (Feet)	Length (Feet)		
9/30/2025	P-85	10174	83	No Wind	60T	24	61	YES	JWM
9/30/2025	P-86	10174	83	No Wind	60T	24	61	YES	JWM
9/30/2025	P-87	10174	83	No Wind	60T	24	61	YES	JWM
9/30/2025	P-88	10174	83	No Wind	60T	24	62	YES	JWM
9/30/2025	P-89	10174	83	No Wind	60T	24	62	YES	JWM
9/30/2025	P-90	10174	83	No Wind	60T	24	62	YES	JWM
9/30/2025	P-91	10174	83	No Wind	60T	24	63	YES	JWM
9/30/2025	P-92	10181	83	No Wind	60T	24	63	YES	JWM
9/30/2025	P-93	10181	83	No Wind	60T	24	63	YES	JWM
9/30/2025	P-94	29442	85	No Wind	60S	24	535	YES	JWM
9/30/2025	P-95	10323	85	No Wind	60S	24	534	YES	JWM
9/30/2025	P-96	10330	85	No Wind	60S	24	535	YES	JWM
10/2/2025	P-97	10304	75	No Wind	60S	24	530	YES	WPA
10/2/2025	P-98	10315	75	No Wind	60S	24	530	YES	WPA
10/2/2025	P-99	29448	75	No Wind	60S	24	530	YES	WPA
10/2/2025	P-100	10322	75	No Wind	60S	24	530	YES	WPA
10/2/2025	P-101	10306	75	No Wind	60S	24	530	YES	WPA
10/2/2025	P-102	10320	75	No Wind	60S	24	530	YES	WPA
10/4/2025	P-103	29445	65	No Wind	60S	24	537	YES	WPA
10/4/2025	P-104	10303	78	No Wind	60S	24	537	YES	WPA
10/4/2025	P-105	10319	78	No Wind	60S	24	538	YES	WPA

Material Type Legend:

60S - 60-Mil Smooth LLDPE Geomembrane
60T - 60-Mil Textured LLDPE Geomembrane
40S - 40-Mil Smooth LLDPE Geomembrane
40T - 40-Mil Textured LLDPE Geomembrane

APPENDIX P
GEOMEMBRANE – TRIAL SEAM LOGS

FUSION AND EXTRUSION TRIAL SEAM LOG

Project Name: **CCSWDA Legacy Landfill Cell 5**

Project Location: **Craighead County, AR**

Olsson Project Number: **025-04399**

Project Specifications:

Fusion Welds:
Peel: ≥ 90 psi
Shear: ≥ 120 psi

Extrusion Welds:
Peel: ≥ 78 psi
Shear: ≥ 120 psi

				Seaming Machine Settings						Peel Tests			Shear Tests				
Fusion/	Material/	Date	Time	Ambient	Operator	Machine	Machine	Speed	Side	1	2	3	1	2	3	Pass/	CQA
Extrusion	Material			Temp	ID	ID	Temp or			A/B	A/B	A/B				Fail	Monitor
(F or E)	(S or T)			(F)			Ext. P.H.			(psi)	(psi)	(psi)	(psi)	(psi)	(psi)		
Fusion	S	9/27/25	9:08	75	LV	1	860	500.0	A	114	129	132	157	150	160	Pass	JWM
									B	123	134	119					
Fusion	S/T	9/27/25	9:09	75	SC	5	860	500.0	A	139	108	125	161	170	156	Pass	JWM
									B	136	115	141					
Fusion	S	9/27/25	9:09	75	SC	5	860	500.0	A	132	125	122	147	155	157	Pass	JWM
									B	133	121	113					
Fusion	T	9/27/25	13:10	83	SC	5	860	500.0	A	134	116	122	141	135	150	Pass	JWM
									B	117	116	129					
Fusion	S/T	9/27/25	13:10	83	SC	5	860	500.0	A	132	125	132	158	157	158	Pass	JWM
									B	135	117	131					
Fusion	S	9/27/25	13:10	83	SC	5	860	500.0	A	113	121	127	156	152	153	Pass	JWM
									B	109	115	114					
Fusion	S	9/27/25	13:10	83	LV	1	860	500.0	A	124	121	119	148	156	161	Pass	JWM
									B	131	114	123					
Fusion	S/T	9/28/25	8:00	64	LV	1	860	500.0	A	122	119	120	163	167	164	Pass	JWM
									B	110	113	125					
Fusion	S	9/28/25	8:00	64	LV	1	860	550.0	A	122	133	124	170	170	170	Pass	JWM
									B	123	120	107					
Fusion	S	9/28/25	7:55	64	SC	5	860	550.0	A	114	116	116	170	169	172	Pass	JWM
									B	126	124	118					
Fusion	S/T	9/28/25	7:55	64	SC	5	860	500.0	A	115	137	131	165	167	168	Pass	JWM
									B	126	132	132					
Fusion	S/T	9/28/25	7:56	64	SK	9	860	400.0	A	121	129	127	172	165	170	Pass	JWM
									B	113	133	130					
Fusion	S	9/28/25	7:58	64	SK	9	860	500.0	A	104	122	123	168	168	166	Pass	JWM
									B	122	115	118					
Fusion	S	9/28/25	13:19	86	LV	1	860	550.0	A	114	124	123	141	138	140	Pass	JWM
									B	130	117	132					
Fusion	S	9/28/25	13:20	86	SC	5	860	550.0	A	122	127	124	137	140	139	Pass	JWM
									B	124	123	120					
Fusion	S	9/28/25	13:25	86	SK	9	860	550.0	A	133	120	121	136	126	141	Pass	JWM
									B	135	122	119					

FUSION AND EXTRUSION TRIAL SEAM LOG

Project Name: **CCSWDA Legacy Landfill Cell 5**

Project Location: **Craighead County, AR**

Olsson Project Number: **025-04399**

Project Specifications:

Fusion Welds:
Peel: ≥ 90 psi
Shear: ≥ 120 psi

Extrusion Welds:
Peel: ≥ 78 psi
Shear: ≥ 120 psi

				Seaming Machine Settings						Peel Tests			Shear Tests				
Fusion/	Material/	Date	Time	Ambient	Operator	Machine	Machine	Speed	Side	1	2	3	1	2	3	Pass/	CQA
Extrusion	Material			Temp	ID	ID	Temp or			A/B	A/B	A/B				Fail	Monitor
(F or E)	(S or T)			(F)			Ext. P.H.			(psi)	(psi)	(psi)	(psi)	(psi)	(psi)		
Fusion	S/T	9/28/25	13:25	86	SK	9	860	400.0	A	122	128	108	129	137	147	Pass	JWM
									B	115	131	107					
Fusion	S	9/29/25	8:00	68	LV	1	860	550.0	A	127	120	128	157	153	157	Pass	JWM
									B	151	128	116					
Fusion	S	9/29/25	8:03	68	SC	5	860	550.0	A	137	129	137	168	161	159	Pass	JWM
									B	136	134	141					
Fusion	S	9/29/25	8:09	68	SK	9	860	550.0	A	114	115	117	154	151	153	Pass	JWM
									B	94	117	109					
Fusion	S	9/29/25	13:17	86	SC	5	860	550.0	A	129	147	112	130	131	129	Pass	JWM
									B	127	130	129					
Fusion	S	9/29/25	13:30	86	LV	1	860	550.0	A	115	115	129	130	133	133	Pass	JWM
									B	130	130	114					
Fusion	S	9/29/25	13:26	86	SK	9	860	550.0	A	129	118	121	137	134	137	Pass	JWM
									B	108	107	125					
Fusion	S/T	9/29/25	13:26	86	SK	9	860	550.0	A	121	121	120	132	122	129	Pass	JWM
									B	122	112	104					
Fusion	S	9/30/25	8:00	68	SC	5	860	550.0	A	120	138	112	146	141	150	Pass	JWM
									B	133	112	109					
Fusion	S	9/30/25	9:30	69	LV	1	860	550.0	A	130	134	135	155	161	160	Pass	JWM
									B	134	126	135					
Fusion	S	9/30/25	8:02	69	SK	9	860	550.0	A	146	139	143	158	161	166	Pass	JWM
									B	138	144	130					
Fusion	S/T	9/30/25	8:02	69	SK	9	860	400.0	A	116	128	134	157	158	156	Pass	JWM
									B	132	135	137					
Fusion	S/T	9/30/25	10:55	82	SC	5	860	500.0	A	127	130	160	146	140	142	Pass	JWM
									B	129	122	115					
Fusion	S	9/30/25	13:25	86	SK	9	860	550.0	A	105	100	106	127	126	131	Pass	JWM
									B	107	119	97					
Fusion	S	9/30/25	13:18	86	LV	1	860	550.0	A	116	133	113	134	134	133	Pass	JWM
									B	108	122	121					
Fusion	S	9/30/25	13:23	86	SC	5	860	550.0	A	122	124	115	137	137	139	Pass	JWM
									B	117	120	127					

FUSION AND EXTRUSION TRIAL SEAM LOG

Project Name: **CCSWDA Legacy Landfill Cell 5**

Project Location: **Craighead County, AR**

Olsson Project Number: **025-04399**

Project Specifications:

Fusion Welds:
Peel: ≥ 90 psi
Shear: ≥ 120 psi

Extrusion Welds:
Peel: ≥ 78 psi
Shear: ≥ 120 psi

				Seaming Machine Settings						Peel Tests			Shear Tests				
Fusion/	Material/	Date	Time	Ambient	Operator	Machine	Machine	Speed	Side	1	2	3	1	2	3	Pass/	CQA
Extrusion	Material			Temp	ID	ID	Temp or			A/B	A/B	A/B				Fail	Monitor
(F or E)	(S or T)			(F)			Ext. P.H.			(psi)	(psi)	(psi)	(psi)	(psi)	(psi)		
Fusion	T/S	9/30/25	13:23	86	SC	5	860	550.0	A	128	124	128	138	134	137	Pass	JWM
									B	118	129	113					
Extrusion	T/S	10/1/25	8:25	77	SC	12	550	550.0	A	122	108	115	149	152	150	Pass	JWM
									B	-	-	-					
Extrusion	T/S	10/1/25	8:50	77	SI	8	550	550.0	A	107	97	115	147	147	147	Pass	JWM
									B	-	-	-					
Extrusion	S	10/1/25	8:55	77	SI	8	550	550.0	A	101	115	122	147	148	146	Pass	JWM
									B	-	-	-					
Extrusion	T/S	10/1/25	13:20	89	SC	12	550	550.0	A	106	124	109	131	127	129	Pass	WPA
									B	-	-	-					
Extrusion	T/S	10/1/25	13:20	89	SI	8	550	550.0	A	115	91	112	129	127	129	Pass	WPA
									B	-	-	-					
Extrusion	S	10/1/25	13:20	89	SI	8	550	550.0	A	125	109	117	130	127	125	Pass	WPA
									B	-	-	-					
Fusion	S	10/2/25	8:25	72	SK	9	860	550.0	A	116	100	135	143	144	147	Pass	WPA
									B	120	132	101					
Fusion	S	10/2/25	8:25	72	LV	1	860	550.0	A	109	118	129	148	142	148	Pass	WPA
									B	119	127	121					
Fusion	S	10/2/25	8:15	72	SC	5	860	550.0	A	132	109	112	160	159	158	Pass	WPA
									B	139	112	117					
Fusion	T/S	10/2/25	8:15	72	SC	5	860	550.0	A	114	114	108	153	154	155	Pass	WPA
									B	123	120	114					
Fusion	S	10/4/25	8:20	75	SC	5	860	550.0	A	145	141	147	177	172	172	Pass	WPA
									B	123	132	135					
Fusion	T/S	10/4/25	8:20	75	SC	5	860	450.0	A	128	125	121	180	183	178	Pass	WPA
									B	124	125	126					
Fusion	S	10/4/25	8:17	75	LV	1	860	550.0	A	143	129	150	154	154	153	Pass	WPA
									B	131	129	122					
Fusion	S	10/4/25	9:20	75	SK	9	860	550.0	A	121	106	118	158	156	161	Pass	WPA
									B	113	118	123					
Fusion	T	10/4/25	13:22	81	SC	4	860	420.0	A	116	118	128	156	155	149	Pass	WPA
									B	122	139	139					

FUSION AND EXTRUSION TRIAL SEAM LOG

Project Name: **CCSWDA Legacy Landfill Cell 5**

Project Location: **Craighead County, AR**

Olsson Project Number: **025-04399**

Project Specifications:

Fusion Welds:
Peel: ≥ 90 psi
Shear: ≥ 120 psi

Extrusion Welds:
Peel: ≥ 78 psi
Shear: ≥ 120 psi

				Seaming Machine Settings						Peel Tests			Shear Tests				
Fusion/	Material/	Date	Time	Ambient	Operator	Machine	Machine	Speed	Side	1	2	3	1	2	3	Pass/	CQA
Extrusion	Material			Temp	ID	ID	Temp or			A/B	A/B	A/B				Fail	Monitor
(F or E)	(S or T)			(F)			Ext. P.H.			(psi)	(psi)	(psi)	(psi)	(psi)	(psi)		
Fusion	S	10/4/25	13:13	81	LV	1	860	550.0	A	111	96	119	147	148	146	Pass	WPA
									B	109	98	119					
Fusion	S	10/4/25	13:15	81	SK	9	860	550.0	A	115	101	116	146	155	163	Pass	WPA
									B	105	103	125					
Fusion	S	10/4/25	13:21	81	SC	5	860	550.0	A	106	102	119	151	153	152	Pass	WPA
									B	112	109	101					
Fusion	T/S	10/4/25	13:21	81	SC	5	860	450.0	A	95	98	94	152	153	152	Pass	WPA
									B	96	108	95					
Fusion	T/S	10/9/25	13:07	73	SC	12	550	550.0	A	118	115	119	153	150	155	Pass	WPA
									B	111	108	112					
Extrusion	S	10/11/25	8:50	68	SC	12	420	550.0	A	123	121	96	145	129	132	Pass	WPA
									B	-	-	-					
Extrusion	T/S	10/11/25	8:50	68	SC	12	420	550.0	A	153	146	129	159	159	157	Pass	WPA
									B	-	-	-					
Extrusion	S	10/11/25	9:30	68	MK	75	550	500.0	A	132	133	123	146	141	144	Pass	WPA
									B	-	-	-					
Extrusion	T	10/11/25	13:00	76	SC	12	530	550.0	A	128	127	123	134	129	140	Pass	WPA
									B	-	-	-					
Extrusion	T	10/11/25	13:00	76	MK	75	400	550.0	A	130	131	128	133	140	143	Pass	WPA
									B	-	-	-					
Extrusion	T/S	10/11/25	13:00	76	MK	75	400	550.0	A	122	105	118	147	150	145	Pass	WPA
									B	-	-	-					

APPENDIX Q
GEOMEMBRANE – SEAM CONTINUITY TEST LOGS

GEOMEMBRANE PRODUCTION SEAMING AND CONTINUITY TEST LOG

PROJECT NAME: **CCSWDA Legacy Landfill Cell 5**

PROJECT LOCATION: **Craighead County, AR**

OLSSON PROJECT NUMBER: **025-04399**

SEAM IDENTIFICATION	MATERIAL/ MATERIAL	WELD DATE	SEAM LENGTH	OPERATOR ID	MACHINE ID	TEST DATE	START TIME - PRESSURE	END TIME - PRESSURE	PASS/ FAIL	CQA MONITOR
P - 1 & P - 2	T/T	9/27/25	38	LV	1	9/27/25	09:22 / 30	09:27 / 30	P	JWM
P - 2 & P - 3	T/T	9/27/25	40	LV	1	9/27/25	09:25 / 30	09:30 / 30	P	JWM
P - 3 & P - 4	T/T	9/27/25	38	SC	5	9/27/25	09:28 / 30	09:33 / 30	P	JWM
P - 4 & P - 5	T/T	9/27/25	37	SC	5	9/27/25	09:30 / 30	09:35 / 30	P	JWM
P - 5 & P - 6	T/T	9/27/25	39	LV	1	9/27/25	09:34 / 30	09:39 / 30	P	JWM
P - 6 & P - 7	T/T	9/27/25	39	SC	5	9/27/25	09:36 / 30	09:41 / 30	P	JWM
P - 7 & P - 8	T/T	9/27/25	37	LV	1	9/27/25	09:45 / 30	09:50 / 30	P	JWM
P - 8 & P - 9	T/T	9/27/25	38	SC	5	9/27/25	09:47 / 30	09:52 / 30	P	JWM
P - 9 & P - 10	T/T	9/27/25	42	LV	1	9/27/25	09:50 / 30	09:55 / 30	P	JWM
P - 10 & P - 11	T/T	9/27/25	43	SC	5	9/27/25	09:54 / 30	09:59 / 30	P	JWM
P - 11 & P - 12	T/T	9/27/25	40	LV	1	9/27/25	10:03 / 30	10:08 / 30	P	JWM
P - 12 & P - 13	T/T	9/27/25	39	SC	5	9/27/25	10:13 / 30	10:18 / 30	P	JWM
P - 13 & P - 14	T/T	9/27/25	38	LV	1	9/27/25	10:16 / 30	10:21 / 30	P	JWM
P - 14 & P - 15	T/T	9/27/25	40	SC	5	9/27/25	10:35 / 30	10:40 / 30	P	JWM
P - 15 & P - 16	T/T	9/27/25	40	LV	1	9/27/25	10:37 / 30	10:42 / 30	P	JWM
P - 16 & P - 17	T/T	9/27/25	40	SC	5	9/27/25	10:38 / 30	10:43 / 30	P	JWM
P - 17 & P - 18	T/T	9/27/25	39	LV	1	9/27/25	10:39 / 30	10:44 / 30	P	JWM
P - 18 & P - 19	T/T	9/27/25	40	SC	5	9/27/25	10:45 / 30	10:50 30	P	JWM
P - 19 & P - 20	T/T	9/27/25	40	LV	1	9/27/25	10:46 / 30	10:51 / 30	P	JWM
P - 20 & P - 21	T/T	9/27/25	41	SC	5	9/27/25	11:00 / 30	11:05 / 30	P	JWM
P - 21 & P - 22	T/T	9/27/25	37	LV	1	9/27/25	11:01 / 30	11:06 / 30	P	JWM
P - 22 & P - 23	T/T	9/27/25	34	SC	5	9/27/25	11:07 / 30	11:12 / 30	P	JWM
P - 23 & P - 24	T/T	9/27/25	17	SC	5	9/27/25	11:35 / 30	11:40 / 30	P	JWM
P - 24 & P - 22	T/T	9/27/25	22	SC	5	9/27/25	11:35 / 30	11:40 / 30	P	JWM
P - 24 & P - 25	T/T	9/27/25	40	LV	1	9/27/25	11:37 / 30	11:42 / 30	P	JWM
P - 25 & P - 26	T/T	9/27/25	39	LV	1	9/27/25	11:39 / 30	11:44 / 30	P	JWM
P - 26 & P - 27	T/T	9/27/25	40	SC	5	9/27/25	11:41 / 30	11:46 / 30	P	JWM
P - 27 & P - 28	T/T	9/27/25	42	LV	1	9/27/25	11:46 / 30	11:51 / 30	P	JWM
P - 28 & P - 29	T/T	9/27/25	41	SC	5	9/27/25	11:47 / 30	11:52 / 30	P	JWM
P - 29 & P - 30	T/T	9/27/25	42	LV	1	9/27/25	13:18 / 30	13:23 / 30	P	JWM
P - 30 & P - 31	T/T	9/27/25	40	LV	1	9/27/25	13:22 / 30	13:27 / 30	P	JWM
P - 31 & P - 32	T/T	9/27/25	46	SC	5	9/27/25	13:25 / 30	13:30 / 30	P	JWM
P - 32 & P - 33	T/T	9/27/25	46	LV	1	9/27/25	13:40 / 30	13:45 / 30	P	JWM
P - 33 & P - 34	T/T	9/27/25	46	SC	5	9/27/25	13:50 / 30	13:55 / 30	P	JWM

GEOMEMBRANE PRODUCTION SEAMING AND CONTINUITY TEST LOG

PROJECT NAME: **CCSWDA Legacy Landfill Cell 5**

PROJECT LOCATION: **Craighead County, AR**

OLSSON PROJECT NUMBER: **025-04399**

SEAM IDENTIFICATION	MATERIAL/ MATERIAL	WELD DATE	SEAM LENGTH	OPERATOR ID	MACHINE ID	TEST DATE	START TIME - PRESSURE	END TIME - PRESSURE	PASS/ FAIL	CQA MONITOR
P - 34 & P - 35	T/T	9/27/25	41	LV	1	9/27/25	13:51 / 30	13:56 / 30	P	JWM
P - 35 & P - 36	T/T	9/27/25	45	SC	5	9/27/25	13:52 / 30	13:57 / 30	P	JWM
P - 36 & P - 37	T/T	9/27/25	45	LV	1	9/27/25	13:56 / 30	14:01 / 30	P	JWM
P - 37 & P - 38	T/T	9/27/25	47	SC	5	9/27/25	13:58 / 30	14:03 / 30	P	JWM
P - 38 & P - 39	T/T	9/27/25	50	SC	5	9/27/25	13:59 / 30	14:04 / 30	P	JWM
P - 39 & P - 40	T/T	9/27/25	50	LV	1	9/27/25	14:11 / 30	14:16 / 30	P	JWM
P - 40 & P - 41	T/T	9/27/25	50	LV	1	9/27/25	14:15 / 30	14:20 / 30	P	JWM
P - 41 & P - 42	T/T	9/27/25	52	SC	5	9/27/25	14:17 / 30	14:22 / 30	P	JWM
P - 42 & P - 43	T/T	9/27/25	46	LV	1	9/27/25	14:40 / 30	14:45 / 30	P	JWM
P - 43 & P - 44	T/T	9/27/25	41	SC	5	9/27/25	14:46 / 30	14:51 / 30	P	JWM
P - 43 & P - 45	T/T	9/27/25	9	SC	5	9/27/25	14:46 / 30	14:51 / 30	P	JWM
P - 44 & P - 46	T/T	9/27/25	46	SC	5	9/27/25	14:51 / 30	14:56 / 30	P	JWM
P - 45 & P - 46	T/T	9/27/25	9	SC	5	9/27/25	14:51 / 30	14:56 / 30	P	JWM
P - 44 & P - 45	T/T	9/27/25	24	SC	5	9/27/25	14:46 / 30	14:51 / 30	P	JWM
P - 46 & P - 47	T/T	9/27/25	51	LV	1	9/27/25	14:53 / 30	14:58 / 30	P	JWM
P - 47 & P - 48	T/T	9/27/25	54	LV	1	9/27/25	14:54 / 30	14:59 / 30	P	JWM
P - 48 & P - 49	T/T	9/27/25	56	SC	5	9/27/25	14:58 / 30	15:03 / 30	P	JWM
P - 49 & P - 50	T/T	9/27/25	58	LV	1	9/27/25	15:01 / 30	15:06 / 30	P	JWM
P - 50 & P - 51	T/T	9/27/25	59	SC	5	9/27/25	15:13 / 30	15:18 / 30	P	JWM
P - 51 & P - 52	T/T	9/27/25	59	LV	1	9/27/25	15:16 / 30	15:21 / 30	P	JWM
P - 52 & P - 53	T/T	9/27/25	60	SC	5	9/27/25	15:19 / 30	15:24 / 30	P	JWM
P - 54 & P - 55	T/T	9/27/25	39	SC	5	9/27/25	15:53 / 30	15:58 / 30	P	JWM
P - 54 & P - 1	T/T	9/27/25	39	LV	1	9/27/25	15:51 / 30	15:56 / 30	P	JWM
P - 56 & P - 24	T/S	9/28/25	24	SK	9	9/28/25	14:48 / 30	14:53 / 30	P	JWM
P - 56 & P - 21	T/S	9/28/25	24	LV	1	9/28/25	11:33 / 30	11:38 / 30	P	JWM
P - 56 & P - 20	T/S	9/28/25	24	LV	1	9/28/25	11:33 / 30	11:38 / 30	P	JWM
P - 56 & P - 19	T/S	9/28/25	24	LV	1	9/28/25	11:28 / 30	11:33 / 30	P	JWM
P - 56 & P - 18	T/S	9/28/25	24	LV	1	9/28/25	11:28 / 30	11:33 / 30	P	JWM
P - 56 & P - 17	T/S	9/28/25	24	LV	1	9/28/25	11:21 / 30	11:26 / 30	P	JWM
P - 56 & P - 16	T/S	9/28/25	24	LV	1	9/28/25	11:21 / 30	11:26 / 30	P	JWM
P - 56 & P - 15	T/S	9/28/25	24	LV	1	9/28/25	11:12 / 30	11:17 / 30	P	JWM
P - 56 & P - 14	T/S	9/28/25	24	LV	1	9/28/25	11:12 / 30	11:17 / 30	P	JWM
P - 56 & P - 13	T/S	9/28/25	24	LV	1	9/28/25	11:24 / 30	11:28 / 30	P	JWM
P - 56 & P - 12	T/S	9/28/25	24	LV	1	9/28/25	11:24 / 30	11:28 / 30	P	JWM

GEOMEMBRANE PRODUCTION SEAMING AND CONTINUITY TEST LOG

PROJECT NAME: **CCSWDA Legacy Landfill Cell 5**

PROJECT LOCATION: **Craighead County, AR**

OLSSON PROJECT NUMBER: **025-04399**

SEAM IDENTIFICATION	MATERIAL/ MATERIAL	WELD DATE	SEAM LENGTH	OPERATOR ID	MACHINE ID	TEST DATE	START TIME - PRESSURE	END TIME - PRESSURE	PASS/ FAIL	CQA MONITOR
P - 56 & P - 11	T/S	9/28/25	24	LV	1	9/28/25	10:19 / 30	10:24 / 30	P	JWM
P - 56 & P - 10	T/S	9/28/25	24	LV	1	9/28/25	10:19 / 30	10:24 / 30	P	JWM
P - 56 & P - 9	T/S	9/28/25	24	LV	1	9/28/25	10:12 / 30	10:17 / 30	P	JWM
P - 56 & P - 8	T/S	9/28/25	24	LV	1	9/28/25	10:12 / 30	10:17 / 30	P	JWM
P - 56 & P - 7	T/S	9/28/25	24	LV	1	9/28/25	10:11 / 30	10:16 / 30	P	JWM
P - 56 & P - 6	T/S	9/28/25	24	LV	1	9/28/25	10:11 / 30	10:16 / 30	P	JWM
P - 56 & P - 5	T/S	9/28/25	24	LV	1	9/28/25	10:00 / 30	10:05 / 30	P	JWM
P - 56 & P - 4	T/S	9/28/25	24	LV	1	9/28/25	10:00 / 30	10:05 / 30	P	JWM
P - 56 & P - 3	T/S	9/28/25	24	LV	1	9/28/25	09:55 / 30	10:00 / 30	P	JWM
P - 56 & P - 2	T/S	9/28/25	24	LV	1	9/28/25	09:55 / 30	10:00 / 30	P	JWM
P - 56 & P - 1	T/S	9/28/25	24	LV	1	9/28/25	09:48 / 30	09:53 / 30	P	JWM
P - 56 & P - 54	T/S	9/28/25	24	LV	1	9/28/25	09:40 / 30	09:45 / 30	P	JWM
P - 56 & P - 55	T/S	9/28/25	24	LV	1	9/28/25	09:40 / 30	09:45 / 30	P	JWM
P - 56 & P - 57	T/S	9/28/25	196	SK	9	9/28/25	12:06 / 30	12:11 / 30	P	JWM
P - 57 & P - 25	T/S	9/28/25	24	SK	9	9/28/25	11:50 / 30	11:55 / 30	P	JWM
P - 57 & P - 58	S/S	9/28/25	540	SC	5	9/28/25	11:50 / 30	11:55 / 30	P	JWM
P - 58 & P - 26	T/S	9/28/25	24	SK	9	9/28/25	13:49 / 30	13:54 / 30	P	JWM
P - 58 & P - 59	S/S	9/28/25	540	SK	9	9/28/25	11:52 / 30	11:57 / 30	P	JWM
P - 59 & P - 27	S/S	9/28/25	24	SK	9	9/28/25	14:48 / 30	14:53 / 30	P	JWM
P - 60 & P - 28	S/S	9/28/25	24	SK	9	9/28/25	14:55 / 30	15:00 / 30	P	JWM
P - 60 & P - 59	S/S	9/28/25	540	SC	5	9/28/25	11:53 / 30	11:58 / 30	P	JWM
P - 60 & P - 61	S/S	9/28/25	540	LV	1	9/28/25	13:30 / 30	13:35 / 30	P	JWM
P - 61 & P - 62	S/S	9/28/25	540	SK	9	9/28/25	15:00 / 30	15:05 / 30	P	JWM
P - 56 & P - 57	S/S	9/28/25	540	SK	9	9/28/25	12:08 / 30	12:13 / 30	P	JWM
P - 62 & P - 63	S/S	9/28/25	540	SK	9	9/28/25	15:03 / 30	15:08 / 30	P	JWM
P - 63 & P - 64	S/S	9/28/25	540	LV	1	9/28/25	15:08 / 30	15:13 / 30	P	JWM
P - 64 & P - 65	S/S	9/28/25	540	SC	5	9/28/25	15:09 / 30	15:14 / 30	P	JWM
P - 61 & P - 29	S/S	9/28/25	24	SK	9	9/28/25	15:00 / 30	15:05 / 30	P	JWM
P - 62 & P - 30	S/S	9/28/25	24	SK	9	9/28/25	15:00 / 30	15:05 / 30	P	JWM
P - 63 & P - 31	S/S	9/28/25	24	SK	9	9/28/25	15:03 / 30	15:08 / 30	P	JWM
P - 64 & P - 32	S/S	9/28/25	24	SK	9	9/28/25	15:08 / 30	15:13 / 30	P	JWM
P - 65 & P - 33	S/S	9/28/25	24	SK	9	9/28/25	15:09 / 30	15:14 / 30	P	JWM
P - 33 & P - 65	S/S	9/29/25	24	SK	9	9/29/25	15:09 / 30	15:14 / 30	P	JWM
P - 66 & P - 65	S/S	9/29/25	540	SC	5	9/29/25	09:40 / 30	09:45 / 30	P	JWM

GEOMEMBRANE PRODUCTION SEAMING AND CONTINUITY TEST LOG

PROJECT NAME: **CCSWDA Legacy Landfill Cell 5**

PROJECT LOCATION: **Craighead County, AR**

OLSSON PROJECT NUMBER: **025-04399**

SEAM IDENTIFICATION	MATERIAL/ MATERIAL	WELD DATE	SEAM LENGTH	OPERATOR ID	MACHINE ID	TEST DATE	START TIME - PRESSURE	END TIME - PRESSURE	PASS/ FAIL	CQA MONITOR
P - 66 & P - 34	S/S	9/29/25	24	SK	9	9/29/25	14:27 / 30	14:32 / 30	P	JWM
P - 66 & P - 67	S/S	9/29/25	540	LV	1	9/29/25	09:43 / 30	09:48 / 30	P	JWM
P - 67 & P - 35	S/S	9/29/25	24	SK	9	9/29/25	14:27 / 30	14:32 / 30	P	JWM
P - 67 & P - 68	S/S	9/29/25	540	SK	9	9/29/25	09:50 / 30	09:55 / 30	P	JWM
P - 68 & P - 36	S/S	9/29/25	24	SK	9	9/29/25	14:30 / 30	14:35 / 30	P	JWM
P - 68 & P - 69	S/S	9/29/25	540	LV	1	9/29/25	10:56 / 30	11:01 / 30	P	JWM
P - 69 & P - 37	S/S	9/29/25	24	SK	9	9/29/25	14:40 / 30	14:45 / 30	P	JWM
P - 69 & P - 70	S/S	9/29/25	540	SC	5	9/29/25	10:58 / 30	11:03 / 30	P	JWM
P - 70 & P - 38	S/S	9/29/25	24	SK	9	9/29/25	14:46 / 30	14:45 / 30	P	JWM
P - 70 & P - 71	S/S	9/29/25	540	SK	9	9/29/25	11:04 / 30	11:09 / 30	P	JWM
P - 71 & P - 39	S/S	9/29/25	24	SK	9	9/29/25	14:45 / 30	14:50 / 30	P	JWM
P - 71 & P - 72	S/S	9/29/25	540	LV	1	9/29/25	13:20 / 30	13:28 / 30	P	JWM
P - 72 & P - 40	S/T	9/29/25	24	SK	9	9/29/25	14:45 / 30	14:50 / 30	P	JWM
P - 72 & P - 73	S/S	9/29/25	540	SC	5	9/29/25	13:22 / 30	13:27 / 30	P	JWM
P - 73 & P - 41	S/T	9/29/25	24	SK	9	9/29/25	14:47 / 30	14:52 / 30	P	JWM
P - 73 & P - 74	S/S	9/29/25	540	SK	9	9/29/25	13:28 / 30	13:33 / 30	P	JWM
P - 74 & P - 42	S/T	9/29/25	24	SK	9	9/29/25	15:17 / 30	15:22 / 30	P	JWM
P - 74 & P - 75	S/S	9/29/25	540	SC	5	9/29/25	15:17 / 30	15:22 / 30	P	JWM
P - 75 & P - 43	S/T	9/29/25	24	SK	9	9/29/25	15:20 / 30	15:25 / 30	P	JWM
P - 75 & P - 76	S/S	9/29/25	540	SC	5	9/29/25	15:20 / 30	15:31 / 30	P	JWM
P - 76 & P - 44	S/T	9/29/25	24	SK	9	9/29/25	15:22 / 30	15:27 / 30	P	JWM
P - 76 & P - 77	S/S	9/29/25	540	LV	1	9/29/25	16:05 / 30	16:10 / 30	P	JWM
P - 77 & P - 46	S/T	9/29/25	24	SK	9	9/29/25	15:22 / 30	15:27 / 30	P	JWM
P - 77 & P - 78	S/S	9/29/25	540	SC	5	9/30/25	16:21 / 30	16:26 / 30	P	JWM
P - 78 & P - 47	S/T	9/29/25	24	SC	5	9/30/25	11:30 / 30	11:35 / 30	P	JWM
P - 78 & P - 79	S/S	9/29/25	540	SK	9	9/30/25	07:59 / 30	08:04 / 30	P	JWM
P - 79 & P - 48	S/T	9/30/25	24	SC	5	9/30/25	11:30 / 30	11:35 / 30	P	JWM
P - 79 & P - 80	S/S	9/30/25	540	SC	5	9/30/25	09:27 / 30	09:32 / 30	P	JWM
P - 80 & P - 49	S/T	9/30/25	24	SC	5	9/30/25	11:33 / 30	11:38 / 30	P	JWM
P - 80 & P - 81	S/S	9/30/25	540	LV	1	9/30/25	09:36 / 30	09:41 / 30	P	JWM
P - 81 & P - 50	S/T	9/30/25	24	SC	5	9/30/25	11:33 / 30	11:38 / 30	P	JWM
P - 81 & P - 82	S/S	9/30/25	540	SK	9	9/30/25	10:25 / 30	10:30 / 30	P	JWM
P - 82 & P - 51	S/T	9/30/25	24	SK	9	9/30/25	11:35 / 30	11:40 / 30	P	JWM
P - 82 & P - 83	S/S	9/30/25	533	SK	5	9/30/25	11:35 / 30	11:42 / 30	P	JWM

GEOMEMBRANE PRODUCTION SEAMING AND CONTINUITY TEST LOG

PROJECT NAME: **CCSWDA Legacy Landfill Cell 5**

PROJECT LOCATION: **Craighead County, AR**

OLSSON PROJECT NUMBER: **025-04399**

SEAM IDENTIFICATION	MATERIAL/ MATERIAL	WELD DATE	SEAM LENGTH	OPERATOR ID	MACHINE ID	TEST DATE	START TIME - PRESSURE	END TIME - PRESSURE	PASS/ FAIL	CQA MONITOR
P - 83 & P - 52	S/T	9/30/25	24	SK	5	9/30/25	11:36 / 30	11:42 / 30	P	JWM
P - 83 & P - 84	S/S	9/30/25	533	CV	1	9/30/25	11:36 / 30	11:42 / 30	P	JWM
P - 84 & P - 53	T/T	9/30/25	24	SK	9	9/30/25	11:40 / 30	11:45 / 30	P	JWM
P - 85 & P - 86	T/T	9/30/25	67	SK	9	9/30/25	13:23 / 30	13:28 / 30	P	JWM
P - 86 & P - 87	T/T	9/30/25	67	SK	9	9/30/25	13:25 / 30	13:30 / 30	P	JWM
P - 87 & P - 88	T/T	9/30/25	66	SK	1	9/30/25	13:27 / 30	13:32 / 30	P	JWM
P - 88 & P - 89	T/T	9/30/25	65	CV	1	9/30/25	13:30 / 30	13:35 / 30	P	JWM
P - 89 & P - 90	T/T	9/30/25	65	SK	9	9/30/25	13:31 / 30	13:36 / 30	P	JWM
P - 90 & P - 91	T/T	9/30/25	65	LV	1	9/30/25	13:32 / 30	13:37 / 30	P	JWM
P - 91 & P - 92	T/T	9/30/25	66	SK	9	9/30/25	13:34 / 30	13:39 / 30	P	JWM
P - 92 & P - 93	T/T	9/30/25	67	CV	1	9/30/25	13:39 / 30	13:44 / 30	P	JWM
P - 85 & P - 53	T/T	9/30/25	67	SK	5	9/30/25	13:22 / 30	13:27 / 30	P	JWM
P - 53 & P - 84	T/S	9/30/25	24	SK	9	9/30/25	11:40 / 30	11:45 / 30	P	JWM
P - 84 & P - 94	S/S	9/30/25	535	SC	5	9/30/25	14:55 / 30	15:00 / 30	P	JWM
P - 94 & P - 95	S/S	9/30/25	530	CV	1	9/30/25	16:12 / 30	16:17 / 30	P	JWM
P - 95 & P - 96	S/S	9/30/25	530	SK	9	9/30/25	16:40 / 30	16:45 / 30	P	JWM
P - 94 & P - 85	T/S	9/30/25	24	SK	5	9/30/25	16:30 / 30	16:43 / 30	P	JWM
P - 95 & P - 86	T/S	9/30/25	24	SK	5	9/30/25	16:38 / 30	16:43 / 30	P	JWM
P - 96 & P - 87	T/S	9/30/25	24	SK	5	9/30/25	16:30 / 30	16:43 / 30	P	JWM
P - 96 & P - 97	S/S	10/2/25	530	SC	5	10/2/25	09:43 / 30	09:48 / 30	P	JWM
P - 97 & P - 88	T/S	10/2/25	24	SC	5	10/2/25	09:44 / 30	09:49 / 30	P	WPA
P - 97 & P - 98	S/S	10/2/25	530	LV	1	10/2/25	10:47 / 30	10:52 / 30	P	WPA
P - 98 & P - 89	T/S	10/2/25	24	LV	1	10/2/25	11:25 / 30	11:30 / 30	P	WPA
P - 98 & P - 99	S/S	10/2/25	530	SK	9	10/2/25	09:52 / 30	09:57 / 30	P	WPA
P - 99 & P - 90	T/S	10/2/25	24	SC	5	10/2/25	09:53 / 30	09:58 / 30	P	WPA
P - 100 & P - 91	T/S	10/2/25	24	CV	1	10/2/25	11:33 / 30	11:38 / 30	P	WPA
P - 101 & P - 92	T/S	10/2/25	24	SK	9	10/2/25	11:34 / 30	11:39 / 30	P	WPA
P - 99 & P - 100	S/S	10/2/25	530	CV	1	10/2/25	11:17 / 30	11:22 / 30	P	WPA
P - 100 & P - 101	S/S	10/2/25	530	SC	5	10/2/25	11:18 / 30	11:23 / 30	P	WPA
P - 93 & P - 102	S/T	10/2/25	24	LV	1	10/2/25	11:39 / 30	11:44 / 30	P	WPA
P - 101 & P - 102	T/S	10/2/25	530	SK	9	10/2/25	11:19 / 30	11:24 / 30	P	WPA
P - 102 & P - 103	S/S	10/4/25	530	SC	5	10/2/25	10:23 / 30	10:28 / 30	P	WPA
P - 103 & P - 106	T/S	10/4/25	24	SC	5	10/4/25	13:00 / 30	13:05 / 30	P	WPA
P - 106 & P - 93	T/S	10/4/25	62	SC	5	10/4/25	13:00 / 30	13:05 / 30	P	WPA

GEOMEMBRANE PRODUCTION SEAMING AND CONTINUITY TEST LOG

PROJECT NAME: **CCSWDA Legacy Landfill Cell 5**

PROJECT LOCATION: **Craighead County, AR**

OLSSON PROJECT NUMBER: **025-04399**

SEAM IDENTIFICATION	MATERIAL/ MATERIAL	WELD DATE	SEAM LENGTH	OPERATOR ID	MACHINE ID	TEST DATE	START TIME - PRESSURE	END TIME - PRESSURE	PASS/ FAIL	CQA MONITOR
P - 106 & P - 107	T/T	10/4/25	62	SK	9	10/4/25	13:04 / 30	13:09 / 30	P	WPA
P - 103 & P - 104	S/S	10/4/25	535	SC	5	10/4/25	10:29 / 30	10:34 / 30	P	WPA
P - 104 & P - 105	S/S	10/4/25	535	SK	9	10/4/25	10:50 / 30	10:55 / 30	P	WPA
P - 104 & P - 107	S/T	10/4/25	24	LV	1	10/4/25	11:25 / 30	11:30 / 30	P	WPA
P - 107 & P - 108	T/T	10/4/25	63	LV	1	10/4/25	11:29 / 30	11:34 / 30	P	WPA
P - 108 & P - 105	S/T	10/4/25	24	LV	1	10/4/25	13:10 / 30	13:15 / 30	P	WPA
P - 109 & P - 108	T/T	10/4/25	67	SC	9	10/4/25	13:15 / 30	13:20 / 30	P	WPA
P - 109 & P - 110	T/T	10/4/25	66	LV	1	10/4/25	13:20 / 30	13:25 / 30	P	WPA
P - 110 & P - 111	T/T	10/4/25	67	SK	9	10/4/25	13:28 / 30	13:33 / 30	P	WPA
P - 111 & P - 112	T/T	10/4/25	55	LV	1	10/4/25	13:48 / 30	13:53 / 30	P	WPA
P - 112 & P - 114	T/T	10/4/25	14	CV	5	10/4/25	13:55 / 30	14:00 / 30	P	WPA
P - 113 & P - 114	T/T	10/4/25	11	CV	5	10/4/25	13:52 / 30	13:57 / 30	P	WPA
P - 113 & P - 112	T/T	10/4/25	23	CV	5	10/4/25	13:52 / 30	13:57 / 30	P	WPA
P - 114 & P - 115	T/T	10/4/25	36	SK	9	10/4/25	13:55 / 30	14:00 / 30	P	WPA
P - 115 & P - 116	T/T	10/4/25	68	SK	9	10/4/25	13:45 / 30	13:50 / 30	P	WPA
P - 116 & P - 117	T/T	10/4/25	73	LV	1	10/4/25	14:15 / 30	14:20 / 30	P	WPA
P - 117 & P - 118	T/T	10/4/25	54	SK	9	10/4/25	14:16 / 30	14:21 / 30	P	WPA
P - 118 & P - 119	T/T	10/4/25	21	LV	1	10/4/25	14:22 / 30	14:27 / 30	P	WPA
P - 119 & P - 120	T/T	10/4/25	70	SC	5	10/4/25	14:24 / 30	14:29 / 30	P	WPA
P - 119 & P - 120	T/T	10/4/25	70	SC	5	10/4/25	14:30 / 30	14:35 / 30	P	WPA
P - 120 & P - 121	T/T	10/4/25	71	SK	9	10/4/25	14:37 / 30	14:42 / 30	P	WPA
P - 121 & P - 122	T/T	10/4/25	75	LV	1	10/4/25	14:38 / 30	14:43 / 30	P	WPA
P - 122 & P - 123	T/T	10/4/25	75	SC	5	10/4/25	15:10 / 30	15:15 / 30	P	WPA
P - 123 & P - 124	T/T	10/4/25	75	LV	1	10/4/25	15:12 / 30	15:27 / 30	P	WPA
P - 124 & P - 125	T/T	10/4/25	75	SK	9	10/4/25	15:18 / 30	15:23 / 30	P	WPA
P - 125 & P - 126	T/T	10/4/25	75	LV	1	10/4/25	15:19 / 30	15:24 / 30	P	WPA
P - 126 & P - 127	T/T	10/4/25	75	SC	5	10/4/25	15:28 / 30	15:33 / 30	P	WPA
P - 127 & P - 128	T/T	10/4/25	75	SC	5	10/4/25	15:39 / 30	15:44 / 30	P	WPA
P - 128 & P - 129	T/T	10/4/25	73	LV	1	10/4/25	15:30 / 30	15:35 / 30	P	WPA
P - 129 & P - 130	T/T	10/4/25	75	SC	5	10/4/25	15:52 / 30	15:57 / 30	P	WPA
P - 130 & P - 131	T/T	10/4/25	75	SC	5	10/4/25	16:18 / 30	16:23 / 30	P	WPA
P - 131 & P - 132	T/T	10/4/25	75	SK	9	10/4/25	16:20 / 30	16:25 / 30	P	WPA
P - 132 & P - 133	T/T	10/4/25	75	SK	9	10/4/25	10:22 / 30	10:27 / 30	P	WPA
P - 133 & P - 134	T/T	10/4/25	75	LV	1	10/4/25	16:24 / 30	16:29 / 30	P	WPA

GEOMEMBRANE PRODUCTION SEAMING AND CONTINUITY TEST LOG

PROJECT NAME: **CCSWDA Legacy Landfill Cell 5**

PROJECT LOCATION: **Craighead County, AR**

OLSSON PROJECT NUMBER: **025-04399**

SEAM IDENTIFICATION	MATERIAL/ MATERIAL	WELD DATE	SEAM LENGTH	OPERATOR ID	MACHINE ID	TEST DATE	START TIME - PRESSURE	END TIME - PRESSURE	PASS/ FAIL	CQA MONITOR
P - 134 & P - 135	T/T	10/4/25	75	SK	9	10/4/25	16:30 / 30	16:35 / 30	P	WPA
P - 135 & P - 136	T/T	10/4/25	75	SK	9	10/4/25	16:32 / 30	16:37 / 30	P	WPA
P - 136 & P - 137	T/T	10/4/25	75	LV	1	10/5/25	16:35 / 30	16:40 / 30	P	WPA
P - 138 & P - 139	S/S	10/5/25	523	SK	9	10/5/25	08:22 / 30	08:27 / 30	P	WPA
P - 138 & P - 105	S/S	10/5/25	520	LV	1	10/5/25	08:30 / 30	08:35 / 30	P	WPA
P - 139 & P - 137	S/T	10/4/25	24	SC	5	10/4/25	18:18 / 30	18:23 / 30	P	WPA
P - 139 & P - 136	S/T	10/4/25	24	SC	5	10/4/25	18:18 / 30	18:25 / 30	P	WPA
P - 139 & P - 135	S/T	10/4/25	24	SC	5	10/4/25	18:10 / 30	18:15 / 30	P	WPA
P - 139 & P - 134	S/T	10/4/25	24	SC	5	10/4/25	18:00 / 30	18:05 / 30	P	WPA
P - 139 & P - 133	S/T	10/4/25	24	SC	5	10/4/25	18:00 / 30	18:05 / 30	P	WPA
P - 139 & P - 132	S/T	10/4/25	24	SC	5	10/4/25	17:53 / 30	17:58 / 30	P	WPA
P - 139 & P - 131	S/T	10/4/25	24	SC	5	10/4/25	17:58 / 30	18:03 / 30	P	WPA
P - 139 & P - 130	S/T	10/4/25	24	SC	5	10/4/25	17:46 / 30	17:51 / 30	P	WPA
P - 139 & P - 129	S/T	10/4/25	24	SC	5	10/4/25	17:46 / 30	17:51 / 30	P	WPA
P - 139 & P - 128	S/T	10/4/25	24	SC	5	10/4/25	17:39 / 30	17:44 / 30	P	WPA
P - 139 & P - 127	S/T	10/4/25	24	SC	5	10/4/25	17:39 / 30	17:44 / 30	P	WPA
P - 139 & P - 125	S/T	10/4/25	24	SC	5	10/4/25	18:50 / 30	18:55 / 30	P	WPA
P - 139 & P - 124	S/T	10/4/25	24	SC	5	10/4/25	18:50 / 30	18:55 / 30	P	WPA
P - 142 & P - 122	S/T	10/5/25	24	SK	9	10/5/25	07:40 / 30	07:45 / 30	P	WPA
P - 142 & P - 121	S/T	10/5/25	24	SK	9	10/5/25	07:40 / 30	07:45 / 30	P	WPA
P - 141 & P - 120	T/T	10/5/25	24	SK	9	10/5/25	08:02 / 30	08:07 / 30	P	WPA
P - 141 & P - 119	T/T	10/5/25	24	SK	9	10/5/25	08:02 / 30	08:07 / 30	P	WPA
P - 140 & P - 118	T/T	10/5/25	24	SK	9	10/5/25	08:10 / 30	08:15 / 30	P	WPA
P - 140 & P - 117	T/T	10/5/25	24	SK	9	10/5/25	08:10 / 30	08:15 / 30	P	WPA
P - 140 & P - 116	T/T	10/5/25	24	SK	9	10/5/25	08:12 / 30	08:17 / 30	P	WPA
P - 140 & P - 139	S/T	10/5/25	63	SK	9	10/5/25	08:06 / 30	08:11 / 30	P	WPA
P - 141 & P - 139	S/T	10/5/25	62	LV	1	10/5/25	07:50 / 30	07:55 / 30	P	WPA
P - 140 & P - 139	S/T	10/5/25	62	LV	1	10/5/25	07:50 / 30	07:55 / 30	P	WPA

APPENDIX R
GEOMEMBRANE – DEFECT, REPAIR, AND NON-DESTRUCT TEST LOGS

GEOMEMBRANE DEFECT, REPAIR, & NON-DESTRUCT LOG

Project Name: **CCSWDA Legacy Landfill Cell 5**

Project Location: **Craighead County, AR**

Olsson Project Number: **025-04399**

Panel and/or Seam Number		Approximate Location	Repair Information		Non-Destructive Test Data		
			Repair Date	Repair Type	Date Vacuum Test Completed	Pass/ Fail	CQA Monitor
R-1	P54,P55,P56	7' FROM NE BERM TOE	10/1/25	PATCH	10/1/25	PASS	WPA
R-2	P1,P54,P56	4' NORTH OF NORTH BERM TOE/7' NORTH BERM TOE	10/1/25	PATCH	10/1/25	PASS	WPA
R-3	P1,P2,P56	7' WEST BERM TOE / 22' FROM NORTH BERM TOE	10/1/25	PATCH	10/1/25	PASS	WPA
R-4	P2,P56	7' WEST BERM TOE / 38' FROM NORTH BERM TOE	10/1/25	PATCH	10/1/25	PASS	WPA
R-5	P2,P3,P56	6' WEST BERM TOE / 47' NORTH BERM TOE	10/1/25	PATCH	10/1/25	PASS	WPA
R-6	P3,P4,P56	6' WEST BERM TOE / 71' NORTH BERM TOE	10/1/25	PATCH	10/1/25	PASS	WPA
R-7	P56,P57	30' WEST BERM TOE / 71' NORTH ERM TOE	10/1/25	PATCH	10/1/25	PASS	WPA
R-8	P4,P5,P56	6' WEST BERM TOE / 95' NORTH BERM TOE	10/1/25	PATCH	10/1/25	PASS	WPA
R-10	P6,P7,P56	4' WEST BERM TOE / 43' NORTH BERM TOE	10/1/25	PATCH	10/1/25	PASS	WPA
R-11	P7,P8,P56	4' WEST BERM TOE / 168' NORTH BERM TOE	10/1/25	PATCH	10/1/25	PASS	WPA
R-12	P8,P9,P56	4' WEST BERM TOE / 192' NORTH BERM TOE	10/1/25	PATCH	10/1/25	PASS	WPA
R-13	P9,P10,P56	4' WEST BERM TOE / 215' NORTH BERM TOE	10/1/25	PATCH	10/1/25	PASS	WPA
R-14	P10,P11,P56	4' WEST BERM TOE / 240' NORTH BERM TOE	10/1/25	PATCH	10/1/25	PASS	WPA
R-15	P11,P12	4' WEST BERM TOE / 265' NORTH BERM TOE	10/1/25	PATCH	10/1/25	PASS	WPA
R-16	P11,P12,P56	4' WEST BERM TOE / 265' NORTH BERM TOE	10/1/25	PATCH	10/1/25	PASS	WPA
R-17	P12,P13,P17	3' WEST BERM TOE / 288' NORTH BERM TOE	10/1/25	PATCH	10/1/25	PASS	WPA
R-18	P13,P14,P56	3' WEST BERM TOE / 313' NORTH BERM TOE	10/1/25	PATCH	10/1/25	PASS	WPA
R-19	P56,P57	27' WEST BERM TOE / 313' NORTH BERM TOE	10/1/25	PATCH	10/1/25	PASS	WPA
R-20	P14,P15,P56	3' WEST BERM TOE / 337' NORTH BERM TOE	10/1/25	PATCH	10/1/25	PASS	WPA
R-21	P15,P16,P56	3' WEST BERM TOE / 362' NORTH BERM TOE	10/1/25	PATCH	10/1/25	PASS	WPA
R-22	P16,P17,P56	3' WEST BERM TOE / 387' NORTH BERM TOE	10/1/25	PATCH	10/1/25	PASS	WPA
R-23	P17,P18,P56	4' WEST BERM TOE / 413' NORTH BERM TOE	10/1/25	PATCH	10/1/25	PASS	WPA
R-24	P18,P19,P56	4' WEST BERM TOE / 434' NORTH BERM TOE	10/1/25	PATCH	10/1/25	PASS	WPA
R-25	P19,P20,P56	4' WEST BERM TOE / 462' NORTH BERM TOE	10/1/25	PATCH	10/1/25	PASS	WPA
R-26	P20,P21,P56	4' WEST BERM TOE / 484' NORTH BERM TOE	10/1/25	PATCH	10/1/25	PASS	WPA
R-27	P21,P22,P23	8' WEST BERM TOE / 10' SOUTH BERM TOE (NORTH OF SOUTH BERM TOE)	10/1/25	PATCH	10/1/25	PASS	WPA
R-28	P23,P24	8' WEST BERM TOE / 11' SOUTH BERM TOE (SOUTH OF SOUTH BERM TOE)	10/1/25	PATCH	10/1/25	PASS	WPA
R-29	P24	8' WEST BERM TOE / 5' SOUTH BERM TOE (NORTH OF SOUTH BERM TOE)	10/1/25	PATCH	10/1/25	PASS	WPA
R-30	P24,P25	28' WEST BERM TOE / 9' SOUTH BERM TOE (SOUTH)	10/1/25	PATCH	10/1/25	PASS	WPA
R-31	P24,P25,P56,P57	28' WEST BERM TOE / 8' SOUTH BERM TOE	10/1/25	PATCH	10/1/25	PASS	WPA
R-32	P57,P25	44' WEST BERM TOE / 8' SOUTH BERM TOE	10/1/25	PATCH	10/1/25	PASS	WPA
R-33	P57,P58,P25,P26	56' WEST BERM TOE / 7' SOUTH BERM TOE	10/1/25	PATCH	10/1/25	PASS	WPA
R-34	P58	43' WEST BERM TOE / SOUTH BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-35	P26,P27,P57	60' WEST BERM TOE / SOUTH BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-36	P58,P59	52' WEST BERM TOE / SOUTH BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-37	P59,P60	76' WEST BERM TOE / SOUTH BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-38	P54,P55,P56	5' FROM WEST BERM	10/1/25	PATCH	10/3/25	PASS	WPA
R-39	P59,P60	235' NORTH BERM TOE / 98' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA

Repair Codes:

P = Patch B = Bead GW = Grind and Weld R = Reconstructed Seam T = Topping Along Fusion Seam CAP = Cap on Seam

GEOMEMBRANE DEFECT, REPAIR, & NON-DESTRUCT LOG

Project Name: **CCSWDA Legacy Landfill Cell 5**

Project Location: **Craighead County, AR**

Olsson Project Number: **025-04399**

Panel and/or Seam Number		Approximate Location	Repair Information		Non-Destructive Test Data		
			Repair Date	Repair Type	Date Vacuum Test Completed	Pass/ Fail	CQA Monitor
R-40	P60,P61	287' NORTH BERM TOE / 96' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-41	P59,P60	13' NORTH BERM TOE / 92' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-42	P59,P60,P27,P28	9' NORTH BERM TOE / 102' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-43	P60,P61	10' NORTH BERM TOE / 111' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-44	P60,P61,P29,P28	9' NORTH BERM TOE / 128' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-45	P61,P62,P29,P30	8' NORTH BERM TOE / 152' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-46	P62,P63,P30,P31	8' NORTH BERM TOE / 176' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-47	P63	13' NORTH BERM TOE / 188' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-48	P62,P63	110' NORTH BERM TOE / 176' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-49	P61,P62	229' NORTH BERM TOE / 152' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-50	P61,P62	121' NORTH BERM TOE / 152' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-51	P64,P65	6' NORTH BERM TOE (NORTH OF) / 223' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-52	P63,P64	17' NORTH BERM TOE / 199' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-53	P63,P64,P31,P32	8' SOUTH BERM TOE / 199' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-54	P64,P65,P32,P33	8' SOUTH BERM TOE / 223' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-55	P65,P66,P33,P34	7' SOUTH BERM TOE / 247' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-56	P66,P67,P34,P35	7' SOUTH BERM TOE / 271' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-57	P67,P35	7' SOUTH BERM TOE / 283' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-58	P65,P66	428' NORTH BERM TOE / 247' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-59	P66	289' NORTH BERM TOE / 260' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-60	P66,P67	92' NORTH BERM TOE / 271' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-61	P68,P69	316' SOUTH BERM TOE / 319' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-62	P67,P68	176' SOUTH BERM TOE / 295' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-63	P68	58' SOUTH BERM TOE / 308' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-64	P68	52' SOUTH BERM TOE / 308' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-65	P68	46' SOUTH BERM TOE / 308' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-66	P68	40' SOUTH BERM TOE / 308' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-67	P68	34' SOUTH BERM TOE / 308' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-68	P68	27' SOUTH BERM TOE / 308' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-69	P68	21' SOUTH BERM TOE / 308' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-70	P68	14' SOUTH BERM TOE / 308' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-71	P67,P68,P35,P36	7' SOUTH BERM TOE / 245' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-72	P68	8' SOUTH BERM TOE / 305' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-73	P68	8' SOUTH BERM TOE / 308' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-74	P68,P69,P36,P37	7' SOUTH BERM TOE / 319' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-75	P36,P37	9' SOUTH BERM TOE (SOUTH OF) / 319' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-76	P69,P70, P37,P38	7' SOUTH BERM TOE / 343' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-77	P70,P71,P38,P39	6' SOUTH BERM TOE / 367' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA

Repair Codes:

P = Patch B = Bead GW = Grind and Weld R = Reconstructed Seam T = Topping Along Fusion Seam CAP = Cap on Seam

GEOMEMBRANE DEFECT, REPAIR, & NON-DESTRUCT LOG

Project Name: **CCSWDA Legacy Landfill Cell 5**

Project Location: **Craighead County, AR**

Olsson Project Number: **025-04399**

Panel and/or Seam Number		Approximate Location	Repair Information		Non-Destructive Test Data		
			Repair Date	Repair Type	Date Vacuum Test Completed	Pass/ Fail	CQA Monitor
R-78	P70,P71	220' SOUTH BERM TOE / 367' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-79	P69,P70	268' SOUTH BERM TOE / 343' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-80	P71,P72	368' SOUTH BERM TOE / 391' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-81	P71,P72	125' SOUTH BERM TOE / 415' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-82	P39,P40,P71,P72	5' SOUTH BERM TOE / 391' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-83	P40,P41,P72,P73	5' SOUTH BERM TOE / 415' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-84	P73,P74	23' SOUTH BERM TOE (SOUTH OF) / 439' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-85	P41,P42,P73,P74	4' SOUTH BERM TOE / 439' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-86	P43,P44,P74,P75	4' SOUTH BERM TOE / 463' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-87	P74,P75	24' SOUTH BERM TOE / 463' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-88	P73,P74	30' SOUTH BERM TOE / 439' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-89	P75,P76	12' SOUTH BERM TOE / 487' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-90	P75,P76	23' SOUTH BERM TOE / 487' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-91	P75,P76	52' SOUTH BERM TOE / 487' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-92	P75,P76	111' SOUTH BERM TOE / 487' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-93	P76,P77	353' SOUTH BERM TOE / 511' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-94	P43,P44,	11' SOUTH BERM TOE / 487' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-95	P43,P44,P45	1' SOUTH BERM TOE / 487' WEST BERM TOE	10/1/25	PATCH	10/3/25	PASS	WPA
R-96	P43,P45,P75,P76	8' SOUTH BERM TOE / 487' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-97	P44,P45,P46	3' SOUTH BERM TOE / 511' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-98	P45,P46,P76,P77	8' SOUTH BERM TOE / 511' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-99	P46,P47	3' SOUTH BERM TOE / 535' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-100	P46,P47,P77,P78	7' SOUTH BERM TOE / 535' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-101	P78	11' SOUTH BERM TOE / 546' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-102	P47,P48,P78,P79	11' SOUTH BERM TOE / 559' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-103	P78,P79	246' SOUTH BERM TOE / 559' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-104	P78,P79	350' SOUTH BERM TOE / 559' WEST BERM TOE (DS-30)	10/2/25	PATCH	10/3/25	PASS	WPA
R-105	P79,P80	15' NORTH BERM TOE(NORTH OF) / 583' WEST BERM TOE (DS-32)	10/2/25	PATCH	10/3/25	PASS	WPA
R-106	P80,P81	422' NORTH BERM TOE / 607' WEST BERM TOE (DS-33)	10/2/25	PATCH	10/3/25	PASS	WPA
R-107	P79,P80	464' NORTH BERM TOE / 583' WEST BERM TOE (DS-31)	10/2/25	PATCH	10/3/25	PASS	WPA
R-108	P48,P49,P79,P80	7' SOUTH BERM TOE / 583' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-109	P49,P50,P80,P81	7' SOUTH BERM TOE / 607' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-110	P50,P51,P81,P82	7' SOUTH BERM TOE / 631' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-111	P51,P52,P82,P83	7' SOUTH BERM TOE / 655' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-112	P83	9' SOUTH BERM TOE / 665' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-113	P82,P83	264' SOUTH BERM TOE / 655' WEST BERM TOE (DS-35)	10/2/25	PATCH	10/3/25	PASS	WPA
R-114	P81,P82	186' NORTH BERM TOE / 631' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-115	P84,P94	24' NORTH BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA

Repair Codes:

P = Patch B = Bead GW = Grind and Weld R = Reconstructed Seam T = Topping Along Fusion Seam CAP = Cap on Seam

GEOMEMBRANE DEFECT, REPAIR, & NON-DESTRUCT LOG

Project Name: **CCSWDA Legacy Landfill Cell 5**

Project Location: **Craighead County, AR**

Olsson Project Number: **025-04399**

Panel and/or Seam Number		Approximate Location	Repair Information		Non-Destructive Test Data		
			Repair Date	Repair Type	Date Vacuum Test Completed	Pass/ Fail	CQA Monitor
R-116	P83,P84	110' SOUTH BERM TOE / 689' WEST BERM TOE (DS-36)	10/2/25	PATCH	10/3/25	PASS	WPA
R-117	P84,P94	83' SOUTH BERM TOE / 713' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-118	P52,P53,P83,P84	7' SOUTH BERM TOE / 689' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-119	P53,P85,P84,P94	8' SOUTH BERM TOE / 713' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-120	P85,P86,P94,P95	9' SOUTH BERM TOE / 737' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-121	P95	11' SOUTH BERM TOE / 745' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-122	P86, P99	9' SOUTH BERM TOE / 748' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-123	P95	125' SOUTH BERM TOE / 750' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-124	P86,P87,P95,P96	9' SOUTH BERM TOE / 761' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-125	P87,P96	9' SOUTH BERM TOE / 773' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-126	P95,P96	250' SOUTH BERM TOE / 761' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-127	P95,P96	316' SOUTH BERM TOE / 76' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-128	P94,P95	316' SOUTH BERM TOE / 737' WEST BERM TOE (DS-39)	10/2/25	PATCH	10/3/25	PASS	WPA
R-129	P97,P98	48' SOUTH BERM TOE / 809' WEST BERM TOE (DS-42)	10/2/25	PATCH	10/3/25	PASS	WPA
R-130	P96	214' SOUTH BERM TOE / 781' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-131	P96,P97	361' SOUTH BERM TOE / 785' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-132	P87,P88,P96,P97	7' SOUTH BERM TOE / 785' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-133	P88,P89,P97,P98	8' SOUTH BERM TOE / 809' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-134	P89,P90,P98,P99	8' SOUTH BERM TOE / 833' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-135	P90,P91,P99,P100	9' SOUTH BERM TOE / 857' WEST BERM TOE	10/2/25	PATCH	10/3/25	PASS	WPA
R-136	P99,P100	155' SOUTH BERM TOE / 857' WEST BERM TOE (DS-45)	10/2/25	PATCH	10/2/25	PASS	WPA
R-137	P98,P99	433' SOUTH BERM TOE / 833' WEST BERM TOE (DS-44)	10/2/25	PATCH	10/2/25	PASS	WPA
R-138	P101,P102	119' NORTH BERM TOE / 905' EAST BERM TOE	10/2/25	PATCH	10/2/25	PASS	WPA
R-139	P100,P101	266' NORTH BERM TOE / 881' WEST BERM TOE (DS-46)	10/2/25	PATCH	10/2/25	PASS	WPA
R-140	P91,P92,P100,P101	8' SOUTH BERM TOE / 881' WEST BERM TOE	10/2/25	PATCH	10/2/25	PASS	WPA
R-141	P92,P93,P101,P102	6' SOUTH BERM TOE / 905' WEST BERM TOE	10/2/25	PATCH	10/2/25	PASS	WPA
R-142	P102,P103,P93,P106	7' SOUTH BERM TOE / 929' WEST BERM TOE	10/5/25	PATCH	10/2/25	PASS	WPA
R-143	P102,P103	17' SOUTH BERM TOE / 929'WEST BERM TOE (DS-48)	10/5/25	PATCH	10/2/25	PASS	WPA
R-144	P106,P107,P103,P104	6' SOUTH BERM TOE / 953' WEST BERM TOE	10/5/25	PATCH	10/2/25	PASS	WPA
R-145	P103,P104	50' SOUTH BERM TOE / 953' WEST BERM TOE (DS-50)	10/5/25	PATCH	10/2/25	PASS	WPA
R-146	P102,P103	39' NORTH BERM TOE (NORTH OF) / 929' WEST BERM TOE (DS-49)	10/5/25	PATCH	10/2/25	PASS	WPA
R-147	P105	155' SOUTH BERM TOE / 50' EAST BERM TOE	10/5/25	PATCH	10/2/25	PASS	WPA
R-148	P104,P105,P107,P108	6' SOUTH BERM TOE / 977' WEST BERM TOE	10/5/25	PATCH	10/2/25	PASS	WPA
R-149	P103	8' SOUTH BERM TOE / 986' WEST BERM TOE	10/5/25	PATCH	10/2/25	PASS	WPA
R-150	P108,P105	6' SOUTH BERM TOE / 990' WEST BERM TOE	10/5/25	PATCH	10/2/25	PASS	WPA
R-151	P108,P109,P105,P138	6' SOUTH BERM TOE /60' EAST BERM TOE	10/5/25	PATCH	10/2/25	PASS	WPA
R-152	P110,P139	5' SOUTH BERM TOE /36' EAST BERM TOE	10/5/25	PATCH	10/2/25	PASS	WPA
R-153	P110,P139	29' EAST BERM TOE / 5' SOUTH BERM TOE	10/5/25	PATCH	10/5/25	PASS	WPA

Repair Codes:

P = Patch B = Bead GW = Grind and Weld R = Reconstructed Seam T = Topping Along Fusion Seam CAP = Cap on Seam

GEOMEMBRANE DEFECT, REPAIR, & NON-DESTRUCT LOG

Project Name: **CCSWDA Legacy Landfill Cell 5**

Project Location: **Craighead County, AR**

Olsson Project Number: **025-04399**

Panel and/or Seam Number		Approximate Location	Repair Information		Non-Destructive Test Data		
			Repair Date	Repair Type	Date Vacuum Test Completed	Pass/ Fail	CQA Monitor
R-154	P110,P111,P116,P139	5' SOUTH BERM TOE / 7' EAST BERM TOE	10/5/25	PATCH	10/5/25	PASS	WPA
R-155	P111,P115,P116	3' SOUTH BERM TOE / 1' EAST BERM TOE	10/5/25	PATCH	10/5/25	PASS	WPA
R-156	P111,P112,P115	22' UP FROM SOUTH BERM TOE / EAST BERM TOE CORNER ALONG EAST & SOUTH BERM BREAK LINE	10/5/25	PATCH	10/5/25	PASS	WPA
R-157	P112,P114,P115	36' UP FROM SOUTH BERM TOE / EAST BERM TOE CORNER ALONG EAST & SOUTH BERM BREAK LINE	10/5/25	PATCH	10/5/25	PASS	WPA
R-158	P113,P114,P112	51' UP FROM SOUTH BERM TOE / EAST BERM TOE CORNER ALONG EAST & SOUTH BERM BREAK LINE (DS-51)	10/5/25	PATCH	10/5/25	PASS	WPA
R-159	P114,P115	50' UP FROM SOUTH BERM TOE / EAST BERM TOE CORNER ALONG EAST & SOUTH BERM BREAK LINE	10/5/25	PATCH	10/5/25	PASS	WPA
R-160	P113,P114	68' UP FROM SOUTH BERM TOE / EAST BERM TOE CORNER ALONG EAST & SOUTH BERM BREAK LINE	10/5/25	PATCH	10/5/25	PASS	WPA
R-161	P116,P117,P140	28' SOUTH BERM TOE / 8' EAST BERM TOE	10/5/25	PATCH	10/5/25	PASS	WPA
R-162	P117,P118,P140	53' SOUTH BERM TOE / 8' EAST BERM TOE	10/5/25	PATCH	10/5/25	PASS	WPA
R-163	P118,P140,P139	67' SOUTH BERM TOE / 15' EAST BERM TOE	10/5/25	PATCH	10/5/25	PASS	WPA
R-164	P118,P119,P140	78' SOUTH BERM TOE / 8' EAST BERM TOE	10/5/25	PATCH	10/5/25	PASS	WPA
R-165	P119,P120,P140	101' SOUTH BERM TOE /8' EAST BERM TOE	10/5/25	PATCH	10/5/25	PASS	WPA
R-166	P119,P120	101' SOUTH BERM TOE / 49' EAST BERM TOE (EAST OF)	10/5/25	PATCH	10/5/25	PASS	WPA
R-167	P120,P121,P140	125' SOUTH BERM TOE / 8' EAST BERM TOE	10/5/25	PATCH	10/5/25	PASS	WPA
R-168	P121,P122,P142	149' SOUTH BERM TOE / 8' EAST BERM TOE	10/5/25	PATCH	10/5/25	PASS	WPA
R-169	P121,P122	149' SOUTH BERM TOE / 9' EAST BERM TOE (EAST OF) (DS-52)	10/5/25	PATCH	10/5/25	PASS	WPA
R-170	P122,P123,P142	8' EAST BERM TOE / 173' SOUTH BERM TOE	10/5/25	PATCH	10/5/25	PASS	WPA
R-171	P125,P124,P139	17' EAST BERM TOE / 185' SOUTH BERM TOE	10/5/25	PATCH	10/5/25	PASS	WPA
R-172	P126,P127,P139	13' EAST BERM TOE / 25' NORTH BERM TOE	10/5/25	PATCH	10/5/25	PASS	WPA
R-173	P127,P128,P139	13' EAST BERM TOE / 227' NORTH BERM TOE	10/5/25	PATCH	10/5/25	PASS	WPA
R-174	P128,P129,P139	13' EAST BERM TOE / 203' NORTH BERM TOE	10/5/25	PATCH	10/5/25	PASS	WPA
R-175	P129,P130,P139	13' EAST BERM TOE / 179' NORTH BERM TOE	10/5/25	PATCH	10/5/25	PASS	WPA
R-176	P128,P129,P142	17' EAST BERM TOE / 317' SOUTH BERM TOE	10/5/25	PATCH	10/5/25	PASS	WPA
R-177	P129,P130,P142	17' EAST BERM TOE / 341' SOUTH BERM TOE	10/5/25	PATCH	10/5/25	PASS	WPA
R-178	P130,P131,P139	17' EAST BERM TOE / 365' SOUTH BERM TOE	10/5/25	PATCH	10/5/25	PASS	WPA
R-179	P131,P132,P139	17' EAST BERM TOE / 389' SOUTH BERM TOE	10/5/25	PATCH	10/5/25	PASS	WPA
R-180	P132,P133,P139	17' EAST BERM TOE / 413' SOUTH BERM TOE	10/5/25	PATCH	10/5/25	PASS	WPA
R-181	P133,P134,P139	17' EAST BERM TOE / 435' SOUTH BERM TOE	10/5/25	PATCH	10/5/25	PASS	WPA
R-182	P134,P135,P139	17' EAST BERM TOE / 459' SOUTH BERM TOE	10/5/25	PATCH	10/5/25	PASS	WPA
R-183	P135,P136,P139	17' EAST BERM TOE / 483' SOUTH BERM TOE	10/5/25	PATCH	10/5/25	PASS	WPA
R-184	P136,P137,P139	17' EAST BERM TOE / 507' SOUTH BERM TOE	10/5/25	PATCH	10/5/25	PASS	WPA
R-185	P131,P132	60' EAST BERM TOE (EAST OF) / 389' SOUTH BERM TOE	10/5/25	PATCH	10/5/25	PASS	WPA
R-186	P132,P133	60' EAST BERM TOE (EAST OF) / 413' SOUTH BERM TOE	10/5/25	PATCH	10/5/25	PASS	WPA
R-187	P105,P138	38' SOUTH BERM TOE / 63' EAST BERM TOE (DS-56)	10/9/25	PATCH	10/9/25	PASS	WPA
R-188	P138,P139	21' NORTH BERM TOE / 39' EAST BERM TOE (DS-57)	10/9/25	PATCH	10/9/25	PASS	WPA
R-189	P137,P139	33' NORTH BERM TOE / 15' EAST BERM TOE (DS-55)	10/9/25	PATCH	10/9/25	PASS	WPA
R-190	P132,P139	83' NORTH BERM TOE / 13' EAST BERM TOE (DS-54)	10/9/25	PATCH	10/9/25	PASS	WPA
R-191	P127,P139	231' NORTH BERM TOE / 13' EAST BERM TOE (DS-53)	10/9/25	PATCH	10/11/25	PASS	WPA

Repair Codes:

P = Patch B = Bead GW = Grind and Weld R = Reconstructed Seam T = Topping Along Fusion Seam CAP = Cap on Seam

GEOMEMBRANE DEFECT, REPAIR, & NON-DESTRUCT LOG

Project Name: **CCSWDA Legacy Landfill Cell 5**

Project Location: **Craighead County, AR**

Olsson Project Number: **025-04399**

Panel and/or Seam Number		Approximate Location	Repair Information		Non-Destructive Test Data		
			Repair Date	Repair Type	Date Vacuum Test Completed	Pass/ Fail	CQA Monitor
R-192	P139,P137	12' NORTH BERM TOE / 13' EAST BERM TOE	10/11/25	PATCH	10/11/25	PASS	WPA
R-193	P139,P136,P135	10' NORTH BERM TOE / 13' EAST BERM TOE (FULL WIDTH OF P-137)	10/11/25	PATCH	10/11/25	PASS	WPA
R-194	P139,P135,P134	4' NORTH BERM TOE / 13' EAST BERM TOE (FULL WIDTH OF P-136)	10/11/25	PATCH	10/11/25	PASS	WPA
R-195	P139,P134,P133	30' NORTH BERM TOE / 13' EAST BERM TOE (FULL WIDTH OF P-134)	10/11/25	PATCH	10/11/25	PASS	WPA
R-196	P139,P133	52' NORTH BERM TOE / 13' EAST BERM TOE (FULL WIDTH OF P-133)	10/11/25	PATCH	10/11/25	PASS	WPA
R-197	P139,P133,P132	74' NORTH BERM TOE / 13' EAST BERM TOE (FULL WIDTH OF P-132)	10/11/25	PATCH	10/11/25	PASS	WPA
R-198	P139,P132,P131	88' NORTH BERM TOE / 13' EAST BERM TOE	10/11/25	PATCH	10/11/25	PASS	WPA
R-199	P139,P131	100' NORTH BERM TOE / 13' EAST BERM TOE (FULL WIDTH OF P-131)	10/11/25	PATCH	10/11/25	PASS	WPA
R-200	P139,P131,P120	123' NORTH BERM TOE / 13' EAST BERM TOE	10/11/25	PATCH	10/11/25	PASS	WPA
R-201	P139,P130,P129	139' NORTH BERM TOE / 13' EAST BERM TOE	10/11/25	PATCH	10/11/25	PASS	WPA
R-202	P139,P129,P128	160' NORTH BERM TOE / 13' EAST BERM TOE	10/11/25	PATCH	10/11/25	PASS	WPA
R-203	P139,P128	176' NORTH BERM TOE / 13' EAST BERM TOE	10/11/25	PATCH	10/11/25	PASS	WPA
R-204	P139,P127	190' NORTH BERM TOE / 13' EAST BERM TOE	10/11/25	PATCH	10/11/25	PASS	WPA
R-205	P139,P127	201' NORTH BERM TOE / 13' EAST BERM TOE	10/11/25	PATCH	10/11/25	PASS	WPA
DS-1	P11,P12	312' NORTH BERM TOE / 22' TOP OF BERM	10/1/25	PATCH	10/3/25	PASS	WPA
DS-2	P24,P25	58' SOUTH WEST CORNER CELL 5 / 20' TOP OF BERM	10/1/25	PATCH	10/3/25	PASS	WPA
DS-3	P36,P37	346' SOUTH WEST CORNER CELL 5 / 27' TOP OF BERM	10/1/25	PATCH	10/3/25	PASS	WPA
DS-4	P46,P47	528' SOUTH WEST CORNER CELL 5 / 49' TOP OF BERM	10/1/25	PATCH	10/3/25	PASS	WPA
DS-5	P19,P20,P56	50' SOUTH BERM TOE OF SLOPE / 5' WEST BERM TOE OF SLOPE	10/1/25	PATCH	10/3/25	PASS	WPA
DS-6	P56,P57	107' NORTH BERM TOE OF SLOPE / 28' WEST BERM TOE OF SLOPE	10/1/25	PATCH	10/3/25	PASS	WPA
DS-7	P57,P58	394' NORTH BERM TOE OF SLOPE / 50' WEST BERM TOE OF SLOPE	10/1/25	PATCH	10/3/25	PASS	WPA
DS-8	P59,P60	178' NORTH BERM TOE OF SLOPE / 74' WEST BERM TOE OF SLOPE	10/1/25	PATCH	10/3/25	PASS	WPA
DS-9	P59,P60	239' NORTH BERM TOE OF SLOPE / 98' WEST BERM TOE OF SLOPE	10/1/25	PATCH	10/3/25	PASS	WPA
DS-10	P60,P61	284'NORTH BERM TOE OF SLOPE / 121' WEST BERM TOE OF SLOPE	10/1/25	PATCH	10/3/25	PASS	WPA
DS-11	P61,P62	121' NORTH BERM TOE OF SLOPE / 147' WEST BERM TOE OF SLOPE	10/1/25	PATCH	10/3/25	PASS	WPA
DS-12	P63,P62	432' SOUTH BERM TOE OF SLOPE / 172'WEST BERM TOE OF SLOPE	10/1/25	PATCH	10/3/25	PASS	WPA
DS-13	P63,P64	58' NORTH BERM TOE OF SLOPE / 195' WEST BERM TOE OF SLOPE	10/1/25	PATCH	10/3/25	PASS	WPA
DS-14	P32,P64	6' SOUTH BERM TOE OF SLOPE / 216'WEST BERM TOE OF SLOPE	10/1/25	PATCH	10/3/25	PASS	WPA
DS-15	P64,P65	506' SOUTH BERM TOE OF SLOPE / 195' WEST BERM TOE OF SLOPE	10/1/25	PATCH	10/3/25	PASS	WPA
DS-16	P65,P66	75' SOUTH BERM TOE OF SLOPE / 243' WEST BERM TOE OF SLOPE	10/1/25	PATCH	10/3/25	PASS	WPA
DS-17	P66,P67	92' NORTH BERM TOE OF SLOPE / 263' WEST BERM TOE OF SLOPE	10/1/25	PATCH	10/3/25	PASS	WPA
DS-18	P67,P68	169' SOUTH BERM TOE OF SLOPE / 241' WEST BERM TOE OF SLOPE	10/1/25	PATCH	10/3/25	PASS	WPA
DS-19	P68,P69	187' NORTH BERM TOE OF SLOPE / 315' WEST BERM TOE OF SLOPE	10/1/25	PATCH	10/3/25	PASS	WPA
DS-20	P69,P70	263' SOUTH BERM TOE OF SLOPE / 339' WEST BERM TOE OF SLOPE	10/1/25	PATCH	10/3/25	PASS	WPA
DS-21	P70,P71	277' NORTH BERM TOE OF SLOPE / 387' WEST BERM TOE OF SLOPE	10/1/25	PATCH	10/3/25	PASS	WPA
DS-22	P71,P72	365' SOUTH BERM TOE OF SLOPE / 387' WEST BERM TOE OF SLOPE	10/1/25	PATCH	10/3/25	PASS	WPA
DS-23	P72,P73	373' NORTH BERM TOE OF SLOPE / 411' WEST BERM TOE OF SLOPE	10/1/25	PATCH	10/3/25	PASS	WPA
DS-24	P73,P74	30' NORTH BERM TOE OF SLOPE / 435' WEST BERM TOE OF SLOPE	10/1/25	PATCH	10/3/25	PASS	WPA

Repair Codes:

P = Patch B = Bead GW = Grind and Weld R = Reconstructed Seam T = Topping Along Fusion Seam CAP = Cap on Seam

GEOMEMBRANE DEFECT, REPAIR, & NON-DESTRUCT LOG

Project Name: **CCSWDA Legacy Landfill Cell 5**

Project Location: **Craighead County, AR**

Olsson Project Number: **025-04399**

Panel and/or Seam Number		Approximate Location	Repair Information		Non-Destructive Test Data		
			Repair Date	Repair Type	Date Vacuum Test Completed	Pass/ Fail	CQA Monitor
DS-25	P74,P75	22' SOUTH BERM TOE OF SLOPE / 459' WEST BERM TOE OF SLOPE	10/1/25	PATCH	10/3/25	PASS	WPA
DS-26	P43,P44	12' SOUTH BERM TOE OF SLOPE / 456' WEST BERM TOE OF SLOPE	10/1/25	PATCH	10/3/25	PASS	WPA
DS-27	P75,P76	50' NORTH BERM TOE OF SLOPE / 483' WEST BERM TOE OF SLOPE	10/1/25	PATCH	10/3/25	PASS	WPA
DS-28	P76,P77	140' SOUTH BERM TOE OF SLOPE / 507' WEST BERM TOE OF SLOPE	10/1/25	PATCH	10/3/25	PASS	WPA
DS-29	P77,P78	244' NORTH BERM TOE OF SLOPE / 531' WEST BERM TOE OF SLOPE	10/2/25	PATCH	10/3/25	PASS	WPA
DS-30	P78,P79	141' NORTH BERM TOE OF SLOPE / 555' WEST BERM TOE OF SLOPE	10/2/25	PATCH	10/3/25	PASS	WPA
DS-31	P79,P80	30' SOUTH BERM TOE OF SLOPE / 579' WEST BERM TOE OF SLOPE	10/2/25	PATCH	10/3/25	PASS	WPA
DS-32	P79,P80	12' NORTH BERM TOE OF SLOPE / 579' WEST BERM TOE OF SLOPE	10/2/25	PATCH	10/3/25	PASS	WPA
DS-33	P80,P81	70' SOUTH BERM TOE OF SLOPE / 603' WEST BERM TOE OF SLOPE	10/2/25	PATCH	10/3/25	PASS	WPA
DS-34	P81,P82	181' NORTH BERM TOE OF SLOPE / 627' WEST BERM TOE OF SLOPE	10/2/25	PATCH	10/3/25	PASS	WPA
DS-35	P82,P83	264' SOUTH BERM TOE OF SLOPE / 651' WEST BERM TOE OF SLOPE	10/2/25	PATCH	10/3/25	PASS	WPA
DS-36	P83,P84	382' NORTH BERM TOE OF SLOPE / 675' WEST BERM TOE OF SLOPE	10/2/25	PATCH	10/3/25	PASS	WPA
DS-37	P84,P94	25' NORTH BERM TOE OF SLOPE / 700' WEST BERM TOE OF SLOPE	10/2/25	PATCH	10/3/25	PASS	WPA
DS-38	P84,P94	59' SOUTH BERM TOE OF SLOPE / 700' WEST BERM TOE OF SLOPE	10/2/25	PATCH	10/3/25	PASS	WPA
DS-39	P94,P95	314' SOUTH BERM TOE OF SLOPE / 723' WEST BERM TOE OF SLOPE	10/2/25	PATCH	10/2/25	PASS	WPA
DS-40	P95,P96	747' NORTH BERM TOE OF SLOPE / 233' WEST BERM TOE OF SLOPE	10/2/25	PATCH	10/3/25	PASS	WPA
DS-41	P96,P97	352' NORTH BERM TOE OF SLOPE / 809' WEST BERM TOE OF SLOPE	10/2/25	PATCH	10/4/25	PASS	WPA
DS-42	P97,P98	438' SOUTH BERM TOE OF SLOPE / 809' WEST BERM TOE OF SLOPE	10/2/25	PATCH	10/4/25	PASS	WPA
DS-43	P89,P98	3' SOUTH BERM TOE OF SLOPE /	10/2/25	PATCH	10/4/25	PASS	WPA
DS-44	P98,P99	55' NORTH BERM TOE OF SLOPE / 833' WEST BERM TOE OF SLOPE	10/2/25	PATCH	10/4/25	PASS	WPA
DS-45	P99,P100	150' SOUTH BERM TOE OF SLOPE / 857' WEST BERM TOE OF SLOPE	10/2/25	PATCH	10/4/25	PASS	WPA
DS-46	P100,P101	268' NORTH BERM TOE OF SLOPE / 881' WEST BERM TOE OF SLOPE	10/2/25	PATCH	10/4/25	PASS	WPA
DS-47	P101,P102	366' SOUTH BERM TOE OF SLOPE / 905' WEST BERM TOE OF SLOPE	10/2/25	PATCH	10/4/25	PASS	WPA
DS-48	P102,P103	14' SOUTH BERM TOE OF SLOPE / 929' WEST BERM TOE OF SLOPE	10/2/25	PATCH	10/4/25	PASS	WPA
DS-49	P102,P103	36' NORTH BERM TOE OF SLOPE / 929' WEST BERM TOE OF SLOPE	10/2/25	PATCH	10/4/25	PASS	WPA
DS-50	P103,P104	50' SOUTH BERM TOE OF SLOPE / 11' EAST BERM TOE OF SLOPE	10/4/25	PATCH	10/5/25	PASS	WPA
DS-51	P114,P115	S51' UP FROM SOUTH BERM TOE OF SLOPE / EAST BERM TOE CORNER ALONG EAST SLOPE BERM BREAK LINE	10/4/25	PATCH	10/5/25	PASS	WPA
DS-52	P121,P122	137' SOUTH BERM TOE OF SLOPE / 9' EAST BERM TOE OF SLOPE (EAST OF)	10/5/25	PATCH	10/5/25	PASS	WPA
DS-53	P127,P139	275' SOUTH BERM TOE OF SLOPE / 11' EAST BERM TOE OF SLOPE	10/5/25	PATCH	10/5/25	PASS	WPA
DS-54	P132,P139	396' SOUTH BERM TOE OF SLOPE / 11' EAST BERM TOE OF SLOPE	10/5/25	PATCH	10/5/25	PASS	WPA
DS-55	P137,P139	36' SOUTH BERM TOE OF SLOPE / 11' EAST BERM TOE OF SLOPE	10/5/25	PATCH	10/5/25	PASS	WPA
DS-56	P105,P138	38' SOUTH BERM TOE OF SLOPE / 63' EAST BERM TOE OF SLOPE	10/9/25	PATCH	10/9/25	PASS	WPA
DS-57	P138,P139	21' NORTH BERM TOE OF SLOPE / 39' EAST BERM TOE OF SLOPE	10/9/25	PATCH	10/9/25	PASS	WPA

Repair Codes:

P = Patch B = Bead GW = Grind and Weld R = Reconstructed Seam T = Topping Along Fusion Seam CAP = Cap on Seam

APPENDIX S
GEOMEMBRANE – DESTRUCTIVE SAMPLE FIELD LOG AND LABORATORY REPORTS

DESTRUCTIVE SAMPLE FIELD TEST LOG

Project Name: **CCSWDA Legacy Landfill Cell 5**

Project Location: **Craighead County, AR**

Olsson Project Number: **025-04399**

Project Specifications:

Fusion Welds:
Peel: ≥ 90 psi
Shear ≥ 120 psi

Extrusion Welds:
Peel: ≥ 78 psi
Shear ≥ 120 psi

					Seaming Machine Settings					Peel Tests						Shear Tests							
Sample Number	Seam Number P / P	Material/ Material	Date	Time	Ambient Temp (F)	Operator ID	Machine ID	Machine Temp or Ext. P.H.	Speed	Side	1 A/B (psi)	2 A/B (psi)	3 A/B (psi)	4 A/B (psi)	5 A/B (psi)	1 (psi)	2 (psi)	3 (psi)	4 (psi)	5 (psi)	Pass/ Fail Field	Pass/ Fail Lab	CQA Monitor
DS-1	P 11 / P 12	T	9/27/25	9:52	76	LV	1	860	500.0	A	107	122	103	96	102	154	157	155	153	154	P	P	WPA
										B	95	97	110	109	98								
DS-2	P 24 / P 25	T	9/27/25	10:21	76	LV	1	860	500.0	A	108	96	114	114	100	152	155	153	153	149	P	P	WPA
										B	107	98	112	115	102								
DS-3	P 36 / P 37	T	9/27/25	13:45	83	LV	1	860	500.0	A	114	96	117	116	107	148	150	151	150	150	P	P	WPA
										B	107	115	107	118	108								
DS-4	P 46 / P 47	S	9/27/25	14:39	83	LV	1	860	500.0	A	105	107	104	107	108	142	146	144	145	144	P	P	WPA
										B	115	112	102	113	118								
DS-5	P 56 / P 20	S/T	9/28/25	11:01	77	LV	1	860	500.0	A	134	127	124	101	107	134	133	135	137	135	P	P	WPA
										B	110	118	109	120	112								
DS-6	P 56 / P 57	S	9/28/25	9:08	74	SK	9	860	400.0	A	112	109	105	114	107	126	126	119	123	120	P	P	WPA
										B	100	102	104	102	102								
DS-7	P 57 / P 58	S	9/28/25	9:27	74	SC	5	860	550.0	A	92	93	94	99	94	130	129	128	131	121	P	P	WPA
										B	95	100	102	91	94								
DS-8	P 58 / P 59	S	9/28/25	10:26	75	SK	9	860	400.0	A	119	117	99	97	103	133	134	120	122	131	P	P	WPA
										B	97	97	95	94	102								
DS-9	P 59 / P 60	S	9/28/25	10:40	76	SK	5	860	550.0	A	93	92	106	92	112	124	124	123	126	127	P	P	WPA
										B	97	96	96	98	99								
DS-10	P 60 / P 61	S	9/28/25	11:18	75	LV	1	860	550.0	A	95	106	98	111	109	125	126	126	127	125	P	P	WPA
										B	101	101	103	103	100								
DS-11	P 61 / P 62	S	9/28/25	11:28	76	SK	9	860	500.0	A	99	93	110	118	97	125	126	126	124	126	P	P	WPA
										B	108	100	103	101	99								
DS-12	P 63 / P 62	S	9/28/25	12:30	75	SK	9	860	500.0	A	109	104	99	95	110	127	126	127	127	127	P	P	WPA
										B	99	102	91	90	105								
DS-13	P 63 / P 64	S	9/28/25	13:54	76	LV	1	860	550.0	A	95	93	93	92	101	125	125	123	121	121	P	P	WPA
										B	107	105	100	96	95								
DS-14	P 64 / P 32	S/T	9/28/25	14:58	86	SK	5	860	550.0	A	129	122	122	118	125	125	127	125	127	125	P	P	WPA
										B	130	116	114	111	119								
DS-15	P 64 / P 65	S	9/28/25	14:09	86	SC	5	860	550.0	A	96	98	108	95	96	127	125	126	127	127	P	P	WPA
										B	92	92	104	97	97								
DS-16	P 65 / P 66	S	9/28/25	8:28	86	SC	5	860	550.0	A	97	99	94	95	102	131	131	131	133	133	P	P	WPA
										B	100	98	96	97	99								
DS-17	P 66 / P 67	S	9/28/25	8:27	86	LV	1	860	550.0	A	109	109	96	113	109	133	136	131	132	135	P	P	WPA
										B	105	102	103	98	100								

Material Type Legend:

60S - 60-Mil Smooth LLDPE Geomembrane 40S - 40-Mil Smooth LLDPE Geomembrane
60T - 60-Mil Textured LLDPE Geomembrane 40T - 40-Mil Textured LLDPE Geomembrane

DESTRUCTIVE SAMPLE FIELD TEST LOG

Project Name: **CCSWDA Legacy Landfill Cell 5**

Project Location: **Craighead County, AR**

Olsson Project Number: **025-04399**

Project Specifications:

Fusion Welds: Peel: ≥ 90 psi Shear ≥ 120 psi

Extrusion Welds: Peel: ≥ 78 psi Shear ≥ 120 psi

					Seaming Machine Settings					Peel Tests						Shear Tests							
Sample Number	Seam Number P / P	Material/ Material	Date	Time	Ambient Temp (F)	Operator ID	Machine ID	Machine Temp or Ext. P.H.	Speed	Side	1 A/B (psi)	2 A/B (psi)	3 A/B (psi)	4 A/B (psi)	5 A/B (psi)	1 (psi)	2 (psi)	3 (psi)	4 (psi)	5 (psi)	Pass/ Fail Field	Pass/ Fail Lab	CQA Monitor
DS-18	P 67 / P 68	S	9/29/25	8:48	77	SK	9	860	550.0	A	104	106	109	100	108	129	130	129	131	129	P	P	WPA
										B	99	102	105	107	102								
DS-19	P 68 / P 69	S	9/29/25	9:40	77	LV	1	860	550.0	A	101	103	108	107	118	130	133	128	129	130	P	P	WPA
										B	105	103	99	102	105								
DS-20	P 69 / P 70	S	9/29/25	9:55	77	SC	5	860	550.0	A	92	92	98	104	95	129	128	129	133	127	P	P	WPA
										B	92	93	93	101	99								
DS-21	P 70 / P 71	S	9/29/25	10:30	78	SK	9	860	550.0	A	98	102	113	115	109	133	134	136	135	134	P	P	WPA
										B	104	104	109	98	110								
DS-22	P 71 / P 72	S	9/29/25	11:00	79	LV	1	860	550.0	A	109	104	100	102	100	125	126	125	127	125	P	P	WPA
										B	111	95	107	106	108								
DS-23	P 72 / P 73	S	9/29/25	11:14	79	SC	5	860	550.0	A	113	108	98	102	98	133	128	131	132	138	P	P	WPA
										B	99	98	101	99	97								
DS-24	P 73 P 74	S	9/25/25	11:30	79	SK	9	860	550.0	A	108	96	120	105	114	144	142	144	143	146	P	P	WPA
										B	105	108	99	107	105								
DS-25	P 74 / P 75	S	9/29/25	13:32	85	SC	5	860	550.0	A	106	117	100	107	104	147	141	142	145	143	P	P	WPA
										B	101	109	115	110	107								
DS-26	P 43 / P 44	T	9/27/25	14:33	85	SC	5	860	550.0	A	108	111	97	105	108	137	140	138	139	138	P	P	WPA
										B	110	109	115	101	106								
DS-27	P 75 / P 76	S	9/29/25	13:55	86	SC	5	860	550.0	A	96	95	107	107	105	139	141	139	136	140	P	P	WPA
										B	100	99	102	98	104								
DS-28	P 76 / P 77	S	9/29/25	15:58	86	LV	1	860	550.0	A	107	97	101	100	104	149	150	151	151	148	P	P	WPA
										B	105	102	99	101	103								
DS-29	P 77 / P 78	S	9/29/25	15:21	86	SC	5	860	550.0	A	108	95	99	100	102	135	133	136	137	1369	P	P	WPA
										B	104	98	100	96	105								
DS-30	P 78 / P 79	S	9/29/25	15:42	86	SK	9	860	550.0	A	97	118	114	109	105	139	137	140	141	141	P	P	WPA
										B	103	110	107	104	106								
DS-31	P 79 / P 80	S	9/30/25	8:09	76	SC	5	860	550.0	A	116	104	101	105	104	138	137	139	141	137	P	P	WPA
										B	109	112	105	107	108								
DS-32	P 79 / P 80	S	9/30/25	8:09	76	SC	5	860	550.0	A	111	109	97	103	105	141	141	138	140	136	P	P	WPA
										B	108	112	98	99	104								
DS-33	P 80 / P 81	S	9/30/25	8:30	78	LV	1	860	550.0	A	95	100	111	108	105	134	136	135	135	134	P	P	WPA
										B	97	103	99	105	109								
DS-34	P 81 / P 82	S	9/30/25	8:51	78	SK	9	860	550.0	A	101	105	109	105	107	131	131	132	133	133	P	P	WPA
										B	104	103	99	101	108								

Material Type Legend:

60S - 60-Mil Smooth LLDPE Geomembrane 40S - 40-Mil Smooth LLDPE Geomembrane

60T - 60-Mil Textured LLDPE Geomembrane 40T - 40-Mil Textured LLDPE Geomembrane

DESTRUCTIVE SAMPLE FIELD TEST LOG

Project Name: **CCSWDA Legacy Landfill Cell 5**

Project Location: **Craighead County, AR**

Olsson Project Number: **025-04399**

Project Specifications:

Fusion Welds: Peel: ≥ 90 psi Shear ≥ 120 psi

Extrusion Welds: Peel: ≥ 78 psi Shear ≥ 120 psi

					Seaming Machine Settings					Peel Tests						Shear Tests							
Sample Number	Seam Number P / P	Material/ Material	Date	Time	Ambient Temp (F)	Operator ID	Machine ID	Machine Temp or Ext. P.H.	Speed	Side	1 A/B (psi)	2 A/B (psi)	3 A/B (psi)	4 A/B (psi)	5 A/B (psi)	1 (psi)	2 (psi)	3 (psi)	4 (psi)	5 (psi)	Pass/ Fail Field	Pass/ Fail Lab	CQA Monitor
DS-35	P 82 / P 83	S	9/30/25	9:34	85	SC	5	860	500.0	A	99	97	95	97	99	130	131	131	137	140	P	P	WPA
										B	103	100	101	97	99								
DS-36	P 83 / P 84	S	9/30/25	9:51	85	LV	1	860	550.0	A	115	97	97	102	104	134	135	131	130	135	P	P	WPA
										B	110	96	100	98	103								
DS-37	P 84 / P 94	S	9/30/25	13:55	86	SC	5	860	550.0	A	103	95	97	100	98	130	130	130	132	131	P	P	WPA
										B	98	100	96	101	97								
DS-38	P 84 / P 94	S	9/30/25	14:33	86	SC	5	860	550.0	A	102	99	95	101	103	132	132	131	129	133	P	P	WPA
										B	105	103	100	97	102								
DS-39	P 94 / P 95	S	9/30/25	14:33	86	LV	1	860	550.0	A	116	106	99	111	104	139	139	130	129	132	132	P	WPA
										B	109	105	103	98	102								
DS-40	P 95 / P 96	S	9/30/25	15:10	85	SK	9	860	550.0	A	100	97	101	102	98	130	130	127	129	132	P	P	WPA
										B	99	102	100	103	99								
DS-41	P 96 / P 97	S	10/2/25	9:47	74	SC	5	860	550.0	A	97	95	108	112	105	127	129	132	130	130	P	P	WPA
										B	105	101	49	97	107								
DS-42	P 97 / P 98	S	10/2/25	9:38	75	LV	1	860	550.0	A	116	116	108	105	116	167	169	169	170	167	P	P	WPA
										B	119	100	119	102	109								
DS-43	P 98 / P 89	S/T	10/2/25	11:20	77	SC	5	860	550.0	A	115	100	145	144	111	161	163	158	170	156	P	P	WPA
										B	127	129	134	129	127								
DS-44	P 98 / P 99	S	10/2/25	8:05	77	SK	9	860	550.0	A	108	136	105	105	136	171	171	171	134	170	P	P	WPA
										B	113	100	104	113	108								
DS-45	P 99 / P 100	S	10/2/25	9:49	87	LV	1	860	550.0	A	126	120	126	107	118	165	165	167	168	164	P	P	WPA
										B	133	140	116	119	115								
DS-46	P 100 / P 101	S	10/2/25	9:53	87	SC	5	860	550.0	A	104	105	107	111	96	164	164	164	165	164	P	P	WPA
										B	103	98	102	110	111								
DS-47	P 101 / P 102	S	10/2/25	9:55	88	SK	9	860	550.0	A	135	132	98	102	128	163	165	159	161	160	P	P	WPA
										B	114	102	98	98	110								
DS-48	P 102 / P 103	S	10/4/25	9:03	75	LV	1	860	550.0	A	127	116	125	114	120	173	173	173	174	172	P	P	WPA
										B	110	99	105	116	111								
DS-49	P 102 / P 103	S	10/4/25	9:03	75	LV	1	860	550.0	A	106	98	101	112	109	169	171	170	170	171	P	P	WPA
										B	105	107	115	121	118								
DS-50	P 103 / P 104	S	10/4/25	9:20	75	SC	5	860	550.0	A	105	106	99	110	106	165	167	165	167	167	P	P	WPA
										B	109	114	110	105	116								
DS-51	P 114 / P 115	T	10/4/25	13:34	81	LV	1	860	550.0	A	102	115	129	123	110	183	184	184	185	181	P	P	WPA
										B	121	118	107	123	119								

Material Type Legend:

60S - 60-Mil Smooth LLDPE Geomembrane 40S - 40-Mil Smooth LLDPE Geomembrane

60T - 60-Mil Textured LLDPE Geomembrane 40T - 40-Mil Textured LLDPE Geomembrane

DESTRUCTIVE SAMPLE FIELD TEST LOG

Project Name: **CCSWDA Legacy Landfill Cell 5**

Project Location: **Craighead County, AR**

Olsson Project Number: **025-04399**

Project Specifications:

Fusion Welds:
Peel: ≥ 90 psi
Shear ≥ 120 psi

Extrusion Welds:
Peel: ≥ 78 psi
Shear ≥ 120 psi

					Seaming Machine Settings					Peel Tests						Shear Tests							
Sample Number	Seam Number P / P	Material/ Material	Date	Time	Ambient Temp (F)	Operator ID	Machine ID	Machine Temp or Ext. P.H.	Speed	Side	1 A/B (psi)	2 A/B (psi)	3 A/B (psi)	4 A/B (psi)	5 A/B (psi)	1 (psi)	2 (psi)	3 (psi)	4 (psi)	5 (psi)	Pass/ Fail Field	Pass/ Fail Lab	CQA Monitor
DS-52	P 121 / P 122	T	10/4/25	11:06	74	SI	8	860	550	A	129	96	114	101	115	182	184	183	184	182	P	P	WPA
										B	119	123	121	115	112								
DS-53	P 127 / P 139	T/S	10/4/25	13:01	73	SC	12	860	550	A	113	116	140	140	128	171	171	172	176	170	P	P	WPA
										B	136	116	138	136	143								
DS-54	P 132 / P 139	T/S	10/4/25	18:06	73	LV	1	860	550	A	116	113	132	111	134	174	177	170	172	173	P	P	WPA
										B	124	128	115	138	125								
DS-55	P 137 / P 139	T/S	10/5/25	17:10	73	SK	9	860	550	A	123	121	116	142	139	161	165	170	164	165	P	P	WPA
										B	138	125	140	120	140								
DS-56	P 105 / P 138	S	10/5/25	16:50	73	SC	5	860	550	A	108	98	122	96	108	158	161	164	168	162	P	P	WPA
										B	98	110	99	99	111								
DS-57	P 138 / P 139	S	10/5/25	17:18	79	SK	9	860	550	A	109	119	98	101	107	169	170	170	173	168	P	P	WPA
										B	95	100	96	100	100								

Material Type Legend:

60S - 60-Mil Smooth LLDPE Geomembrane 40S - 40-Mil Smooth LLDPE Geomembrane
60T - 60-Mil Textured LLDPE Geomembrane 40T - 40-Mil Textured LLDPE Geomembrane

APPENDIX T
GEOCOMPOSITE – QC CERTFICATES

PATRIOT ENVIRONMENTAL
AN ESI COMPANY

220 West Carl Hubbell Blvd., #671
TEL (405) 279–6052

To:	Dumey Contracting	Date:	9/23/25
Address:	6554 Hwy 77	Job Name:	Legacy Landfill Cell 5
	Benton, MO 63736		Jonesboro, AR
Phone:		Transmittal Number:	04
Attention:	Tom Jansen	Project Number:	
Email:	tjansen@dumeycontracting.com	Submitted By:	Barrett Sawatzky

We are sending you: [X] Attached [ ] Under Separate Cover Via _____ the following items:

[ ] Shop Drawings [ ] Prints [ ] Plans [ ] Samples [ ] Specifications

[ ] Copy of Letter [ ] Change Order [ ] _____

Copies	Date	Submittal #	REV	Description	Action
1	9/23/25			Skaps - Geocomposite MQC	For Approval

Sent Via:

[X] E-Mail [ ] US Mail [ ] Overnight [ ] Hand Delivered [ ] Other _____

If enclosures are not as noted, please notify us at once……..

September 20, 2025

Customer: **Patriot Environmental, LLC**
Customer P.O.#: **P1785**
Project: **Legacy LF, AR**
Product: **TN 180-1-6**

We hereby certify that the TN 180-1-6 drainage geocomposite, meets or exceeds the project requirements as stated in the specifications. The properties listed in this section are:

Property	Test Method	Unit	Value	Qualifier
Geonet[3]				
Thickness	ASTM D 5199	mil	175	MAV[6]
Carbon Black	ASTM D 4218	%	2.0	MAV
Tensile Strength	ASTM D 7179	lbs/in	40	MAV
Melt Flow	ASTM D 1238[2]	g/10 min	1.0	Maximum
Density	ASTM D 1505	g/cm^3	0.94	MAV
Transmissivity[1a]	ASTM D 4716	m^2/sec	1.0×10^{-3}	MAV
Composite				
Ply Adhesion	ASTM D 7005	lb/in	1.0	MAV
Transmissivity[1b]	ASTM D 4716	m^2/sec	4.0×10^{-4}	MAV
Geotextile[3 & 4]				
Fabric Weight	ASTM D 5261	oz/yd^2	6.0	MARV[5]
Grab Strength	ASTM D 4632	lbs	160	MARV
Grab Elongation	ASTM D 4632	%	50	MARV
Trap Tear Strength	ASTM D 4533	lbs	65	MARV
CBR Puncture	ASTM D 6241	lbs	435	MARV
Water Flow Rate	ASTM D 4491	gpm/ft^2	110	MARV
Permittivity	ASTM D 4491	sec^{-1}	1.5	MARV
AOS	ASTM D 4751	US Sieve	70	MaxARV
UV Resistance (Certify Only)	ASTM D 4355	%/hrs	70/500	MARV

Notes:

1a. *Transmissivity measured using water at 21 ± 2 ° C (70 ± 4 ° F) with a gradient of 0.1 and a confining pressure of 10,000 psf between steel plates after 15 minutes.*
1b. *Transmissivity measured using water at 21 ± 2 ° C (70 ± 4 ° F) with a gradient of 0.1 and a confining pressure of 10,000 psf between steel plates after 15 minutes.*
2. *Condition 190/2.16*
3. *Geotextile and Geonet properties are prior to lamination.*
4. *Geotextile data is provided by the supplier.*
5. *MARV is statistically defined as mean minus two standard deviations and it is the value which is exceeded by 97.5% of all the test data.*
6. *Minium average value*

Quality Approval

Malkesh Patel

APPROVED 5 QA

*571 Industrial Parkway, Commerce, GA 30529 * Ph : 706-336-7000 * Fax : 706-336-7007 * Email : contact@skaps.com*

Product: TN 180-1-6
Project : Legacy LF, AR

We hereby certify the following test results for the above referenced product/project :

Geocomposite			Geonet					
Roll Number	Ply Adhesion (lb/in) Side "A"	Transmissivity (m^2/sec)	Resin Lot Number	Density (g/cm^3)	Thickness (mils)	Carbon Black (%)	Tensile Strength MD (lb/in)	Transmissivity (m^2/sec)
158661010001	1.66	9.32×10^{-4}	NAHX 610312	0.9509	185	2.46	57	3.09×10^{-3}
158661010002			NAHX 610312	0.9509				
158661010003			NAHX 610312	0.9509				
158661010004			NAHX 610312	0.9509				
158661010005			NAHX 610312	0.9509				
158661010006			NAHX 610312	0.9509				
158661010007			NAHX 610312	0.9509				
158661010008			NAHX 610312	0.9509				
158661010009			NAHX 610312	0.9509				
158661010010	1.85		NAHX 610312	0.9506	182	2.32	52	
158661010011			NAHX 610312	0.9506				
158661010012			NAHX 610312	0.9506				
158661010013			NAHX 610312	0.9506				
158661010014			NAHX 610312	0.9506				
158661010015			NAHX 610312	0.9506				
158661010016			NAHX 610312	0.9506				
158661010017			NAHX 610312	0.9506				
158661010018			NAHX 610312	0.9506				
158661010019			NAHX 610312	0.9506				
158661010020	1.87	9.01×10^{-4}	NAHX 610312	0.9507	178	2.50	50	3.18×10^{-3}
158661010021			NAHX 610312	0.9507				
158661010022			NAHX 610312	0.9507				
158661010023			NAHX 610312	0.9507				
158661010024			NAHX 610312	0.9507				

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Product: TN 180-1-6
Project : Legacy LF, AR

We hereby certify the following test results for the above referenced product/project :

Geocomposite			Geonet					
Roll Number	Ply Adhesion (lb/in) Side "A"	Transmissivity (m^2/sec)	Resin Lot Number	Density (g/cm^3)	Thickness (mils)	Carbon Black (%)	Tensile Strength MD (lb/in)	Transmissivity (m^2/sec)
158661010025			NAHX 610312	0.9507				
158661010026			NAHX 610312	0.9507				
158661010027			NAHX 610312	0.9507				
158661010028			NAHX 610312	0.9507				
158661010029			NAHX 610312	0.9507				
158661010030	1.92		NAHX 610312	0.9511	189	2.54	46	
158661010031			NAHX 610312	0.9511				
158661010032			NAHX 610312	0.9511				
158661010033			NAHX 610312	0.9511				
158661010034			NAHX 610312	0.9511				
158661010035			NAHX 610312	0.9511				
158661010036			NAHX 610312	0.9511				
158661010037			NAHX 610312	0.9511				
158661010038			NAHX 610312	0.9511				
158661010039			NAHX 610312	0.9511				
158661010040	2.36	9.06×10^{-4}	NAHX 610312	0.9510	179	2.33	48	2.74×10^{-3}
158661010041			NAHX 610312	0.9510				
158661010042			NAHX 610312	0.9510				
158661010043			NAHX 610312	0.9510				
158661010044			NAHX 610312	0.9510				
158661010045			NAHX 610312	0.9510				
158661010046			NAHX 610312	0.9510				
158661010047			NAHX 610312	0.9510				
158661010048			NAHX 610312	0.9510				

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Product: TN 180-1-6
Project : Legacy LF, AR

We hereby certify the following test results for the above referenced product/project :

Geocomposite			Geonet					
Roll Number	Ply Adhesion (lb/in) Side "A"	Transmissivity (m^2/sec)	Resin Lot Number	Density (g/cm^3)	Thickness (mils)	Carbon Black (%)	Tensile Strength MD (lb/in)	Transmissivity (m^2/sec)
158661010049			NAHX 610312	0.9510				
158661010050	3.07		NAHX 610312	0.9508	190	2.31	51	
158661010051			NAHX 610312	0.9508				
158661010052			NAHX 610312	0.9508				
158661010053			NAHX 610312	0.9508				
158661010054			NAHX 610312	0.9508				
158661010055			NAHX 610312	0.9508				
158661010056			NAHX 610312	0.9508				
158661010057			NAHX 610312	0.9508				
158661010058			NAHX 610312	0.9508				
158661010059			NAHX 610312	0.9508				
158661010060	2.49	9.22×10^{-4}	NAHX 610312	0.9511	187	2.29	47	2.91×10^{-3}
158661010061			NAHX 610312	0.9511				
158661010062			NAHX 610312	0.9511				
158661010063			NAHX 610312	0.9511				
158661010064			NAHX 610312	0.9511				
158661010065			NAHX 610312	0.9511				
158661010066			NAHX 610312	0.9511				
158661010067			NAHX 610312	0.9511				
158661010068			NAHX 610312	0.9511				
158661010069			NAHX 610312	0.9511				
158661010070	3.05		NAHX 610312	0.9508	191	2.37	56	
158661010071			NAHX 610312	0.9508				
158661010072			NAHX 610312	0.9508				

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Product: TN 180-1-6
Project : Legacy LF, AR

We hereby certify the following test results for the above referenced product/project :

Geocomposite			Geonet					
Roll Number	Ply Adhesion (lb/in) Side "A"	Transmissivity (m^2/sec)	Resin Lot Number	Density (g/cm^3)	Thickness (mils)	Carbon Black (%)	Tensile Strength MD (lb/in)	Transmissivity (m^2/sec)
158661010073			NAHX 610312	0.9508				
158661010074			NAHX 610312	0.9508				
158661010075			NAHX 610312	0.9508				
158661010076			NAHX 610312	0.9508				
158661010077			NAHX 610312	0.9508				
158661010078			NAHX 610312	0.9508				
158661010079			NAHX 610312	0.9508				
158661010080	3.00	9.15×10^{-4}	NAHX 610312	0.9507	181	2.26	54	3.05×10^{-3}
158661010081			NAHX 610312	0.9507				
158661010082			NAHX 610312	0.9507				
158661010083			NAHX 610312	0.9507				
158661010084			NAHX 610312	0.9507				
158661010085			NAHX 610312	0.9507				
158661010086			NAHX 610312	0.9507				
158661010087			NAHX 610312	0.9507				
158661010088			NAHX 610312	0.9507				
158661010089			NAHX 610312	0.9507				
158661010090	2.66		NAHX 610312	0.9509	183	2.45	55	
158661010091			NAHX 610312	0.9509				
158661010092			NAHX 610312	0.9509				
158661010093			NAHX 610312	0.9509				
158661010094			NAHX 610312	0.9509				
158661010095			NAHX 610312	0.9509				
158661010096			NAHX 610312	0.9509				

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Product: TN 180-1-6
Project : Legacy LF, AR

We hereby certify the following test results for the above referenced product/project :

Geocomposite			Geonet					
Roll Number	Ply Adhesion (lb/in) Side "A"	Transmissivity (m^2/sec)	Resin Lot Number	Density (g/cm^3)	Thickness (mils)	Carbon Black (%)	Tensile Strength MD (lb/in)	Transmissivity (m^2/sec)
158661010097			NAHX 610312	0.9509				
158661010098			NAHX 610312	0.9509				
158661010099			NAHX 610312	0.9509				
158661010100	2.21	8.99×10^{-4}	NAHX 610312	0.9510	184	2.23	45	2.97×10^{-3}
158661010101			NAHX 610312	0.9510				
158661010102			NAHX 610312	0.9510				
158661010103			NAHX 610312	0.9510				
158661010104			NAHX 610312	0.9510				
158661010105			NAHX 610312	0.9510				
158661010106			NAHX 610312	0.9510				
158661010107			NAHX 610312	0.9510				
158661010108			NAHX 610312	0.9510				
158661010109			NAHX 610312	0.9510				
158661010110	2.38		NAHX 610312	0.9506	177	2.30	43	
158661010111			NAHX 610312	0.9506				
158661010112			NAHX 610312	0.9506				
158661010113			NAHX 610312	0.9506				
158661010114			NAHX 610312	0.9506				
158661010115			NAHX 610312	0.9506				
158661010116			NAHX 610312	0.9506				
158661010117			NAHX 610312	0.9506				
158661010118			NAHX 610312	0.9506				
158661010119			NAHX 610312	0.9506				
158661010120	1.98	9.47×10^{-4}	NAHX 610312	0.9511	186	2.48	44	2.92×10^{-3}

*571 Industrial Parkway, Commerce, GA 30529 * Ph : 706-336-7000 * Fax : 706-336-7007 * Email : contact@skaps.com*

Product: TN 180-1-6
Project : Legacy LF, AR

We hereby certify the following test results for the above referenced product/project :

Geocomposite			Geonet					
Roll Number	Ply Adhesion (lb/in) Side "A"	Transmissivity (m^2/sec)	Resin Lot Number	Density (g/cm^3)	Thickness (mils)	Carbon Black (%)	Tensile Strength MD (lb/in)	Transmissivity (m^2/sec)
158661010121			NAHX 610312	0.9511				
158661010122			NAHX 610312	0.9511				
158661010123			NAHX 610312	0.9511				
158661010124			NAHX 610312	0.9511				
158661010125			NAHX 610312	0.9511				
158661010126			NAHX 610312	0.9511				
158661010127			NAHX 610312	0.9511				
158661010128			NAHX 610312	0.9511				
158661010129			NAHX 610312	0.9511				
158661010130	2.95		NAHX 610312	0.9509	188	2.40	49	
158661010131			NAHX 610312	0.9509				
158661010132			NAHX 610312	0.9509				
158661010133			NAHX 610312	0.9509				
158661010134			NAHX 610312	0.9509				
158661010135			NAHX 610312	0.9509				
158661010136			NAHX 610312	0.9509				
158661010137			NAHX 610312	0.9509				
158661010138			NAHX 610312	0.9509				
158661010139			NAHX 610312	0.9509				
158661010140	2.85	9.35×10^{-4}	NAHX 610312	0.9507	180	2.41	53	3.14×10^{-3}
158661010141			NAHX 610312	0.9507				
158661010142			NAHX 610312	0.9507				
158661010143			NAHX 610312	0.9507				
158661010144			NAHX 610312	0.9507				

*571 Industrial Parkway, Commerce, GA 30529 * Ph : 706-336-7000 * Fax : 706-336-7007 * Email : contact@skaps.com*

Product: TN 180-1-6
Project : Legacy LF, AR

We hereby certify the following test results for the above referenced product/project :

Geocomposite			Geonet					
Roll Number	Ply Adhesion (lb/in) Side "A"	Transmissivity (m^2/sec)	Resin Lot Number	Density (g/cm^3)	Thickness (mils)	Carbon Black (%)	Tensile Strength MD (lb/in)	Transmissivity (m^2/sec)
158661010145			NAHX 610312	0.9507				
158661010146			NAHX 610312	0.9507				
158661010147			NAHX 610312	0.9507				
158661010148			NAHX 610312	0.9507				
158661010149			NAHX 610312	0.9507				
158661010150	3.11		NAHX 610312	0.9508	177	2.53	42	
158661010151			NAHX 610312	0.9508				
158661010152			NAHX 610312	0.9508				
158661010153			NAHX 610312	0.9508				
158661010154			NAHX 610312	0.9508				
158661010155			NAHX 610312	0.9508				
158661010156			NAHX 610312	0.9508				
158661010157			NAHX 610312	0.9508				
158661010158			NAHX 610312	0.9508				
158661010159			NAHX 610312	0.9508				
158661010160	1.77	8.84×10^{-4}	NAHX 610312	0.9510	184	2.44	47	3.17×10^{-3}
158661010161			NAHX 610312	0.9510				
158661010162			NAHX 610312	0.9510				
158661010163			NAHX 610312	0.9510				
158661010164			NAHX 610312	0.9510				
158661010165			NAHX 610312	0.9510				
158661010166			NAHX 610312	0.9510				
158661010167			NAHX 610312	0.9510				

*571 Industrial Parkway, Commerce, GA 30529 * Ph : 706-336-7000 * Fax : 706-336-7007 * Email : contact@skaps.com*

POLYETHYLENE RESIN CERTIFICATION

Customer Name : Patriot Environmental, LLC
Project Name : Legacy LF, AR
Geocomposite Manufacturer : SKAPS Industries
Geocomposite Production Plant : Commerce, GA
Geocomposite Brand Name : TN 180-1-6

We hereby certify the following test results for the above referenced product/project:

Resin Manufacturer	Resin Lot Number	Property	Test Method	Units	Resin Manufacturer Value	Tested Value*
Osterman and Company	NAHX 610312	Density	ASTM D1505	g/cm^3	0.9470	0.9461
		Melt flow Index	ASTM D1238[(a)]	g/10 min	0.25	0.14

(a) Condition 190/2.16

* Data from SKAPS Quality Control

*571 Industrial Parkway, Commerce, GA 30529 * Ph : 706-336-7000 * Fax : 706-336-7007 * Email : contact@skaps.com*

Geotextile Certification

Product: TN 180-1-6
Project : Legacy LF, AR

We hereby certify the following test results for the above referenced product/project :

GEOCOMP ROLL#	FABRIC SIDE	WEIGHT oz/yd^2	GRAB lbs. (MD)	GRAB ELG % (MD)	GRAB lbs. (XMD)	GRAB ELG % (XMD)	TRAP lbs. (MD)	TRAP lbs. (XMD)	CBR PUNCTURE lbs	AOS us sieve	WATER-FLOW gpm/ft^2	PERM-ITY sec^{-1}
158661010001	Side A	6.31	163	91	226	112	74	120	455	70	135	1.80
158661010020	Side A	6.31	163	91	226	112	74	120	455	70	135	1.80
158661010040	Side A	6.31	163	91	226	112	74	120	455	70	135	1.80
158661010060	Side A	6.39	191	76	207	107	73	130	521	70	135	1.80
158661010080	Side A	6.39	191	76	207	107	73	130	521	70	135	1.80
158661010100	Side A	6.29	164	65	236	113	87	124	465	70	136	1.82
158661010120	Side A	6.29	164	65	236	113	87	124	465	70	136	1.82
158661010140	Side A	6.41	167	75	216	101	82	112	485	70	135	1.80
158661010160	Side A	6.27	182	90	211	109	76	109	469	70	136	1.82

*571 Industrial Parkway, Commerce, GA 30529 * Ph : 706-336-7000 * Fax : 706-336-7007 * Email : contact@skaps.com*

APPENDIX U
GEOCOMPOSITE – CONFORMANCE TESTING RESULTS

SEPTEMBER 2025

SUMMARY OF SINGLE-SIDED GEOCOMPOSITE CONFORMANCE TEST RESULTS

OLSSON
CCSWDA LEGACY LF C-5
ARKANSAS

US-0048676.8029

SAMPLE DESIGNATION	Reference Value	015866-1010001	015866-1010024	015866-1010047	015866-1010070	015866-1010093	015866-1010116	015866-1010139	015866-1010162	-	-
PEEL ADHESION (ppi) ASTM D7005	>=1.0	3.9	3.5	6.3	3.3	3.5	3.6	4.3	5.4	-	-
TRANSMISSIVITY (m^2/sec) (1) ASTM D4716	>=4E-04	8.2E-04	7.2E-04	7.3E-04	7.5E-04	6.7E-04	7.5E-04	7.0E-04	7.2E-04	-	-

(1) Pressure: 10,000 psf, Gradient: 1, Seat time: 15 minutes, Configuration: Plate / specimen / plate.

SEPTEMBER 2025 US-0048676.8029

GEOCOMPOSITE TEST RESULTS

PROJECT NAME: OLSSON/CCSWDA LEGACY LF C-5/AR

ROLL DESIGNATION: 0158661010001

	PEEL ADHESION (ppi)	TRANSMISSIVITY[1] (m^2/s)
1.	2.1	8.1E-04
2.	2.7	8.3E-04
3.	7.2	
4.	5.0	
5.	2.5	
AVG	3.9	8.2E-04

ROLL DESIGNATION: 0158661010024

	PEEL ADHESION (ppi)	TRANSMISSIVITY[1] (m^2/s)
1.	2.2	7.3E-04
2.	3.5	7.1E-04
3.	7.9	
4.	3.2	
5.	0.7	
AVG	3.5	7.2E-04

ROLL DESIGNATION: 0158661010047

	PEEL ADHESION (ppi)	TRANSMISSIVITY[1] (m^2/s)
1.	6.2	7.6E-04
2.	5.1	7.1E-04
3.	9.1	
4.	4.1	
5.	6.8	
AVG	6.3	7.3E-04

ROLL DESIGNATION: 0158661010070

	PEEL ADHESION (ppi)	TRANSMISSIVITY[1] (m^2/s)
1.	2.2	7.7E-04
2.	3.5	7.3E-04
3.	8.5	
4.	1.2	
5.	1.0	
AVG	3.3	7.5E-04

(1) Pressure: 10,000 psf, Gradient: 1, Seat time: 15 minutes, Configuration: Plate / specimen / plate.

SEPTEMBER 2025 US-0048676.8029

GEOCOMPOSITE TEST RESULTS

PROJECT NAME: OLSSON/CCSWDA LEGACY LF C-5/AR

ROLL DESIGNATION: 0158661010093

	PEEL ADHESION (ppi)	TRANSMISSIVITY[1] (m^2/s)
1.	1.1	6.4E-04
2.	4.3	7.1E-04
3.	6.5	
4.	1.8	
5.	3.7	
AVG	3.5	6.7E-04

ROLL DESIGNATION: 0158661010116

	PEEL ADHESION (ppi)	TRANSMISSIVITY[1] (m^2/s)
1.	1.3	7.7E-04
2.	5.7	7.3E-04
3.	5.4	
4.	2.3	
5.	3.3	
AVG	3.6	7.5E-04

ROLL DESIGNATION: 0158661010139

	PEEL ADHESION (ppi)	TRANSMISSIVITY[1] (m^2/s)
1.	3.1	7.1E-04
2.	7.2	6.9E-04
3.	8.3	
4.	2.3	
5.	0.7	
AVG	4.3	7.0E-04

ROLL DESIGNATION: 0158661010162

	PEEL ADHESION (ppi)	TRANSMISSIVITY[1] (m^2/s)
1.	2.8	7.1E-04
2.	8.1	7.3E-04
3.	8.5	
4.	4.3	
5.	3.5	
AVG	5.4	7.2E-04

(1) Pressure: 10,000 psf, Gradient: 1, Seat time: 15 minutes, Configuration: Plate / specimen / plate.

SEPTEMBER 2025

SUMMARY OF GEONET
CONFORMANCE TEST RESULTS
OLSSON
CCSWDA LEGACY LF CELL 5
ARKANSAS

US-0048676.8029

ROLL DESIGNATION	REFERENCE VALUE	015866-1010001	015866-1010024	015866-1010047	015866-1010070	015866-1010093	015866-1010116	015866-1010139	015866-1010162	-	-
THICKNESS (mils) ASTM D5199	>=175	209	209	210	209	210	209	205	206	-	-
DENSITY (g/cc) ASTM D1505	>=0.940	0.955	0.955	0.953	0.955	0.955	0.955	0.954	0.954	-	-
CARBON BLACK CONTENT (%) ASTM D 1603	>=2.0	2.5	2.6	2.4	2.4	2.3	2.4	2.4	2.3	-	-
TENSILE STRENGTH (ppi) MD (1) ASTM D7179	>=40	50	48	48	48	50	51	51	47	-	-

(1) MD corresponds to Machine Direction.

NETSUM

SEPTEMBER 2025 US-0048676.8029

GEONET TEST RESULTS

PROJECT NAME: OLSSON/CCSWDA LEGACY LF CELL 5/AR
PROJECT NUMBER: US-0048676.8029

ROLL DESIGNATION: 0158661010001

	THICKNESS (mils)	DENSITY (g/cc)	CARBON BLACK CONTENT (%)	TENSILE STRENGTH (ppi)
1.	211.8	0.957	2.49	48.1
2.	214.6	0.955	2.59	54.1
3.	212.2	0.954		50.1
4.	210.2			43.9
5.	208.7			55.0
6.	203.9			
7.	207.1			
8.	206.3			
9.	209.1			
10.	206.7			
AVG	209	0.955	2.5	50

ROLL DESIGNATION: 0158661010024

	THICKNESS (mils)	DENSITY (g/cc)	CARBON BLACK CONTENT (%)	TENSILE STRENGTH (ppi)
1.	205.1	0.954	2.58	46.0
2.	209.8	0.954	2.60	53.4
3.	222.0	0.956		46.9
4.	210.2			42.1
5.	201.6			49.6
6.	198.4			
7.	203.9			
8.	214.2			
9.	214.6			
10.	206.7			
AVG	209	0.955	2.6	48

SEPTEMBER 2025 US-0048676.8029

GEONET TEST RESULTS

PROJECT NAME: OLSSON/CCSWDA LEGACY LF CELL 5/AR
PROJECT NUMBER: US-0048676.8029

ROLL DESIGNATION: 0158661010047

	THICKNESS (mils)	DENSITY (g/cc)	CARBON BLACK CONTENT (%)	TENSILE STRENGTH (ppi)
1.	205.9	0.954	2.40	41.9
2.	211.8	0.954	2.40	51.4
3.	217.7	0.951		43.8
4.	204.7			50.3
5.	204.3			55.3
6.	205.1			
7.	212.6			
8.	218.9			
9.	209.4			
10.	208.7			
AVG	210	0.953	2.4	48

ROLL DESIGNATION: 0158661010070

	THICKNESS (mils)	DENSITY (g/cc)	CARBON BLACK CONTENT (%)	TENSILE STRENGTH (ppi)
1.	208.7	0.956	2.39	49.5
2.	213.4	0.954	2.38	53.5
3.	213.0	0.955		43.9
4.	207.5			45.5
5.	205.9			50.0
6.	212.6			
7.	207.9			
8.	212.6			
9.	206.7			
10.	204.3			
AVG	209	0.955	2.4	48

SEPTEMBER 2025 US-0048676.8029

GEONET TEST RESULTS

PROJECT NAME: OLSSON/CCSWDA LEGACY LF CELL 5/AR
PROJECT NUMBER: US-0048676.8029

ROLL DESIGNATION: 0158661010093

	THICKNESS (mils)	DENSITY (g/cc)	CARBON BLACK CONTENT (%)	TENSILE STRENGTH (ppi)
1.	205.1	0.954	2.33	44.5
2.	207.9	0.954	2.30	54.9
3.	205.9	0.958		47.4
4.	210.2			50.5
5.	207.9			52.4
6.	209.8			
7.	216.1			
8.	216.1			
9.	210.2			
10.	207.5			
AVG	210	0.955	2.3	50

ROLL DESIGNATION: 0158661010116

	THICKNESS (mils)	DENSITY (g/cc)	CARBON BLACK CONTENT (%)	TENSILE STRENGTH (ppi)
1.	203.9	0.956	2.34	43.9
2.	203.9	0.954	2.41	50.9
3.	210.6	0.954		49.6
4.	205.9			58.6
5.	207.1			50.3
6.	207.1			
7.	211.8			
8.	218.1			
9.	213.0			
10.	203.9			
AVG	209	0.955	2.4	51

SEPTEMBER 2025 US-0048676.8029

GEONET TEST RESULTS

PROJECT NAME: OLSSON/CCSWDA LEGACY LF CELL 5/AR
PROJECT NUMBER: US-0048676.8029

ROLL DESIGNATION: 0158661010139

	THICKNESS (mils)	DENSITY (g/cc)	CARBON BLACK CONTENT (%)	TENSILE STRENGTH (ppi)
1.	199.2	0.954	2.41	46.0
2.	205.5	0.957	2.41	55.1
3.	209.8	0.952		43.0
4.	207.5			58.4
5.	194.9			53.5
6.	200.0			
7.	211.8			
8.	213.8			
9.	213.0			
10.	199.2			
AVG	205	0.954	2.4	51

ROLL DESIGNATION: 0158661010162

	THICKNESS (mils)	DENSITY (g/cc)	CARBON BLACK CONTENT (%)	TENSILE STRENGTH (ppi)
1.	207.5	0.954	2.30	43.6
2.	205.9	0.954	2.31	51.1
3.	204.7	0.955		43.5
4.	202.8			51.0
5.	199.2			47.3
6.	206.3			
7.	209.1			
8.	213.4			
9.	207.9			
10.	206.7			
AVG	206	0.954	2.3	47

APPENDIX V
PROTECTIVE COVER AND WASHED GRAVEL – TESTING RESULTS

MTA ENGINEERS

Corporate Office:
P.O. Box 23715 • Little Rock, AR 72221 • Ph. 501.753.2526
mtaengineers.com

Geotechnical Engineering • Materials Testing • Special Inspection • Design

Offices in: Little Rock, AR • Springdale, AR • Jonesboro, AR • Birmingham, AL

November 19, 2025

To: Olsson Engineers
3 Innwood Circle Ste 220
Little Rock, AR 72211

Attention: Paul Crawford PE- pcrawford@olsson.com

RE: Legacy Landfill Cell Five
Laboratory Testing

On November 6, 2025, we received samples of multiple types of stone for laboratory testing at our lab located in Little Rock, Arkansas. We tested the material in general accordance with the ASTM specifications provided. The results of these lab tests are outlined below. Additional test reports are attached.

 # 57 Redrock (Leachate Collection Trench Gravel)

ASTM D3042 Calcium Carbonate Content: 0.1% Calcite Content

Sieve Analysis (attached)

2 ½" minus rock (Leachate Collection Sump Gravel)

ASTM D3042 Calcium Carbonate Content: 0.1% Calcite Content

Sieve Analysis (attached)

Pit Run Gravel (Protective Cover Layer)

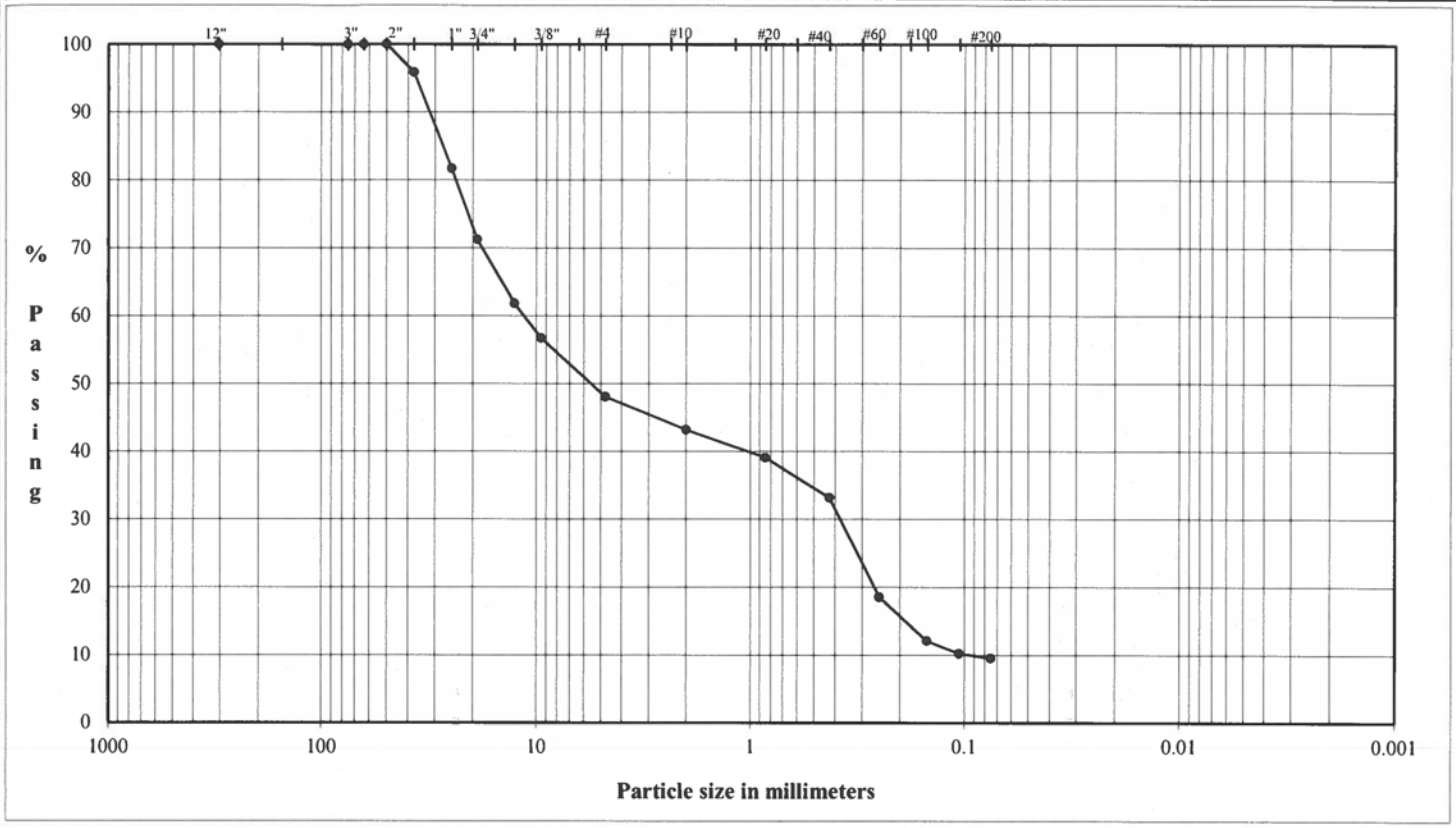
ASTM D3042 Calcium Carbonate Content: 0.15% Calcite Content

SEPTEMBER 2025 US-0048676.8029

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D6913 & D4318

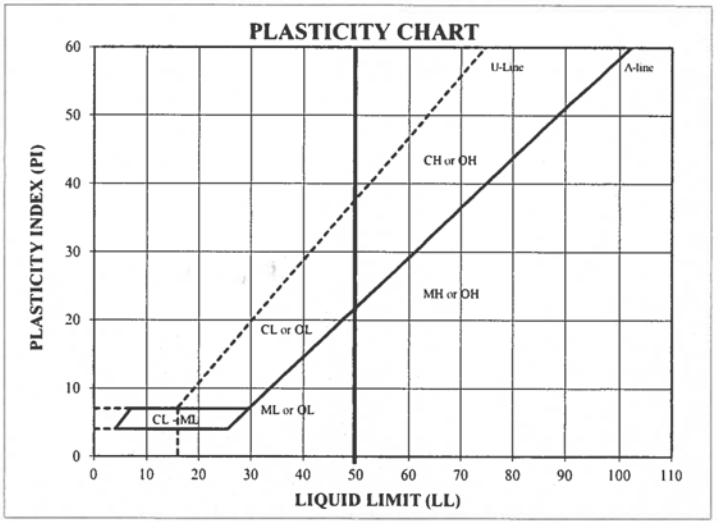
PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
SAMPLE ID: **PCL** - Depth: -
TYPE: **Bag**



COBBLES	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Particle Size Percentage
12.0"	304.8	**100.0**		
3.0"	75.0	**100.0**	Cobbles	**0.0**
2.5"	63.5	**100.0**		
2.0"	50.0	**100.0**		
1.5"	37.5	**95.9**		
1.0"	25.0	**81.7**		
0.75"	19.0	**71.2**	Coarse Gravel	**28.8**
0.50"	12.7	**61.8**		
0.375"	9.5	**56.7**		
#4	4.8	**48.1**	Fine Gravel	**23.2**
#10	2.0	**43.2**	Coarse Sand	**4.9**
#20	0.85	**39.1**		
#40	0.43	**33.2**	Medium Sand	**10.0**
#60	0.25	**18.5**		
#100	0.15	**12.1**		
#140	0.11	**10.2**		
#200	0.08	**9.5**	Fine Sand	**23.7**
			Fines	**9.5**



ATTERBERG LIMITS
Method - B (Dry preparation)

M.	LL	PL	PI	LI
1.7				

LL (oven-dried) / < 0.75 = ORGANIC (OL OH)

DESCRIPTION: GRAVEL and SAND, fine to coarse gravel, fine to coarse sand, some fines; reddish yellow.

USCS: (GP-GM)

TECH	JC
DATE	9/4/25
CHECK	M
REVIEW	DA
APPROVE	

CONSTANT HEAD PERMEABILITY TEST
ASTM D2434

PROJECT TITLE	OLSSON/CCSWDA LEGACY LF CELL 5/AR	**SAMPLE ID**	PCL
PROJECT NUMBER	US-0048676.8029	**SAMPLE TYPE**	Bag
REMARKS	-	**SAMPLE DEPTH**	-

	TIME (sec)	VOLUME (mL)	TEMP. °C	(mL/sec)	
1.	300.44	17.0	20.8	0.06	
2.	300.38	16.5	20.8	0.05	*
3.	300.37	17.0	20.8	0.06	*
4.	300.50	16.5	20.8	0.05	*
5.	300.56	17.0	20.8	0.06	*

INITIAL UNIT WEIGHT DETERMINATION

APPARATUS & WET SAMPLE (g):	14213
APPARATUS WEIGHT (g):	4240
WET SAMPLE WEIGHT (g):	9973
SAMPLE LENGTH (in):	10.0
SAMPLE DIAMETER (in):	6.5
SAMPLE AREA (in^2):	33.18
SAMPLE AREA (cm^2):	214.08
SAMPLE VOLUME (in^3):	331.83
SAMPLE VOLUME (ft^3):	0.192
WET DENSITY (pcf):	114.5
DRY DENSITY (pcf):	114.5

INITIAL MOISTURE CONTENT

WET SAMPLE & TARE (g):	
DRY SAMPLE & TARE (g):	
WEIGHT OF TARE (g):	
WEIGHT OF WATER (g):	
DRY SAMPLE WEIGHT (g):	
MOISTURE CONTENT (%):	

FINAL DIMENSIONS

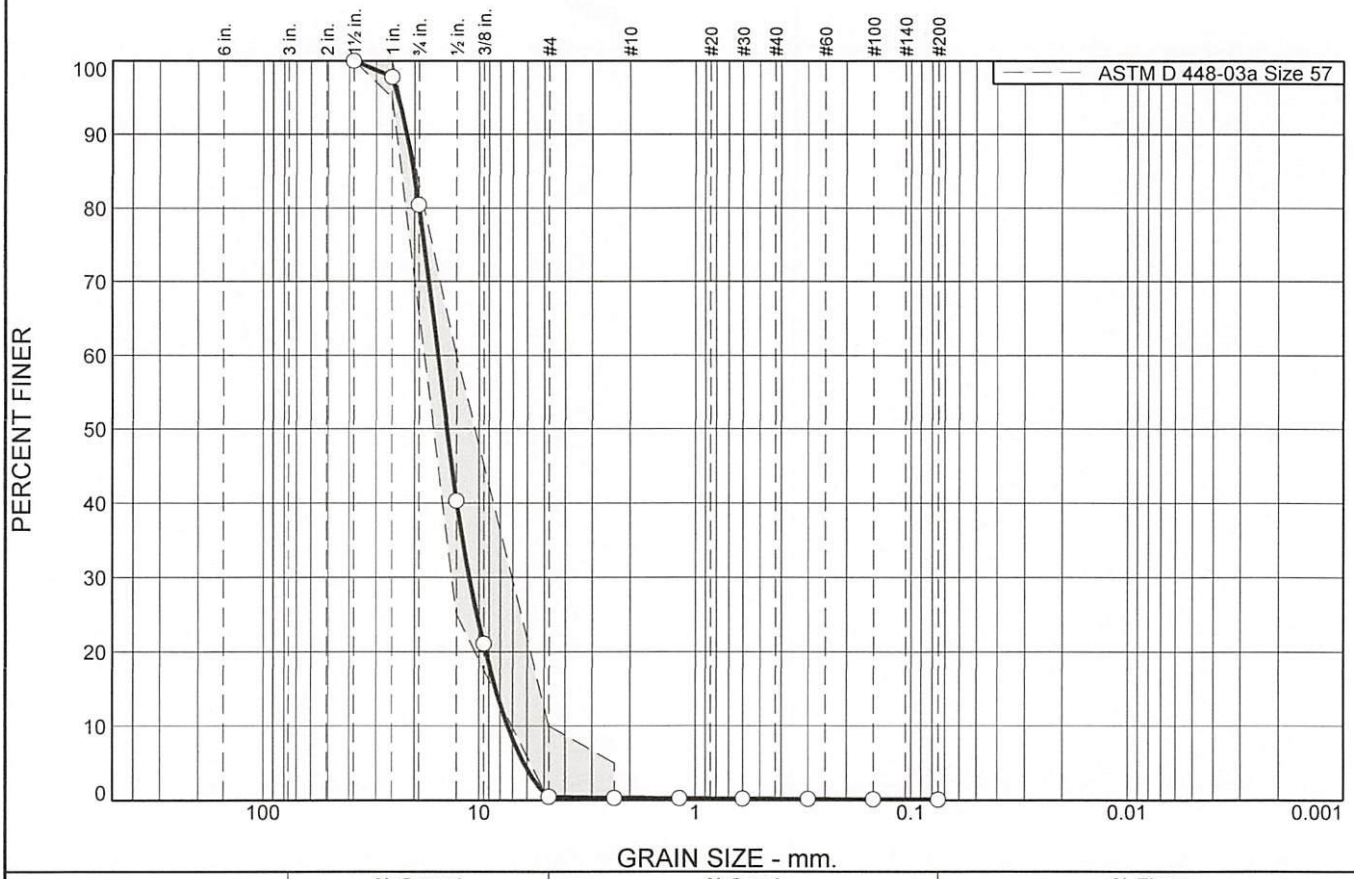
SAMPLE LENGTH (in):	10.0
SAMPLE DIAMETER (in):	6.5
AVERAGE Q VALUE (ml/sec):	0.06
AVERAGE TEMP (°C):	20.8
TEMPERATURE CORRECTION:	0.981
HEAD OF WATER (in):	2.9
HYDRAULIC GRADIENT (i):	0.29

K VALUE CORRECTED FOR 20°C = 1.3E-03 cm/sec

TECH	CJ
DATE	9/9/25
CHECK	M
REVIEW	DA
APPROVE	

Leachate Trench Gravel

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	19.6	80.0	0.1	0.1	0.1	0.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1-1/2"	100.0	100.0	
1"	97.8	95.0 - 100.0	
3/4"	80.4		
1/2"	40.3	25.0 - 60.0	
3/8"	21.1		
#4	0.4	0.0 - 10.0	
#8	0.3	0.0 - 5.0	
#16	0.2		
#30	0.2		
#50	0.2		
#100	0.1		
#200	0.1		

* ASTM D 448-03a Size 57

Soil Description

57 STONE

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 21.6238 D_{85}= 20.1432 D_{60}= 15.4986
D_{50}= 14.0697 D_{30}= 11.0956 D_{15}= 8.3762
D_{10}= 7.3599 C_u= 2.11 C_c= 1.08

Classification

USCS= GP AASHTO= A-1-a

Remarks

Location: REDROCK
Sample Number: ONE

Date: 11/10/25

CTTP LAB # 905100

Materials Testing of Arkansas

Little Rock, AR

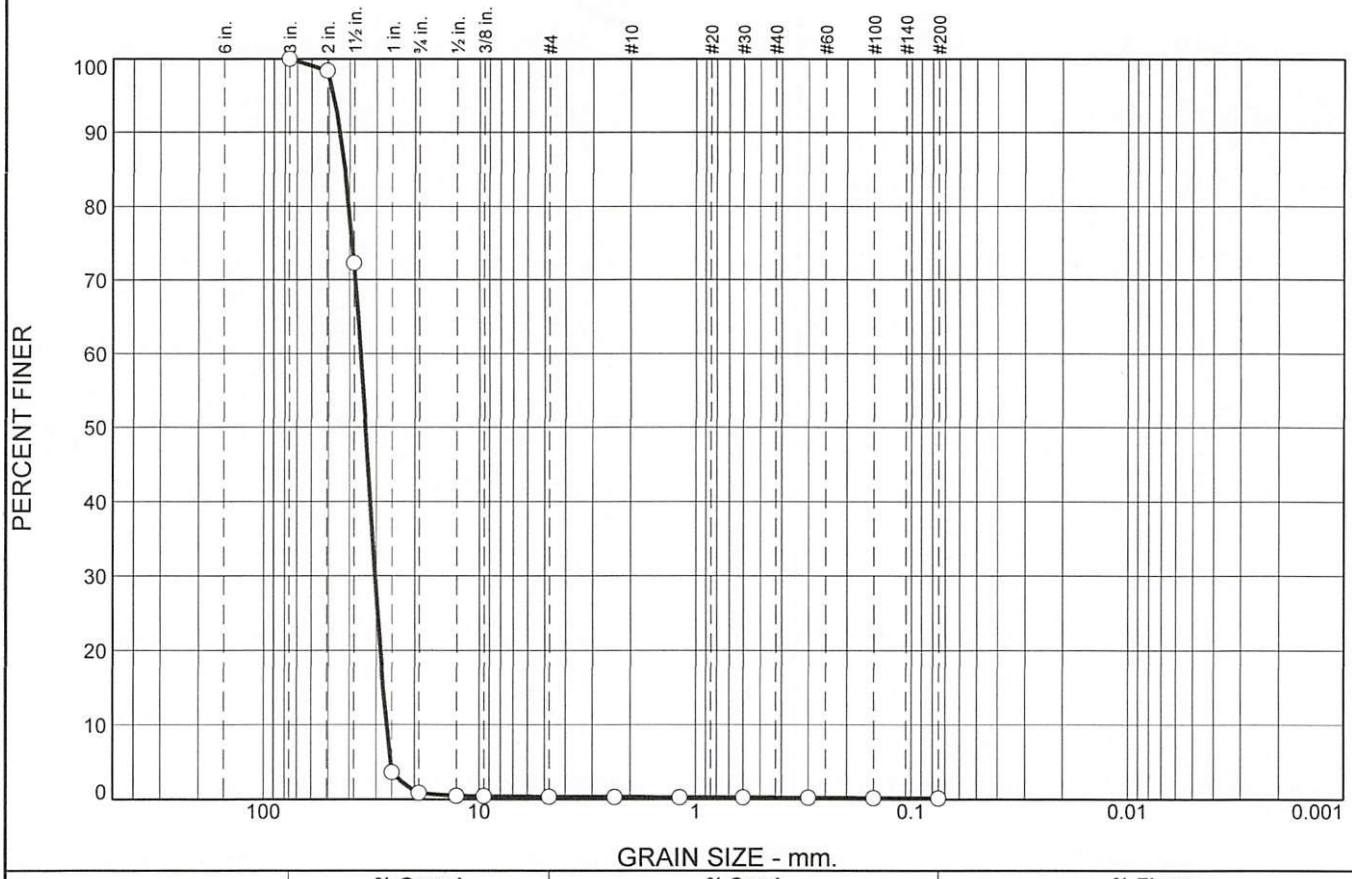
Client: OLSSON ENGINEERS
Project: LEGACY LANDFILL CELL FIVE

Project No: LR25-782 **Figure**

Tested By: SHANNON PENNINGTON **Checked By:** ANDREW ACKLEY LAB MANAGER

Leachate Sump Gravel

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	99.1	0.6	0.3				

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3"	100.0		
2"	98.4		
1 1/2"	72.3		
1"	3.6		
3/4"	0.9		
1/2"	0.5		
3/8"	0.4		
#4	0.3		
#8	0.3		
#16	0.3		
#30	0.2		
#50	0.2		
#100	0.2		
#200	0.1		

* (no specification provided)

Soil Description

2 1/2" MINUS

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 44.2379 D_{85}= 41.9909 D_{60}= 35.4704
D_{50}= 33.6660 D_{30}= 30.3904 D_{15}= 27.8708
D_{10}= 26.9141 C_u= 1.32 C_c= 0.97

Classification

USCS= GP AASHTO=

Remarks

Location: # 23 ROCK
Sample Number: ONE

Date: 11/10/25

CTTP LAB # 905100

Materials Testing of Arkansas

Little Rock, AR

Client: OLSSON ENGINEERS
Project: LEGACY LANDFILL CELL FIVE

Project No: LR25-782 **Figure**

Tested By: SHANNON PENNINGTON **Checked By:** ANDREW ACKLEY LAB MANAGER

APPENDIX W
GEOTEXTILE – CONFORMANCE TESTING RESULT

SEPTEMBER 2025

SUMMARY OF GEOTEXTILE CONFORMANCE TEST RESULTS

OLSSON
CCSWDA LEGACY LF CELL 5
ARKANSAS

US-0048676.8029

ROLL DESIGNATION	REFERENCE VALUE	015866-1010001A	015866-1010024A	015866-1010047A	015866-1010070A	015866-1010093A	015866-1010116A	015866-1010139A	015866-1010162A	-	-
MASS PER UNIT AREA (oz/yd^2) ASTM D5261	>=6.0	7.3	7.3	7.3	7.3	7.7	7.3	8.3	7.8	-	-
PUNCTURE STRENGTH (lbs) ASTM D4833	>=85	129	135	126	118	142	119	133	139	-	-
APPARENT OPENING SIZE (mm)	-	0.150	0.146	0.157	0.143	0.133	0.157	0.144	0.130	-	-
(U.S. SIEVE NO.) ASTM D4751	>=70	100	100	80	100	100	80	100	100	-	-
PERMITTIVITY (sec-1)	>=1.3	1.7	1.9	2.0	1.8	1.9	2.0	1.9	1.7	-	-
PERMEABILITY (cm/sec) (2)	-	0.51	0.55	0.57	0.56	0.56	0.55	0.56	0.56	-	-
FLOW RATE ($gal/min/ft^2$) ASTM D4491	-	130.6	143.7	150.3	135.8	141.3	146.5	142.7	130.3	-	-
GRAB STRENGTH (lbs)	>=160	193	211	205	204	217	194	245	235	-	-
MD/TD (1) ASTM D4632	>=160	207	220	215	206	227	195	221	241	-	-
GRAB ELONGATION (%)	>=50	64	69	70	72	72	70	73	76	-	-
MD/TD (1) ASTM D4632	>=50	76	81	83	81	79	83	79	80	-	-
TRAPEZOIDAL TEAR STRENGTH	>=65	92	91	90	92	96	82	94	92	-	-
(lbs) MD/TD (1) ASTM D4533	>=65	95	113	102	103	108	93	108	109	-	-

(1) MD/TD corresponds to Machine Direction / Transverse Direction.
(2) Permeability calculated by multiplying measured thickness by permittivity.

TEXTSUM.XLS

SEPTEMBER 2025 **US-0048676.8029**

GEOTEXTILE TEST RESULTS

PROJECT NAME: OLSSON/CCSWDA LEGACY LF CELL 5/AR
ROLL DESIGNATION: 0158661010001 A

	MASS PER UNIT AREA (oz/yd²)	PUNCTURE STRENGTH (pounds)	APPARENT OPENING SIZE (mm)	PERMITTIVITY (sec-1)
1.	6.67	116.2	0.126	1.69
2.	5.77	118.7	0.169	2.06
3.	7.10	122.5	0.148	1.81
4.	8.09	118.3	0.163	1.42
5.	8.79	169.0	0.143	
			0.150	1.7

			EQUIVALENT SIEVE SIZE	PERMEABILITY (cm/sec)	FLOW RATE (gal/min/ft^2)
AVG	7.3	129	100	0.51	130.6

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)	
	MD	TD	MD	TD	MD	TD
1.	244.2	246.2	57.3	84.7	124.7	87.0
2.	208.2	173.5	67.3	77.7	80.8	80.0
3.	129.5	189.0	53.3	78.3	83.8	83.0
4.	174.5	207.0	67.3	73.0	89.8	97.5
5.	182.5	219.2	68.0	69.7	94.8	100.5
6.	162.5	168.7	59.3	71.7	62.3	98.0
7.	185.5	165.0	67.7	71.7	84.5	92.3
8.	184.0	206.5	60.3	72.0	108.5	100.7
9.	227.5	252.7	73.3	78.7	91.8	104.7
10.	231.0	244.0	62.0	83.0	102.2	101.5
AVG	193	207	64	76	92	95

SEPTEMBER 2025 **US-0048676.8029**

GEOTEXTILE TEST RESULTS

PROJECT NAME: OLSSON/CCSWDA LEGACY LF CELL 5/AR
ROLL DESIGNATION: 0158661010024 A

	MASS PER UNIT AREA (oz/yd²)	PUNCTURE STRENGTH (pounds)	APPARENT OPENING SIZE (mm)	PERMITTIVITY (sec-1)
1.	6.92	132.0	0.150	1.96
2.	7.17	142.2	0.145	1.90
3.	7.69	144.2	0.128	2.03
4.	6.62	106.0	0.171	1.79
5.	8.20	152.2	0.137	
			0.146	1.9
			EQUIVALENT SIEVE SIZE	
AVG	7.3	135	100	

	PERMEABILITY (cm/sec)	FLOW RATE (gal/min/ft^2)
AVG	0.55	143.7

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)	
	MD	TD	MD	TD	MD	TD
1.	208.0	220.7	65.3	85.7	87.3	108.7
2.	234.2	238.5	77.0	84.3	94.0	130.0
3.	218.5	203.7	76.0	77.0	108.5	107.5
4.	196.7	240.0	73.7	83.3	85.8	135.0
5.	195.0	208.7	67.0	79.0	74.5	89.5
6.	206.5	227.0	82.3	74.7	87.5	123.2
7.	194.7	241.2	71.7	80.3	85.8	134.7
8.	191.7	209.5	59.0	82.3	79.8	102.7
9.	201.7	189.7	64.3	78.0	94.8	100.2
10.	266.7	219.7	57.7	89.3	115.7	96.5
AVG	211	220	69	81	91	113

SEPTEMBER 2025 **US-0048676.8029**

GEOTEXTILE TEST RESULTS

PROJECT NAME: OLSSON/CCSWDA LEGACY LF CELL 5/AR
ROLL DESIGNATION: 0158661010047 A

	MASS PER UNIT AREA (oz/yd²)	PUNCTURE STRENGTH (pounds)	APPARENT OPENING SIZE (mm)	PERMITTIVITY (sec-1)
1.	7.70	117.8	0.140	1.92
2.	7.22	120.5	0.147	2.09
3.	6.48	120.7	0.174	2.06
4.	6.85	118.0	0.177	1.97
5.	8.15	153.2	0.149	
			0.157	2.0
			EQUIVALENT SIEVE SIZE	
AVG	7.3	126	80	

	PERMEABILITY (cm/sec)	FLOW RATE (gal/min/ft²)
AVG	0.57	150.3

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)	
	MD	TD	MD	TD	MD	TD
1.	257.5	247.0	68.7	89.3	97.5	109.5
2.	226.2	221.5	70.0	77.3	80.5	109.0
3.	187.0	225.0	68.3	79.7	93.3	125.7
4.	212.0	243.0	77.7	86.3	93.5	105.7
5.	188.0	253.2	69.0	78.0	74.8	107.7
6.	199.7	202.5	76.7	77.7	82.8	72.0
7.	141.7	204.2	93.3	86.7	76.0	100.7
8.	204.7	174.2	67.3	78.0	89.3	85.0
9.	183.2	189.5	60.3	85.0	112.2	98.5
10.	249.5	193.5	51.7	89.0	104.5	102.0
AVG	205	215	70	83	90	102

SEPTEMBER 2025 **US-0048676.8029**

GEOTEXTILE TEST RESULTS

PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
ROLL DESIGNATION: **0158661010070 A**

	MASS PER UNIT AREA (oz/yd²)	PUNCTURE STRENGTH (pounds)	APPARENT OPENING SIZE (mm)	PERMITTIVITY (sec-1)
1.	7.75	122.7	0.122	1.86
2.	6.36	128.5	0.148	1.74
3.	7.98	110.5	0.148	1.75
4.	6.92	102.5	0.147	1.92
5.	7.28	123.7	0.149	
			0.143	1.8

			EQUIVALENT SIEVE SIZE	PERMEABILITY (cm/sec)	FLOW RATE (gal/min/ft^2)
AVG	7.3	118	100	0.56	135.8

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)	
	MD	TD	MD	TD	MD	TD
1.	265.7	190.0	58.7	89.7	97.3	112.5
2.	210.7	238.5	74.7	84.3	90.0	101.0
3.	208.5	184.7	68.0	83.7	99.3	91.5
4.	153.0	177.5	86.3	78.7	79.8	95.0
5.	208.0	213.7	74.7	72.3	94.3	111.5
6.	202.7	187.5	72.0	76.3	86.3	85.0
7.	165.5	210.0	74.3	77.0	86.8	104.7
8.	200.0	198.5	85.7	76.7	101.5	112.5
9.	201.0	243.2	63.7	82.3	95.5	135.0
10.	227.0	217.7	63.3	86.0	93.5	86.0
AVG	204	206	72	81	92	103

SEPTEMBER 2025 **US-0048676.8029**

GEOTEXTILE TEST RESULTS

PROJECT NAME: OLSSON/CCSWDA LEGACY LF CELL 5/AR
ROLL DESIGNATION: 0158661010093 A

	MASS PER UNIT AREA (oz/yd²)	PUNCTURE STRENGTH (pounds)	APPARENT OPENING SIZE (mm)	PERMITTIVITY (sec-1)
1.	8.41	146.2	0.131	1.79
2.	8.26	153.7	0.125	1.79
3.	6.53	148.0	0.135	2.36
4.	7.05	124.5	0.143	1.61
5.	8.25	136.7	0.133	
			0.133	1.9

			EQUIVALENT SIEVE SIZE	PERMEABILITY (cm/sec)	FLOW RATE (gal/min/ft^2)
AVG	7.7	142	100	0.56	141.3

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)	
	MD	TD	MD	TD	MD	TD
1.	243.0	243.0	65.3	89.3	102.2	109.7
2.	237.7	216.5	75.3	75.7	95.5	112.7
3.	176.7	207.2	66.7	72.7	79.0	115.2
4.	189.0	237.2	73.7	81.0	92.8	115.7
5.	170.0	191.7	65.0	72.0	92.5	103.0
6.	203.0	234.7	92.7	78.3	96.8	93.5
7.	238.0	236.2	82.3	74.3	104.7	124.2
8.	200.5	234.0	68.7	81.3	82.5	102.7
9.	231.2	257.0	69.7	80.7	95.5	99.5
10.	283.0	209.7	65.0	85.7	120.2	100.0
AVG	217	227	72	79	96	108

SEPTEMBER 2025 **US-0048676.8029**

GEOTEXTILE TEST RESULTS

PROJECT NAME: OLSSON/CCSWDA LEGACY LF CELL 5/AR
ROLL DESIGNATION: 0158661010116 A

	MASS PER UNIT AREA (oz/yd²)	PUNCTURE STRENGTH (pounds)	APPARENT OPENING SIZE (mm)	PERMITTIVITY (sec-1)
1.	8.61	118.0	0.154	1.72
2.	7.23	134.2	0.154	2.16
3.	6.86	119.7	0.165	2.09
4.	6.97	114.0	0.166	1.87
5.	7.07	110.2	0.148	
			0.157	2.0

			EQUIVALENT SIEVE SIZE	PERMEABILITY (cm/sec)	FLOW RATE (gal/min/ft^2)
AVG	7.3	119	80	0.55	146.5

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)	
	MD	TD	MD	TD	MD	TD
1.	242.0	220.0	65.3	94.3	96.3	95.0
2.	187.5	228.2	67.0	86.7	80.8	85.5
3.	168.2	184.2	64.7	88.7	72.8	92.3
4.	203.0	181.0	83.0	84.0	65.3	72.0
5.	176.7	160.5	82.7	72.0	65.8	97.3
6.	208.7	209.2	77.3	71.7	77.0	103.7
7.	164.0	183.0	71.0	78.3	80.5	100.7
8.	179.0	198.7	63.0	82.3	76.5	101.5
9.	187.0	193.5	70.3	79.3	87.8	91.3
10.	221.0	187.7	56.0	93.0	117.0	91.8
AVG	194	195	70	83	82	93

SEPTEMBER 2025 **US-0048676.8029**

GEOTEXTILE TEST RESULTS

PROJECT NAME: OLSSON/CCSWDA LEGACY LF CELL 5/AR
ROLL DESIGNATION: 0158661010139 A

	MASS PER UNIT AREA (oz/yd²)	PUNCTURE STRENGTH (pounds)	APPARENT OPENING SIZE (mm)	PERMITTIVITY (sec-1)
1.	6.39	115.0	0.144	1.71
2.	8.65	126.5	0.147	1.98
3.	7.83	104.2	0.150	2.22
4.	8.79	140.5	0.148	1.72
5.	9.87	178.2	0.131	
			0.144	1.9
			EQUIVALENT SIEVE SIZE	
AVG	8.3	133	100	

	PERMEABILITY (cm/sec)	FLOW RATE (gal/min/ft²)
AVG	0.56	142.7

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)	
	MD	TD	MD	TD	MD	TD
1.	261.7	218.5	56.7	94.7	100.2	89.8
2.	244.7	205.0	67.7	81.7	83.8	139.2
3.	244.5	232.7	72.0	82.7	83.0	90.5
4.	205.2	192.2	69.3	75.3	90.8	93.8
5.	177.2	201.2	83.3	73.7	71.0	96.5
6.	229.5	205.7	77.3	73.3	89.0	98.0
7.	276.7	235.0	84.7	78.0	103.5	103.7
8.	239.7	252.5	77.3	76.7	111.5	143.7
9.	292.7	216.7	73.3	72.0	98.0	111.7
10.	277.5	252.5	67.0	84.3	105.7	113.5
AVG	245	221	73	79	94	108

SEPTEMBER 2025 **US-0048676.8029**

GEOTEXTILE TEST RESULTS

PROJECT NAME: **OLSSON/CCSWDA LEGACY LF CELL 5/AR**
ROLL DESIGNATION: **0158661010162 A**

	MASS PER UNIT AREA (oz/yd²)	PUNCTURE STRENGTH (pounds)	APPARENT OPENING SIZE (mm)	PERMITTIVITY (sec-1)
1.	9.06	162.7	0.120	1.39
2.	7.73	123.7	0.137	1.96
3.	7.10	118.5	0.117	1.87
4.	6.74	159.0	0.148	1.74
5.	8.47	130.2	0.130	
			0.130	1.7

			EQUIVALENT SIEVE SIZE	PERMEABILITY (cm/sec)	FLOW RATE (gal/min/ft^2)
AVG	7.8	139	100	0.56	130.3

	GRAB STRENGTH (pounds)		GRAB ELONGATION (%)		TRAPEZOIDAL TEAR (pounds)	
	MD	TD	MD	TD	MD	TD
1.	267.0	287.7	70.7	91.3	96.8	122.7
2.	257.7	308.7	79.0	86.0	97.0	106.0
3.	250.0	270.5	77.0	78.0	84.3	125.5
4.	217.5	245.0	78.7	77.7	83.3	122.0
5.	252.5	239.0	78.7	73.0	72.0	102.5
6.	172.0	220.5	67.7	77.7	87.3	92.8
7.	191.7	204.5	94.3	77.7	88.8	106.5
8.	201.2	201.7	69.3	78.3	94.0	97.3
9.	219.7	214.0	73.7	79.7	93.0	114.0
10.	318.2	220.5	68.0	84.3	120.2	100.2
AVG	235	241	76	80	92	109

APPENDIX X
LEACHATE PUMPING SYSTEM

EPG Companies Inc.

SUBMITTAL

FOR

Legacy Landfill

EPG Job# S45605

EPG Companies Inc.

Submittal Index

Legacy Landfill

EPG Job# S45605

Bulletin	1055	List of Equipment
Drawing	09949-0000	Series 9 SurePump™
Drawing	09949-0010	Series 9 Size 4 Sump Drainer
Bulletin	0335h	EPG SurePump™ Wheeled Sump Drainer
Form	117	Attachment to 0335h
Bulletin	0480g	Materials of Construction
Bulletin	0124	Engineer's Specification EPG LevelMaster™ LT Submersible Level Sensor
Bulletin	7610a	EPG Series YCL925PT PumpMaster™ Controller 1 Phase
Form	117	Attachment to 7610a
Drawing	13624-0250	Panel Schematic
Drawing	03626-0500	BJBP500 Breakout Junction Box for Motor Lead
Drawing	02523-0605	BJBL600B Breakout Junction Box for Level Sensor
Bulletin	0285e	Model NW Stainless Steel Discharge Adapter
Bulletin	0291d	Installation Instructions – NW Disconnect
Bulletin	1035a	Stainless Steel Check Valves
Bulletin	6065	Stainless Steel Ball Valves
Information	2 Pages	Badger M2000 Technical Brief
Bulletin	2236	Extended Limited Warranty
Form	127a	Submittal Acceptance Form

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EPG Companies Inc.

List of Equipment

Legacy Landfill

EPG Job# S45605

1 Each WPZ00905020C1044OX
EPG Model WSDPT 9-5 SurePump, patented, Size 4 wheeled stainless steel sump drainer with 2 HP, 230 VAC, 1Ø motor. Includes 75' of CP jacketed 14-4 motor lead, 0-5 PSI submersible level sensor with 75' of lead, and 75' of 1/8" stainless steel suspension cable and clamps.

1 Each CPT
Certified Pump Test for WSDPT 9-5 pump

1 Each NW3SS
EPG Discharge Adapter, 3", SS disconnect.

1 Each MAGM20003 DB
Badger 3" Mag Meter, Model M-2000, Flanged ends, with Modbus Daughter Board, 3" CS Body 150# Flanged with: PTFE Liner, Alloy C Electrodes, 316SS Grounding Rings, Remote Amplifier, NEMA 6P/IP67 Submersible, and 30' Cable.

1 Each BV300SS
Ball Valve, 3", 304SS, NPT, with PTFE seals

1 Each CVSE300
Check Valve, 3" FNPT, 304SS In-line poppet type, with Viton O-ring seat.

1 Each BJBP500
EPG Breakout Box, NEMA 4X non-metallic enclosure for 1 ea. motor lead, with SureSeal connectors.

1 Each BJBL600B
EPG Breakout Box, NEMA 4X non-metallic enclosure box for 1 ea. level sensor. Includes desiccant dryer, bellows, and SureSeal connectors.

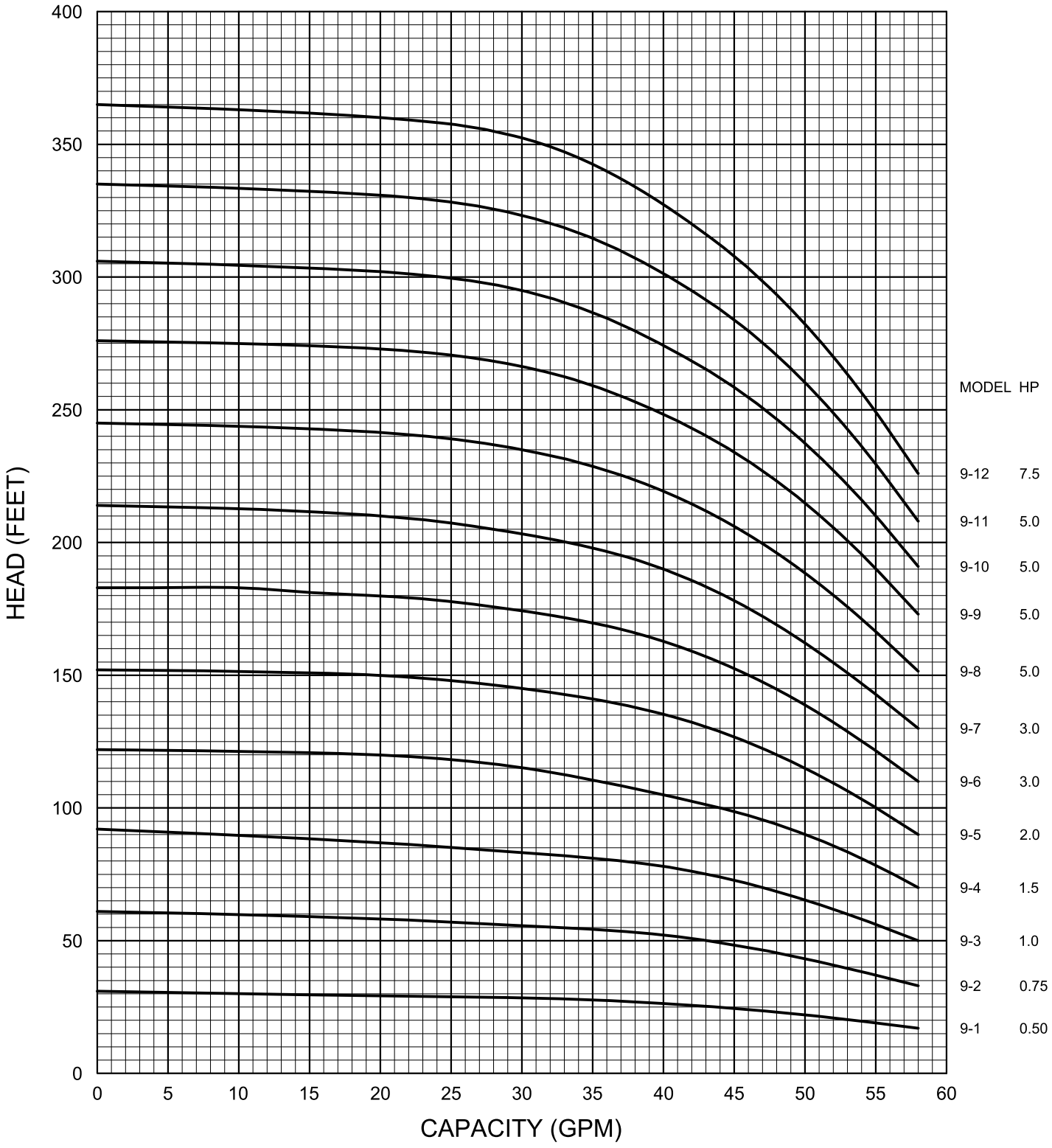
1 Each YCL925PT
EPG PumpMaster UL Listed control panel to operate a 2 HP, 230 VAC, 1 phase motor via an Operator Control Station (OCS) with displays for level, run time, cycles, flow rate and total, and alarms. Includes (H)OA switch, start winding, indicating lights (pump run and sump high alarm) mounted on inner door, fused power supply for mag meter, tank full shut off circuit with light, and a top mounted common alarm strobe light. Enclosure is rated NEMA 4X stainless steel.

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Series 9 SurePump™

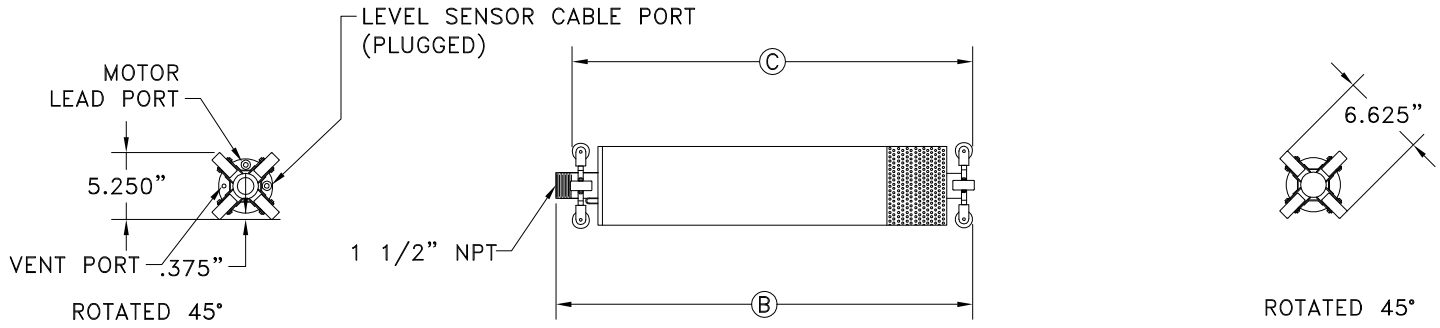
Flow Range 20 - 50 GPM

60 Hz

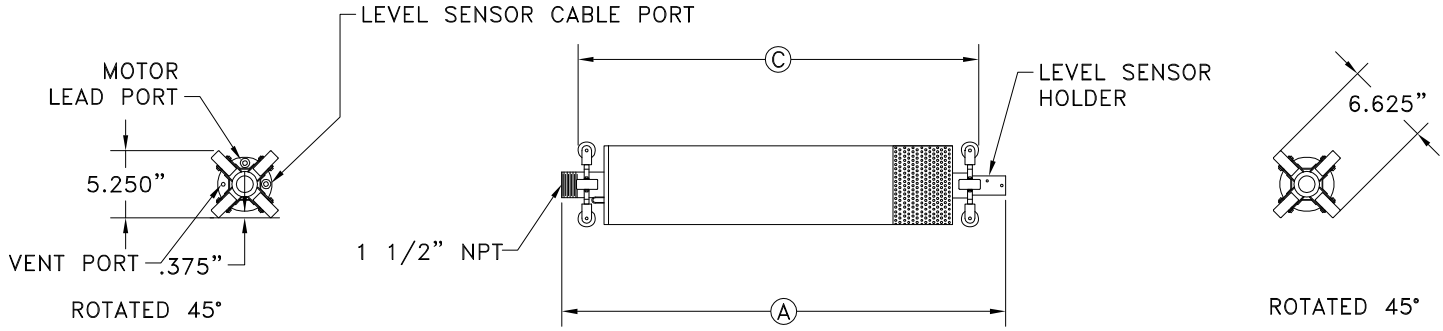


SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

SERIES 9 SIZE 4 SUMP DRAINER



WSD



WSDPT

MODEL	HP	PHASE	A	B	C	*APPROX. SHIPPING WEIGHT	
						WSD	WSDPT
9–1	0.50	1	32.66	31.54	30.79	62.79	67.79
9–1	0.50	3	32.66	31.54	30.79	62.79	67.79
9–2	0.75	1	35.76	34.64	33.89	68.95	68.95
9–2	0.75	3	35.76	34.64	33.89	68.95	68.95
9–3	1.00	1	38.82	37.71	36.95	75.08	80.08
9–3	1.00	3	38.82	37.71	36.95	75.08	80.08
9–4	1.50	1	42.66	41.54	40.79	77.36	82.36
9–4	1.50	3	40.79	39.67	38.92	77.36	82.36
9–5	2.00	1	46.13	45.01	44.26	86.09	91.09
9–5	2.00	3	44.63	43.51	42.76	79.64	84.64
9–6	3.00	1	56.19	55.07	54.32	92.53	97.53
9–6	3.00	3	53.19	52.07	51.32	88.37	93.37

MODEL	HP	PHASE	A	B	C	*APPROX. SHIPPING WEIGHT	
						WSD	WSDPT
9–7	3.00	1	58.16	57.04	56.29	94.81	99.81
9–7	3.00	3	55.16	54.01	53.29	90.65	95.65
9–8	5.00	1	66.13	65.01	64.26	126.69	131.69
9–8	5.00	3	60.13	59.01	58.26	113.36	118.36
9–9	5.00	1	68.10	66.98	66.23	128.97	133.97
9–9	5.00	3	62.10	60.98	60.23	115.64	120.64
9–10	5.00	1	70.07	68.95	68.20	150.91	155.91
9–10	5.00	3	64.07	62.95	62.20	131.25	136.25
9–11	5.00	1	72.04	70.92	70.17	153.19	158.19
9–11	5.00	3	66.04	64.92	64.17	133.53	138.53

NOTE: ALL DIMENSIONS ARE IN INCHES.

*SHIPPING WEIGHT INCLUDES
WSD: CRATE, 50' OF 14–4 MOTOR LEAD, 50' OF 1/8" SS CABLE.
WSDPT: CRATE, 50' OF 14–4 MOTOR LEAD, 50' OF 1/8" SS CABLE, LEVEL SENSOR AND CABLE.

ENGINEER'S SPECIFICATION

EPG WSDPT SurePump™ Wheeled Sump Drainer

for side slope riser installations with built-in level sensor

Furnish _1_ centrifugal submersible EPG WSDPT SurePump Wheeled Sump Drainer(s) (U.S. patented), Model WSDPT _9_ - _5_ with _5_ impeller stages. Each unit shall be suitable for side slope riser installation. Each unit shall be equipped with a _2_ HP, submersible electric motor for operation on _230_ Volts, _1_ phase, 60 Hertz service with _75_ feet of power cable. Each SurePump Wheeled Sump Drainer shall have a _1 ½_ inch MNPT threaded discharge nozzle and be capable of delivering _45_ GPM at _127_ feet of TDH. Each SurePump will be fitted with _75_ feet of stainless steel lifting cable of sufficient strength to permit removal of the unit.

DESIGN
Each SurePump Wheeled Sump Drainer shall be capable of pumping contaminated ground water for spill recovery, leachate, and condensate removal. A removable level transmitter and mount (patented) shall be installed at the center bottom of the Sump Drainer for liquid level control. The stainless steel Sump Drainer shall permit the unit to "pump down" to within _8_ inches of the sump bottom without any loss of performance or damage to the pump. External “priming” shall not be required nor allowed. The Sump Drainer shall be sealed with fluid inlet only at bottom and be equipped with a vent valve to assist with the evacuation of air from the Sump Drainer.

MATERIALS
Major components shall be made of 304 stainless steel, seal rings are to be made of E-Glide™, and bearings are to be E-Glide. In addition, all fasteners shall be 304 stainless steel. Teflon or rubber bearings and seal rings are not allowed.

CHECK VALVE
Each unit shall include a built-in check valve with non-metallic seat, and housing and disc of 304 stainless steel.

SHAFT
The shaft shall be of 304 stainless steel and rotate on E-Glide bearings that are fluid lubricated.

DIFFUSER CHAMBER
The diffuser chambers for each impeller shall be 304 stainless steel and fitted with E-Glide impeller seal rings.

IMPELLERS
The impeller(s) shall be closed and consist of 304 stainless steel.

SUMP DRAINER
The sump drainer shall be fabricated from 304 stainless steel with sealed top, sealed around motor lead and level sensor cable. Shall have fluid entrance only below the bottom of the motor to promote cooling. Shall have multiple wheels on each end. Shall have the level sensor mounted at the bottom central axis. The use of HDPE, PVC, or similar plastics is not allowed.

MOTOR
The motor shall be a submersible, hermetically sealed motor. The motor shall be designed for continuous duty, capable of sustaining up to _100_ starts per day. The motor shall be connected to the pump via a motor adaptor and coupling in 304 stainless steel. Single phase motors in ½ HP to 1 HP only shall have thermal protection in the motor windings to protect the windings from overload. The unit will restart automatically after the motor cools down. Larger horsepower single phase motors and three phase motors shall have thermal protection located in the control panel that is manually reset.

MOTOR LEAD WIRE
The lead wire shall be no-splice with EPG’s “CP” waterproof and chemically resistant jacket over 600 Volt insulation and be of the length specified. Wire shall be sized for amp load of the motor.

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Materials of Construction

EPG SurePump™

	STANDARD
Check Valve Housing	304 Stainless Steel
Check Valve	304 Stainless Steel
Check Valve Seat	E-Glide™
Diffuser Chamber	304 Stainless Steel
Impeller Seal Ring	E-Glide™
Impeller	304 Stainless Steel
Motor Adapter	304 Stainless Steel
Inlet Screen	304 Stainless Steel
Pump Shaft	304/314 Stainless Steel
Coupling	329/420/431 Stainless Steel
Fasteners	304 Stainless Steel
Bearings	E-Glide™

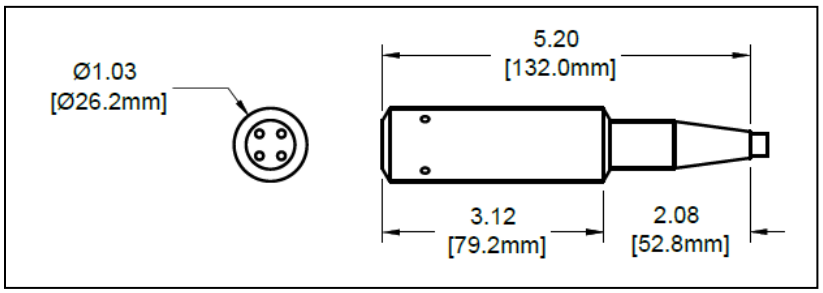
FRANKLIN ELECTRIC MOTORS

	1/3 to 2 HORSEPOWER	3 to 60 HORSEPOWER
End Bell Castings	304 Stainless Steel over Iron	304 Stainless Steel over Iron
Stator Shell	301 Stainless Steel	301 Stainless Steel
Shaft Extension	303 Stainless Steel	303 Stainless steel
Fasteners	316 Stainless Steel	300 Stainless Steel
Seal Cover	Tefzel	Sintered Bronze
Shaft Seal	Viton	Viton, Carbon, Ceramic Face Seal
Diaphragm	Viton	Nitrile Rubber
Diaphragm Plate	304 Stainless Steel	304 Stainless Steel
Diaphragm Spring	302 Stainless Steel	302 Stainless Steel
Diaphragm Cover	316 Stainless Steel	304 Stainless Steel
Slinger	Viton	Nitrile Rubber
Lead Sleeve	316 Stainless Steel	316 Stainless Steel
Lead Jam Nut	316 Stainless Steel	N/A
Lead Jam Clamp	N/A	300 Stainless Steel
Lead Potting	Epoxy	Epoxy
Lead Bushing	Viton	Viton

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ENGINEER'S
SPECIFICATION

EPG LevelMaster™
EP Submersible Level Sensor



GENERAL FEATURES

* Application: The LevelMaster sensor is designed specifically to work with the EPG SurePump™, but its durability, accuracy and weight make it the logical choice for stand alone level applications. The chemical resistant jacketed cable with water block contains a vent tube for atmospheric pressure compensation.
* Ranges Available: 0-28" through 0-690' models are standard. Call EPG for other available ranges.
* Accuracy: The LevelMaster sensor has built-in temperature compensation as well as precise calibration giving an accuracy of ±0.25% at ambient temperature and a combined repeatability and hysteresis error of ±0.10%.
* Fully Submersible: The LevelMaster sensor is fully submersible in any liquid compatible with 316 stainless steel and the chemical resistant polyurethane cable jacket. It is designed for submergence at depths greater than 1.5X operating level without sustaining damage. Call EPG for more severe service.
* Superior Noise Immunity: Designed for heavy duty use in hostile environments, the LevelMaster sensor gives outstanding noise immunity. Unlike transducers, whose signals may be distorted by outside interference, the LevelMaster sensor utilizes a conditioned compensated 4-20 mA output to maximize signal strength and accuracy. The sensor also features a shielded lead to help prevent signal disruption from outside sources.

PERFORMANCE

* Depth Range:	0-28" thru 0-690' (0-1 PSI thru 0-300 PSI)
* Static Accuracy:	±0.25% FSO
* Thermal Error:	0.10% FSO/°C
* Resolution:	+0.0001% FS

ENVIRONMENTAL

* Compensated temp range:	0° to 50°C
* Operating temp range:	-20° to 60°C

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ELECTRICAL

* Excitation:	9 to 28 VDC, Red = (+) excitation, Black = (-) excitation
* Input Current:	20 mA maximum
* Output:	4-20 mA (2 wire)
* Zero offset (max):	4-20 mA, ±.25mA
* Output impedance:	<10 ohms
* Insulation resistance:	100 megohms at 50VDC
* Circuit protection:	Polarity, surge & shorted output
* Power supply rejection:	<±.05% FSO/VDC (mA output)
* Electrical termination:	2-22 AWG conductors in a shielded cable with sensor breather and polyurethane jacket

PHYSICAL

* Dimensions:	Nominal diameter of 1.03" X 5.2" length
* Weight:	7 oz. (not including cable)
* Cable:	Polyurethane jacketed shielded cable with polyethylene vent tube and Kevlar tension members (.05 lbs/ft)
* Wetted materials:	316 SS, Viton
* Mounting provision:	Suspended by cable

MODEL {Call EPG for other ranges available – specify length (---)}

PART #	DESCRIPTION	RANGE
EP05X---P	**Submersible Pressure Transmitter**	0-11'
EP07X---P	" " "	0-16'
EP10X---P	" " "	0-23'
EP15X---P	" " "	0-34'
EP20X---P	" " "	0-46'

OPTIONS

* Titanium Housing:	Used for highly corrosive environments (TI).
* Lightning Protection:	Protects against transient voltages and lightning associated surges up to 20,000 amperes (009).
* Temperature Sensor:	A sensor with 4-20 mA output for temperature (0-50ºC) is available (007). Excitation: 9-30 VDC, White = (+) excitation, Green = (-) excitation.
* Tefzel® Cable:	Recommended for use in highly corrosive environments. It offers additional resistance over standard polyurethane cable (TZ).
Part # Examples:	EP05X100TZ-009 (0-5 PSI, 100' of Tefzel cable, and lightning protection) EP10X250P-007 (0-10 PSI, 250' of polyurethane cable, and temperature sensor) EP05X100TZ/TI (0-5 PSI, 100' of Tefzel cable, and titanium housing)

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ENGINEER'S SPECIFICATION

EPG Series YCL925PT PumpMaster™ Controller

1Ø CONTROL PANEL

Furnish 1 EPG Companies Inc., UL listed 508A/698A, Series YCL925PT controller(s) to operate a pump motor and auxiliary equipment in manual or automatic mode. The control panel enclosure shall be NEMA type 4X.

The enclosure shall be equipped with a window in the outer door, an inner door, a stainless steel drip shield, and a tamper resistant latch. The NEMA 4 (standard) enclosure is finished with polyester urethane paint. The NEMA 4X (optional) enclosure can be either X stainless steel or white powder coated N/A stainless steel.

The control system will operate from a 230 Volt, 60 Hertz, single phase power supply. Pump control components will be sized to operate a pump motor of specified horsepower.

The control panel shall include the following as standard features:

* Main Disconnect Switch: The main disconnect switch shall be 30 Amp rated and will prevent opening of the control panel while the power is on, and includes 230 Volt, 15 Amp dual element fuses.
* "Hand-Off-Auto" Selector Switch: Allows manual or automatic operation of the pump motor. The selector switch shall be a heavy duty, oil tight, NEMA 4 rated switch mounted on the inner door. The hand position shall be momentary with a spring return.
* Motor Contactor: The motor contactor shall be sized to the pump motor horsepower.
* Motor Start Winding Control with Start Capacitor and Start Winding Relay: A capacitor is used to start the motor, and a relay is used to remove the start winding from the circuit when the motor reaches operating speed.
* Control Transformer: A transformer with fused primary and secondary shall isolate the control circuit from the power circuit and provide easier and safer field wiring of accessories. It shall lower incoming voltage to 120 Volts.
* Run Light: Indicates energization of motor circuit. It shall be heavy duty, oil tight, NEMA 4 rated and shall have an LED lamp with 100,000 hour life. The light shall be mounted on the inner door and will be green in color.
* OCS as Level Control: The (Operator Control Station) shall be mounted on the inner door. The processor shall have a transflective touchscreen and four selection keys. It shall have the capacity to monitor and maintain liquid levels as well as output alarms. It shall also provide a high-high or low-low level alarm fail safe feature that shuts off the pump motor. The high-high or low-low alarm may indicate level sensor failure or a problem with the pump. The level control shall be accurate to within 0.1 inch.
* OCS as Cycle Counter and Elapsed Time Meter: Shall display the number of starts and elapsed run time of the pump motor.
* OCS as Flow Meter: Shall display the flow rate (gpm) and totalized flow rate.
* OCS Shall include the following: Micro SD memory card, Ethernet communication, USB port, RS232 port and RS485 port.
* Level Simulator: The level simulator shall be mounted on the inner door. The level simulator is a built-in test circuit designed to simulate a 4-20 mA load to assist in level meter setup and troubleshooting.
* Intrinsically Safe Barrier: The level sensor circuit shall be by protected by an intrinsically safe barrier.
* Heater with Adjustable Thermostat: A heater with adjustable thermostat shall promote even distribution of heat and elimination of hot spots and condensation. It shall also maintain the minimum temperature required for the operation of the OCS. The heater element shall be mounted in space between the sub-panel and the back of the enclosure and provide a minimum of 100 inches square of heating area.

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* GFCI: Ground fault circuit shall protect level sensing circuit from ground fault.
* Surge Protector: Shall protect sensor circuits and indicating lights from power surges.
* Lightning Arrestor: Shall be grounded, metal-to-metal, to water strata. When properly grounded, the lightning arrestor will protect electrical equipment against lightning induced surges.
* Terminal Strip: A labeled and numbered terminal strip provides easy connection of external components.
* Corrosion Inhibitor Emitter: Inclusion of an industrial corrosion inhibitor emitter shall protect internal components of control panel from corrosion for up to one year and shall be replaceable.

SYSTEM LOGIC AND FUNCTION

The controller is designed to start and stop a pump using the OCS level control meter with a submersible pressure transmitter. The pump starts at the pump start level set point and continues to run until the liquid level decreases to the pump stop level set point as programmed in the OCS level control meter. If the liquid level rises to the high level alarm set point, a high level alarm will be annunciated. If the liquid level falls to the low level alarm set point, a low level alarm will be annunciated. If the liquid level rises to the high-high or falls to the low-low level fail-safe set point, the pump motor will shut off. The pressure transmitter level sensor shall have a range of 0 to 11 feet with a 4-20 mA output signal. The OCS also displays the level, flow rate, totalized flow, counts the number of pump starts and displays run time in hours.

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ATTACHMENT TO BULLETIN 7610a

ENGINEER'S SPECIFICATION
EPG YCL925PT Controller
1Ø Control Panel

EPG Job# S45605

This controller includes the following optional features:

- Operator Control Station (OCS) with displays for:
  - Level
  - Run time
  - Cycles
  - Flow rate and total
  - Alarms
- Includes (H)OA switch
- Start winding
- Indicating lights (pump run and sump high alarm) mounted on inner door
- Fused power supply for mag meter
- Tank full shut off circuit with light
- Top mounted common alarm strobe light
- Enclosure is rated NEMA 4X stainless steel

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MOTOR	HP	VOLTAGE	FLA	FUSE SIZE
LEACHATE PUMP	2	230	10.00	15A

ANSI/UL 1449 4TH EDITION
TYPE 1 OR 2 SURGE PROTECTION DEVICE
W/UL96A LIGHTNING PROTECTION
W/LED STATUS INDICATOR

240VAC 1PH 2 POLE 3 WIRE

NOTE: MAIN OVERCURRENT PROTECTION TO BE PROVIDED BY OTHERS (SEE THE CONTROL PANEL LABEL FOR THE (MAXIMUM) RECOMMENDED UPSTREAM TYPE AND SIZE OVER CURRENT PROTECTIVE DEVICE)

SURGE PROTECTION DEVICE

GND

SPD1

LEGACY LANDFILL

DANGER
HIGH VOLTAGE

#10AWG (BLK)

230VAC 1Ø

L1

L2

GND

GND

MAIN DISCONNECT

30 AMP (RATED)

#10AWG (BLK)

F1

F2

15 AMP

LEACHATE PUMP CONTROL

MC1

MC1

2HP @ 230VAC 1Ø
START WINDING CONTROL

L1

L2

RELAY

SC

RC

Y

R

B

NOTE 1

MTR1

LEACHATE PUMP MOTOR

GND

MAIN RESET

START RESET

PB1

PB2

(BLU)

NOTE: THE RESET PUSH BUTTON MODIFICATION MOVES THE RESET PUSH BUTTONS (PB1-PB2) FROM THE START WINDING CONTROLS TO THE ENCLOSURE INNER DOOR FOR EASIER ACCESS

NOTE: USE THE SAME SIZE AND COLOR WIRE THAT WAS PROVIDED WITH THE START WINDING CONTROL FOR THE RESET BUTTONS (PB1-PB2) MODIFICATION

CAUTION: DISCONNECT ALL INCOMING POWER SOURCES BEFORE SERVICING THIS CONTROL PANEL

NOTE: ENCLOSURE IS RATED NEMA TYPE 4X STAINLESS STEEL

A

A'

230VAC 1Ø POWER

FIELD WIRING TERMINALS

LINE (PANEL) TOTAL AMPS

L1
L2 — 230VAC 1Ø 60HZ
14.44 AMPS

GND — GROUND

LOAD (230VAC)

Y
R
B
GND — LEACHATE PUMP MOTOR

		RATINGS	
FUSE	TYPE	VOLTS	AMPS
F1-F2	LPJ-SP	600	15
F3-F4	LPJ-SP	600	2-8/10
F5	FNM	250	2
F6	FNM	250	3-1/2
F7	FNM	250	1

FOR NOTES AND REVISIONS SEE SHEET 9

JOB No. S45605

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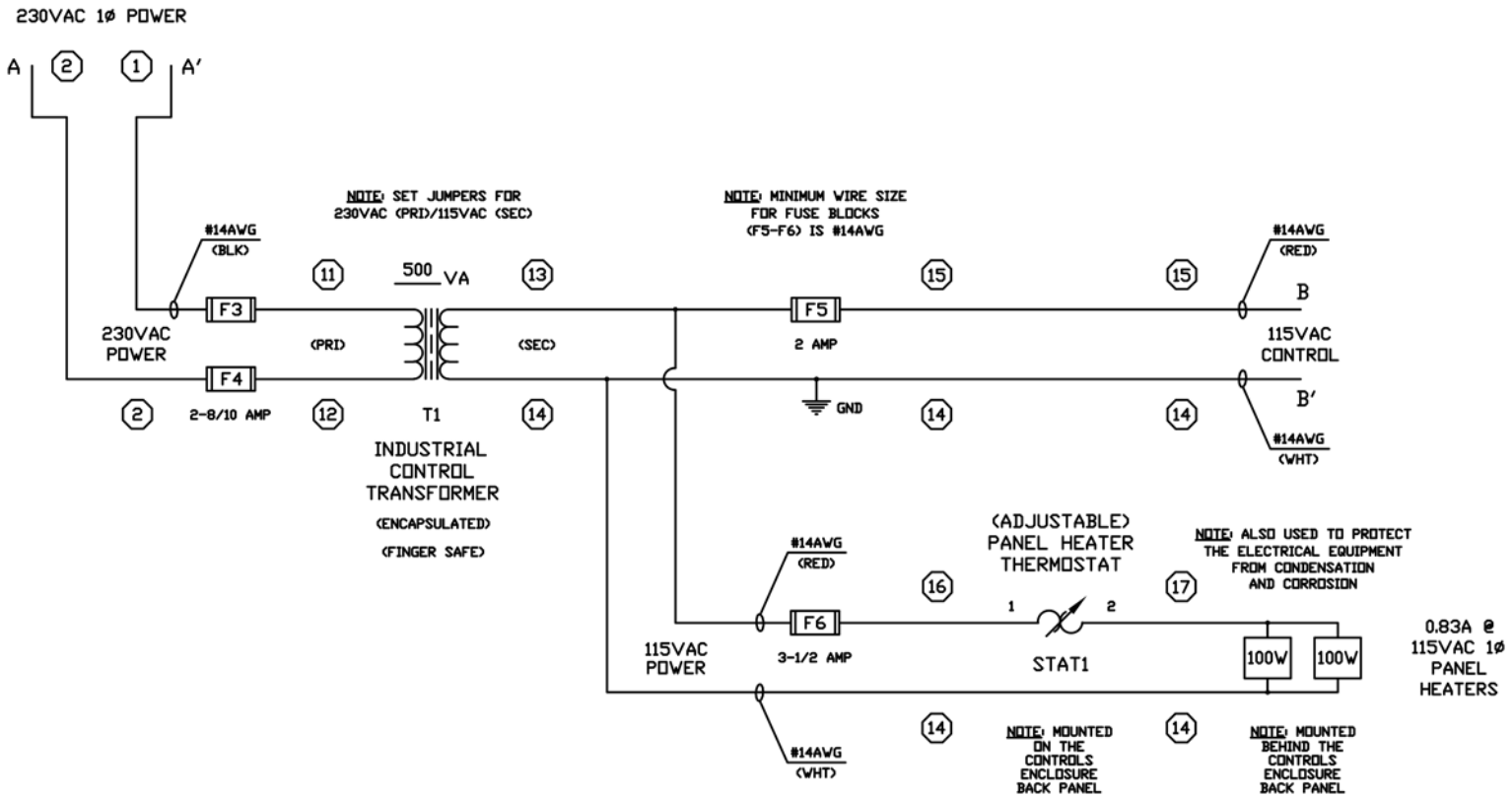
REVISIONS

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EPG COMPANIES

YCL925PT CONTROL PANEL
230VAC 1Ø SH 1 OF 9

DESIGN RCK
DRAWN RCK
CHK'D
SCALE
DATE 08-27-25
APP'D
MATERIAL
DRAWING NO. 13624-0250



FOR NOTES AND REVISIONS SEE SHEET 9

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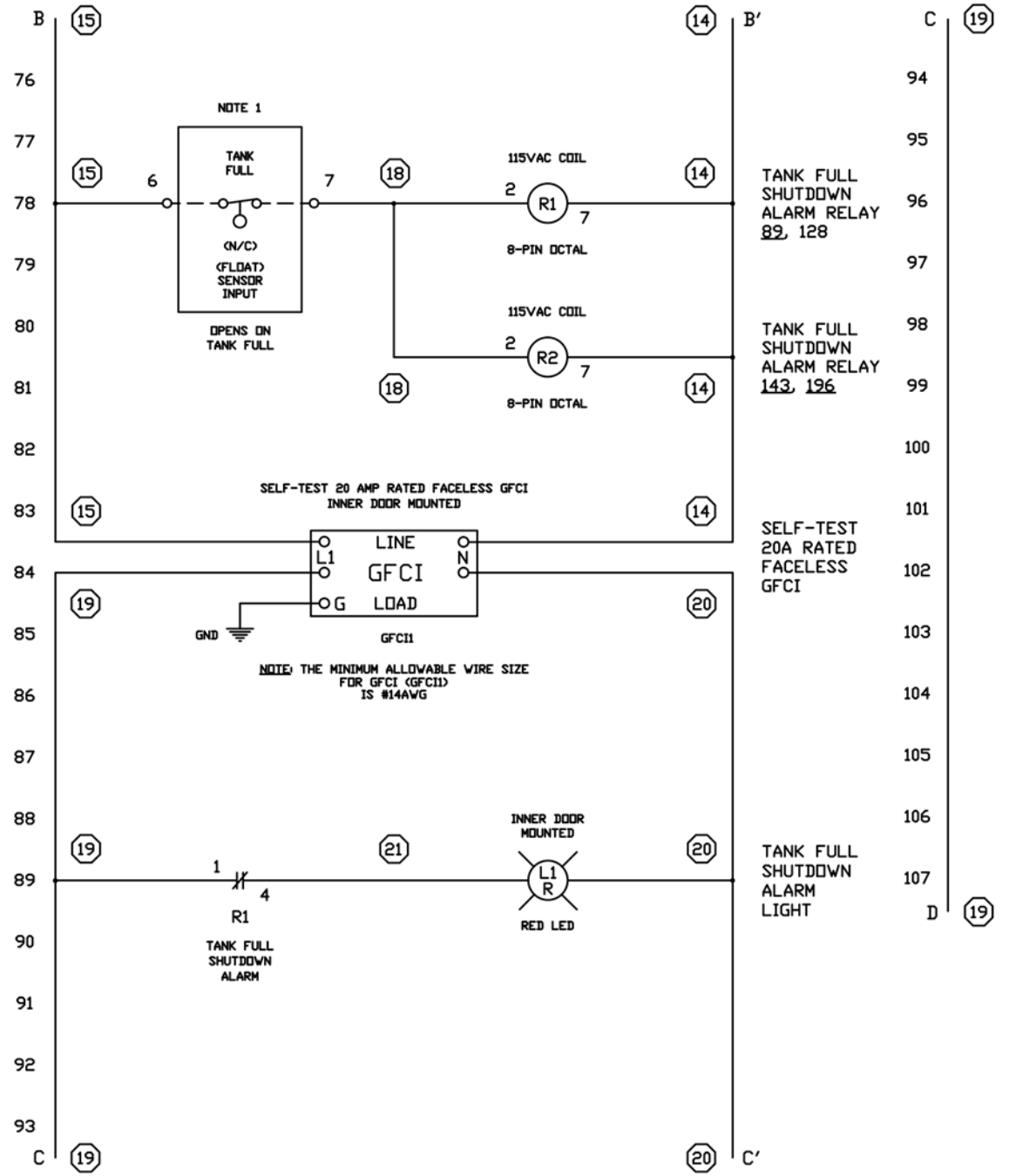
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EPG COMPANIES

YCL925PT CONTROL PANEL
230VAC 1Ø SH 2 OF 9

DESIGN	SCALE	MATERIAL
RCK		
DRAWN: RCK	DATE: 08-27-25	DRAWING NO.: 13624-0251
CHK'D	APP'D	



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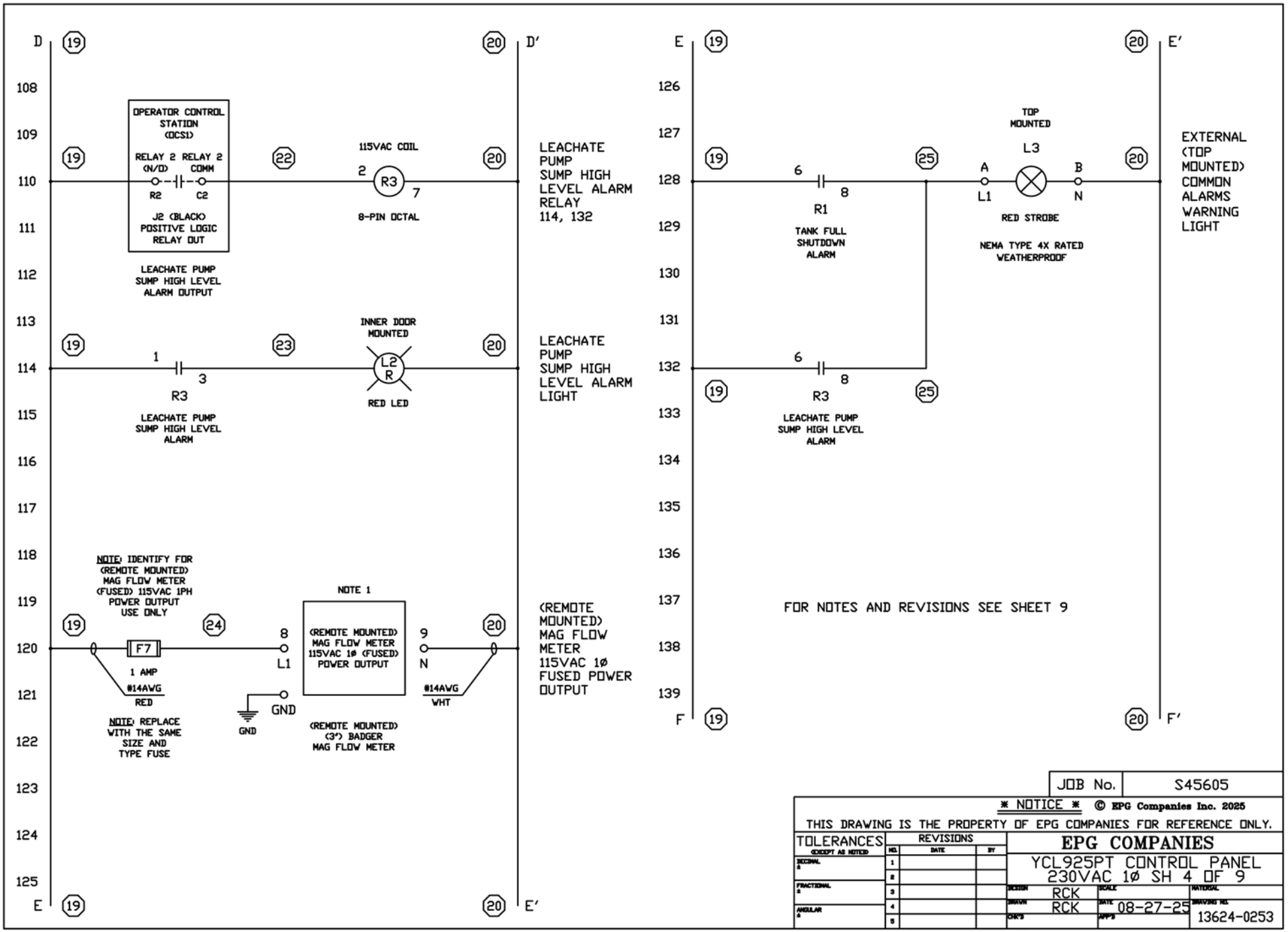
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EPG COMPANIES

YCL925PT CONTROL PANEL
230VAC 1Ø SH 3 OF 9

DESIGN	SCALE	MATERIAL
RCK		
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CHK'D	APP'D	

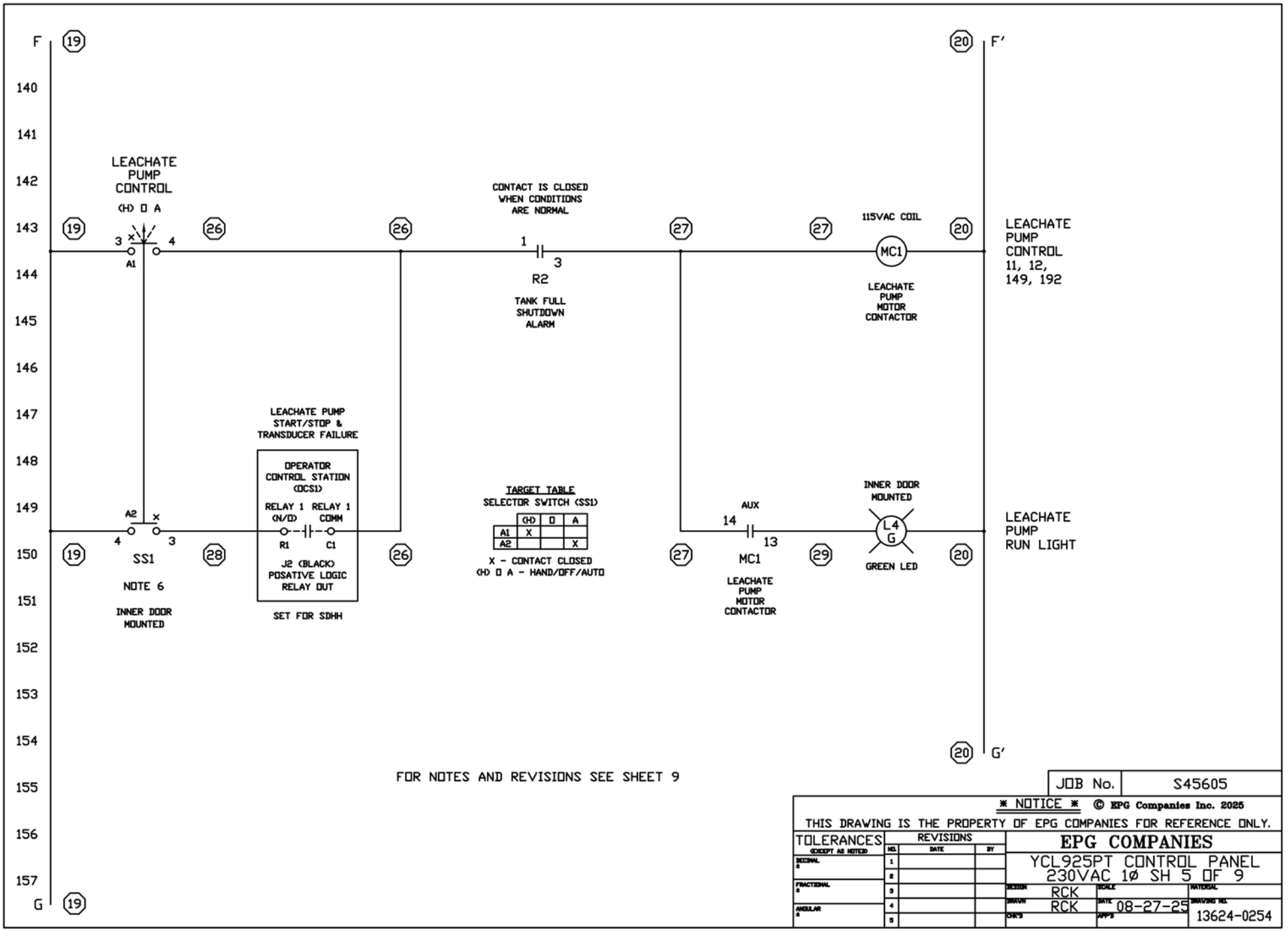


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DECIMAL ±	NO.	DATE	BY	YCL925PT CONTROL PANEL 230VAC 1Ø SH 4 OF 9		
FRACTIONAL ±	1			DESIGN RCK	SCALE	MATERIAL
ANGULAR ±	2			DRAWN RCK	DATE 08-27-25	DRAWING NO. 13624-0253
	3			CHK'D	APP'D	
	4					
	5					



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TOLERANCES (EXCEPT AS NOTED)	REVISIONS			EPG COMPANIES		
DECIMAL ±	NO.	DATE	BY	YCL925PT CONTROL PANEL 230VAC 1Ø SH 5 OF 9		
FRACTIONAL ±	1					
ANGULAR ±	2					
	3			DESIGN RCK	SCALE	MATERIAL
	4			DRAWN RCK	DATE 08-27-25	DRAWING NO. 13624-0254
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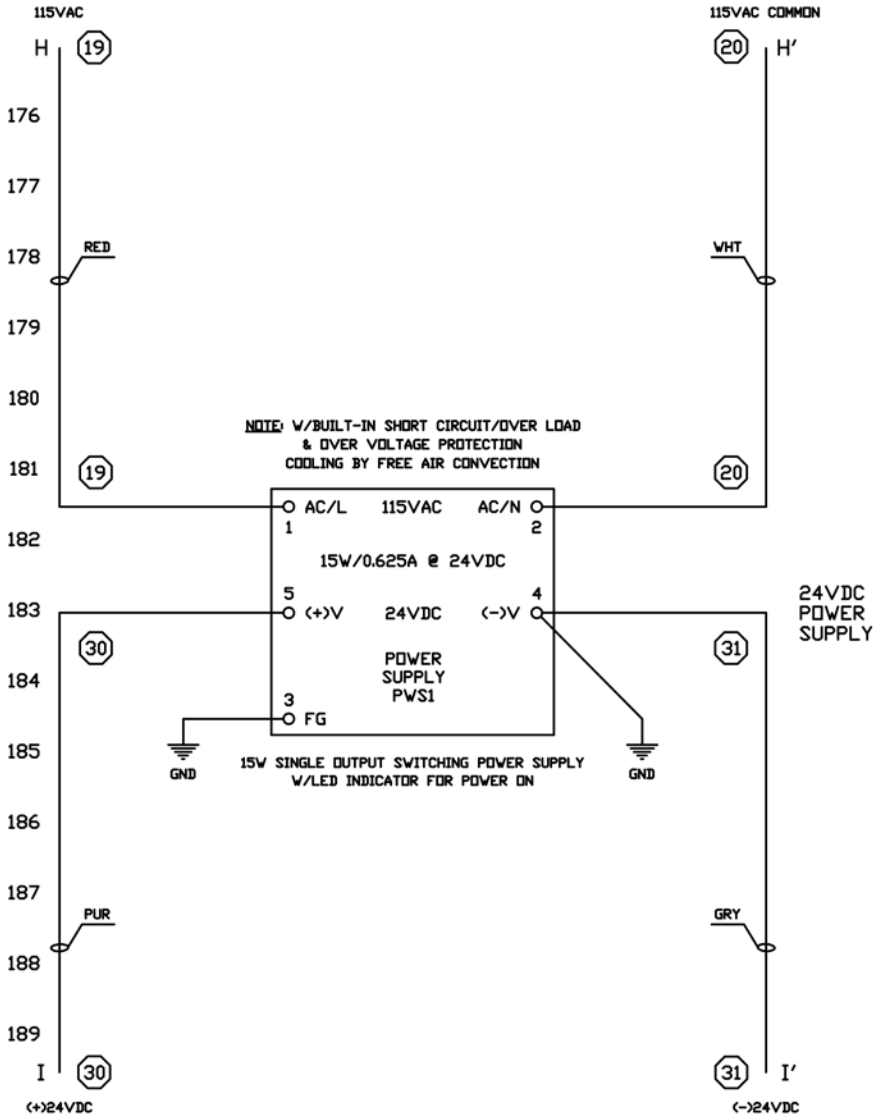
NOTE: W/OPERATOR CONTROL STATION (OCS1)
(REMOTE MOUNTED) USB RECEPTACLE MOUNTED ON THE INNER DOOR
W/INTERCONNECTING CABLE & (BLANK) USB FLASH DRIVE
(USED FOR DATA LOGGING)

NOTE: INPUTS I11(H3) & I12(H4) ARE NOT USED

OPERATOR CONTROL STATION (OCS1)					
P/N OCS-004P-102 (I/O MAP)					
I/O	DESC	L/N	I/O	DESC	L/N
I1	LEACHATE PUMP RUN INPUT	192	A1	LEACHATE PUMP (4-20mA) LEVEL SENSOR INPUT	222
I2	TANK FULL SHUTDOWN ALARM INPUT	196	A2	(SPARE)	
I3	(SPARE)		A3	(SPARE)	
I4	(SPARE)		A4	(SPARE)	
I5	(SPARE)		R1	LEACHATE PUMP START/STOP OUTPUT	149
I6	(SPARE)		R2	LEACHATE PUMP SUMP HIGH LEVEL ALARM OUTPUT	110
I7	(SPARE)		R3	(SPARE)	
I8	(SPARE)		R4	(SPARE)	
I9(H1)	(SPARE)		R5	(SPARE)	
	(SPARE)		R6	(SPARE)	

I - DIGITAL INPUT, H - HIGH SPEED, A - ANALOG INPUT, R - RELAY (DIGITAL) OUTPUT

FOR NOTES AND REVISIONS SEE SHEET 9



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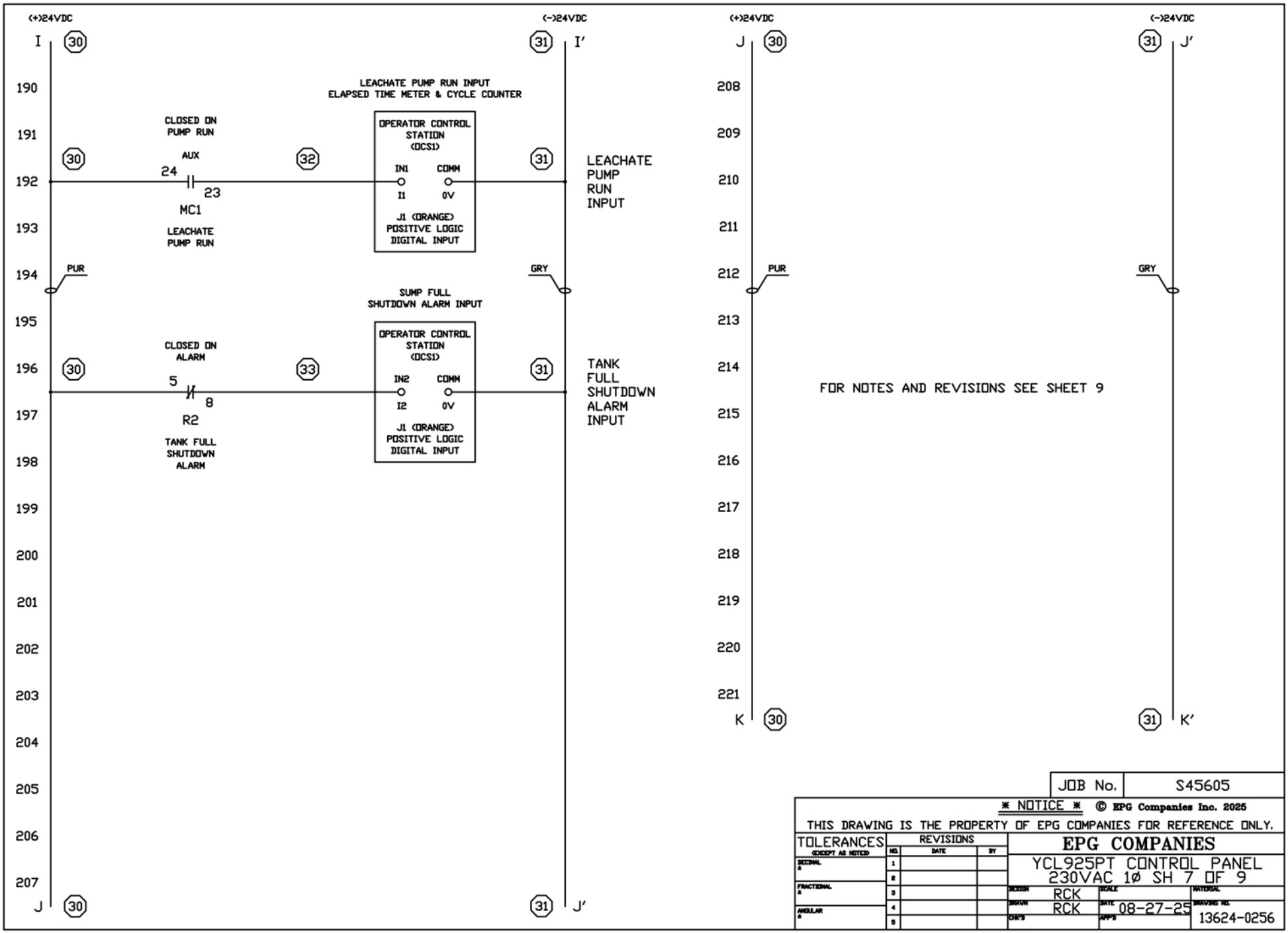
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EPG COMPANIES
YCL925PT CONTROL PANEL
230VAC 1Ø SH 6 OF 9

DESIGN	RCK	SCALE	MATERIAL
DRAWN	RCK	DATE 08-27-25	DRAWING NO. 13624-0255
CHK'D		APP'D	



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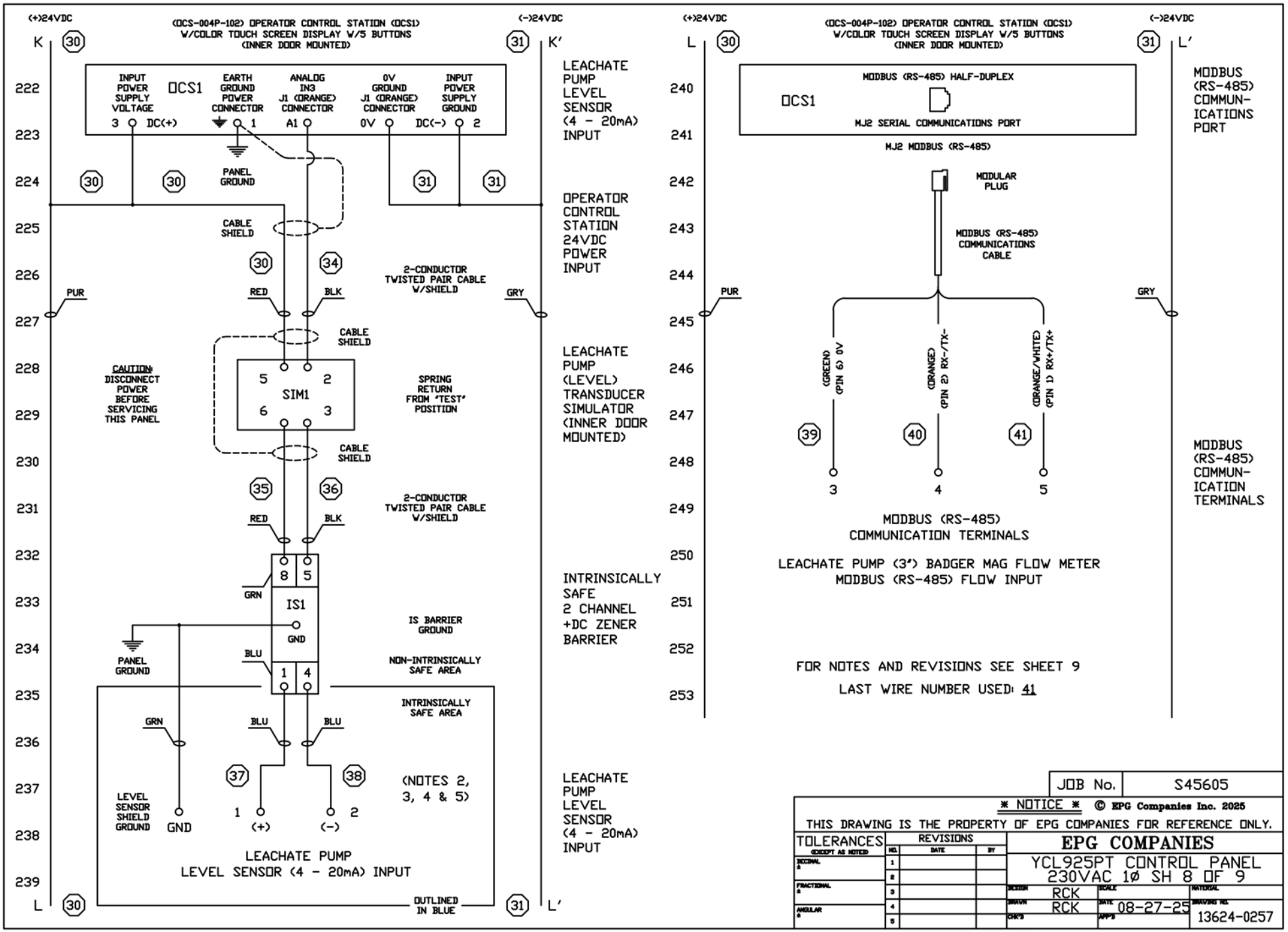
TOLERANCES (EXCEPT AS NOTED)
DECIMAL ±
FRACTIONAL ±
ANGULAR ±

REVISIONS			
	NO.	DATE	BY
	1		
	2		
	3		
	4		
	5		

EPG COMPANIES

YCL925PT CONTROL PANEL
230VAC 1Ø SH 7 OF 9

DESIGN	RCK	SCALE	MATERIAL
DRAWN	RCK	DATE 08-27-25	DRAWING NO. 13624-0256
CHK'D		APP'D	



FOR NOTES AND REVISIONS SEE SHEET 9

LAST WIRE NUMBER USED: 41

JOB No.	S45605

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TOLERANCES (EXCEPT AS NOTED)	REVISIONS NO.	DATE	BY	EPG COMPANIES
DECIMAL ±	1			YCL925PT CONTROL PANEL 230VAC 1Ø SH 8 OF 9
FRACTIONAL ±	2			
ANGULAR ±	3			DESIGN RCK
	4			DRAWN RCK
	5			CHK'D
				SCALE
				DATE 08-27-25
				APP'D
				MATERIAL
				DRAWING NO. 13624-0257

FIELD WIRING TERMINALS

LEVEL SENSOR (INTRINSICALLY SAFE TERMINALS)

L/N 237

1	— (+) RED	LEACHATE PUMP LEVEL SENSOR (4 - 20mA) INPUT (NOTES 2, 3, 4 & 5)
2	— (-) BLACK	
GND	— SHIELD GROUND	

(OCS1) OPERATOR CONTROL STATION (RS-485) SERIAL COMMUNICATIONS CABLE

L/N 248

3	— (PIN 6)	— 0V	— GREEN	MODBUS (RS-485) COMMUNICATION TERMINALS	LEACHATE PUMP (3") BADGER MAG FLOW METER MODBUS (RS-485) FLOW INPUT
4	— (PIN 2)	— RX-/TX-	— ORANGE		
5	— (PIN 1)	— RX+/TX+	— ORN/WHT		

LEVEL SENSOR (DRY INPUT CONTACT)

L/N 78

6	(REMOTE MOUNTED) TANK FULL (FLOAT) SENSOR (N/C) (DRY INPUT CONTACT)
7	

LOAD (115VAC)

L/N 128

A	— L1	(TOP MOUNTED) COMMON ALARMS WARNING LIGHT (L3)
B	— N	

LOAD (115VAC)

L/N 120

8	— L1	(REMOTE MOUNTED) MAG FLOW METER (FUSED) 115VAC 1PH POWER OUTPUT
9	— N	
GND	— GND	

NOTES:

1. NOT PART OF CONTROLLER
2. REFERENCE INSTALLATION OF INTRINSICALLY SAFE INSTRUMENT SYSTEMS IN CLASS I HAZARDOUS LOCATIONS, ANSI/ISA-RP 12.6-1987, SECTION 4.5.4
3. WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY
4. INSTALL IN ACCORDANCE WITH ARTICLE 504 OF THE NATIONAL ELECTRIC CODE
5. MAXIMUM CABLE LENGTH FROM THE LEVEL SENSOR TO THE LEVEL CONTROL METER (M1) IS 3000 FEET
6. SELECTOR SWITCH, (SS1) WILL SPRING RETURN FROM THE "HAND" POSITION

JOB No.	S45605

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TOLERANCES (EXCEPT AS NOTED)	REVISIONS NO.	DATE	BY
DECIMAL ±	1		
FRACTIONAL ±	2		
ANGULAR ±	3		
	4		
	5		

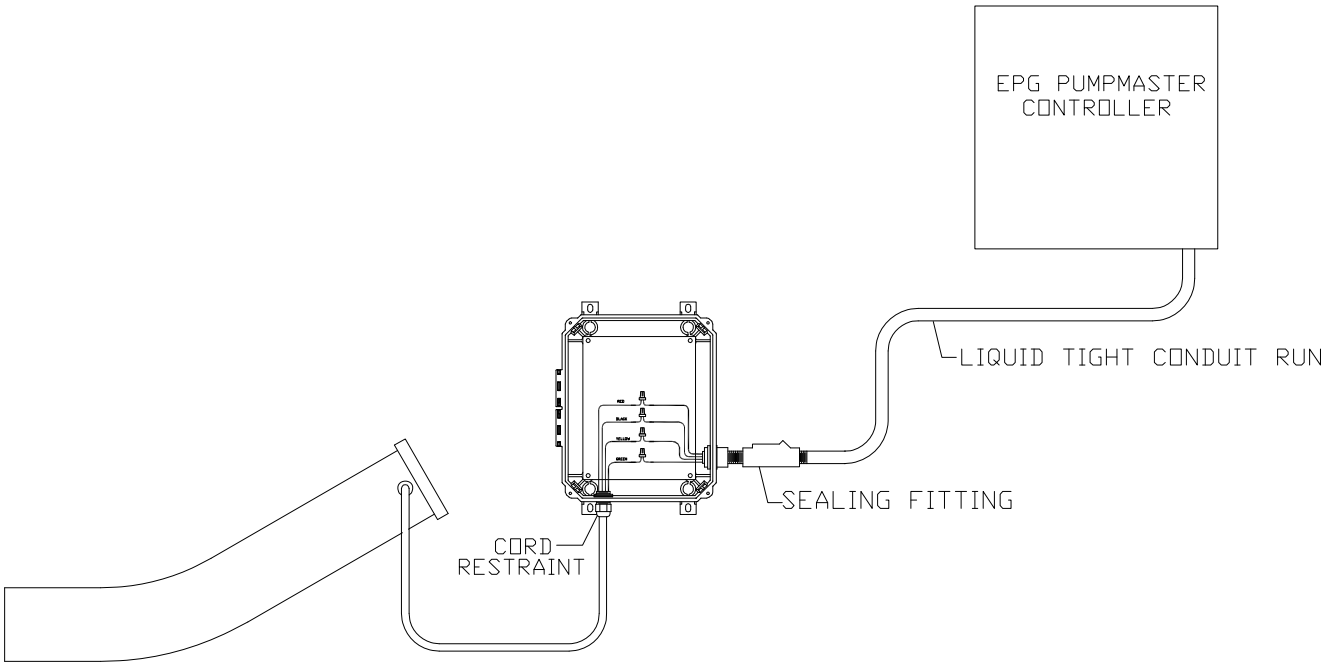
EPG COMPANIES

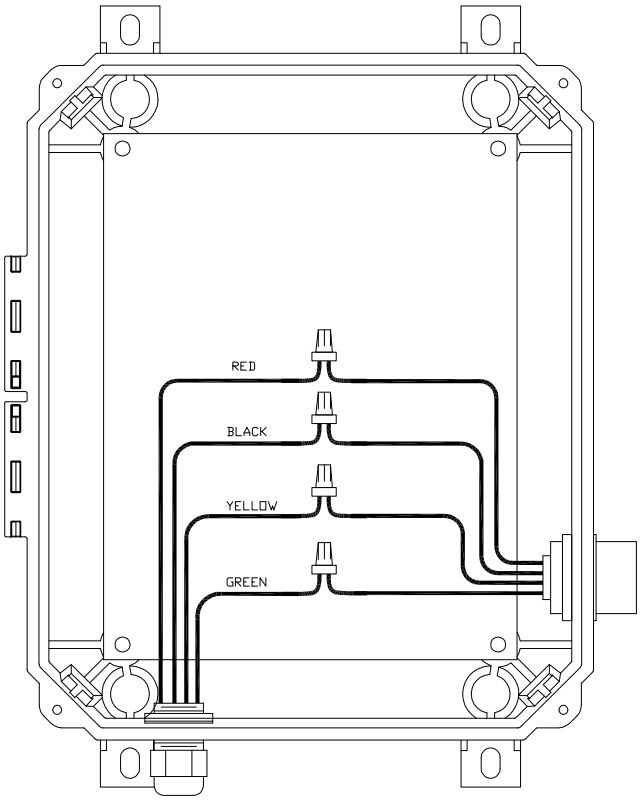
YCL925PT CONTROL PANEL
230VAC 1Ø SH 9 OF 9

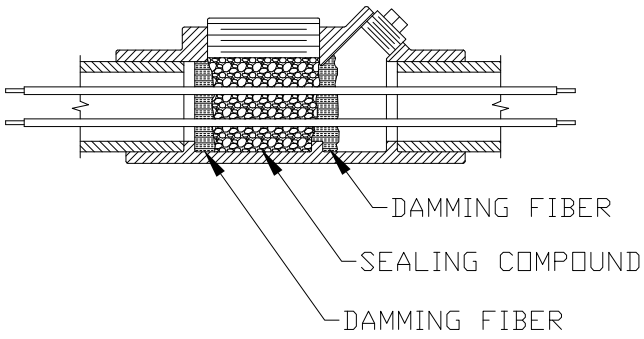
DESIGN	SCALE	MATERIAL
RCK		
DRAWN: RCK	DATE: 08-27-25	DRAWING NO.: 13624-0258
CHK'D	APP'D	

BJBP500

BREAKOUT JUNCTION BOX FOR MOTOR LEAD







NOTE:

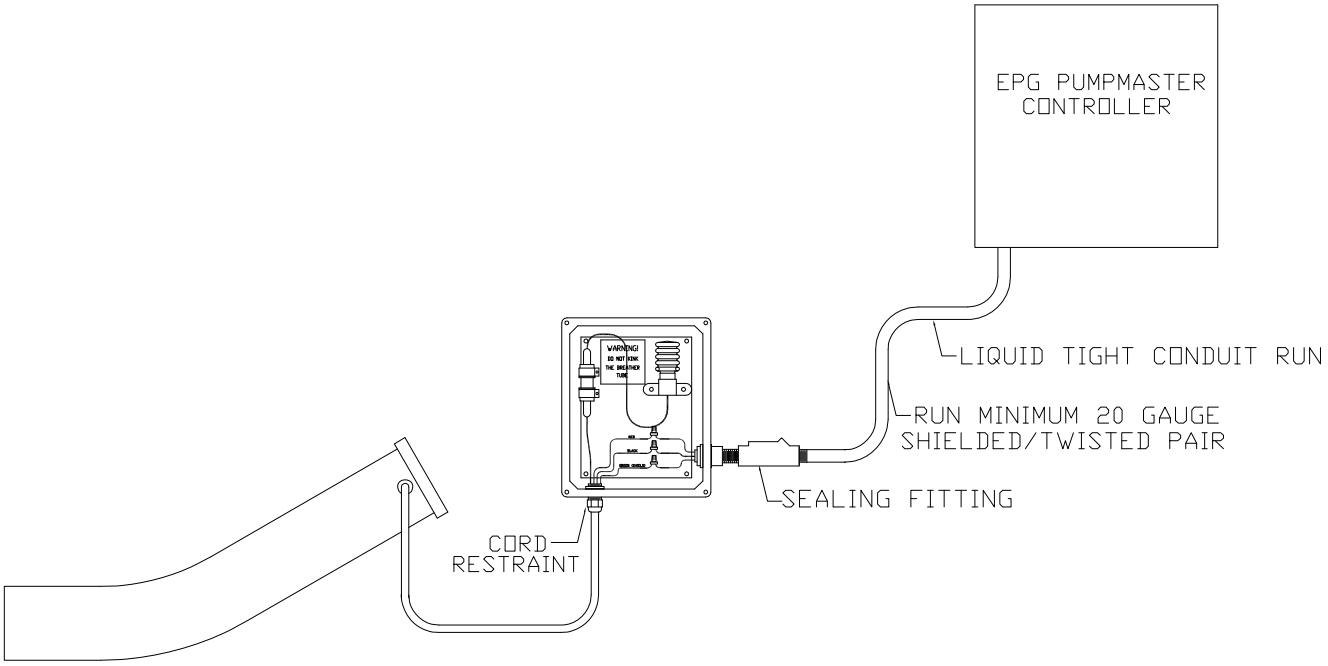
BOX DIMENSIONS (OUTER WALL):
10 ¾" X 8 ¾" X 6"

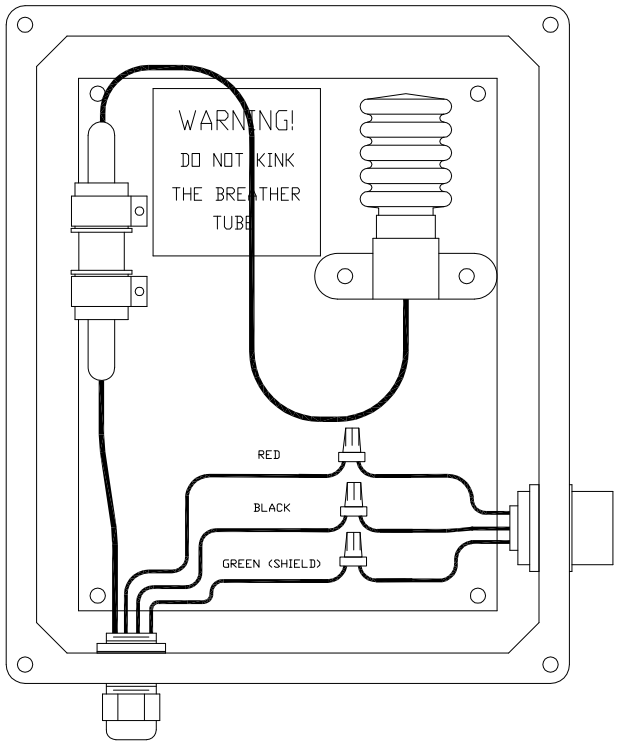
MOUNTING HOLES FOR 5/16" BOLT/SCREW,
12⅛" X 6" CENTER TO CENTER, 4 PL.

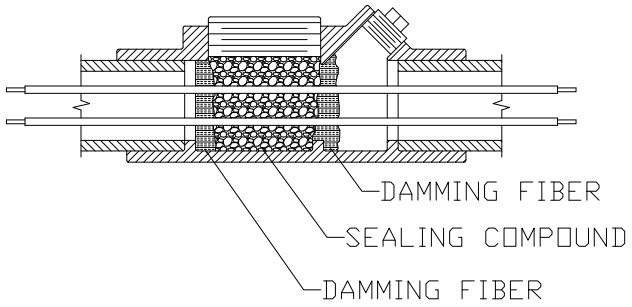
			* NOTICE * © EPG Companies Inc. 2002		
			REFERENCE		
TOLERANCES (EXCEPT AS NOTED)	REVISIONS NO.	DATE	BY	EPG COMPANIES	
DECIMAL ±	1			TYPICAL INSTALLATION	
FRACTIONAL ±	2			DESIGN	SCALE NONE / MATERIAL
ANGULAR ±	3			DRAWN U.E.V.	DATE 05/07/02 / DRAWING NO. 03626-0500
	4			CHK'D	APP'D
	5				

BJBL600B

BREAKOUT JUNCTION BOX FOR LEVEL SENSOR







NOTE:

BOX DIMENSIONS (OUTER WALL):
10 ¾″ X 8 ¾″ X 6″

MOUNTING HOLES FOR 5/16″ BOLT/SCREW,
12⅛″ X 6″ CENTER TO CENTER, 4 PL.

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REFERENCE

TOLERANCES (EXCEPT AS NOTED)	REVISIONS NO.	DATE	BY
DECIMAL ±	1		
	2		
FRACTIONAL ±	3		
	4		
ANGULAR ±	5		

EPG COMPANIES

TYPICAL INSTALLATION

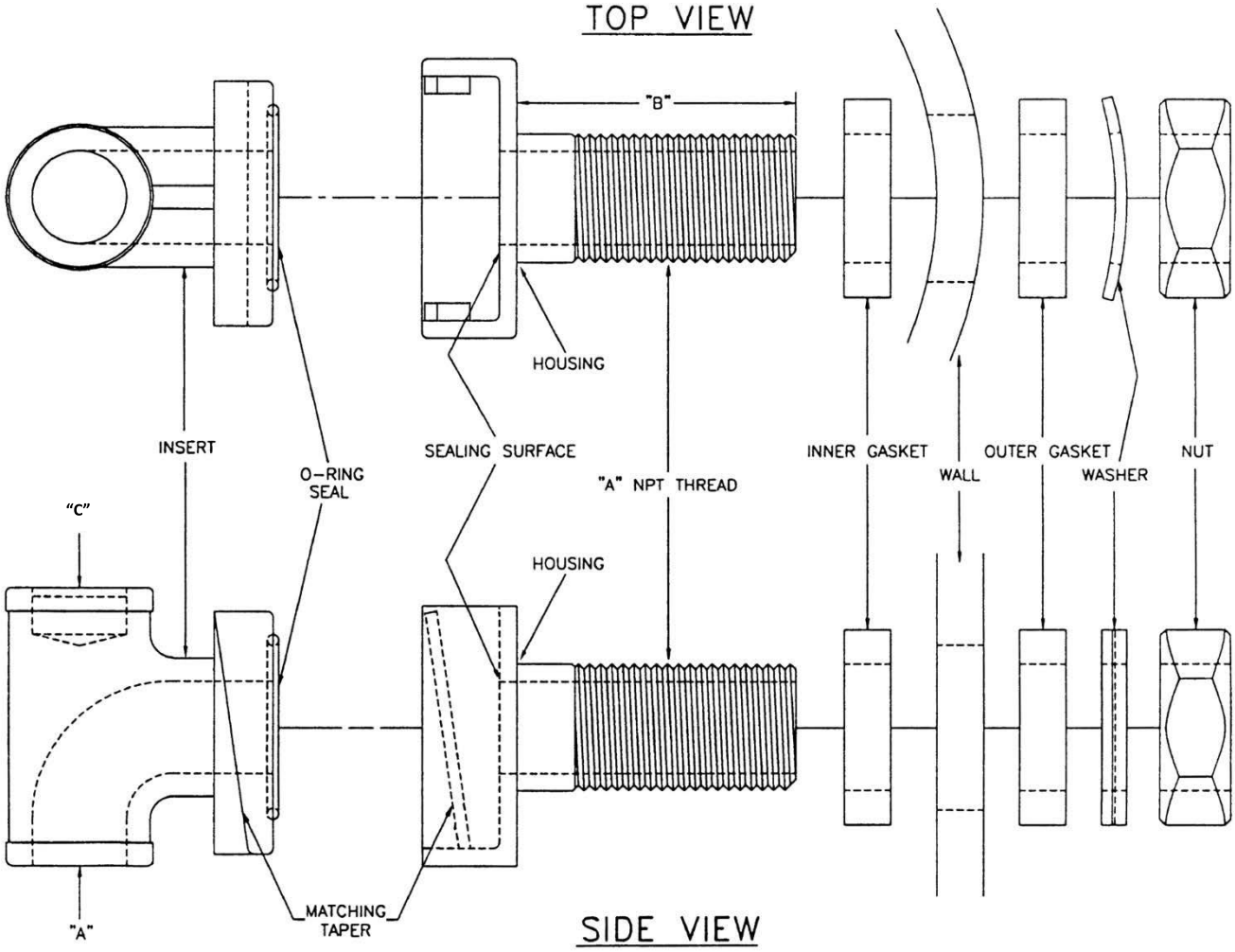
DESIGN	C.A.S.	SCALE	NONE	MATERIAL
DRAWN	C.A.S.	DATE	05/07/02	DRAWING NO. 02523-0605
CHK'D		APP'D		

Model NW Stainless Steel Discharge Adapter

For Leachate, Monitoring, and Remediation Piping Applications

MODEL	"A"	"B"	"C"	Minimum I.D.	Weight (lbs.)
NW1.5SS-C	1.5" NPT	4"	1.5” NPT	8"	8
NW2SS-C	2" NPT	5"	2” NPT	8"	12
NW3SS	3" NPT	6.25"	1.5” NPT	12"	26
NW4SS	4" NPT	8.125"	4” NPT	12"	33
NW6SS	6” NPT	11.5”	3” NPT	18”	50

- 316 stainless steel construction for “C” models. All others are 304 Stainless Steel
- Insert and housing are tapered for easy installation and removal
- Viton® O-Ring seal
- EPDM gasket for inner and outer wall seal
- Extended length nipple on housing allows adapter to fit from 1/4" to 4" thick wall pipe
- 1.5", 2", 3", 4", 6” NPT sized fittings for pump pipe, lift out pipe and discharge pipe
- Tested to 300 PSIG

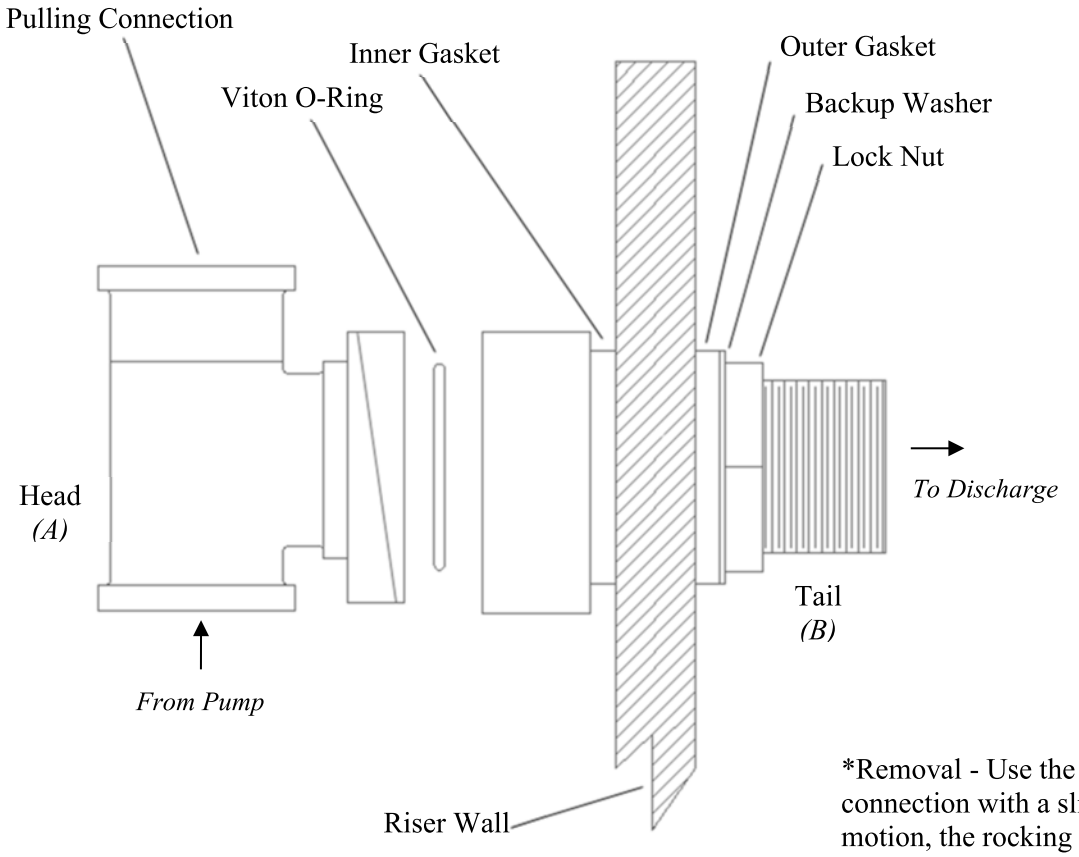


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Installation Instructions - NW Disconnect

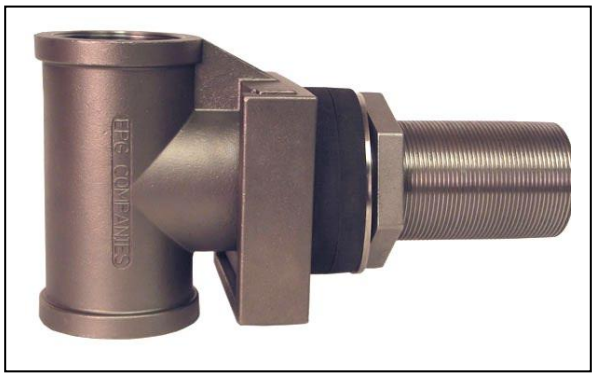
For Leachate, Monitoring, and Remediation Pumping Applications

- Using correctly sized hole saw, drill thru one wall of the riser in alignment with the force main.
- Install inner gasket on the threaded NW tail.
- Install the NW tail thru hole in riser.
- Install outside gasket, backup washer & locknut, tighten lock nut until the NW tail is secure.
- Lubricate the o-ring and install into the o-ring groove in the NW head.



*Removal - Use the pulling connection with a slight rocking motion, the rocking motion helps unseat the taper.

MODEL	"A"	"B"	Hole Saw Size
NW1.5SS-C	1-1/2" NPT	1-1/2" NPT	2"
NW2SS-C	2" NPT	2" NPT	2-1/2"
NW3SS	3" NPT*	3" NPT	3-5/8"
NW4SS	4" NPT	4" NPT	4-3/4"
NW6SS	6” NPT*	6” NPT	6-3/4”



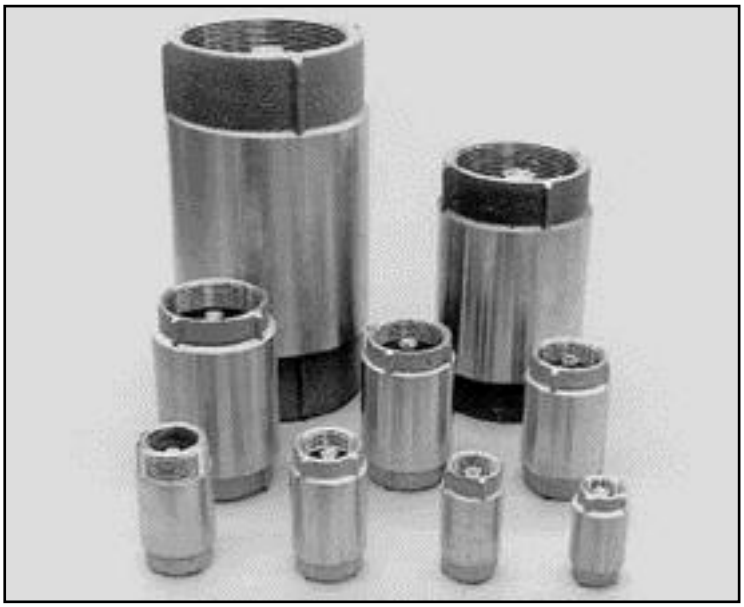
** Indicates Model Has 1.5” Pulling Connection*

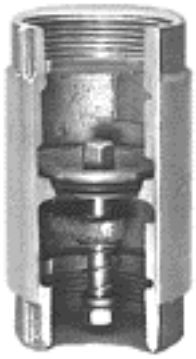
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STAINLESS STEEL CHECK VALVES

(SOLID 304 STAINLESS STEEL CONSTRUCTION)

- Inline poppet type check valve with VITON O-ring seat
- Stainless Steel spring for positive closing and low cracking pressure
- Valves can be used in both vertical and horizontal positions
- 200 PSIG working pressure





Order No.	Size	Length	Wt./Lbs.
CVSE50	0.5”	2.44”	.37
CVSE75	0.75”	2.81”	.49
CVSE100	1”	3.25”	.69
CVSE125	1.25”	3.69”	1.17
CVSE150	1.5”	4”	1.43
CVSE200	2”	5.06”	2.52
CVSE300	3”	7.25”	7.35
CVSE400	4”	10.41”	15.00

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January 2004

Stainless Steel Ball Valves

EPG Stainless Steel Ball Valves can be used to decrease flow and/or introduce artificial head in discharge piping systems. When a pump operates outside its recommended curve, damage will occur to the pump and/or motor. Setting the EPG Stainless Steel Ball Valve to the proper discharge flow will allow the pump to operate within the recommended pump curve.

- Full Ported
- PTFE Seals
- AISI 316 SS Ball
- Blowout Proof SS Stem
- Plastic Coated SS Handle
- 1000 PSI Non-Shock Cold Working Pressure
- -20 F to + 350 F
- Double Seals
- No Metal to Metal
- Handle Stops
- Removable Handle
- NPT Female x Female Ports



PART #	SIZE	LENGTH	WEIGHT (lbs.)
BV25SS	.25"	2.42"	.66
BV37.5SS	.375"	2.42"	.66
BV50SS	.50"	2.50"	.77
BV75SS	.75"	3.00"	1.28
BV100SS	1.00"	3.60"	2.29
BV125SS	1.25"	3.93"	3.40
BV150SS	1.50"	4.65"	4.98
BV200SS	2.00"	5.40"	8.38
BV250SS	2.50"	6.53"	15.00
BV300SS	3.00"	7.60"	25.36
BV400SS	4.00"	10.20"	50.72

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Badger Meter

M-Series® Mag Meter

M-2000 Detector

GENERAL

The Badger Meter M-Series® mag meter model M-2000 detector is the result of years of research and field use in electromagnetic flow meters. Based on Faraday's law of induction, these meters can measure almost any liquid, slurry or paste that has minimum electrical conductivity.

Designed, developed and manufactured under strict quality standards, the M-Series meter features sophisticated, processor-based signal conversion with accuracies of ±0.25 percent. The wide selection of liner and electrode materials helps ensure maximum compatibility and minimum maintenance over a long operating period.

OPERATION

The flow meter is a stainless steel tube lined with a nonconductive material. Outside the tube, two DC powered electromagnetic coils are positioned diametrically opposing each other. Perpendicular to these coils, two electrodes are inserted into the flow tube. Energized coils create a magnetic field across the whole diameter of the pipe.

As a conductive fluid flows through the magnetic field, a voltage is induced across the electrodes. This voltage is proportional to the average flow velocity of the fluid and is measured by the two electrodes. This induced voltage is then amplified and processed digitally by the converter to produce an accurate analog or digital signal. The signal can then be used to indicate flow rate and totalization or to communicate to remote sensors and controllers.

This technology provides many advantages. With no parts in the flow stream, there is no pressure loss. Also, accuracy is not affected by temperature, pressure, viscosity, density or flow profile. Finally, with no moving parts, there is practically no maintenance required.

APPLICATION

Because of its inherent advantages over other more conventional technologies, this meter can be used in the majority of industrial flow applications. Whether the fluid is water or highly corrosive, very viscous, contains a moderate amount of solids or requires special handling, this meter can accurately measure fluid flow. Today, magnetic meters are successfully used in industries including food and beverage, pharmaceutical, water and wastewater and chemical.

ELECTRODES

When looking from the end of the meter into the inside bore, the two measuring electrodes are positioned at three o'clock and nine o'clock. M-2000 mag meters have an "empty pipe detection" feature. This is accomplished with a third electrode positioned in the meter between twelve o'clock and one o'clock.



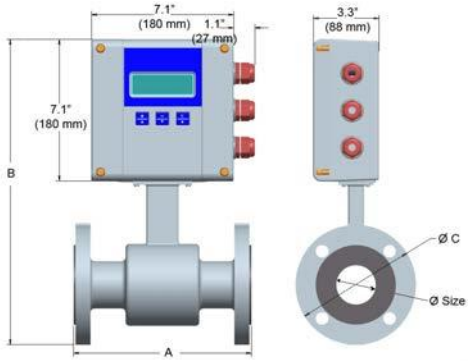
M-2000 Detector

If this electrode is not covered by fluid for a minimum five-second duration, the meter will display an "empty pipe detection" condition, send out an error message if desired, and stop measuring to maintain accuracy. When the electrode again becomes covered with fluid, the error message will disappear and the meter will continue measuring.

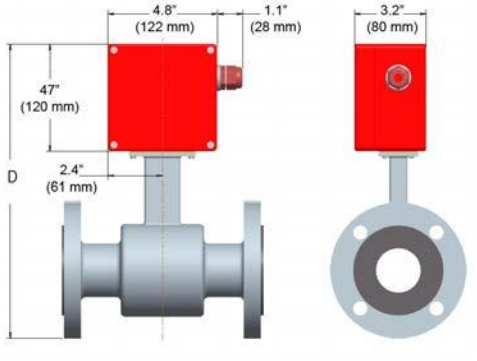
As an option to using grounding rings, a grounding electrode (fourth electrode) can be built into the meter during manufacturing to assure proper grounding. The position of this electrode is at five o'clock.

FEATURES

- ±0.25 percent accuracy independent of fluid viscosity, density and temperature
- Unaffected by most solids contained in fluids
- Pulsed DC magnetic field for zero point stability
- No pressure loss for low operational costs
- Corrosion resistant liners for long life
- Calibrated in state-of-the art facilities
- Integral and remote signal converter availability
- Optional grounding rings or grounding electrode
- Measurement largely independent of flow profile
- NSF listed



Meter with M-2000 amplifier



Meter with junction box for remote M-2000 amplifier

Size		A		B		C		D		Est. Weight with M-2000		Flow Range			
												LPM		GPM	
inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	lbs	kg	min	max	min	max
1/4	6	6.7	170	14.0	356	3.5	89	11.4	288	10	4.5	0.063	20	0.02	5
5/16	8	6.7	170	14.0	356	3.5	89	11.4	288	10	4.5	0.114	34	0.03	9
3/8	10	6.7	170	14.0	356	3.5	89	11.4	288	10	4.5	0.177	53	0.05	14
1/2	15	6.7	170	14.0	356	3.5	89	11.4	288	10	4.5	0.416	125	0.11	33
3/4	20	6.7	170	14.2	361	3.9	99	11.5	293	13	5.5	0.75	225	0.2	59
1	25	8.9	225	14.4	366	4.3	108	11.7	298	18	8.0	1.20	350	0.3	93
1 1/4	32	8.9	225	15.2	386	4.6	117	12.5	318	20	9.0	2.00	575	0.5	152
1 1/2	40	8.9	225	15.4	390	5.0	127	12.7	322	21	9.5	3.00	900	0.8	239
2	50	8.9	225	15.9	403	6.0	152	13.2	335	26	11.5	4.70	1400	1	373
2 1/2	65	11.0	280	17.1	434	7.0	178	14.4	366	52	23.5	8	2400	2	631
3	80	11.0	280	17.3	440	7.5	191	14.7	372	54	24.5	12	3600	3	956
4	100	11.0	280	18.4	466	9.0	229	15.7	398	56	25.5	19	5600	5	1493
5	125	15.8	400	19.6	498	10.0	254	16.9	430	58	26.0	30	8800	8	2334
6	150	15.8	400	20.6	524	11.0	279	17.9	456	60	27.0	40	12700	11	3361
8	200	15.8	400	22.5	572	13.5	343	20.4	518	86	39.0	75	22600	20	5975
10	250	19.7	500	26.8	681	16.0	406	24.1	613	178	81.0	120	35300	30	9336
12	300	19.7	500	28.9	734	19.0	483	26.2	666	207	94.0	170	50800	45	13444
14	350	19.7	500	30.8	782	21.0	533	28.2	716	258	117	230	69200	60	18299
16	400	23.6	590	33.7	856	23.5	597	31.0	788	306	139	300	90400	80	23901
18	450	23.6	590	35.0	890	25.0	635	32.4	822	400	181	380	114000	100	30250
20	500	23.6	590	38.2	969	27.5	699	35.5	901	493	224	470	140000	125	37346
22	550	23.6	590	39.6	1005	29.5	749	36.9	937	523	237	570	170000	150	45188
24	600	23.6	590	42.2	1071	32.0	813	39.5	1003	552	251	680	200000	180	53778
28	700	23.6	590	46.2	1173	36.5	927	44.0	1118	648	294	920	275000	240	73100
30	750	31.5	800	48.3	1228	39.0	984	45.7	1161	702	319	1060	315000	280	84000
32	800	31.5	800	52.2	1325	41.4	1015	49.5	1257	768	349	1200	361000	320	95600
36	900	31.5	800	55.3	1405	46.0	1168	54.1	1374	848	385	1500	457000	400	121000
40	1000	31.5	800	60.0	1525	50.2	1230	57.4	1457	922	419	1900	565000	500	149300
42	1050	36.0	914	66.0	1675	53.0	1346	63.4	1610	1198	499	2100	620000	550	164600
48	1200	39.4	1000	69.9	1775	59.4	1455	67.2	1707	1208	549	2700	814000	720	215100
54	1400	39.4	1000	78.5	1995	68.4	1675	75.9	1927	1362	619	3700	1100000	980	292700

SPECIFICATIONS - Detector

Flow Range: 0.1 - 39.4 fps (0.03-12 m/s)
Sizes: 1/4 inch to 54 inches (6 mm to 1400 mm)
Min. Conductivity: ≥ 5 micromhos/cm
Accuracy:
± 0.25 percent of rate for velocities greater than 1.64 ft/s (0.50 m/s)
± 0.004 ft/s (± 0.001 m/s) for velocities less than 1.64 ft/s (0.50 m/s)
Electrode Materials: Standard: Alloy C
Optional: 316 stainless steel, gold/platinum plated, tantalum, platinum/rhodium
Liner Material: PFA up to 3/8 inch, PTFE 1/2 inch to 24 inches, Soft and Hard Rubber from 1 to 54 inches, Halar® from 14 to 40 inches
NSF Listed: Models with hard rubber liner 4-inch size and up; PTFE liner - All sizes.

Fluid Temperature:
With Remote Amplifier:
PFA, PTFE & Halar 311°F (155°C)
Rubber 178°F, (80°C)
With Meter Mounted Amplifier:
PFA, PTFE & Halar 212°F (100°C)
Rubber 178°F, (80°C)
Pressure Limits:
Maximum allowable non-shock pressure and temperature ratings for steel pipe flanges, according to American National Standard ANSI B16.5. (Example: 150-pound flanges, rated 285 PSI at ambient temperature.) (Example: 300-pound flange rated 740 PSI at ambient temperature.)
Coil Power: Pulsed DC
Ambient Temperature: -4°F to 140°F (-20°C to 60°C)

Pipe Spool Material: 316 stainless steel
Meter Housing Material: Carbon steel welded
Flanges: Carbon steel - Standard (ANSI B16.5 Class 150 RF)
316 stainless steel - Optional
Meter Enclosure Classification: NEMA 4X (IP66)
Optional: Submersible NEMA 6P (remote amplifier required)
Junction Box Enclosure Protection:
(for remote amplifier option) Powder coated die-cast aluminum, NEMA 4 (IP65)
Cable Entries: 1/2-inch NPT Cord Grip
Optional Stainless Steel Grounding Rings:

Meter Size	Thickness (of one ring)
up through 10 inches	.135 inch
12 to 20 inches	.187 inch

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Badger Meter | P.O. Box 245036, Milwaukee, Wisconsin 53224-9536
800-876-3837 | infocentral@badgermeter.com | www.badgermeter.com

EXTENDED LIMITED WARRANTY

This agreement shall be deemed to have been entered into in the State of Minnesota, and shall be construed in accordance with the laws of the State of Minnesota, including Minnesota's enactment of the Uniform Commercial Code. Buyer hereby stipulates and agrees that Hennepin County, Minnesota shall be the proper jurisdiction for adjudicating all claims and controversies arising from this agreement.

Products manufactured by EPG Companies Inc. are warranted for a period of 36 months from date of manufacture to be free from defects of materials and workmanship. It is expressly agreed that the exclusive remedy under this warranty is limited solely to the repair or replacement, at the sole discretion of EPG, of the part that failed. The cost of labor for any field repairs is not covered by this warranty. EPG Companies will not be liable for any damage or wear due to abnormal conditions or improper installation.

To qualify for an Extended 36 Month Limited Warranty, the following conditions must be met.

A. Pumps, controls and accessories must be purchased as a package.
B. Form 200 or 230 must be completed by the installer and on file at EPG prior to warranty request.

Products not manufactured by EPG Companies Inc. are covered by the original manufacturer's warranty, which EPG Companies passes through to the purchaser. Warranty determination will be made by the actual manufacturer.

To have a defective part repaired or replaced, you must return the defective product to EPG Companies. Please call (800) 762-8418 or (763) 424-2613 to obtain a RMA number. Send defective product (freight prepaid) with RMA #, description of installation, installation data and failure date to EPG Companies Inc., 19900 County Rd. 81, Maple Grove, MN 55311.

EPG Companies will not be held liable for any incidental or consequential damages, losses or expenses incurred from installation, use or any other reason. THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING IMPLIED WARRANTIES OF EITHER FITNESS FOR A PARTICULAR PURPOSE OR OF MERCHANTABILITY, WHICH EXTEND BEYOND THOSE SPECIFICALLY LISTED HERE.

If equipment is to be stored for a period greater than six months, proper storage precautions must be taken if the warranty is to be maintained. Please contact EPG Companies for specific requirements regarding product storage.

To qualify for the delayed installation warranty you must contact EPG Companies Inc., at (800) 762-8418 or (763) 424-2613 within 60 days of purchase.

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EPG SurePump™ Installation Record

EPG Job No. 545605

Installer's Name C2R

Address Po box 1203

City Humble State TX Zip 77347

Phone 713-724-0255 Fax

Contact name Charles Reich

Owner's Name Legacy LF

Address 238 Co Rd 476

City Jonesboro State AR Zip 72404

Phone Fax

Contact name

Sump Name/ ID Date Installed 12/16/2025

Leachate or Condensate Temp °F Or °C

Pump:

Model No. WSDPT 9-5

Rating: GPM@ Ft. TDH

HP 2 Voltage 230 Phase 1

Actual Pump Delivery GPM@ PSI

Operating Cycle ON (Min/Hr) OFF (Min/Hr) (Circle Min. or Hr. as appropriate)

Side Slope Riser Information:

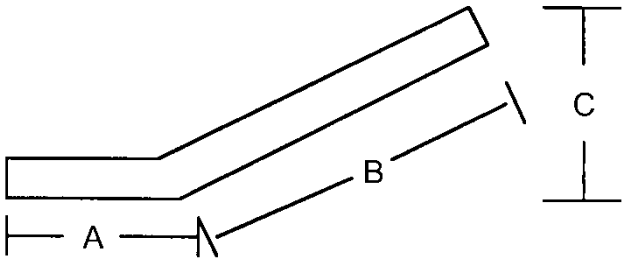
Slope :1

Length of riser Pipe (A+B) ft.

Vertical Distance = Sump to Top of Riser Pipe (C) ft.

Riser ID SDR

Distance From Top of Riser Pipe to Controller ft.



Power Supply:

Cable: Service Entrance to Control Distance ft Wire Size AWG/MCM

Copper Jacketed Aluminum Individual conductors

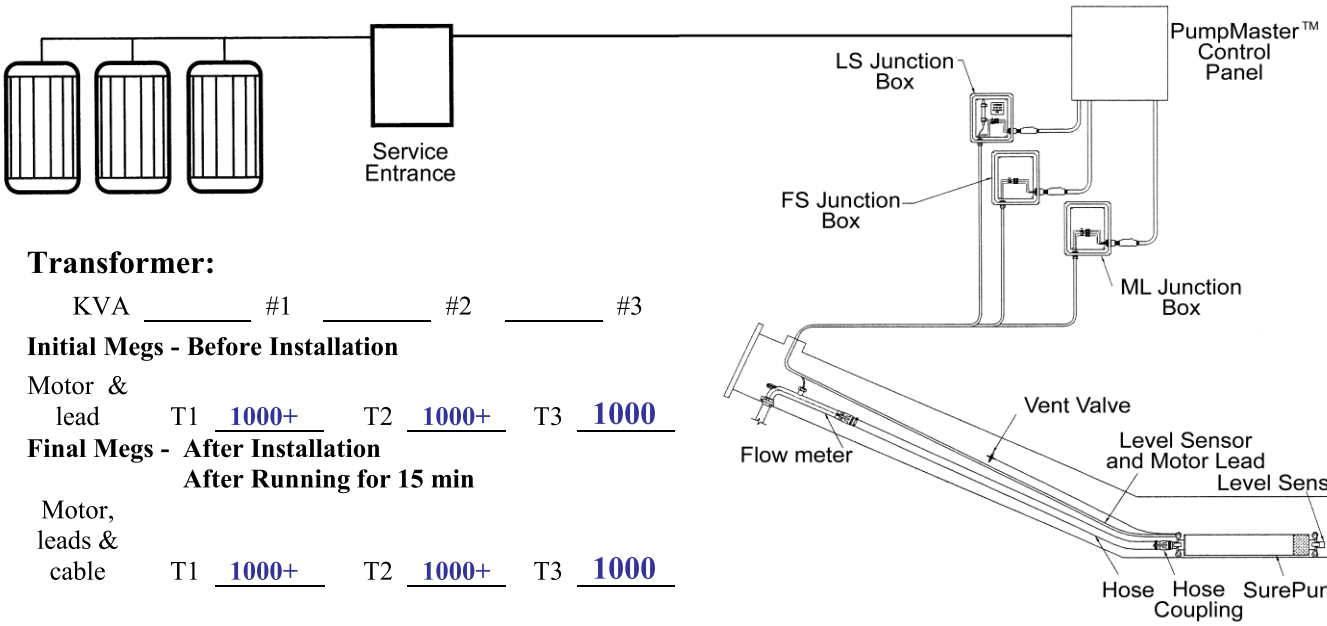
Cable: Control to Motor ft AWG/MCM

Copper Jacketed

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EPG Companies Inc.

July 2002



Transformer:

KVA _____ #1 _____ #2 _____ #3

Initial Megs - Before Installation

Motor & lead T1 1000+ T2 1000+ T3 1000

Final Megs - After Installation
After Running for 15 min

Motor, leads & cable T1 1000+ T2 1000+ T3 1000

Incoming Voltage:

No Load L1-L2 230 L2-L3 228 L1-L3 230

Full Load L1-L2 229 L2-L3 228 L1-L3 228

Running Amps:

Hookup:1

Full Load L1 9.3 L2 9.2 L3 9.4 % unbalanced _____

Hookup:2

Full Load L1 9.1 L2 9.1 L3 9.2 % unbalanced _____

Hookup:3

Full Load L1 9.2 L2 9.2 L3 9.4 % unbalanced _____

Ground wire size N/A AWG/MCM

DC Ground Current _____ mA Ground Test N/A Ohms

Motor Surge Protection X Yes _____ No

Control Panel:

Model # YCL925PT

Short Circuit Device

Circuit Breaker X Rating X Setting

Fuses X Type X Rating

X Standard X Time Delay

Controls are Grounded to:

_____ Motor

X Rod

_____ Power Supply

Start Overloads:

Set at X amps

Name: Charles Reich

Company C2R

Date 12-22-2025

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Plastic Fusion Fabricators, Inc.
Your Total Containment Resource

Material Submittals 8-12-25

To

Dumey Contracting, Inc.
6554 State Highway 77
Benton, MO. 63736
Attn: Tom Jansen

HDPE Pipe System
Designed By Olsson Engineering

For

Craighead County Solid Waste Disposal Authority
Legacy Landfill
Cell 5 Construction
238 County Road 476
Jonesboro, AR. 72404

PFF Job # 500066

PFF Project Manager: Leif Martin
Cell Phone: (256) 508-7572
Email: lmartin@plasticfusion.com

Plastic Fusion Fabricators, Inc.
Your Total Containment Resource

Manufacturers

WL Plastics:
Leachate Collection

6” DR 17 HDPE IPS Perforated Pipe
With (3) Rows of .375” Diameter Holes On 6” Centers Staggered
6” DR 17 HDPE IPS Solid Cleanout & Intercell Stormwater Berm Pipe
18” DR 11 HDPE IPS Solid & Perf Sump & Riser Pipe
4”x 8” DR 17/17 HDPE DC IPS Forcemain Pipe
3” DR 11 HDPE IPS Storage Tank Crossover Pipe
4” DR 11 HDPE IPS Storage Tank Pipe
6” DR 11 HDPE IPS Storage Tank Drainpipe

SKAPS Industries:

6oz GE-160 Non-Woven Geotextile Filter Fabric

Integrity Fusion Products:

3” DR 11 IPS Molded Flange Adapter (Pump Discharge Pad)
3” DR 11 316 SS Backup Ring
4” DR 11 IPS Molded Flange Adapter (Inline FM Stub-Out/Valve Box)
4” DR 11 Epoxy Coated DI Backup Ring
6” DR 17 IPS Molded Flange Adapter (Stormwater Berm)
6” DR 11 Epoxy Coated DI Backup Ring
6” DR 11 IPS Molded Flange Adapter (Storage Tank Drain)
6” DR 11 316 SS Backup Ring
4” DR 11 IPS Molded 45º Elbow
3” DR 11 IPS Molded 90º Elbow
4” DR 11 IPS Molded 90º Elbow
3” DR 11 IPS Molded Tee
4” DR 11 IPS Molded Tee
4”x 3” DR 11 IPS Molded Concentric Reducer
6” DR 17 IPS Molded Cap
8” DR 11 IPS Molded Butt Cap-Slip Cap (Cleanouts w/Handle)
4” DR 11 Molded Lateral Wye
3” DR 11 x Male 316 SS NPT IPS Transition Fitting

AIS:

4”x 8” DR 11/17 DC 90º Elbow
4”x 8” DR 11/17 DC 45º Elbow
4”x 8” DR 11/17 DC Tee
4”x 8” DR 17/17 DC End Termination
4”x 8” DR 17/17 DC End Cap
6” DR 17 Fabricated (2-Piece) 18.4º Elbow

Haitima Valves:

3” 316 SS Male Camlock
3” 316 SS Flanged Ball Valve
4” 316 SS Flanged Swing Check Valve
6” 316 SS Flanged Gate Valve

API International:

4” 304 SS Blind 150#

Dixon:

3” SS NPT x Female Camlock

See PFF submittal drawings.

WL PLASTICS
An INEOS Business

WL102
IPS Pipe Sizes & Pressure Class



Multi-application use

The ideal piping solution

WL102 IPS Pipe Sizes & Pressure Class

Contact WL Plastics customer service to confirm the availability of sizes shown, and for PCs and DRs not shown.
See table footnotes for additional information.

PE4710/ PE100		PC[B], psi	335	320	250	200	160	140	125	100	80	65
IPS size[A]	Avg. OD (in)	DR	7	7.3	9	11	13.5	15.5	17	21	26	32.5
3/4	1.050	Min wall, in	0.150	0.144	0.117	0.095						
		Avg ID[C], in	0.732	0.745	0.803	0.848						
		Weight, lb/ft	0.187	0.177	0.148	0.124						
1	1.315	Min wall, in	0.188	0.180	0.146	0.120						
		Avg ID[C], in	0.917	0.933	1.005	1.062						
		Weight, lb/ft	0.288	0.278	0.232	0.195						
1 1/4	1.660	Min wall, in	0.237	0.227	0.184	0.151	0.123					
		Avg ID[C], in	1.157	1.178	1.269	1.340	1.399					
		Weight, lb/ft	0.459	0.442	0.369	0.310	0.257					
1 1/2	1.900	Min wall, in	0.271	0.260	0.211	0.173	0.141					
		Avg ID[C], in	1.325	1.348	1.452	1.534	1.602					
		Weight, lb/ft	0.600	0.580	0.485	0.406	0.337					
2	2.375	Min wall, in	0.339	0.325	0.264	0.216	0.176	0.153	0.140			
		Avg ID[C], in	1.656	1.685	1.816	1.917	2.002	2.050	2.079			
		Weight, lb/ft	0.939	0.906	0.758	0.634	0.526	0.462	0.425			
3	3.500	Min wall, in	0.500	0.479	0.389	0.318	0.259	0.226	0.206	0.167		
		Avg ID[C], in	2.440	2.484	2.676	2.825	2.950	3.021	3.064	3.147		
		Weight, lb/ft	2.040	1.968	1.646	1.376	1.141	1.006	0.923	0.757		
4	4.500	Min wall, in	0.643	0.616	0.500	0.409	0.333	0.290	0.265	0.214	0.173	0.138
		Avg ID[C], in	3.137	3.193	3.440	3.633	3.793	3.885	3.939	4.046	4.133	4.206
		Weight, lb/ft	3.372	3.253	2.720	2.275	1.887	1.660	1.526	1.247	1.018	0.819
6	6.625	Min wall, in	0.946	0.908	0.736	0.602	0.491	0.427	0.390	0.315	0.255	0.204
		Avg ID[C], in	4.619	4.701	5.064	5.348	5.585	5.719	5.799	5.956	6.085	6.193
		Weight, lb/ft	7.305	7.059	5.894	4.930	4.095	3.599	3.307	2.703	2.209	1.781
8	8.625	Min wall, in	1.232	1.182	0.958	0.784	0.639	0.556	0.507	0.411	0.332	0.265
		Avg ID[C], in	6.013	6.120	6.593	6.963	7.271	7.445	7.549	7.754	7.922	8.062
		Weight, lb/ft	12.385	11.963	9.988	8.359	6.939	6.100	5.597	4.591	3.744	3.012
10	10.750	Min wall, in	1.536	1.473	1.194	0.977	0.796	0.694	0.632	0.512	0.413	0.331
		Avg ID[C], in	7.494	7.628	8.218	8.678	9.062	9.280	9.409	9.665	9.873	10.049
		Weight, lb/ft	19.245	18.581	15.515	12.983	10.774	9.490	8.695	7.128	5.805	4.689
12	12.750	Min wall, in	1.821	1.747	1.417	1.159	0.944	0.823	0.750	0.607	0.490	0.392
		Avg ID[C], in	8.889	9.047	9.747	10.293	10.748	11.006	11.160	11.463	11.710	11.918
		Weight, lb/ft	27.062	26.138	21.837	18.267	15.155	13.348	12.238	10.023	8.169	6.587
14	14.000	Min wall, in	2.000	1.918	1.556	1.273	1.037	0.903	0.824	0.667	0.538	0.431
		Avg ID[C], in	9.760	9.934	10.702	11.302	11.801	12.085	12.254	12.587	12.858	13.087
		Weight, lb/ft	32.635	31.511	26.329	22.030	18.279	16.082	14.763	12.093	9.848	7.952
16	16.000	Min wall, in	2.286	2.192	1.778	1.455	1.185	1.032	0.941	0.762	0.615	0.492
		Avg ID[C], in	11.154	11.353	12.231	12.916	13.487	13.812	14.005	14.385	14.695	14.956
		Weight, lb/ft	42.629	41.157	34.384	28.777	23.872	21.005	19.269	15.789	12.866	10.375
18	18	Min wall, in	2.571	2.466	2	1.636	1.333	1.161	1.059	0.857	0.692	0.554
		Avg ID[C], in	12.549	12.773	13.76	14.531	15.173	15.538	15.755	16.183	16.532	16.826
		Weight, lb/ft	53.94	52.089	43.513	36.403	30.21	26.584	24.395	19.977	16.286	13.142

3", 4", 6" DR 11 Tank Farm
4"x 8" DR 17/17 DC FM
6" DR 17 Perf & Solid Cell
18" DR 11 Sump & Riser
See submittal drawings.

PE4710/ PE100		PC[B], psi	335	320	250	200	160	140	125	100	80	65
IPS size[A]	Avg. OD (in)	DR	7	7.3	9	11	13.5	15.5	17	21	26	32.5
20	20	Min wall, in	2.857	2.74	2.222	1.818	1.481	1.29	1.176	0.952	0.769	0.615
		Avg ID[C], in	13.943	14.192	15.289	16.145	16.859	17.265	17.506	17.981	18.369	18.695
		Weight, lb/ft	66.599	64.307	53.715	44.947	37.294	32.82	30.102	24.658	20.109	16.211
22	22	Min wall, in	3.143	3.014	2.444	2	1.63	1.419	1.294	1.048	0.846	0.677
		Avg ID[C], in	15.337	15.611	16.818	17.76	18.545	18.991	19.256	19.779	20.206	20.565
		Weight, lb/ft	80.591	77.812	64.991	54.391	45.149	39.712	36.433	29.858	24.335	19.629
24	24	Min wall, in	3.429	3.288	2.667	2.182	1.778	1.548	1.412	1.143	0.923	0.738
		Avg ID[C], in	16.731	17.03	18.347	19.375	20.231	20.717	21.007	21.577	22.043	22.434
		Weight, lb/ft	95.916	92.603	77.365	64.735	53.726	47.26	43.369	35.525	28.963	23.344
26	26	Min wall, in	3.714	3.562	2.889	2.364	1.926	1.677	1.529	1.238	1	0.8
		Avg ID[C], in	18.126	18.449	19.876	20.989	21.917	22.444	22.758	23.375	23.88	24.304
		Weight, lb/ft	114.714	110.769	92.535	77.44	64.261	56.532	51.856	42.486	34.648	27.94
28	28	Min wall, in	4.000	3.836	3.111	2.545	2.074	1.806	1.647	1.333	1.077	0.862
		Avg ID[C], in	19.520	19.868	21.404	22.604	23.603	24.17	24.508	25.173	25.717	26.174
		Weight, lb/ft	133.49	128.466	107.312	89.785	74.522	65.563	60.154	49.266	40.187	32.421
30	30	Min wall, in			3.333	2.727	2.222	1.935	1.765	1.429	1.154	0.923
		Avg ID[C], in			22.933	24.218	25.289	25.897	26.259	26.971	27.554	28.043
		Weight, lb/ft			123.183	103.076	85.543	75.264	69.068	56.585	46.135	37.196
32	32	Min wall, in			3.556	2.909	2.37	2.065	1.882	1.524	1.231	0.985
		Avg ID[C], in			24.462	25.833	26.975	27.623	28.009	28.77	29.391	29.913
		Weight, lb/ft			140.183	117.285	97.324	85.672	78.557	64.37	52.494	42.34
34	34	Min wall, in			3.778	3.091	2.519	2.194	2	1.619	1.308	1.046
		Avg ID[C], in			25.991	27.447	28.661	29.35	29.76	30.568	31.228	31.782
		Weight, lb/ft			158.244	132.411	109.905	96.714	88.7	72.657	59.264	47.773
36	36	Min wall, in			4.000	3.273	2.667	2.323	2.118	1.714	1.385	1.108
		Avg ID[C], in			27.52	29.062	30.347	31.076	31.511	32.366	33.065	33.652
		Weight, lb/ft			177.399	148.454	123.208	108.424	99.457	81.446	66.444	53.581
42	42	Min wall, in				3.818	3.111	2.71	2.471	2	1.615	1.292
		Avg ID[C], in				33.906	35.404	36.255	36.762	37.76	38.575	39.26
		Weight, lb/ft				202.039	167.675	147.568	135.372	110.874	90.393	72.893
48	48	Min wall, in					3.556	3.097	2.824	2.286	1.846	1.477
		Avg ID[C], in					40.461	41.435	42.014	43.154	44.086	44.869
		Weight, lb/ft					219.036	192.774	176.813	144.833	118.082	95.233
54	54	Min wall, in						3.484	3.176	2.571	2.077	1.662
		Avg ID[C], in						46.614	47.266	48.549	49.597	50.478
		Weight, lb/ft						243.921	223.713	183.253	149.464	120.556

Contact WL Plastics plant customer service to confirm availability and for sizes and DRs not shown.

A. Sizes per ASTM D3035 and ASTM F714. See WL116 Pipe Standards.

B. See WL130 for FM Sizes and Ratings. Pressure class (PC) for water at 73°F. Ratings will vary for other fluids and temperatures. See WL118 Pressure Rating for more information.

C. Calculated Avg ID = Avg OD – (2.12 x min wall), and is for estimating fluid flow. Pipe ID is approximate, not a specification dimension.

D. All dimensions in inches.

E. NSF-61 Certification for potable water service available upon request.

F. See WL101 for fusion, mechanical and electrofusion joining information.

G. The information in this publication does not constitute a guarantee or warranty for piping installations and cannot be guaranteed because the conditions of use are beyond WL Plastics control. See WL125 Terms and Conditions of Sale.

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Manufacturing locations

Bowie, TX
Casper, WY
Cedar City, UT
Elizabethtown, KY
Lubbock, TX (HDPE)
Lubbock, TX (MDPE)
Rapid City, SD
Snyder, TX
Statesboro, GA
Titusville, PA (HDPE/MDPE)

Corporate office

3575 Lone Star Circle, Suite 300,
Fort Worth, TX, 76177

Contact

Contact WL Plastics for more information

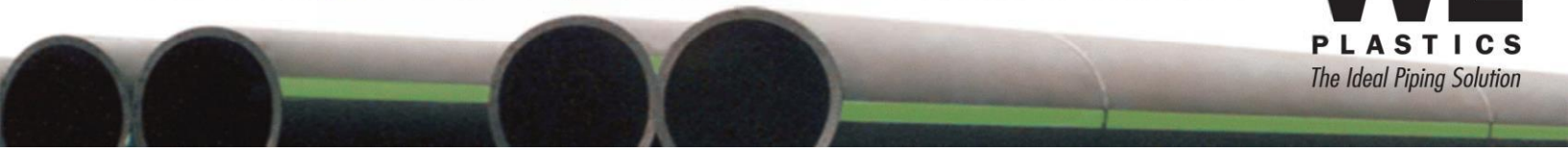
SALES: wlsales@wlplastics.com

TECHNICAL: wltechnical@wlplastics.com

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WL106C PE4710/PE100 PIPE COMPOUND



Typical Physical Properties for WL Plastics PE4710/PE100 Pipe Compound

- WL Plastics PE4710/PE100 pipe is manufactured from pressure rated PE4710/PE100 polyethylene compounds that meet or exceed ASTM D3350 requirements and Cell Classification PE445586C. WL Plastics PE4710/PE100 compound meets or exceed ASTM D3350 requirements and Cell Classification PE345464C and material code designation PE3608/PE80.
- WL Plastics PE4710/PE100 polyethylene pipe compounds are Listed by PPI in TR-4 and are stress rated for pressure pipe with PPI HDS ratings for water at 73°F (23°C), PPI MRS ratings for water at 68°F (20ºC) and PPI HDB ratings at 73°F (23°C) and 140°F (60ºC).
- WL Plastics PE4710/PE100 exceeds PPI TR-3 and ASTM D3350 slow crack growth (SCG) resistance requirements per ASTM F1473 (PENT). WL Plastics PE4710/PE100 ductility is substantiated with greater than 438,300 hours (50 years) at 73ºF (23ºC) before the onset of SCG.
- For potable water service, WL Plastics PE4710/PE100 black polyethylene compounds are certified to NSF-61

Physical Property	*Test Method*	*Typical Value*[1]
Cell classification (black compound)	ASTM D3350	PE445586C
Oxidative Resistance Classification	ASTM D3350	CC3
Melt Index (190/2.16)	ASTM D1238	0.1 g/10 min
High Load Melt Index[2](190/21.6)	ASTM D1238	6 – 12 g/10 min
Density with 2% minimum carbon black (73°F/23°C)	ASTM D792	0.960 g/cm^3
Tensile strength at yield (2 in/min; 73°F/23°C)	ASTM D638	3500 < 4000 psi
Tensile elongation (2 in/min; 73°F/23°C)	ASTM D638	>400%
Flexural modulus (73°F/23°C)	ASTM D790	>135,000 psi
SCG Resistance, PENT (80°C, 2.4 MPa)	ASTM F1473	> 5000 h
Thermal stability	ASTM D3350	>428ºF (> 220°C)
Brittleness temperature	ASTM D746	<-103°F (<-75ºC)
Thermal expansion coefficient	ASTM D696	8 x 10^{-5} in/in/°F
MRS[3] at 68°F (20°C)	ISO 9080 & ISO 12162	1450 psi (10MPa)
HDB[3] at 73°F (23ºC)	ASTM D2837/PPI TR-3	1600 psi (11.0 MPa)
HDB[3] at 140°F (60ºC)	ASTM D2837/PPI TR-3	1000 psi (6.9 MPa)
HDS[3] for water at 73°F (23ºC)	ASTM D2837/PPI TR-3	1000 psi (6.9 MPa)
HDS for water at 140ºF (60ºC)	ASTM D2837/PPI TR-3	630 psi (4.3 MPa)
RCP Resistance, Critical Pressure at 32ºF (0ºC)	ISO 13477	>174 psi (>1.2 MPa)[4]
RCP Resistance, Critical Temp. at 72.5 psi (0.5 MPa)	ISO 13477	<2ºF (<-17ºC)[4]

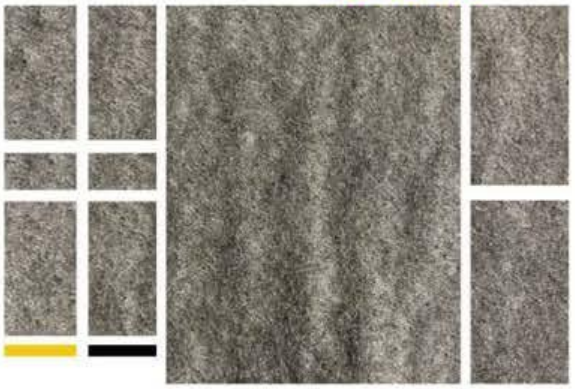
Contact WL Plastics Customer Service for availability. (1) Typical values determined from laboratory tests of samples of compounds (resins) prepared as plaque specimens in accordance with industry standard test methods. Values determined on samples prepared from pipe may vary. The typical values presented herein are for PE4710/PE100 polyethylene pipe compounds (resins) but do not constitute engineering properties for pipe. (2) Overall range of HLMI values for all compounds from all WL Plastics compound suppliers; HLMI variation for an individual compound will be well within the overall range. (3) Listed HDB, HDS and MRS ratings in accordance with ASTM D 2837/PPI TR-3 and ISO 9080/ISO12162 are published in PPI TR-4 by the compound manufacturer (independent listing) and by WL Plastics (dependent listing). WL Plastics dependent listing compounds are identified by a compound code for the supplier: D (Dow); E (Lyondell Basell); S (Ineos).

This publication is intended for use as a piping system guide. It should not be used in place of a professional engineer's judgment or advice and it is not intended as installation instructions. The information in this publication does not constitute a guarantee or warranty for piping installations and cannot be guaranteed because the conditions of use are beyond our control. The user of this information assumes all risk associated with its use. WL Plastics Corporation has made every reasonable effort to ensure accuracy, but the information in this publication may not be complete, especially for special or unusual applications. Changes to this publication may occur from time to time without notice. Contact WL Plastics Corporation to determine if you have the most current edition. Publication duplication permitted.

NON-WOVEN GEOTEXTILE

GE - 160

SKAPS GE-160 is a needle-punched nonwoven geotextile made of 100% virgin polypropylene staple fibers, which are formed into a random network for dimensional stability. SKAPS GE-160 resists ultraviolet deterioration, rotting, biological degradation, naturally encountered alkalis and acids. Polypropylene is stable within the pH range of 2 to 13.



SKAPS GE-160 conforms to the Minimum Average Roll Values (MARV) listed below:

Property	Method	English (MARV[2])	Metric (MARV[2])
Weight	ASTM D 5261	6 oz/yd^2	203 g/m^2
Grab Tensile Strength	ASTM D 4632	160 lbs	0.711 kN
Grab Elongation	ASTM D 4632	50%	50%
Trapezoid Tear Strength	ASTM D 4533	65 lbs	0.29 kN
Thickness[4]	ASTM D-5199	85 mils	2.16 mm
CBR Puncture Resistance	ASTM D 6241	450 lbs	2 kN
Permittivity[4]	ASTM D 4491	1.63 sec^{-1}	1.63 sec^{-1}
Permeability[4]	ASTM D 4491	0.48 cm/sec	0.48 cm/sec
Water Flow[4]	ASTM D 4491	125 gpm/ft^2	5080 l/min/m^2
Apparent Opening Size (AOS)[3&4]	ASTM D 4751	70 US Sieve	0.212 mm
UV Resistance	ASTM D 4355	70%/500 hrs.	70%/500 hrs.

Packaging

Roll Dimensions (W x L)	15 x 900 ft.	4.58 m x 274.32 m
Area Per Roll	1500 sq. yards	1256 sq. meters

Note

1. The property values listed above are subject to change without notice.
2. Minimum Average Roll Values (MARV) is calculated as the average minus two standard deviations. Statistically, it yields approximately 97.5% degree of confidence that any samples taken from quality assurance testing will meet or exceed the values described above.
3. Maximum Average Roll Value (MaxARV)
4. At time of manufacturing. Handling may change these properties.

This information is provided for reference purposes only and is not intended as a warranty or guarantee. SKAPS assumes no liability in connection with the use of this information.

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www.skaps.com

INTEGRITY
Fusion Products, Inc.

2025

Flange Adapter & Backup Ring Submittal Package



Integrity Fusion Products
Peachtree City, Georgia
1/1/2025

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INTEGRITY Fusion Products, Inc.

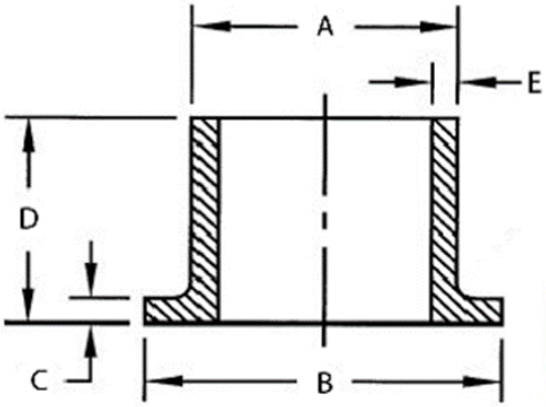
Injection Molded Flange Adapters & Back-Up Rings

Integrity Fusion Products offers a full line of injection molded **IPS** and **DIPS** Non-Beveled HDPE Flange Adapters, and a growing line of 60^{O} Beveled Flange Adapters for butterfly valves.; and, a full line of **Fusion Bonded Epoxy Coated Ductile Iron Back-Up Rings**, and class 150 316 Stainless Steel Back-Up Rings that are manufactured in a variety of nominal pipe sizes and SDR's. **Molded HDPE Flange Adapters** from Integrity Fusion Products in our manufacturing facility located in Peachtree City, GA; are manufactured and tested to meet the requirements of ASTM D2513, ASTM D3261, and ANSI/AWWA C901 and C906 for use with outside diameter-controlled pipe and fittings conforming to ASTM D2513, ASTM D3035, and ASTM F-714. All **Back-Up Rings** are manufactured to comply to the drilling and mating requirements in **ANSI/ASME B16.5** and **AWWA C207** for use in applications 24" and smaller; and with **ANSI/ASME B16.47** and **AWWA C207** for use in applications 26" and larger.



Molded Flange Adapter w/o Bevel Dimension Sheet





CERTIFIED TO NSF/ANSI 61 SECTION 4 NSF/ANSI 372

FM APPROVED

MADE IN THE USA

BABA COMPLIANT

Product Family:	Injection Molded Butt Fusion Fitting	**Fitting Design:**	Flange Adapter
Resin Status:	NSF Listed Bi-Modal Virgin Resin	**Nominal Pipe Sizes:**	2" – 36"
Resin Type:	ASTM D3350 designated PE3408/PE4710/PE100	**Nominal Pipe Standard:**	IPS and DIPS
Resin Cell Class:	4455574-CC3	**Currently Available SDR's:**	17, 11, 9, 7
Manufactured and tested to meet requirements of:	ASTM D2513, ASTM D3261, ANSI/AWWA C901 & C906, FM 1613, NSF 61		
For use on pipe and fittings conforming to:	ASTM D2513, ASTM D3035, ASTM F-714		

For Material and Testing information, please refer to our Molded Fitting Specification Sheet.

IPS

Intercell Berm Flange

SDR 17 (standard dimension ratio) **125 PSI** (MAOP @ 73.4° F)

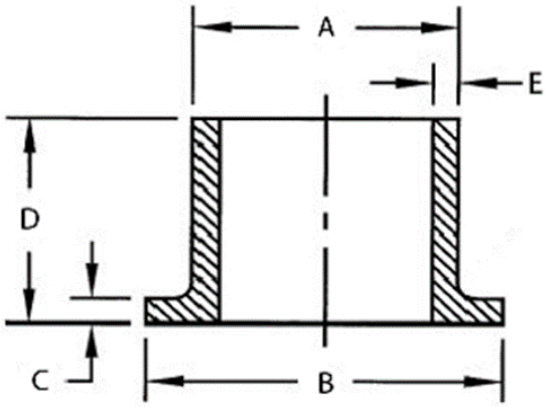
Nominal Size	A (OD) [in.]	B [in.]	C [in.]	D (length) [in.]	E (wall) [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	2.375	3.940	0.40	5.710	0.140	0.30	100401	-----
3" IPS	3.500	5.000	0.42	5.820	0.206	0.55	100405	-----
4" IPS	4.500	6.000	0.54	6.540	0.265	1.10	100409	-----
6" IPS	6.625	8.500	0.80	8.000	0.390	2.75	100413	-----
8" IPS	8.625	10.63	1.02	9.020	0.507	5.50	100417	-----
10" IPS	10.75	12.75	1.29	10.01	0.632	9.10	100421	-----
12" IPS	12.75	15.00	1.55	10.75	0.750	13.55	100424	-----
14" IPS	14.00	17.50	1.62	12.00	0.824	20.00	100427	-----
16" IPS	16.00	20.00	1.85	12.00	0.941	26.00	100429	-----
18" IPS	18.00	21.12	2.08	12.00	1.059	30.00	100431	-----
20" IPS	20.00	23.50	2.31	12.00	1.176	38.00	100433	-----
24" IPS	24.00	28.00	2.77	14.00	1.412	66.00	100437	-----
28" IPS	28.00	32.30	3.23	14.00	1.647	88.00	100439	-----
30" IPS	30.00	34.30	3.46	14.00	1.765	101.00	100441	-----
32" IPS	32.00	34.30	3.69	14.00	1.882	118.00	100443	-----
36" IPS	36.00	40.80	4.16	14.00	2.118	148.00	100445	-----

Integrity Fusion Products
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Peachtree City, GA 30269

Phone: 770.632.7530
Toll Free: 888.770.6330
www.integrityFusion.com

Molded Flange Adapter w/o Bevel Dimension Sheet





CERTIFIED TO NSF/ANSI 61 SECTION 4 NSF/ANSI 372

FM APPROVED

MADE IN THE USA

BABA COMPLIANT

IPS

SDR 11 (standard dimension ratio) — **200 PSI (MAOP @ 73.4° F)**

Nominal Size	A (OD) [in.]	B [in.]	C [in.]	D (length) [in.]	E (wall) [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	2.375	3.940	0.40	5.710	0.126	0.50	100400	FM 200
3" IPS	3.500	5.000	0.42	5.820	0.318	0.55	100404	FM 200
4" IPS	4.500	6.000	0.54	6.540	0.409	1.50	100408	FM 200
6" IPS	6.625	8.500	0.80	8.000	0.602	3.95	100412	FM 200
8" IPS	8.625	10.63	1.02	9.020	0.784	7.40	100416	FM 200
10" IPS	10.75	12.75	1.29	10.01	0.977	12.80	100420	FM 200
12" IPS	12.75	15.00	1.55	10.75	1.159	19.60	100423	FM 200
14" IPS	14.00	17.50	1.62	12.00	1.273	27.00	100426	-----
16" IPS	16.00	20.00	1.85	12.00	1.455	36.00	100428	-----
18" IPS	18.00	21.12	2.08	12.00	1.636	42.00	100430	-----
20" IPS	20.00	23.50	2.31	12.00	1.818	54.00	100432	-----
24" IPS	24.00	28.00	2.77	14.00	2.182	91.00	100436	-----
28" IPS	28.00	32.30	3.23	14.00	2.545	123.00	100438	-----
30" IPS	30.00	34.30	3.46	14.00	2.727	140.00	100440	-----
32" IPS	32.00	34.30	3.69	14.00	2.909	160.00	100442	-----
36" IPS	36.00	40.80	4.16	14.00	3.273	205.00	100444	-----

IPS

SDR 9 (standard dimension ratio) — **255 PSI (MAOP @ 73.4° F)**

Nominal Size	A (OD) [in.]	B [in.]	C [in.]	D (length) [in.]	E (wall) [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	2.375	3.940	0.55	6.10	0.264	0.50	100403	FM 250
3" IPS	3.500	5.000	0.67	6.10	0.389	1.15	100407	FM 250
4" IPS	4.500	6.610	0.79	6.10	.0500	2.05	100411	FM 250
6" IPS	6.625	8.500	1.02	8.07	0.736	TBD	100415	FM 250
8" IPS	8.625	10.63	1.02	10.67	0.958	TBD	100419	FM 250
10" IPS	10.75	12.99	1.18	11.50	1.194	TBD	Coming Soon	-----
12" IPS	12.75	15.75	1.38	10.83	1.417	TBD	Coming Soon	-----

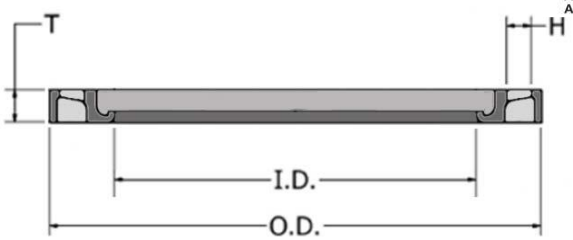
Integrity Fusion Products
270 Parkade Court
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Convoluted Ductile Iron Back-Up Ring Dimension Sheet







Integrity Fusion Products offers a line of **Convoluted Ductile Iron Backup Rings** manufactured from **ASTM A536 grade 65-45-12** material and are available in a variety of nominal **IPS** and **DIPS** HDPE pipe diameters and SDR ratings. Our **Convoluted Ductile Iron Backup Rings** are designed and manufactured to comply to the drilling and mating requirements in **ANSI/ASME B16.5** and **AWWA C207** for use in applications *24" and smaller*; and with **ANSI/ASME B16.47** and **AWWA C207** for use in applications *26" and larger*. Our **Fusion Bonded Epoxy Coating** offers superior long-term corrosion resistance characteristics over the industry standard Red Oxide primer, or painted epoxy coatings which tend to chip and rust shortly after installation, and as a visual convenience to our customers, our Epoxy Coated Backup Rings are **color coded** as follows: Red indicates an IPS size, and Blue indicates a DIPS size. All Integrity Fusion Ductile Iron Backup Rings, 12" and smaller, have been FM tested and approved. SDR 11 Backup Rings meet all FM 200 requirements, and SDR 7 – 9 Backup rings all meet FM 335 requirements.

IPS

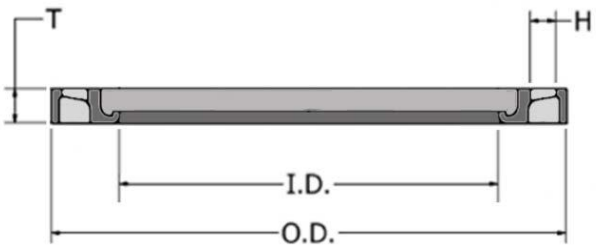
Intercell Berm Backup Ring

SDR 11 (Epoxy Coated Ductile Iron Backup Ring) **200 PSI Class 150# Bolt Pattern**

Nominal Size	OD (in.)	ID (in.)	Thickness (in.)	# Bolt Holes	Hole Dia. (ins)	Weight [lbs.]	Item Code	FM Class
2" IPS	6.00	2.60	0.50	4	0.75	1.80	100200	FM 200
3" IPS	7.50	3.75	0.53	4	0.75	2.80	100202	FM 200
4" IPS	9.00	4.75	0.55	8	0.75	3.80	100204	FM 200
6" IPS	11.00	6.88	0.63	8	0.88	5.60	100206	FM 200
8" IPS	13.50	8.88	0.85	8	0.88	9.80	100208	FM 200
10" IPS	16.00	11.00	0.98	12	1.00	13.30	100210	FM 200
12" IPS	19.00	13.15	1.25	12	1.00	22.30	100212	FM 200
14" IPS	21.00	14.40	1.38	12	1.13	31.00	100214	-----
16" IPS	23.50	16.40	1.65	16	1.13	42.00	100216	-----
18" IPS	25.00	18.34	1.67	16	1.25	45.00	100218	-----
20" IPS	27.50	20.50	1.81	20	1.25	58.00	100220	-----
24" IPS	32.00	24.50	2.17	20	1.38	86.00	100222	-----
28" IPS	36.50	28.60	2.50	28	1.38	113.0	100224	-----
30" IPS	38.75	30.60	2.60	28	1.38	141.0	100226	-----
32" IPS	41.75	32.60	2.75	28	1.63	161.0	100227	-----
36" IPS	46.00	36.60	3.15	32	1.63	217.0	100228	-----

Stainless Steel Back-Up Ring Dimension Sheet





American Water Works Association

ANSI American National Standards Institute

ASME SETTING THE STANDARD

FM APPROVED

Integrity Fusion Products offers a line of class 150 **Convoluted Stainless Steel Backup Rings** manufactured from **ASTM A351CF8M (316) 70/30/30** material and are available in a variety of nominal **IPS** and **DIPS** HDPE pipe diameters and SDR ratings up to 24". For sizes 28" to 36", we offer **ASTM A351CF8M (316) 70/30/30 Flat Plate Style Backup Rings**. Integrity Fusion Products **Stainless Steel Backup Rings** are designed and manufactured to comply with the drilling and mating requirements set forth in **ANSI/ASME B16.5** and **AWWA C207** for use in applications *24" and smaller*; and with **ANSI/ASME B16.47** and **AWWA C207** for use in applications *26" and larger*. All Integrity Fusion Stainless Steel Backup Rings, 12" and smaller, have been FM tested and approved. SDR 11 Backup Rings meet all FM 200 requirements, and SDR 7 – 9 Backup rings all meet FM 335 requirements.

IPS

SDR 11 (316 Stainless Steel Backup Ring) **200 PSI Class 150# Bolt Pattern**

Nominal Size	OD (in.)	ID (in.)	Thickness (in.)	# Bolt Holes	Hole Dia. (ins)	Weight [lbs.]	Item Code	FM Class
2" IPS	6.00	2.64	0.45	4	0.75	1.70	100241	FM 200
3" IPS	7.50	3.75	0.53	4	0.75	2.60	100242	FM 200
4" IPS	9.00	4.80	0.55	8	0.75	3.80	100243	FM 200
6" IPS	11.00	6.90	0.63	8	0.88	5.50	100244	FM 200
8" IPS	13.50	8.90	0.85	8	0.88	9.50	100245	FM 200
10" IPS	16.00	11.00	0.99	12	1.00	13.9	100246	FM 200
12" IPS	19.00	13.15	1.26	12	1.00	16.6	100247	FM 200
14" IPS	21.00	14.42	1.38	12	1.13	33.0	100248	-----
16" IPS	23.50	16.47	1.57	16	1.13	44.0	100249	-----
18" IPS	25.00	18.50	1.65	16	1.25	48.0	100250	-----
20" IPS	27.50	20.50	1.85	20	1.25	63.0	100252	-----
24" IPS	32.00	24.60	2.18	20	1.38	98.0	100253	-----
28" IPS (**)	36.42	28.66	2.76	28	1.42	277.8	100265	-----
30" IPS (**)	38.78	30.67	2.87	28	1.42	327.5	100266	-----
32" IPS (**)	41.73	32.52	-----	28	1.63	204.6	100267	-----
34" IPS (**)	43.74	34.53	-----	32	1.63	224.9	100268	-----
36" IPS (**)	46.06	36.81	3.50	32	1.65	520.0	100269	-----

** Double asterisk shows the Backup Ring is a flat plate design

INTEGRITY
Fusion Products, Inc.

2025

Molded Fitting Submittal Package



Integrity Fusion Products

Peachtree City, Georgia

1/1/2025

INTEGRITY
Fusion Products, Inc.

Injection Molded Butt Fusion Fittings

Integrity Fusion Products offers a full line of injection molded **IPS** and **DIPS** HDPE Fittings that are manufactured in a variety of nominal pipe sizes and SDR's, in our manufacturing facility located in Peachtree City, GA. **Injection Molded HDPE Fittings** from Integrity Fusion Products are manufactured and tested to meet and/or exceed the requirements of **ASTM D2513**, **ASTM D3261**, and **ANSI/AWWA C901** and **C906**, and **FM 1613** ***(where applicable)*** for use with outside diameter-controlled polyethylene pipe and fittings conforming to **ASTM D2513**, **ASTM D3035**, and **ASTM F-714**. Integrity Fusion Product **Molded HDPE Fittings** can be heat fused or electrofused to any manufacturers' PE pipe, molded fittings, or fabricated fittings manufactured from material made from **PE3408** / **PE4710** / **PE100** resin that complies to **ASTM D3350**.



Molded PE3408 / PE4710 / PE100 HDPE Fittings

Molded HDPE Fittings, Flange Adapters, and MJ Adapters manufactured by Integrity Fusion Products in Peachtree City, GA, are all-purpose, injection molded **High-Density Polyethylene Fittings** that are designed and manufactured for use in applications that include, but are not limited to:

- **Oil and gas production**
- **Municipal potable water distribution and service lines**
- **Stormwater conveyance**
- **Irrigation**
- **Mining**
- **Cable**
- **Natural gas distribution**
- **Wastewater conveyance**
- **Drainage**
- **Industrial piping applications**
- **Landfill**
- **Telecom Conduit**

MADE IN THE USA BABA COMPLIANT

Integrity Fusion Products manufactures **Molded HDPE Fittings** in a variety of sizes, configurations and SDR's that are produced from virgin, pre-blended, NSF listed bi-modal black high density polyethylene resin that has a cell classification of **445574C-CC3** that conforms to **ASTM D3350** and is recognized by the Plastic Pipe Institute as having a **PE3408 / PE4710 / PE100** rating with an **HDB** (Hydrostatic Design Basis) of **1600 psi @ 73° F**.

Injection Molded HDPE Fittings from Integrity Fusion Products are manufactured, tested, certified, and listed in accordance with standards and requirements that meet a wide range of project requirements that include:

ASTM D2513	-	**Specification for Thermoplastic Gas Pressure Pipe, Tubing and Fittings**
ASTM D3350	-	**Specification for Polyethylene Plastic Pipes and Fittings Materials**
ASTM D3261	-	**Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Pipe and Tubing**
ASTM F714	-	**Specifications for HDPE Pipe Dimensions**
AWWA C901	-	**Polyethylene (Pe) Pressure Pipe and Tubing, 3/4 In. Through 3 In. For Water Service**
AWWA C906	-	**Polyethylene (Pe) Pressure Pipe and Tubing, 4 In. Through 65 In. For Water Works**
FM 1613	-	**Approval Standard: Plastic Pipe and Fittings for Underground Fire Protection Service**
ANSI/NSF 61	-	**Plastic Piping System Components & Related Materials**
ASTM F2880	-	**Specification for lap-Joint Type Flange Adapters for use on Polyethylene Pressure Pipe**

Integrity Fusion Products Injection Molded HDPE Fittings are tested in accordance with the following standard ASTM test methods.

ASTM D1598	-	**Time-to-Failure of Plastic Pipe Under Constant Internal Pressure.**
ASTM D1599	-	**Short-Term Hydraulic Pressure Failure of Plastic Pipe, Tubing and Fittings.**
ASTM D2122	-	**Test method for Determining Dimensions of Thermoplastic Pipe and Fittings.**

Injection Molded HDPE Fittings from Integrity Fusion Products can be heat fused to any manufacturers' PE pipe, molded fittings, or fabricated fittings manufactured from material made from **PE3408 / PE4710 / PE100** resin that complies to **ASTM D3350**.

Injection Molded HDPE Fittings from Integrity Fusion Products are designed for use on HDPE pressure pipe applications that conform to **ASTM F714**, **D2513** and **D3350** and are pressure rated according to industry guidelines for natural gas and water applications. **(TABLE 1)**

Pressure Rating of IntegriFuse PE4710 Molded Fittings

Fitting SDR (Standard Dimension Ration)	MAOP (Design Factor of .63)	MAOP (Gas) (Design Factor of .40)
7/9	333/250	125/125
11/17	200/125	125/80
21	100	64

NOTE: Pressure ratings are based on an operating temperature of up to 73° ambient temperature and will need to be reduced for higher temperatures and certain applications.

TABLE 1

Conditions for the Required De-Rating of a Molded Fittings MAOP

The **Maximum Allowable Operating Pressures (MAOP)** for molded PE4710 fittings ***must be de-rated for elevated temperatures in all service applications***, including Oil & Gas Gathering Systems installed in Class 1 or Class 2 locations (low population areas not subject to DOT CFR *Title 49 Part 192* regulations) or where Federal Codes do not apply. *Including Water, Brine, Dry Natural Gas applications with NO associated hydrocarbons.*

API Specification 15LE (1995) states "In most circumstances, the HDB obtained at 73° F can be used for applications up to 100° F without further derating" Values in this table use a material design factor of .63 and a Fluid Service Factor of 1.0

The maximum operating temperature of Integrity Fusion Products PE4710 Molded Fittings ***should not exceed 140° F.***

Fitting MAOP by SDR vs. Operating Temperature				
SDR	**73.4° F**	**100° F**	**120° F**	**140° F**
7	333 psi	260 psi	210 psi	166 psi
9	250 psi	195 psi	158 psi	125 psi
11	200 psi	156 psi	126 psi	100 psi
17	125 psi	98 psi	79 psi	63 psi

TABLE 2

Dry, gaseous hydrocarbons have no adverse effect on our molded fittings normal expected service life, and naturally occurring chemicals in the soil will not attack or cause our fittings to degrade. They do not rust, rot, or corrode; they naturally resist the buildup of scale and other deposits, and they do not support the growth of algae, bacteria, fungi, or other marine life.

Table 3 provides an added derated MAOP of a molded electrofusion fitting when installed into services and applications subjected to an extended exposure of liquid hydrocarbon concentrations of 2% and greater.

Values in Table 3 use a material design factor of .63 and a Fluid Service Factor of 0.5

MAOP by SDR Derated for Operating Temperature and Transporting a Media Containing 2% or greater Hydrocarbon Content				
SDR	**73.4° F**	**100° F**	**120° F**	**140° F**
7	166 psi	129 psi	105 psi	83 psi
9	125 psi	98 psi	79 psi	63 psi
11	100 psi	78 psi	63 psi	50 psi

TABLE 3

Fluid Service Factors

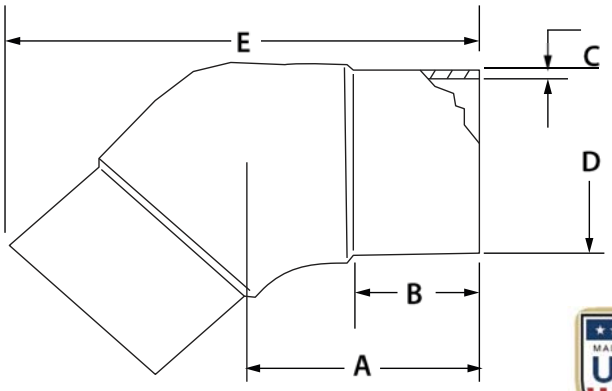
Produced Water, Brine, Process Water with no associated liquid hydrocarbons	**1.0**
Dry Natural Gas (no hydrocarbon liquids used in Class 1 and Class 2 locations and in low population area not subject to DOT CFR *Title 49 part 192*	**1.0**
Crude Oil, Wet Natural Gas, Liquid Hydrocarbons, Process Water with >2% liquid hydrocarbons	**.5**
Gas Distribution piping that is permeated by solvating chemicals, liquid hydrocarbons or liquified gas condensate	**.5**

Injection Molded Fittings from Integrity Fusion Products have a strong resistance to chemical compounds. For more information on the chemical resistance of PE4710 resin, please reference PPI Technical Report TR-19.

Injection Molded Fittings can be stored outdoors but it is highly recommended that **they** be stored indoors in their original packaging. Black HDPE fittings stored properly indoors have unlimited shelf life.

Molded 45° Butt Fusion Elbow Dimension Sheet





CERTIFIED TO NSF/ANSI 61 SECTION 4 NSF/ANSI 372

FM APPROVED

MADE IN THE USA

BABA COMPLIANT

Product Family:	Injection Molded Butt Fusion Fitting	**Fitting Design:**	45° Elbow
Resin Status:	NSF Listed Bi-Modal Virgin Resin	**Nominal Pipe Sizes:**	2" – 12"
Resin Type:	ASTM D3350 designated PE3408/PE4710/PE100	**Nominal Pipe Standard:**	IPS and DIPS
Resin Cell Class:	4455574-CC3	**Currently Available SDR's:**	17, 11, 9, 7
Manufactured and tested to meet requirements of:	ASTM D2513, ASTM D3261, ANSI/AWWA C901 & C906, FM 1613, NSF 61		
For use on pipe and fittings conforming to:	ASTM D2513, ASTM D3035, ASTM F-714		

For Material and Testing information, please refer to our Molded Fitting Specification Sheet.

IPS

SDR 17 (standard dimension ratio) — **125 PSI** (MAOP @ 73.4° F)

Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	E [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	3.230	2.64	0.140	2.375	6.380	0.30	100002	-----
3" IPS	4.720	3.86	0.206	3.500	9.330	0.90	100006	-----
4" IPS	5.310	4.21	0.265	4.500	10.63	1.70	100010	-----
6" IPS	6.890	5.35	0.390	6.625	14.09	4.40	100014	-----
8" IPS	8.460	6.54	0.507	8.625	17.48	9.80	100018	-----
10" IPS	10.04	7.64	0.632	10.75	20.94	14.9	100022	-----
12" IPS	10.63	7.80	0.750	12.75	22.64	22.1	100024	-----

IPS

SDR 11 (standard dimension ratio) — **200 PSI** (MAOP @ 73.4° F)

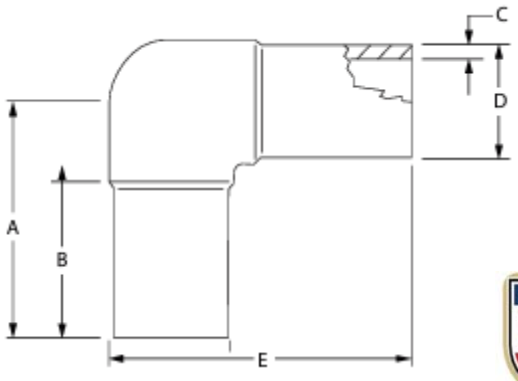
Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	E [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	3.230	2.64	0.216	2.375	6.380	0.40	100001	FM 200
3" IPS	4.720	3.86	0.318	3.500	9.330	1.20	100005	FM 200
4" IPS	5.310	4.21	0.409	4.500	10.63	2.10	100009	FM 200
6" IPS	6.890	5.35	0.602	6.625	14.09	6.10	100013	FM 200
8" IPS	8.460	6.54	0.784	8.625	17.48	12.6	100017	FM 200
10" IPS	10.04	7.64	0.977	10.75	20.94	21.3	100021	FM 200
12" IPS	10.63	7.80	1.159	12.75	22.64	31.4	100023	FM 200

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Molded 90° Butt Fusion Elbow Dimension Sheet





CERTIFIED TO NSF/ANSI 61 SECTION 4 NSF/ANSI 372

FM APPROVED

MADE IN THE USA

BABA COMPLIANT

Product Family:	Injection Molded Butt Fusion Fitting	**Fitting Design:**	90° Elbow
Resin Status:	NSF Listed Bi-Modal Virgin Resin	**Nominal Pipe Sizes:**	2" – 12"
Resin Type:	ASTM D3350 designated PE3408/PE4710/PE100	**Nominal Pipe Standard:**	IPS and DIPS
Resin Cell Class:	4455574-CC3	**Currently Available SDR's:**	17, 11, 9, 7

Manufactured and tested to meet requirements of: ASTM D2513, ASTM D3261, ANSI/AWWA C901 & C906, FM 1613, NSF 61

For use on pipe and fittings conforming to: ASTM D2513, ASTM D3035, ASTM F-714

For Material and Testing information, please refer to our Molded Fitting Specification Sheet.

IPS

SDR 17 (standard dimension ratio) — **125 PSI** (MAOP @ 73.4° F)

Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	E [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	4.36	2.64	0.140	2.375	5.63	.04	100106	-----
3" IPS	5.85	3.50	0.206	3.500	7.73	1.1	100110	-----
4" IPS	6.85	3.80	0.265	4.500	9.21	2.0	100114	-----
6" IPS	8.94	4.75	0.390	6.625	12.40	5.4	100118	-----
8" IPS	11.81	7.20	0.507	8.625	16.13	12.5	100122	-----
10" IPS	13.78	8.27	0.632	10.750	19.15	22.0	100126	-----
12" IPS	14.96	8.46	0.750	12.750	21.33	36.7	100128	-----

IPS

SDR 11 (standard dimension ratio) — **200 PSI** (MAOP @ 73.4° F)

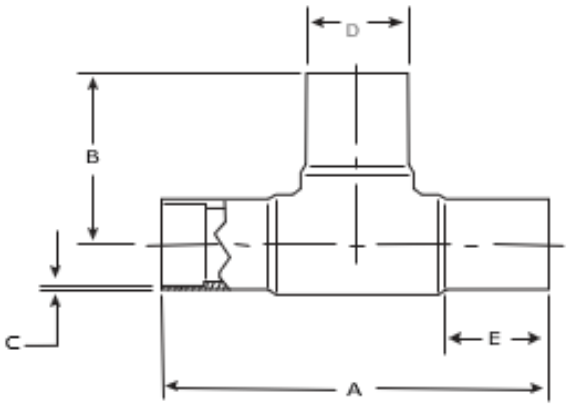
Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	E [in.]	Weight [lbs.]	Item Code	FM Class
¾ IPS	3.19	2.14	0.095	1.050	3.82	0.1	100100	-----
1" IPS	3.31	2.18	0.120	1.315	4.06	0.2	100101	-----
1 ¼" IPS	3.48	2.15	1.151	1.660	4.41	0.3	100102	-----
1 ½" IPS	3.92	2.37	0.173	1.900	5.00	0.4	100103	-----
2" IPS	4.36	2.64	0.140	2.375	5.63	.05	100105	FM 200
3" IPS	5.85	3.50	0.206	3.500	7.73	1.1	100109	FM 200
4" IPS	6.85	3.80	0.265	4.500	9.21	2.0	100113	FM 200
6" IPS	8.94	4.75	0.390	6.625	12.40	5.4	100117	FM 200
8" IPS	11.81	7.20	0.507	8.625	16.13	12.5	100121	FM 200
10" IPS	13.78	8.27	0.632	10.750	19.15	22.0	100125	FM 200
12" IPS	14.96	8.46	0.750	12.750	21.33	36.7	100127	FM 200

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Molded Butt Fusion Equal Tee Dimension Sheet





CERTIFIED TO NSF/ANSI 61 SECTION 4 NSF/ANSI 372

FM APPROVED

MADE IN THE USA

BABA COMPLIANT

Product Family:	Injection Molded Butt Fusion Fitting	**Fitting Design:**	Equal Tee
Resin Status:	NSF Listed Bi-Modal Virgin Resin	**Nominal Pipe Sizes:**	3/4" – 12"
Resin Type:	ASTM D3350 designated PE3408/PE4710/PE100	**Nominal Pipe Standard:**	IPS and DIPS
Resin Cell Class:	4455574-CC3	**Currently Available SDR's:**	17, 11, 9, 7

Manufactured and tested to meet requirements of: ASTM D2513, ASTM D3261, ANSI/AWWA C901 & C906, FM 1613, NSF 61

For use on pipe and fittings conforming to: ASTM D2513, ASTM D3035, ASTM F-714

For Material and Testing information, please refer to our Molded Fitting Specification Sheet.

IPS

SDR 17 (standard dimension ratio) — **125 PSI** (MAOP @ 73.4° F)

Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	E [in.]	Weight [lbs.]	Item Code	FM Class
3" IPS	11.81	5.910	0.206	3.500	3.54	1.50	100709	-----
4" IPS	13.78	6.890	0.264	4.500	3.94	2.80	100713	-----
6" IPS	18.11	9.060	0.390	6.625	4.72	7.50	100717	-----
8" IPS	23.62	11.81	0.507	8.625	5.71	17.5	100721	-----
10" IPS	27.56	13.78	0.632	10.75	6.30	28.3	100725	-----
12" IPS	31.57	15.97	0.750	12.75	7.52	47.5	100727	-----

IPS

SDR 11 (standard dimension ratio) — **200 PSI** (MAOP @ 73.4° F)

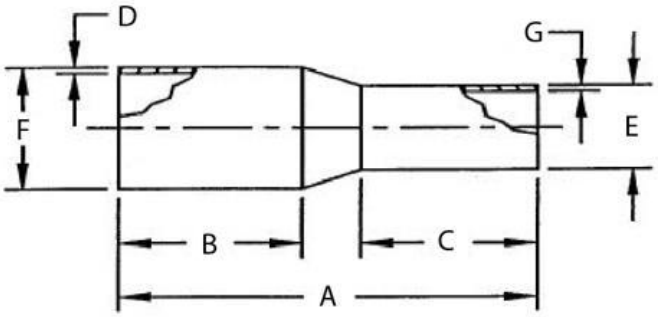
Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	E [in.]	Weight [lbs.]	Item Code	FM Class
¾ IPS	6.380	3.190	0.095	1.050	2.14	0.20	100700	-----
1" IPS	6.620	3.310	0.120	1.315	2.18	0.20	100701	-----
1 ¼" IPS	6.970	3.480	0.151	1.660	2.15	0.40	100702	-----
1 ½" IPS	7.840	3.920	0.173	1.900	2.37	0.60	100704	-----
2" IPS	8.660	4.330	0.216	2.375	2.48	1.00	100705	FM 200
3" IPS	11.81	5.910	0.318	3.500	3.54	1.50	100708	FM 200
4" IPS	13.78	6.890	0.409	4.500	3.94	3.90	100712	FM 200
6" IPS	18.11	9.060	0.602	6.625	4.72	40.5	100716	FM 200
8" IPS	23.62	11.81	0.784	8.625	5.71	23.2	100720	FM 200
10" IPS	27.56	13.78	0.977	10.75	6.30	39.4	100724	FM 200
12" IPS	31.57	15.97	1.159	12.75	7.52	66.3	100726	FM 200

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Molded Butt Fusion Reducer Dimension Sheet





CERTIFIED TO NSF/ANSI 61 SECTION 4 NSF/ANSI 372

FM APPROVED

MADE IN THE USA

BABA COMPLIANT

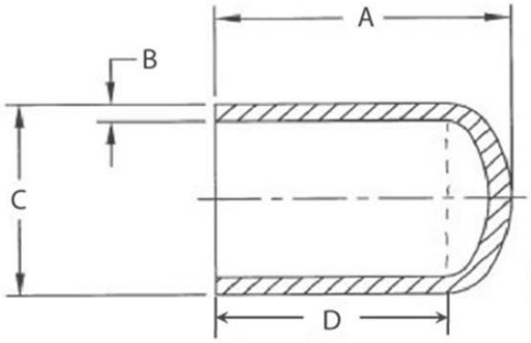
IPS

SDR 11 (standard dimension ratio) **200 PSI (MAOP @ 73.4° F)**

Nominal Size	A [in.]	B [in.]	C [in.]	D (wall) [in.]	E (OD) [in.]	F (OD) [ins.]	G (wall) [ins.]	Weight [lbs.]	Item Code	FM Class
1 x ¾ IPS	4.58	2.17	2.17	0.120	1.050	1.315	0.095	0.05	100600	-----
1 ¼ x 1 IPS	4.66	2.20	2.15	0.151	1.315	1.660	0.120	0.10	100601	-----
1 ½ x 1 IPS	5.12	2.44	2.16	0.173	1.315	1.900	0.120	0.15	100602	-----
1 ½ x 1 ¼ IPS	4.83	2.44	2.17	0.173	1.660	1.900	0.151	0.15	100603	-----
2 x 1 IPS	5.62	2.53	2.13	0.216	1.315	2.375	0.120	0.20	100604	-----
2 x 1 ¼ IPS	5.34	2.53	2.15	0.216	1.660	2.375	0.151	0.20	100605	-----
2 x 1 ½ IPS	5.40	2.53	2.42	0.216	1.900	2.375	0.173	0.25	100606	-----
3 x 2 IPS	7.87	3.94	2.95	0.318	2.375	3.500	0.216	0.50	100607	FM 200
4 x 2 IPS	9.06	4.33	2.95	0.409	2.375	4.500	0.216	1.25	100611	FM 200
4 x 3 IPS	9.06	4.33	3.94	0.409	3.500	4.500	0.318	1.15	100615	FM 200
6 x 3 IPS	11.03	5.06	3.71	0.602	3.500	6.625	0.318	3.15	100619	FM 200
6 x 4 IPS	11.42	5.12	4.33	0.602	4.500	6.625	0.409	3.75	100621	FM 200
8 x 4 IPS	12.80	5.99	4.05	0.784	4.500	8.625	0.409	6.70	100625	FM 200
8 x 6 IPS	12.80	6.10	5.12	0.784	6.625	8.625	0.602	7.70	100627	FM 200
10 x 6 IPS	14.06	6.16	5.29	0.977	6.625	10.75	0.602	11.55	100631	FM 200
10 x 8 IPS	14.37	6.95	5.88	0.977	8.625	10.75	0.784	13.40	100633	FM 200
12 x 6 IPS	16.00	6.95	5.22	1.159	6.625	12.75	0.602	17.15	100635	FM 200
12 x 8 IPS	16.54	7.09	6.10	1.159	8.625	12.75	0.784	19.41	100637	FM 200
12 x 10 IPS	16.54	7.09	6.69	1.159	10.75	12.75	0.977	21.30	100639	FM 200

Molded Butt Fusion End Cap Dimension Sheet





CERTIFIED TO NSF/ANSI 61 SECTION 4 NSF/ANSI 372

FM APPROVED

MADE IN THE USA

BABA COMPLIANT

Product Family:	Injection Molded Butt Fusion Fitting	**Fitting Design:**	End Cap
Resin Status:	NSF Listed Bi-Modal Virgin Resin	**Nominal Pipe Sizes:**	3/4" – 12"
Resin Type:	ASTM D3350 designated PE3408/PE4710/PE100	**Nominal Pipe Standard:**	IPS
Resin Cell Class:	4455574-CC3	**Currently Available SDR's**	17, 11, 9, 7
Manufactured and tested to meet requirements of:	ASTM D2513, ASTM D3261, ANSI/AWWA C901 & C906, FM 1613, NSF 61		
For use on pipe and fittings conforming to:	ASTM D2513, ASTM D3035, ASTM F-714		

For Material and Testing information, please refer to our Molded Fitting Specification Sheet.

IPS

SDR 17 (standard dimension ratio) — **125 PSI** (MAOP @ 73.4° F)

Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	3.230	0.140	2.375	2.52	0.10	100306	-----
3" IPS	4.720	0.206	3.500	3.70	0.40	100310	-----
4" IPS	5.310	0.264	4.500	3.98	0.70	100314	-----
6" IPS	6.890	0.390	6.625	4.84	2.00	100318	-----
8" IPS	8.660	0.507	8.625	5.83	4.20	100322	-----
10" IPS	9.840	0.633	10.75	6.30	7.50	100326	-----
12" IPS	11.77	0.750	12.75	7.52	12.4	100328	-----

IPS

SDR 11 (standard dimension ratio) — **200 PSI** (MAOP @ 73.4° F)

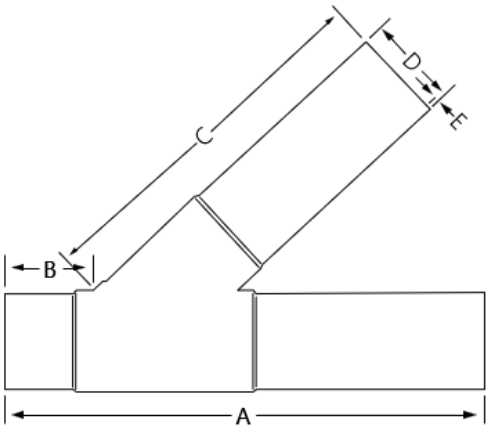
Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	Weight [lbs.]	Item Code	FM Class
¾" IPS	2.550	0.095	1.050	2.18	0.10	100300	-----
1" IPS	2.640	0.120	1.315	2.18	0.10	100302	-----
1 ¼" IPS	2.770	0.151	1.660	2.18	0.10	100303	-----
1 ½" IPS	3.100	0.173	1.900	2.42	0.70	100304	-----
2" IPS	3.230	0.216	2.375	2.52	0.80	100305	FM 200
3" IPS	4.720	0.318	3.500	3.70	0.90	100309	FM 200
4" IPS	5.310	0.409	4.500	3.98	1.10	100313	FM 200
6" IPS	6.890	0.603	6.625	4.84	2.90	100317	FM 200
8" IPS	8.660	0.785	8.625	5.83	6.30	100321	FM 200
10" IPS	9.840	0.978	10.75	6.30	10.9	100325	FM 200
12" IPS	11.77	1.160	12.75	7.52	18.4	100327	FM 200

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Molded Butt Fusion 45° Wye Dimension Sheet





CERTIFIED TO NSF/ANSI 61 SECTION 4 NSF/ANSI 372

MADE IN THE USA

BABA COMPLIANT

Product Family:	Injection Molded Butt Fusion Fitting	**Fitting Design:**	45°Wye
Resin Status:	NSF Listed Bi-Modal Virgin Resin	**Nominal Pipe Sizes:**	2" – 8"
Resin Type:	ASTM D3350 designated PE3408/PE4710/PE100	**Nominal Pipe Standard:**	IPS
Resin Cell Class:	4455574-CC3	**Currently Available SDR's:**	17, 11
Manufactured and tested to meet requirements of:	ASTM D2513, ASTM D3261, ANSI/AWWA C901 & C906, FM 1613, NSF 61		
For use on pipe and fittings conforming to:	ASTM D2513, ASTM D3035, ASTM F-714		

For Material and Testing information, please refer to our Molded Fitting Specification Sheet.

IPS

SDR 17 (standard dimension ratio) — **125 PSI** (MAOP @ 73.4° F)

Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	E [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	23.74	5.28	13.10	2.375	0.140	2.10	100901	-----
3" IPS	24.56	5.90	13.10	3.500	0.206	3.00	100903	-----
4" IPS	28.50	5.70	20.60	4.500	0.264	7.00	100905	-----
6" IPS	34.65	5.30	26.00	6.625	0.390	19.8	100907	-----
8" IPS	37.40	5.70	27.56	8.625	0.507	44.9	100909	-----

IPS

SDR 11 (standard dimension ratio) — **200 PSI** (MAOP @ 73.4° F)

Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	E [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	23.74	5.28	13.10	2.375	0.216	2.20	100900	-----
3" IPS	24.56	5.90	13.10	3.500	0.318	4.70	100902	-----
4" IPS	28.50	5.70	20.60	4.500	0.409	9.70	100904	-----
6" IPS	34.65	5.30	26.00	6.625	0.603	26.2	100906	-----
8" IPS	37.40	5.70	27.56	8.625	0.785	52.0	100908	-----

Limited Product Warranty

Integrity Fusion Products, Inc. *warrants its materials to be free of defects in workmanship under normal use and service, when used for purposes under the conditions for which they are intended for a period of one (1) year.*

This warranty shall not apply to any Integrity Fusion Products, Inc. material that has been altered, repaired and/or used in any way, stored outside, or has been subject to misuse, negligence, accident and/or has not been installed in accordance with installation instructions.

This warranty does not cover labor or other costs of installing or repairing the products. Buyer's sole remedy for defective product shall be to receive replacement product as provided in this Limited Warranty. Seller's liability arising out of or related to the product supplied by Integrity Fusion Products shall in no event exceed the original price of the defective product. Seller will not be liable for any consequential, incidental, special, indirect or punitive damages, loss of profits, loss of business opportunity or other loss even if seller knew or should have known of the possibility of such damages or losses. Buyer shall assume all responsibility and expenses for removal, reinstallation and freight charges in connection with the foregoing remedy.

Integrity Fusion Products, Inc. shall not be held liable for any delays caused by shipping any material or equipment by third party shipping companies. Integrity Fusion Products, Inc. shall not be responsible for any delays caused by shipping errors of material and/or equipment.

Any claim regarding shortage or damages from shipment of material must be submitted in writing to Integrity Fusion Products, Inc within 7 days after receipt of shipment. Buyer shall note loss or damage on shipment Bill of Lading and provide a delivery receipt stating such with driver's signature. Loss or damages to materials in transit is the responsibility of the carrier

The buyer must comply with the standard warranty investigation procedures for Integrity Fusion Products which includes providing sample of the product in question and completing Integrity Fusion Products Investigation Report Form. Failure to provide needed and required information and samples for investigation purposes will result in the limited warranty being null and void.

General Electrofusion Requirements

Installation of electrofusion fittings requiring 42V-48V must be carried out using an IntegriFuse or I Fuse 105 Electrofusion processor. For IntegriFuse Electrofusion fittings requiring an amperage of over 80 amps, the IntegriFuse I Fuse 105 Electrofusion Processor is required.

The I Fuse 105 Electrofusion processor is an 8-48-volt output multi-voltage fusion processor with temperature compensating feature operating at 220/230 VAC requiring power supplied through a portable power generator rated at the necessary continuous watts.

If the pipe is out of round the use of a Re-Round Clamp is required to ensure proper installation.

Improper scraping, cleaning, and alignment of pipe during the installation procedures results in limited warranty being null and void.

Electrofusion Installation instructions must be adhered to or our Limited Warranty is null and void. Installation of electrofusion fittings must be carried out by properly trained and qualified operator(s). Large diameter fittings require certification by Integrity Fusion Products, Inc.

Integrifuse Valve

The Limited Warranty shall apply only to operations which fall under the guidelines of conditions in which the valve was designed for and for applications of normal use. The limited liability will be null and void in the case that the valve failure was caused by excessive operating or surge pressure, introduction of any chemicals or acids that cause degradation to the seats or stem, excessive water hammer, introduction of abrasives such as sand and or grit, butt fusion of HDPE pipe material with SDR differences greater than 2 (SDR 11 to SDR 17 is not permitted), hot soil conditions, excessive temperature.

Integrifuse Butt Fusion Fittings

The Limited Warranty shall apply only to operations which fall under the guidelines of conditions in which the butt fusion fitting was designed for and for applications of normal use. The limited liability will be null and void in the case that the fitting failure was caused by excessive operating or surge pressure, excessive water hammer, introduction of abrasives such as sand and or grit that have cause abrasion of the fitting, butt fusion of HDPE pipe material with SDR differences greater than 2 (SDR 11 to SDR 17 is not permitted). This warranty does not cover failure resulting from improper fusion by the installer.

Purchaser is responsible for passing on this Limited Warranty to their customer.

Molded PE3408 / PE4710 / PE100 HDPE Fittings

Molded HDPE Fittings, Flange Adapters, and MJ Adapters manufactured by Integrity Fusion Products in Peachtree City, GA, are all-purpose, injection molded **High-Density Polyethylene Fittings** that are designed and manufactured for use in applications that include, but are not limited to:

- **Oil and gas production**
- **Municipal potable water distribution and service lines**
- **Stormwater conveyance**
- **Irrigation**
- **Mining**
- **Cable**
- **Natural gas distribution**
- **Wastewater conveyance**
- **Drainage**
- **Industrial piping applications**
- **Landfill**
- **Telecom Conduit**

MADE IN THE USA BABA COMPLIANT

Integrity Fusion Products manufactures **Molded HDPE Fittings** in a variety of sizes, configurations and SDR's that are produced from virgin, pre-blended, NSF listed bi-modal black high density polyethylene resin that has a cell classification of **445574C-CC3** that conforms to **ASTM D3350** and is recognized by the Plastic Pipe Institute as having a **PE3408 / PE4710 / PE100** rating with an **HDB** (Hydrostatic Design Basis) of **1600 psi @ 73° F**.

Injection Molded HDPE Fittings from Integrity Fusion Products are manufactured, tested, certified, and listed in accordance with standards and requirements that meet a wide range of project requirements that include:

ASTM D2513	-	**Specification for Thermoplastic Gas Pressure Pipe, Tubing and Fittings**
ASTM D3350	-	**Specification for Polyethylene Plastic Pipes and Fittings Materials**
ASTM D3261	-	**Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Pipe and Tubing**
ASTM F714	-	**Specifications for HDPE Pipe Dimensions**
AWWA C901	-	**Polyethylene (Pe) Pressure Pipe and Tubing, 3/4 In. Through 3 In. For Water Service**
AWWA C906	-	**Polyethylene (Pe) Pressure Pipe and Tubing, 4 In. Through 65 In. For Water Works**
FM 1613	-	**Approval Standard: Plastic Pipe and Fittings for Underground Fire Protection Service**
ANSI/NSF 61	-	**Plastic Piping System Components & Related Materials**
ASTM F2880	-	**Specification for lap-Joint Type Flange Adapters for use on Polyethylene Pressure Pipe**

Integrity Fusion Products Injection Molded HDPE Fittings are tested in accordance with the following standard ASTM test methods.

ASTM D1598	-	**Time-to-Failure of Plastic Pipe Under Constant Internal Pressure.**
ASTM D1599	-	**Short-Term Hydraulic Pressure Failure of Plastic Pipe, Tubing and Fittings.**
ASTM D2122	-	**Test method for Determining Dimensions of Thermoplastic Pipe and Fittings.**

Injection Molded HDPE Fittings from Integrity Fusion Products can be heat fused to any manufacturers' PE pipe, molded fittings, or fabricated fittings manufactured from material made from **PE3408 / PE4710 / PE100** resin that complies to **ASTM D3350**.

Injection Molded HDPE Fittings from Integrity Fusion Products are designed for use on HDPE pressure pipe applications that conform to **ASTM F714**, **D2513** and **D3350** and are pressure rated according to industry guidelines for natural gas and water applications. **(TABLE 1)**

Pressure Rating of IntegriFuse PE4710 Molded Fittings

Fitting SDR (Standard Dimension Ration)	MAOP (Design Factor of .63)	MAOP (Gas) (Design Factor of .40)
7/9	333/250	125/125
11/17	200/125	125/80
21	100	64

NOTE: Pressure ratings are based on an operating temperature of up to 73° ambient temperature and will need to be reduced for higher temperatures and certain applications.

TABLE 1

Conditions for the Required De-Rating of a Molded Fittings MAOP

The **Maximum Allowable Operating Pressures (MAOP)** for molded PE4710 fittings ***must be de-rated for elevated temperatures in all service applications***, including Oil & Gas Gathering Systems installed in Class 1 or Class 2 locations (low population areas not subject to DOT CFR *Title 49 Part 192* regulations) or where Federal Codes do not apply. *Including Water, Brine, Dry Natural Gas applications with NO associated hydrocarbons.*

API Specification 15LE (1995) states "In most circumstances, the HDB obtained at 73° F can be used for applications up to 100° F without further derating" Values in this table use a material design factor of .63 and a Fluid Service Factor of 1.0

The maximum operating temperature of Integrity Fusion Products PE4710 Molded Fittings ***should not exceed 140° F.***

Fitting MAOP by SDR vs. Operating Temperature				
SDR	**73.4° F**	**100° F**	**120° F**	**140° F**
7	333 psi	260 psi	210 psi	166 psi
9	250 psi	195 psi	158 psi	125 psi
11	200 psi	156 psi	126 psi	100 psi
17	125 psi	98 psi	79 psi	63 psi

TABLE 2

Dry, gaseous hydrocarbons have no adverse effect on our molded fittings normal expected service life, and naturally occurring chemicals in the soil will not attack or cause our fittings to degrade. They do not rust, rot, or corrode; they naturally resist the buildup of scale and other deposits, and they do not support the growth of algae, bacteria, fungi, or other marine life.

Table 3 provides an added derated MAOP of a molded electrofusion fitting when installed into services and applications subjected to an extended exposure of liquid hydrocarbon concentrations of 2% and greater.

Values in Table 3 use a material design factor of .63 and a Fluid Service Factor of 0.5

MAOP by SDR Derated for Operating Temperature and Transporting a Media Containing 2% or greater Hydrocarbon Content				
SDR	**73.4° F**	**100° F**	**120° F**	**140° F**
7	166 psi	129 psi	105 psi	83 psi
9	125 psi	98 psi	79 psi	63 psi
11	100 psi	78 psi	63 psi	50 psi

TABLE 3

Fluid Service Factors

Produced Water, Brine, Process Water with no associated liquid hydrocarbons	**1.0**
Dry Natural Gas (no hydrocarbon liquids used in Class 1 and Class 2 locations and in low population area not subject to DOT CFR *Title 49 part 192*	**1.0**
Crude Oil, Wet Natural Gas, Liquid Hydrocarbons, Process Water with >2% liquid hydrocarbons	**.5**
Gas Distribution piping that is permeated by solvating chemicals, liquid hydrocarbons or liquified gas condensate	**.5**

Injection Molded Fittings from Integrity Fusion Products have a strong resistance to chemical compounds. For more information on the chemical resistance of PE4710 resin, please reference PPI Technical Report TR-19.

Injection Molded Fittings can be stored outdoors but it is highly recommended that **they** be stored indoors in their original packaging. Black HDPE fittings stored properly indoors have unlimited shelf life.

INTEGRITY
Fusion Products, Inc.

2025

Transition Fitting Submittal Package



Integrity Fusion Products

Peachtree City, Georgia

1/1/2025

INTEGRITY
Fusion Products, Inc.

HDPE to Steel Transition Fittings

Integrity Fusion Products manufactures a full line of **Standard and Heavy-Duty Epoxy Coated Carbon Steel** and **Standard Stainless Steel, HDPE Transition Fittings** in a variety of sizes, configurations, SDR's. Current Transition offerings meet or exceed all **ASTM D2513 Cat.3** mechanical joint requirements, with **Cat.1 Transition Fittings to be released soon**. **(Cat.3 Transition Fittings CANNOT be used in natural gas applications)**. **Integrity Fusion Products Transiting Fittings** are manufactured in a variety of nominal pipe sizes and SDR's and are tested to meet the requirements of **ASTM D3261**, **ASTM 1598, ASTM 1599, ANSI/AWWA C901**, **C906**, and **NSF/ANSI/ CAN-61, and NSF/ANSI-372 (where applicable)**, for use with outside diameter-controlled pipe and fittings conforming to **ASTM D2513**, **ASTM D3035**, and **ASTM F-714.**



Steel to HDPE Transition Fitting Specification Sheet

Steel to HDPE Transition Fittings manufactured by Integrity Fusion Products, are all-purpose, steel to HDPE mechanical transition fittings that are designed and manufactured for use in applications that include, but are not limited to:

- ***Municipal water distribution & service lines***
- ***Wastewater conveyance***
- ***Irrigation***
- ***Geothermal***
- ***Industrial piping applications***
- ***Process Lines***
- ***Mining***
- ***Landfill***
- ***Oil and gas production***
- ***Saltwater Disposal***
- ***Dredging***
- ***Telecom Conduit***

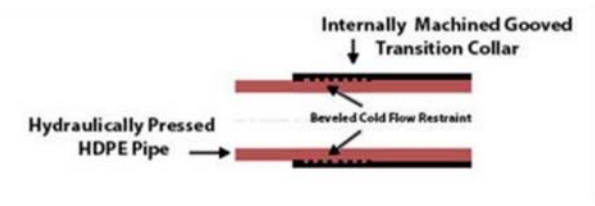
Integrity Fusion Products manufactures a full line of **Epoxy Coated Carbon Steel and Stainless Steel to HDPE Transition Fittings** in a variety of sizes, configurations, SDR's that meet or exceed the **ASTM D2513 Category 3** mechanical joint requirements **(this fitting CANNOT be used in natural gas applications).** **Integrity Fusion Products Transiting Fittings** are manufactured in a variety of nominal pipe sizes and SDR's and are tested to meet the requirements of **ASTM D3261**, **ASTM 1598, ASTM 1599, ANSI/AWWA C901**, **C906**, and **NSF/ANSI/ CAN-61, and NSF/ANSI-372 (where applicable)**, for use with outside diameter-controlled pipe and fittings conforming to **ASTM D2513**, **ASTM D3035**, and **ASTM F-714.**

PIPE:

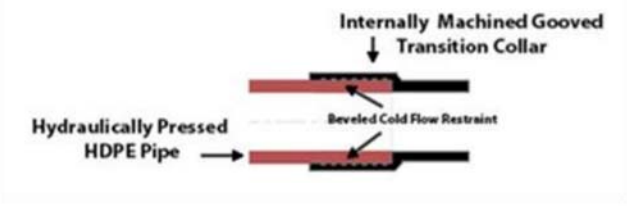
Integrity Fusion Products Transiting Fittings are manufactured using pipe stock produced from virgin, pre-blended, bi-modal black high density polyethylene resin that has a cell classification of **445574C-CC3** that conforms to **ASTM D3350** and is recognized by the Plastic Pipe Institute as having a **PE3408 / PE4710 / PE100** rating with an **HDB** (Hydrostatic Design Basis) of **1600 psi @ 73° F,** and can be heat fused to any manufacturers' PE pipe, molded fittings, or fabricated fittings manufactured from material made from PE3408 / PE4710 / PE100 resin that complies to **ASTM D3350**.

TRANSITION COLLAR:

The internally machined and beveled groove design in our **Epoxy Coated Carbon ASTM A53/API-5 Steel**, and **ASTM A249 or ASTM A269 304 Stainless Steel or 316 Stainless Steel Transition Collars,** provides a robust mechanical joint allowing it to work at the MAOP of the inserted HDPE pipes SDR. **Standard Transition Fittings** provide complete, unobstructed HDPE coverage through the ID of the transition collar, while the **Heavy-Duty Transition Fittings are Epoxy Coated internally and externally,** with both designs providing you with a **piggable seal**, and total corrosion protection. All NPT threads are made to **ANSI/ASME B1.20.1,** and the Standard Machine Groove to **ASME B31.1.**



Cat. 3 Standard Style



Cat. 3 Heavy Duty Style

Transition Fittings from Integrity Fusion Products are manufactured, tested, certified, and listed in accordance with standards and requirements that meet a wide range of project requirements that include:

ASTM D2513	-	**Specification for Thermoplastic Gas Pressure Pipe, Tubing and Fittings**
ASTM D3350	-	**Specification for Polyethylene Plastic Pipes and Fittings Materials**
ASTM D3261	-	**Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Pipe and Tubing**
ASTM F714	-	**Specifications for HDPE Pipe Dimensions**
AWWA C901	-	**Polyethylene (Pe) Pressure Pipe and Tubing, 3/4 In. Through 3 In. For Water Service**
AWWA C906	-	**Polyethylene (Pe) Pressure Pipe and Tubing, 4 In. Through 65 In. For Water Works**
ANSI/NSF 61	-	**Plastic Piping System Components & Related Materials**

Conditions for the Required De-Rating of a Transition Fitting Fittings MAOP

The **Maximum Allowable Operating Pressures (MAOP)** for molded PE4710 fittings ***must be de-rated for elevated temperatures in all service applications***, including Oil & Gas Gathering Systems installed in Class 1 or Class 2 locations (low population areas not subject to DOT CFR *Title 49 Part 192* regulations) or where Federal Codes do not apply. *Including Water, Brine, Dry Natural Gas applications with NO associated hydrocarbons.*

API Specification 15LE (1995) states "In most circumstances, the HDB obtained at 73° F can be used for applications up to 100° F without further derating" Values in this table use a material design factor of .63 and a Fluid Service Factor of 1.0

The maximum operating temperature of Integrity Fusion Products PE4710 Molded Fittings ***should not exceed 140° F.*** **(TABLE 2)**

Fitting MAOP by SDR vs. Operating Temperature				
SDR	**73.4° F**	**100° F**	**120° F**	**140° F**
7	333 psi	260 psi	210 psi	166 psi
9	250 psi	195 psi	158 psi	125 psi
11	200 psi	156 psi	126 psi	100 psi
17	125 psi	98 psi	79 psi	63 psi

TABLE 2

Dry, gaseous hydrocarbons have no adverse effect on our molded fittings normal expected service life, and naturally occurring chemicals in the soil will not attack or cause our fittings to degrade. They do not rust, rot, or corrode; they naturally resist the buildup of scale and other deposits, and they do not support the growth of algae, bacteria, fungi, or other marine life.

Table 3 provides an added derated MAOP of a molded electrofusion fitting when installed into services and applications subjected to an extended exposure of liquid hydrocarbon concentrations of 2% and greater.

Values in Table 3 use a material design factor of .63 and a Fluid Service Factor of 0.5

MAOP by SDR Derated for Operating Temperature and Transporting a Media Containing 2% or greater Hydrocarbon Content				
SDR	**73.4° F**	**100° F**	**120° F**	**140° F**
7	166 psi	129 psi	105 psi	83 psi
9	125 psi	98 psi	79 psi	63 psi
11	100 psi	78 psi	63 psi	50 psi

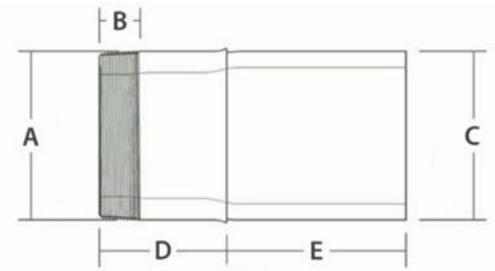
TABLE 3

Fluid Service Factors

Produced Water, Brine, Process Water with no associated liquid hydrocarbons	**1.0**
Dry Natural Gas (no hydrocarbon liquids used in Class 1 and Class 2 locations and in low population area not subject to DOT CFR *Title 49 part 192*	**1.0**
Crude Oil, Wet Natural Gas, Liquid Hydrocarbons, Process Water with >2% liquid hydrocarbons	**.5**
Gas Distribution piping that is permeated by solvating chemicals, liquid hydrocarbons or liquified gas condensate	**.5**

Standard Male NPT Transition Fitting 77
Specification & Dimension Sheet





CERTIFIED TO NSF/ANSI 61 SECTION 4 NSF/ANSI 372

AWWA C901/C906

Integrity Fusion Products offers a full line of Standard **ANSI/ASME B1.20.1 NPT** (male MPT or Female FPT), **Epoxy Coated Carbon ASTM A53/API-5 Steel**, and **ASTM A249 or ASTM A269 304 Stainless Steel or 316 Stainless Steel** HDPE Transition Fittings that are **AWWA C116-01 & C213-01** compliant. ***Integrity Fusion Products Standard Transition Fittings*** provide a robust mechanical joint built around an internally machined and beveled groove design, allowing it to work at the MAOP ***(maximum allowable operating pressure)*** of the inserted HDPE pipes SDR. ***Integrity Fusion Products Standard Transition Fittings*** are designed to provide complete, unobstructed HDPE coverage through the ID of the transition collar for total corrosion protection, providing you with a ***piggable*** seal plus a pipe restraint rating equivalent to the expected thermal stresses that occur in a pipeline. ***Integrity Fusion Standard Transition Fittings*** meet or exceed the **ASTM D2513 Category 3** mechanical joint requirements **(this fitting CANNOT be used in natural gas applications)** and are manufactured in a variety of nominal pipe sizes and SDR's. ***Integrity Fusion Products Standard Transition Fittings*** are manufactured and tested to meet the requirements of **ASTM D3261**, **ASTM 1598, ASTM 1599, ANSI/AWWA C901**, **C906**, and **NSF/ANSI/ CAN-61, and NSF/ANSI-372 (where applicable)**, for use with outside diameter-controlled pipe and fittings conforming to **ASTM D2513**, **ASTM D3035**, and **ASTM F-714.** ***Integrity Fusion Products Standard Transition Fittings*** can be heat fused to any manufacturers' PE pipe, molded fittings, or fabricated fittings manufactured from material made from PE3408 / PE4710 / PE100 resin that complies to **ASTM D3350**. ***Integrity Fusion Products Standard Transition Fittings*** are also available in a **Standard Cut Groove design.**

Steel to HDPE Transition Fittings manufactured by Integrity Fusion Products, are all-purpose, steel to HDPE mechanical transition fittings that are designed and manufactured for use in applications that include, but are not limited to:

- **Oil and gas production**
- **Municipal potable water distribution and service lines**
- **Saltwater Disposal**
- **Irrigation**
- **Mining**
- **Geothermal**
- **Dredging**
- **Wastewater conveyance**
- **Process Lines**
- **Industrial piping applications**
- **Landfill**
- **Telecom Conduit**

NOTE: When installing the standard transition fitting, the installer should always use pipe joint sealant or Teflon tape on the threads. First, hand tighten the transition fitting and then use two (2) strap wrenches to tighten the transition fitting the rest of the way. **DO NOT USE PIPE WRENCHES. Pipe wrenches can deform the transition sleeve and result in compromising the seal created between the tightly pressed pipe and internally machined and beveled grooves creating a potential leak path. Over tightening may also damage the transition collar a cause ovality or damage. Always pressure test for leaks before backfilling.** Backfill and compact carefully around transition and service line to prevent ground shifts which could damage the valve and/or transition fitting.

Integrity Fusion Products
270 Parkade Court
Peachtree City, GA 30269

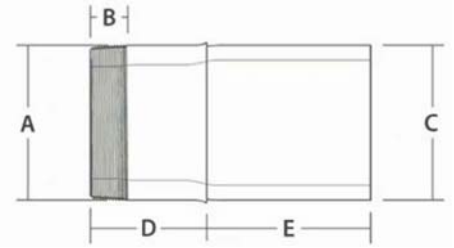
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Phone: 770.632.7530
Toll Free: 888.770.6330
www.integrityFusion.com

INTEGRITY Fusion Products, Inc.

Standard Male NPT Transition Fitting Specification & Dimension Sheet





CERTIFIED TO NSF/ANSI 61 SECTION 4 NSF/ANSI 372

AWWA C901/C906

ASME SETTING THE STANDARD

ANSI American National Standards Institute

Male (MIPT) NPT Transitions

SDR 17 (standard dimension ratio) — **125 PSI (MAOP @ 73.4°F)**

Nominal Size	Transition Collar Epoxy or Stainless	A Thread Diameter	B Thread Length	C HDPE Pipe OD	D Steel Collar Length	E Exposed HDPE Length	Weight [lbs.]	Item Code
6" IPS	Epoxy	6.625	1.56	6.625	5.00	8.00		400634
	304 Stainless	6.625	1.56	6.625	5.00	8.00		400626
	316 Stainless	6.625	1.56	6.625	5.00	8.00		400630

Male (MIPT) NPT Transitions

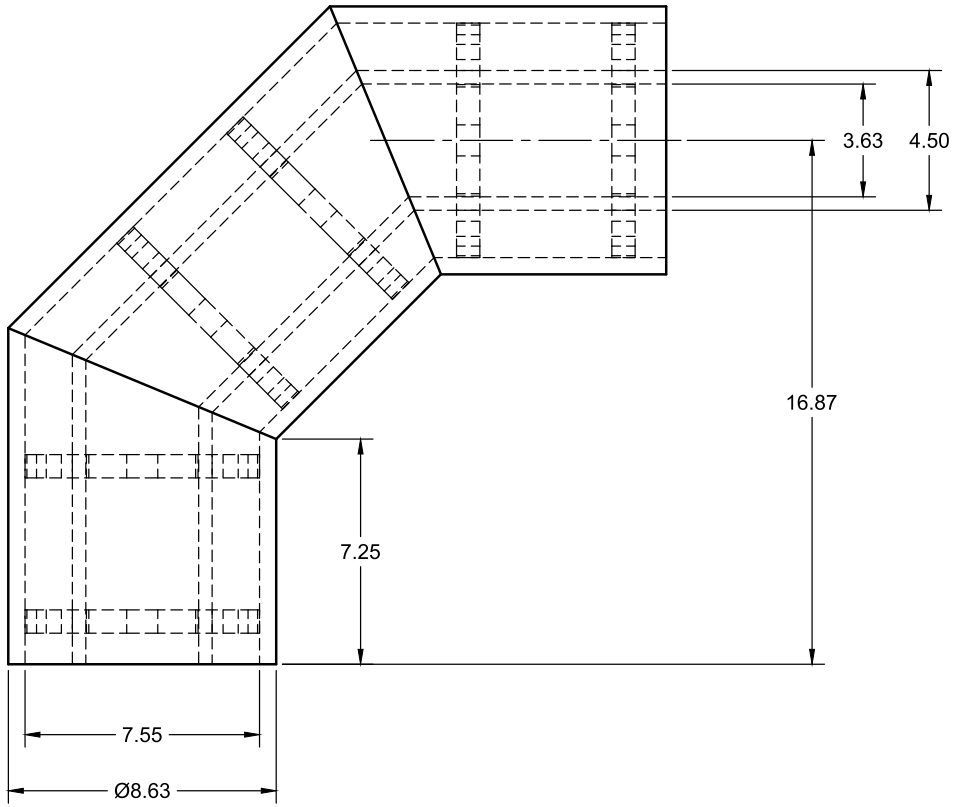
SDR 11 (standard dimension ratio) — **200 PSI (MAOP @ 73.4°F)**

Nominal Size	Transition Collar Epoxy or Stainless	A Thread Diameter [in.]	B Thread Length [in.]	C HDPE Pipe OD [in.]	D Steel Collar Length [in.]	E Exposed HDPE Length [in.]	Weight [lbs.]	Item Code
¾" IPS	Epoxy	1.050	0.70	10.50	1.80	6.20		400563
	304 Stainless	1.050	0.70	10.50	1.80	6.20		400564
	316 Stainless	1.050	0.70	10.50	1.80	6.20		400571
1" IPS	Epoxy	1.315	0.99	1.315	2.00	6.00		400577
	304 Stainless	1.315	0.99	1.315	2.00	6.00		400573
	316 Stainless	1.315	0.99	1.315	2.00	6.00		400575
1 ¼" IPS	Epoxy	1.660	1.01	1.660	2.60	5.40		400583
	304 Stainless	1.660	1.01	1.660	2.60	5.40		400579
	316 Stainless	1.660	1.01	1.660	2.60	5.40		400581
1 ½" IPS	Epoxy	1.900	1.03	1.900	2.60	5.40		400586
	304 Stainless	1.900	1.03	1.900	2.60	5.40		400585
	316 Stainless	1.900	1.03	1.900	2.60	5.40		400614
2" IPS	Epoxy	2.375	1.06	2.375	3.00	5.00		400593
	304 Stainless	2.375	1.06	2.375	3.00	5.00		400587
	316 Stainless	2.375	1.06	2.375	3.00	5.00		400590
3" IPS	Epoxy	3.500	1.26	3.500	4.00	4.00		400602
	304 Stainless	3.500	1.26	3.500	4.00	4.00		400596
	316 Stainless	3.500	1.26	3.500	4.00	4.00		400599
4" IPS	Epoxy	4.500	1.48	4.500	4.00	8.00		400611
	304 Stainless	4.500	1.48	4.500	4.00	8.00		400605
	316 Stainless	4.500	1.48	4.500	4.00	8.00		400608
6" IPS	Epoxy	6.625	1.56	6.625	5.00	8.00		400633
	304 Stainless	6.625	1.56	6.625	5.00	8.00		400625
	316 Stainless	6.625	1.56	6.625	5.00	8.00		400629

NOTE: When installing the standard transition fitting, the installer should always use pipe joint sealant or Teflon tape on the threads. First, hand tighten the transition fitting and then use two (2) strap wrenches to tighten the transition fitting the rest of the way. **DO NOT USE TRADITIONAL PIPE WRENCHES (only use strap wrenches). Pipe wrenches can deform the transition sleeve and result in compromising the seal created between the tightly pressed pipe and internally machined and beveled grooves creating a potential leak path. Over tightening may also damage the transition collar a cause ovality or damage. Always pressure test for leaks before backfilling.** Backfill and compact carefully around transition and service line to prevent ground shifts which could damage the valve and/or transition fitting.

Integrity Fusion Products
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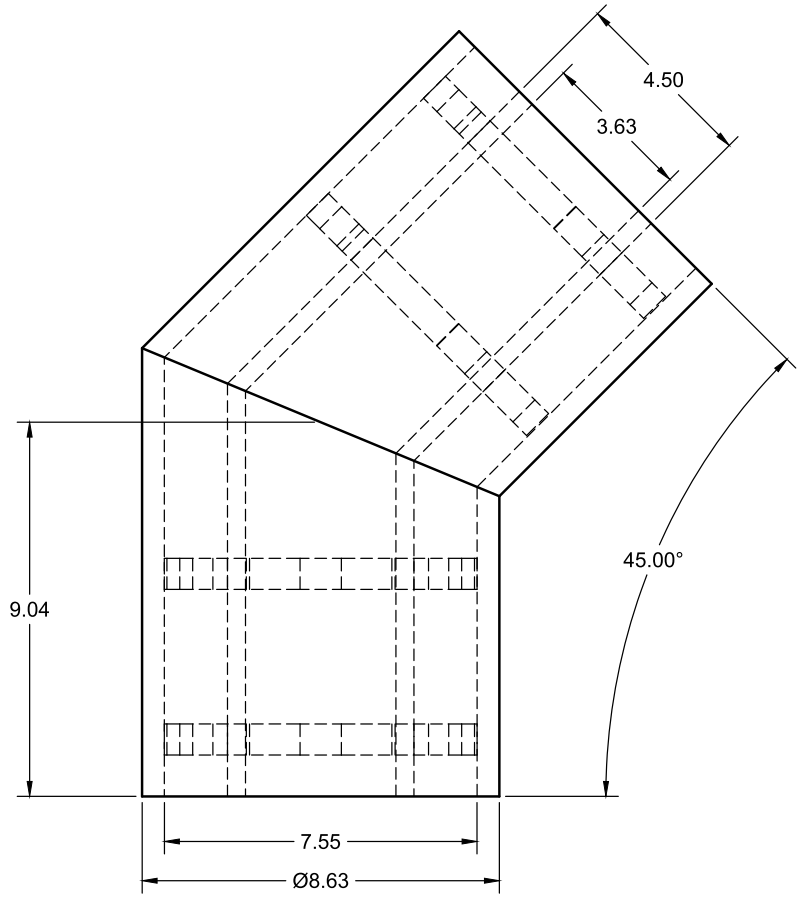
Notes:

1. ALL DIMENSIONS ARE IN INCHES UNLESS SPECIFIED OTHERWISE
2. DIMENSIONAL TOLERANCES ARE ± 1"
3. ANGULAR TOLERANCE ARE ± 2°
4. FITTING MAY BE COUNTERBORED UPON REQUEST TO MATCH THE WALL THICKNESS OF THE PIPE MAIN TO WHICH IT WILL BE JOINED
5. ALL CHANGES MUST BE APPROVED BY FM
6. GORE-PIPE SEGMENT FUSION-JOINTS FOLLOW ASTM F2620 JOINING PROCEDURS

Customer Approval Signature _____

AIS LLC
FABRICATED FITTINGS

DRAWN JH	4/22/2024	AIS, LLC 274 Front Street, Bon Air, AL 35032
CHECKED CM		TITLE: 8" SDR-17 X 4" SDR-11 3-Seg 90 Dual Contained
QA		
MFG		
APPROVED		SIZE B | CODE | DWG NO | REV
		SCALE 1:4 | SHEET 1/1

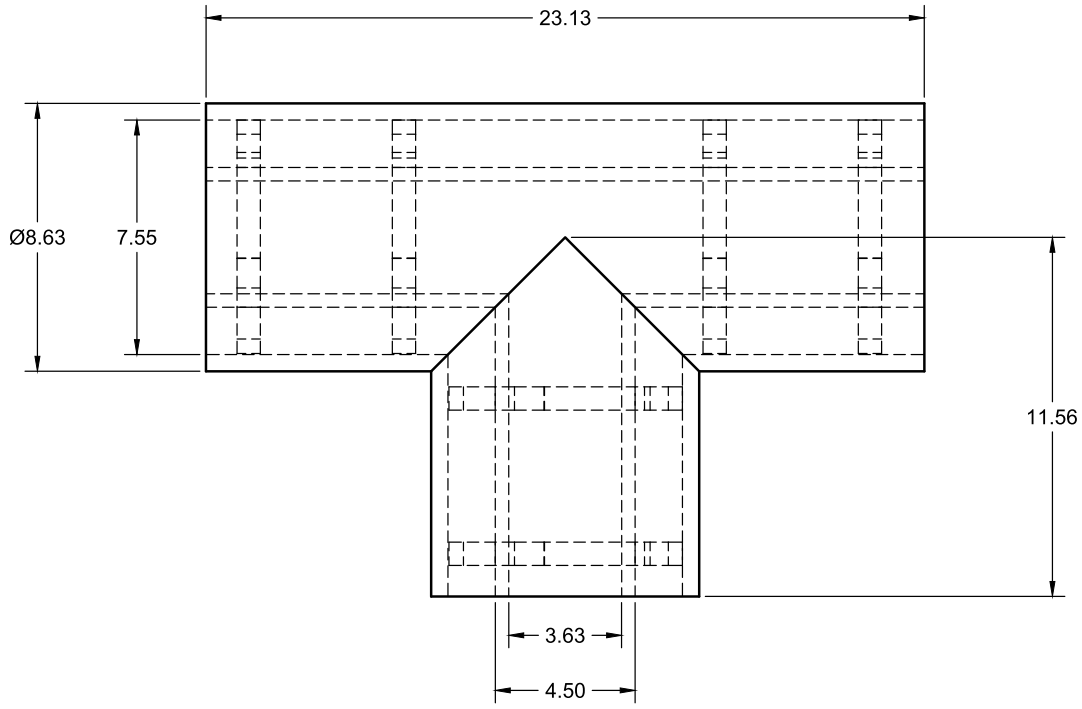


Notes:
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5. ALL CHANGES MUST BE APPROVED BY FM
6. GORE-PIPE SEGMENT FUSION-JOINTS FOLLOW ASTM F2620 JOINING PROCEDURS

Customer Approval Signature _____

AIS LLC
FABRICATED FITTINGS

DRAWN JH	3/11/2025	AIS, LLC 274 Front Street, Bon Air, AL 35032
CHECKED CM		TITLE: 8" SDR-17 X 4" SDR-11 2-Seg 45 Dual Contained
QA		
MFG		
APPROVED		SIZE B | CODE | DWG NO | REV
		SCALE 1:3 | SHEET 1/1



FABRICATED FITTINGS

Notes:
1. ALL DIMENSIONS ARE IN INCHES UNLESS SPECIFIED OTHERWISE
2. DIMENSIONAL TOLERANCES ARE ± 1"
3. ANGULAR TOLERANCE ARE ± 2°
4. FITTING MAY BE COUNTERBORED UPON REQUEST TO MATCH THE WALL THICKNESS OF THE PIPE MAIN TO WHICH IT WILL BE JOINED
5. ALL CHANGES MUST BE APPROVED BY FM
6. GORE-PIPE SEGMENT FUSION-JOINTS FOLLOW ASTM F2620 JOINING PROCEDURS

Customer Approval Signature _____

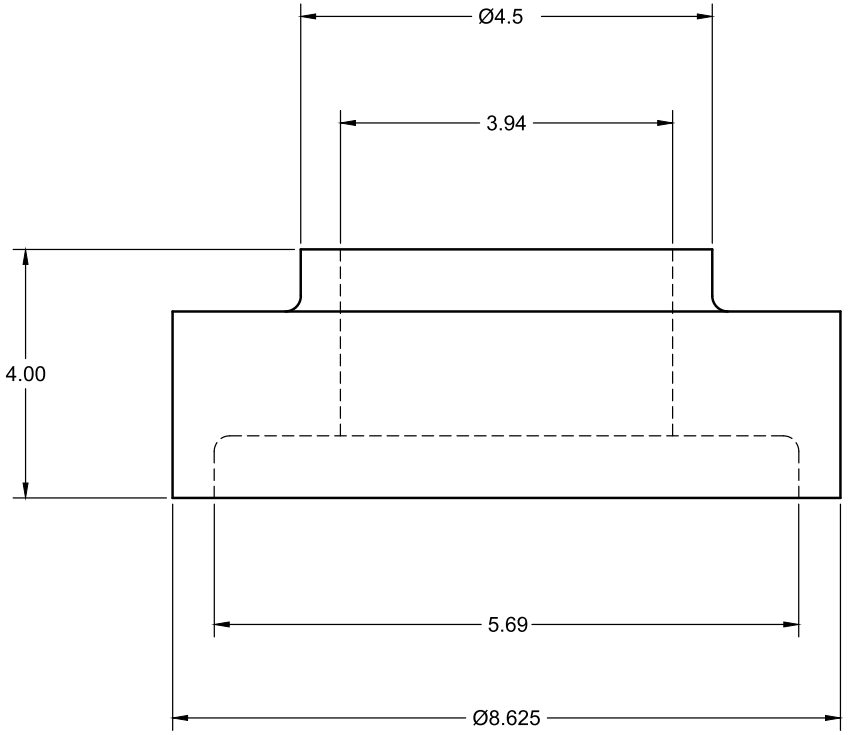
DRAWN	JH	4/7/2025
CHECKED	CM	
QA		
MFG		
APPROVED		

AIS, LLC
274 Front Street, Bon Air, AL 35032

TITLE
8" SDR-17 X 4" SDR-11 Tee Dual Contained

SIZE	CODE	DWG NO	REV
B			

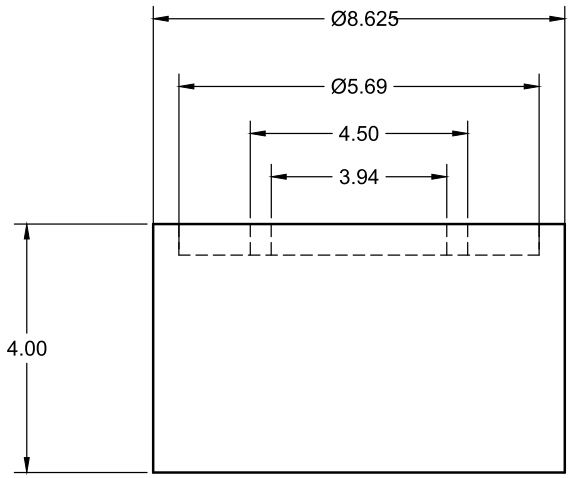
SCALE 1:4 | SHEET 1/1

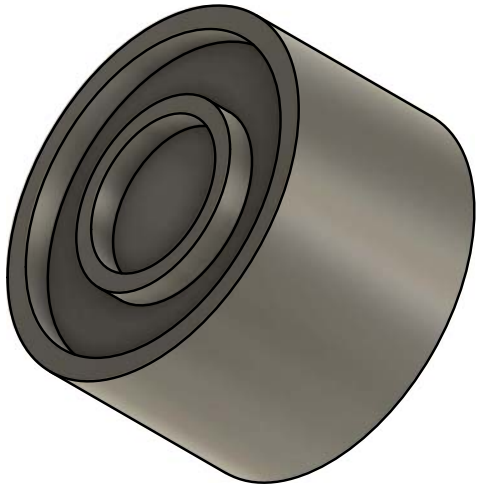


Notes:
1. ALL DIMENSIONS ARE IN INCHES UNLESS SPECIFIED OTHERWISE
2. DIMENSIONAL TOLERANCES ARE ± 1"
3. ANGULAR TOLERANCE ARE ± 2°
4. FITTING MAY BE COUNTERBORED UPON REQUEST TO MATCH THE WALL THICKNESS OF THE PIPE MAIN TO WHICH IT WILL BE JOINED
5. ALL CHANGES MUST BE APPROVED BY FM
6. GORE-PIPE SEGMENT FUSION-JOINTS FOLLOW ASTM F2620 JOINING PROCEDURS

Customer Approval Signature _____

DRAWN JH	12/8/2021	AIS, LLC 274 Front Street, Bon Air, AL 35032
CHECKED CM		TITLE 8" SDR-17 X 4" SDR-17 END TERMINATION
QA		
MFG		
APPROVED		
		SIZE B / CODE / DWG NO / REV
		SCALE 1:2 / SHEET 1/1



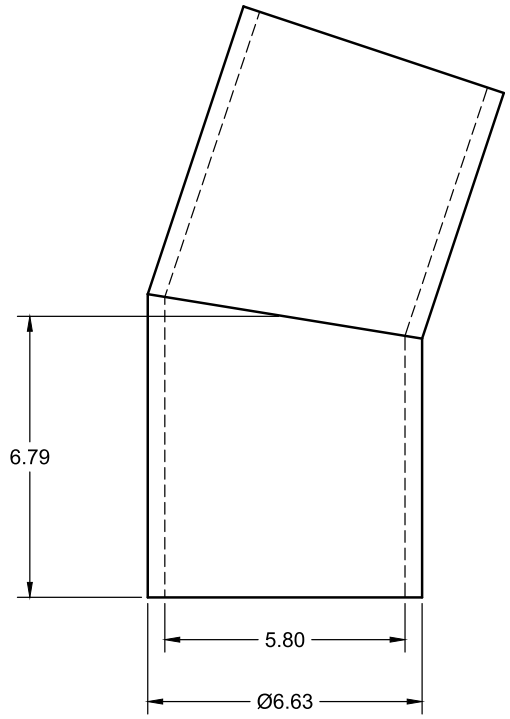


FABRICATED FITTINGS

Notes:
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2. DIMENSIONAL TOLERANCES ARE ± 1"
3. ANGULAR TOLERANCE ARE ± 2°
4. FITTING MAY BE COUNTERBORED UPON REQUEST TO MATCH THE WALL THICKNESS OF THE PIPE MAIN TO WHICH IT WILL BE JOINED
5. ALL CHANGES MUST BE APPROVED BY FM
6. GORE-PIPE SEGMENT FUSION-JOINTS FOLLOW ASTM F2620 JOINING PROCEDURS

Customer Approval Signature _____

DRAWN JH	4/29/2024	AIS, LLC 274 Front Street, Bon Air, AL 35032
CHECKED CM		TITLE: 8" SDR-17 X 4" SDR-17 D/C Cap
QA		
MFG		
APPROVED		
		SIZE B | CODE | DWG NO | REV
		SCALE 1:2 | SHEET 1/1



Notes:
1. ALL DIMENSIONS ARE IN INCHES UNLESS SPECIFIED OTHERWISE
2. DIMENSIONAL TOLERANCES ARE ± 1"
3. ANGULAR TOLERANCE ARE ± 2°
4. FITTING MAY BE COUNTERBORED UPON REQUEST TO MATCH THE WALL THICKNESS OF THE PIPE MAIN TO WHICH IT WILL BE JOINED
5. ALL CHANGES MUST BE APPROVED BY FM
6. GORE-PIPE SEGMENT FUSION-JOINTS FOLLOW ASTM F2620 JOINING PROCEDURS

Customer Approval Signature _____

AIS LLC
FABRICATED FITTINGS

DRAWN JH	1/24/2025	AIS, LLC 274 Front Street, Bon Air, AL 35032
CHECKED CM		TITLE 6" SDR-17 2-Seg 18.4
QA		
MFG		
APPROVED		SIZE B | CODE | DWG NO | REV
		SCALE 1:3 | SHEET 1/1

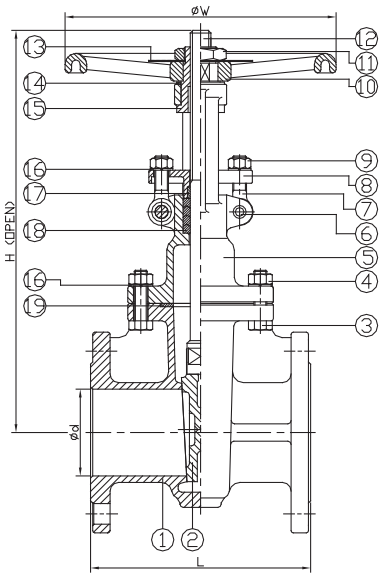
FLANGED END GATE VALVE

2054



FEATURES

- 1/2"~24" (DN15~DN600)
- W.P. : PN16
  CLASS 150/300/600
- W.T. : -20°C~200°C (-4°F~392°F)
- Investment casting
- Rising stem



ITEM	PARTS	MATERIAL
1	BODY	ASTM A351-CF8M / 1.4408
2	DISC	
3	BONNET BOLT	AISI 304
4	BONNET NUT	
5	BONNET	ASTM A351-CF8M / 1.4408
6	HINGE PIN	AISI 304
7	EYE BOLT	
8	GLAND	ASTM A351-CF8 / 1.4308
9	EYE NUT	AISI 304
10	HAND WHEEL	FCD
11	NUT	BRONZE
12	STEM	AISI 316
13	NAME PLATE	AISI 304
14	SPRING	BRONZE
15	YOKE SLEEVE	
16	SPRING WASHER	AISI 304
17	GLAND PACKING	PTFE
18	PACKING	
19	SEAL	PTFE / 304+GRAPHITE

* 5" UP GASKET: 304 + GRAPHITE

DN	d	CLASS 150			CLASS 300			PN 16		
		L	H	W	L	H	W	L	H	W
15	15	108	182	120	140	197	120	115	182	120
20	20	117	195	120	152	211	120	120	195	120
25	25	127	237	120	165	232	120	125	237	120
32	32	140	294	200	-	-	-	130	294	200
40	40	165	294	200	190	283	250	140	294	200
50	50	178	335	200	216	353	250	150	335	200
65	65	190	393	200	241	404	250	170	39	200
80	80	203	467	250	283	470	250	180	467	250
100	100	229	549	250	305	560	300	190	549	250
125	125	254	630	300	381	626	300	200	630	300
150	150	267	743	300	403	753	350	210	743	300
200	200	292	910	350	419	968	400	230	910	350
250	250	330	1097	400	457	1117	400	250	1097	400
300	300	356	1285	400	502	1380	500	270	1285	400

unit:mm

NPS	d	CLASS 150			CLASS 300			PN 16		
		L	H	W	L	H	W	L	H	W
1/2"	0.59	4.25	7.17	4.72	5.51	7.76	4.72	4.53	7.17	4.72
3/4"	0.79	4.61	7.68	4.72	5.98	8.31	4.72	4.72	7.68	4.72
1"	0.98	5	9.33	4.72	6.5	9.13	4.72	4.92	9.33	4.72
1-1/4"	1.26	5.51	11.57	7.87	-	-	-	5.12	11.57	7.87
1-1/2"	1.57	6.5	11.57	7.87	7.48	11.14	9.84	5.51	11.57	7.87
2"	1.97	7.01	13.19	7.87	8.5	13.9	9.84	5.91	13.19	7.87
2-1/2"	2.56	7.48	15.47	7.87	9.49	15.91	9.84	6.69	1.54	7.87
3"	3.15	7.99	18.39	9.84	11.14	18.5	9.84	7.09	18.39	9.84
4"	3.94	9.02	21.61	9.84	12.01	22.05	11.81	7.48	21.61	9.84
5"	4.92	10	24.8	11.81	15	24.65	11.81	7.87	24.8	11.81
6"	5.91	10.51	29.25	11.81	15.87	29.65	13.78	8.27	29.25	11.81
8"	7.87	11.5	35.83	13.78	16.5	38.11	15.75	9.06	35.83	13.78
10"	9.84	12.99	43.19	15.75	17.99	43.98	15.75	9.84	43.19	15.75
12"	11.81	14.02	50.59	15.75	19.76	54.33	19.69	10.63	50.59	15.75

unit:in

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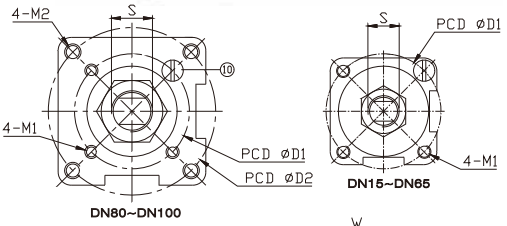
2-PC. FLANGED END BALL VALVE 2020S

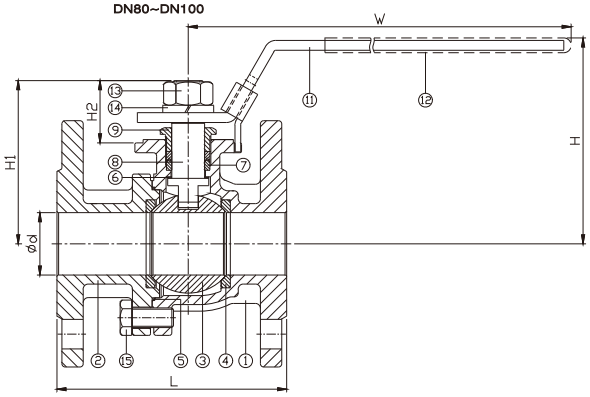


FEATURES

- Full port, 1/2"~8" (DN15~DN200)
- W.P. : CLASS 150/300
- W.T. : -20°C~200°C (-4°F~392°F)
- Investment casting
- Blow-out proof stem
- Anti-static device (option)
- Locking device
- ISO 5211 Mounting pad
- TA-Luft approved (option)

- Flange dimension: ASME B16.5
- Face to face: ASME B16.10





ITEM	PARTS	MATERIAL
1	BODY	ASTM A351-CF8M ASTM A216-WCB
2	CAP	
3	BALL	ASTM A351-CF8M
4	SEAT	PTFE / RTFE
5	SEAL	PTFE
6	THRUST WASHER	
7	PACKING	
8	STEM	ASTM A276-316
9	GLAND NUT	AISI 304
10	STOP PIN	
11	HANDLE	STAINLESS STEEL
12	HANDLE SLEEVE	PVC
13	STEM NUT	AISI 304
14	SPRING WASHER	
15	BOLT	

DN	d	H	H1	H2	S	W	D1	D2	M1	M2	CLASS 150		CLASS 300	
											L	Torque (N-M)	L	Torque (N-M)
15	15	86	57.2	23.7	11.11	169	42	-	M5	-	108	3.8	140	7.5
20	20	89	60	23.5	11.1	169	42	-	M5	-	117	5.5	152	7.6
25	25	103	73.5	29	12.7	205.5	50	-	M6	-	127	6.5	165	17.5
32	32	103	78.5	29	12.7	205.5	50	-	M6	-	140	9	178	20
40	38	130	102.9	39.4	19.05	267	70	-	M8	-	165	25	190	22.9
50	50	135	110.4	39.4	19.05	267	70	-	M8	-	178	38	216	32.2
65	65	147	122	38.6	19.05	289	70	-	M8	-	190	45	241	42.3
80	80	166	142	43	19.05	390	70	102	M8	M10	203	61	282	87.2
100	100	181	157	43	19.05	390	70	102	M8	M10	228.5	80	305	98.2

unit:mm

NPS	d	H	H1	H2	S	W	D1	D2	M1	M2	CLASS 150		CLASS 300	
											L	Torque (in-lb)	L	Torque (in-l
1/2"	0.59	3.39	2.25	0.93	0.44	6.65	1.65	-	M5	-	4.25	33.6	5.51	66.4
3/4"	0.79	3.5	2.36	0.93	0.44	6.65	1.65	-	M5	-	4.61	48.7	5.98	67.3
1"	0.98	4.06	2.89	1.14	0.5	8.09	1.97	-	M6	-	5	57.5	6.5	154.9
1-1/4"	1.26	4.06	3.09	1.14	0.5	8.09	1.97	-	M6	-	5.51	79.7	7.01	177
1-1/2"	1.5	5.12	4.05	1.55	0.75	10.51	2.76	-	M8	-	6.5	221.3	7.48	202.7
2"	1.97	5.31	4.35	1.55	0.75	10.51	2.76	-	M8	-	7.01	336.3	8.5	285
2-1/2"	2.56	5.79	4.8	1.52	0.75	11.38	2.76	-	M8	-	7.48	398.3	9.49	374.4
3"	3.15	6.54	5.59	1.69	0.75	15.35	2.76	4.02	M8	M10	7.99	539.9	11.1	771.8
4"	3.94	7.13	6.18	1.69	0.75	15.35	2.76	4.02	M8	M10	9	708.1	12.01	869.1

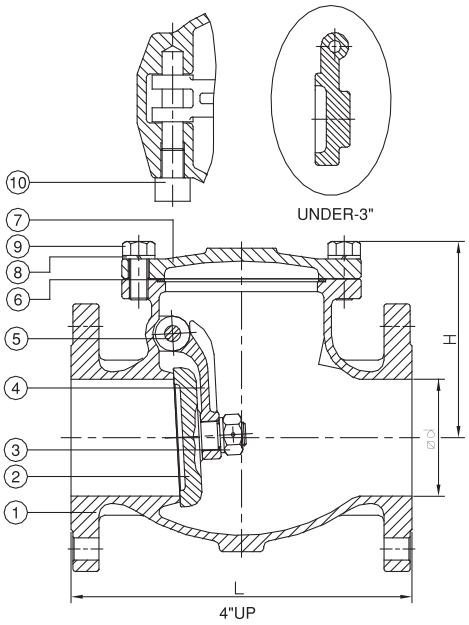
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FEATURES

- 1/2"~24" (DN15~DN600)
- W.P. : PN16/40
  CLASS 150/300/600
  JIS 10K
- W.T. : -20°C~200°C (-4°F~392°F)
- Investment casting



ITEM	PARTS	MATERIAL	
1	BODY	ASTM A351-CF8M/ 1.4408	ASTM A351-CF8/ 1.4308
2	DISC		
3	NUT	AISI 304	
4	ARM HINGE	ASTM A351-CF8M / 1.4408	ASTM A351-CF8 / 1.4308
5	HINGE PIN	AISI 316	AISI 304
6	SEAL	PTFE/304+GRAPHITE	
7	BONNET	ASTM A351-CF8M / 1.4408	ASTM A351-CF8 / 1.4308
8	SPRING WASHER	AISI 304	
9	BONNET BOLT		
10	BOLT		

* 8" UP GASKET: 304 + GRAPHITE

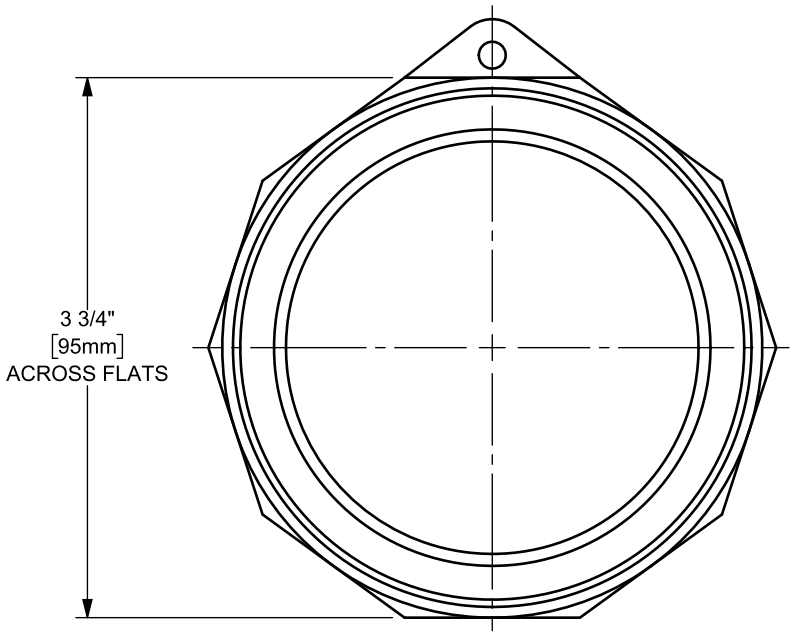
DN	d	CLASS 150		CLASS 300		PN 16	
		L	H	L	H	L	H
15	15	108	51	152	61	130	51
20	20	117	54	178	61	150	54
25	25	127	64	203	79	160	64
32	32	140	68	-	-	180	68
40	40	165	75	229	93	200	75
50	50	203	97	267	127	230	97
65	65	216	111	292	144	290	111
80	80	241	120	318	154	310	120
100	100	292	162	356	196	350	162
125	125	330	179	400	217	400	179
150	150	356	203	444	230	480	203
200	200	495	236	533	265	600	236
250	250	622	302	622	319	730	302
300	300	698	340	-	-	850	340
350	337	787	385	-	-	-	-

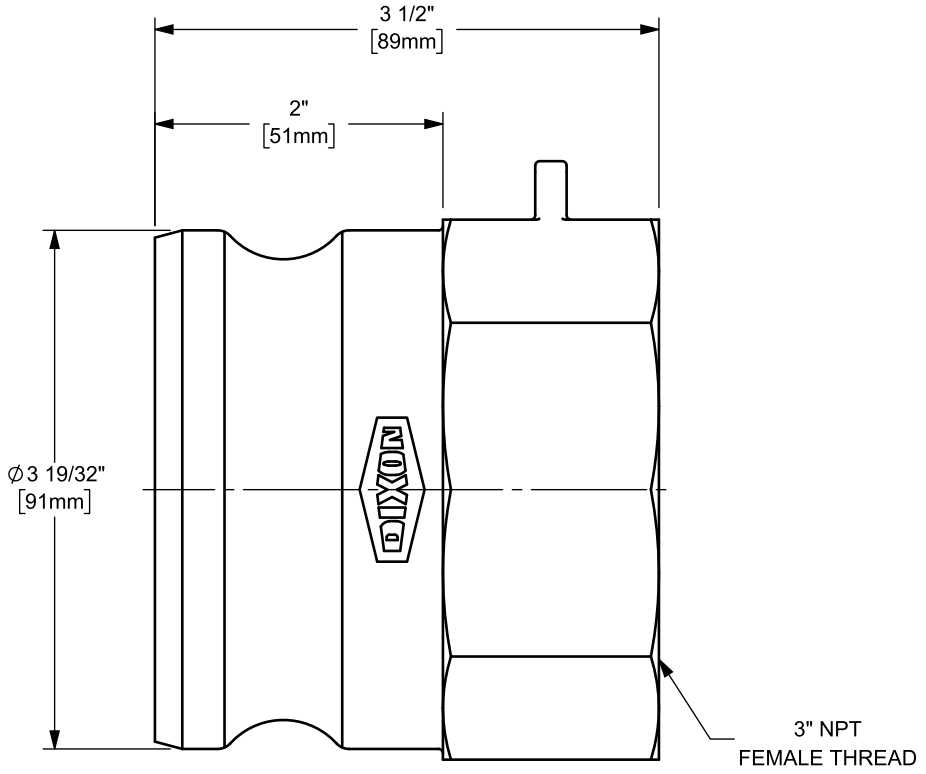
unit:mm

NPS	d	CLASS 150		CLASS 300		PN 16	
		L	H	L	H	L	H
1/2"	0.59	4.25	2.01	5.98	2.4	5.12	2.01
3/4"	0.79	4.61	2.13	7.01	2.4	5.91	2.13
1"	0.98	5	2.52	7.99	3.11	6.3	2.52
1-1/4"	1.26	5.51	2.68	-	-	7.09	2.68
1-1/2"	1.57	6.5	2.95	9.02	3.66	7.87	2.95
2"	1.97	7.99	3.82	10.51	5	9.06	3.82
2-1/2"	2.56	8.5	4.37	11.5	5.67	11.42	4.37
3"	3.15	9.49	4.72	12.52	6.06	12.2	4.72
4"	3.94	11.5	6.38	14.02	7.72	13.78	6.38
5"	4.92	12.99	7.05	15.75	8.54	15.75	7.05
6"	5.91	14.02	7.99	17.48	9.06	18.9	7.99
8"	7.87	19.49	9.29	20.98	10.43	23.62	9.29
10"	9.84	24.49	11.89	24.49	12.56	28.74	11.89
12"	11.81	27.48	13.39	-	-	33.46	13.39
14"	13.27	30.98	15.16	-	-	-	-

unit:in

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TITLE: 3" DIXON™ / BOSS-LOCK™ ADAPTER x FEMALE NPT w/ LONG HEX CAM AND GROOVE FITTING

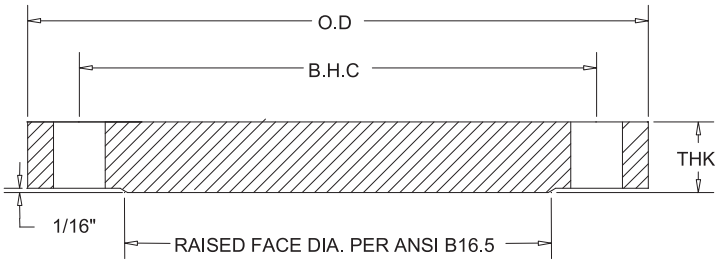
MATERIAL: STAINLESS STEEL

PART NUMBER: **300-A-SS**

ANSI/ASME B16.5 Forged Flanges

Domestic & Import







ANSI Class 150 Forged Stainless Steel Raised Face Blind Flanges

API Part Number	Size	O.D.	I.D.	ø B.H.C	ø B.H.	# B.H	THK	RF DIA	Weight lbs
SRFB0050	0.5	3.50	BLIND	2.38	0.630	4	0.440	1.375	3.0
SRFB0075	0.75	3.88	BLIND	2.75	0.630	4	0.500	1.688	4.0
SRFB0100	1	4.25	BLIND	3.13	0.630	4	0.563	2.000	4.5
SRFB0125	1.25	4.63	BLIND	3.50	0.630	4	0.630	2.500	5.0
SRFB0150	1.5	5.00	BLIND	3.88	0.630	4	0.690	2.875	5.5
SRFB0200	2	6.00	BLIND	4.75	0.750	4	0.750	3.625	6.0
SRFB0250	2.5	7.00	BLIND	5.50	0.750	4	0.880	4.125	9.0
SRFB0300	3	7.50	BLIND	6.00	0.750	4	0.940	5.000	11.5
SRFB0350	3.5	8.50	BLIND	7.00	0.750	8	0.940	5.500	13.5
SRFB0400	4	9.00	BLIND	7.50	0.750	8	0.940	6.188	15.5
SRFB0500	5	10.00	BLIND	8.50	0.875	8	0.940	7.313	19.5
SRFB0600	6	11.00	BLIND	9.50	0.875	8	1.000	8.500	25.5
SRFB0800	8	13.50	BLIND	11.75	0.875	8	1.130	10.625	44.5
SRFB1000	10	16.00	BLIND	14.25	1.000	12	1.190	12.750	67.0
SRFB1200	12	19.00	BLIND	17.00	1.000	12	1.250	15.000	98.0
SRFB1400	14	21.00	BLIND	18.75	1.125	12	1.380	16.250	134.0
SRFB1600	16	23.50	BLIND	21.25	1.125	16	1.440	18.500	176.0
SRFB1800	18	25.00	BLIND	22.75	1.250	16	1.563	21.000	215.0
SRFB2000	20	27.50	BLIND	25.00	1.250	20	1.690	23.000	286.0
SRFB2200	22	29.50	BLIND	27.25	1.375	20	1.840	25.250	358.0
SRFB2400	24	32.00	BLIND	29.50	1.375	20	1.880	27.250	426.0

Notes:

a. Dimensions and Tolerances per ASME/ANSI B16.5 Class 150.

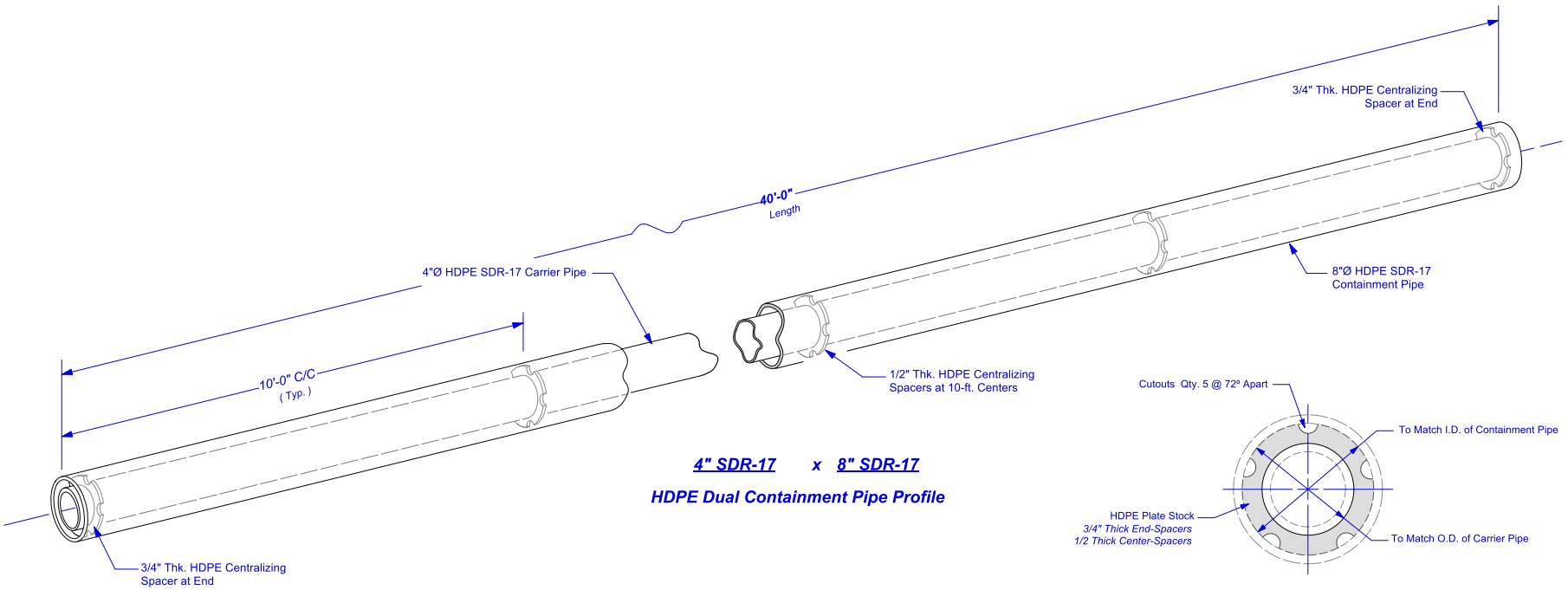
b. Material meets ASTM A182 Forged Steel requirements.

c. All Stainless Steel flanges available in Dual Grade 304/304L or 316/316L.

ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE STATED.

Dual Containment Piping

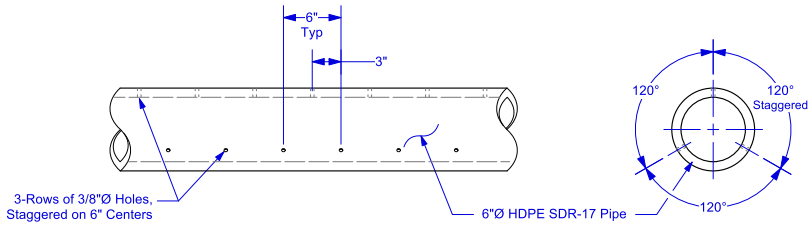
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4" SDR-17 x 8" SDR-17

HDPE Dual Containment Pipe Profile

HDPE Centralizing Spacer



6"Ø HDPE SDR-17 Perforated Leachate Piping Layout

NO.	DATE	REVISIONS	BY

Drawn By: J. Yoder (Draftsman / Designer)	Date: 8-12-2025	PFF Drawing No: **04037-0066 a**	Scale: N. T. S.	Rev. **0**
Customer Approval:	Date:	PFF Job No: 500066	Sheet: 1 of 3	

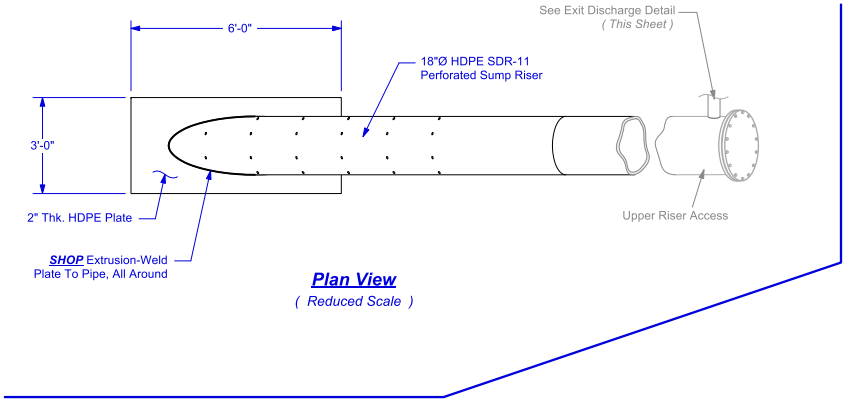
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Dumey Contracting, Inc. - Craighead Co. Solid Waste Disposal
Legacy Landfill, Cell 5 Construction / Jonesboro, AR
HDPE Dual-Containment ForceMain Piping Layout Details

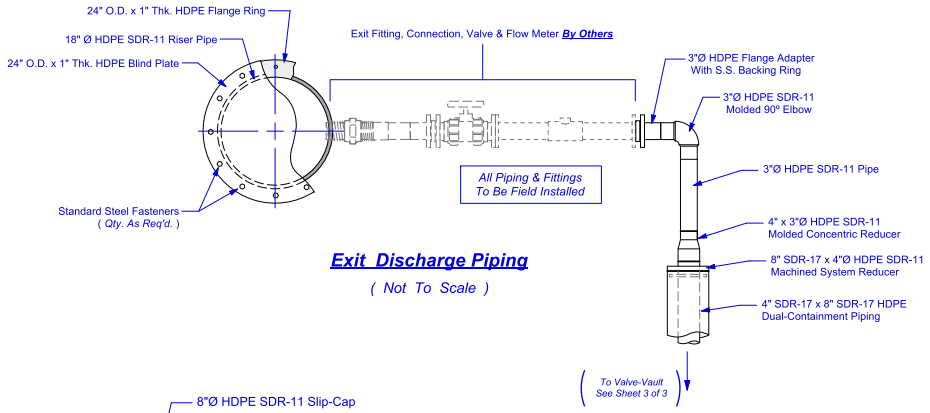
PFF Drawing Form C (17 x 22)

Leachate Collection Sump Riser

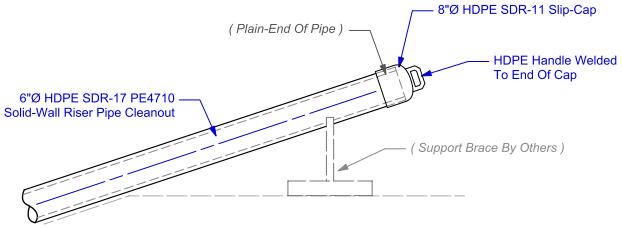
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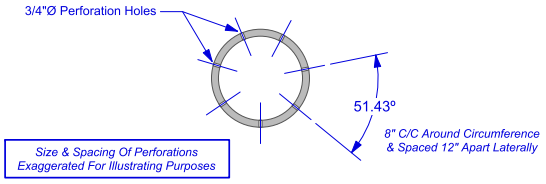
Plan View
(Reduced Scale)

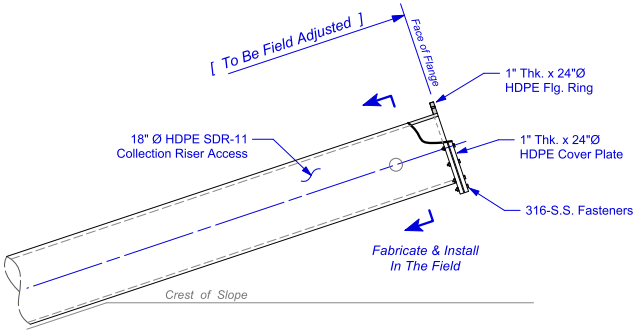


Exit Discharge Piping
(Not To Scale)

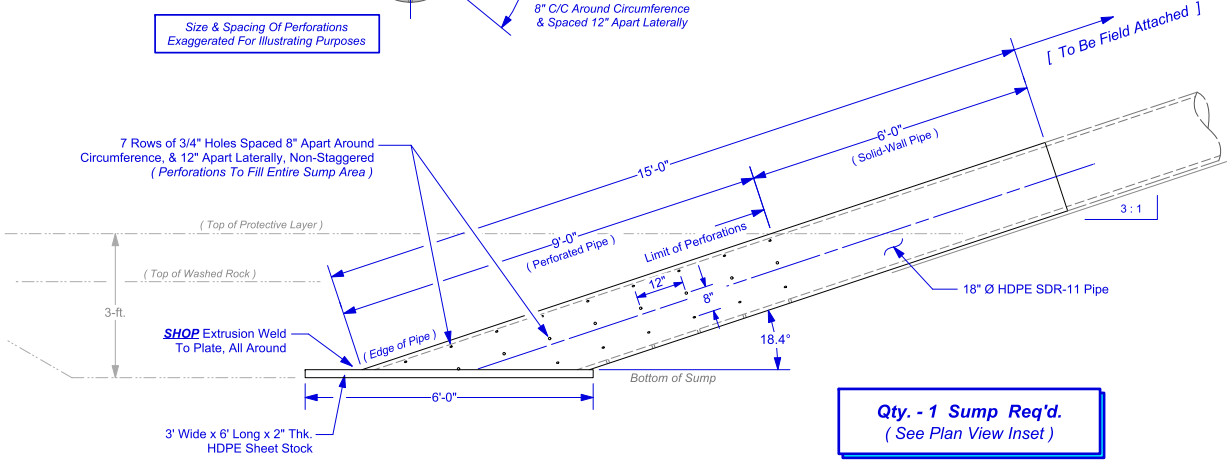


Leachate Cleanout





Upper Riser Access



Lower Collection Sump Riser
(Scale 1/2" = 1'-0")

Qty. - 1 Sump Req'd.
(See Plan View Inset)

NO.	DATE	BY

REVISIONS

Drawn By: J. Yoder (Draftsman / Designer)	Date: 8-12-2025	PFF Drawing No: **04037-0066 b**	Scale: *(As Shown)* Rev. **0**
Customer Approval:	Date:	PFF Job No: 500066	Sheet: 2 of 3

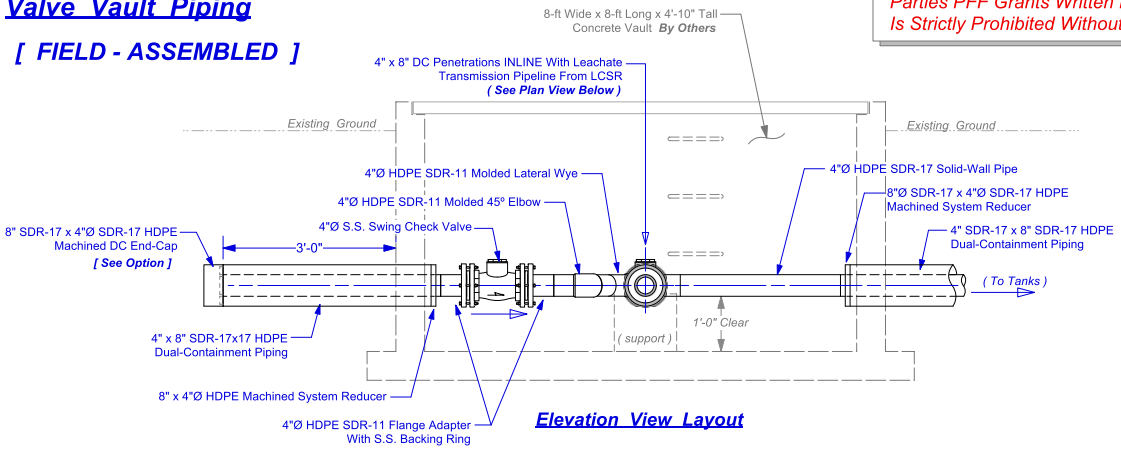
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18"Ø HDPE Leachate Collection Sump & Riser Access Details

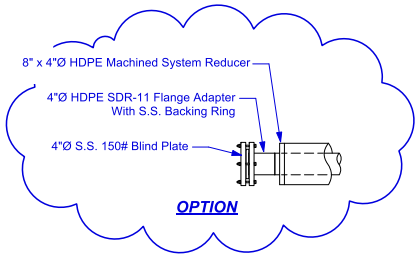
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Valve Vault Piping

[FIELD - ASSEMBLED]

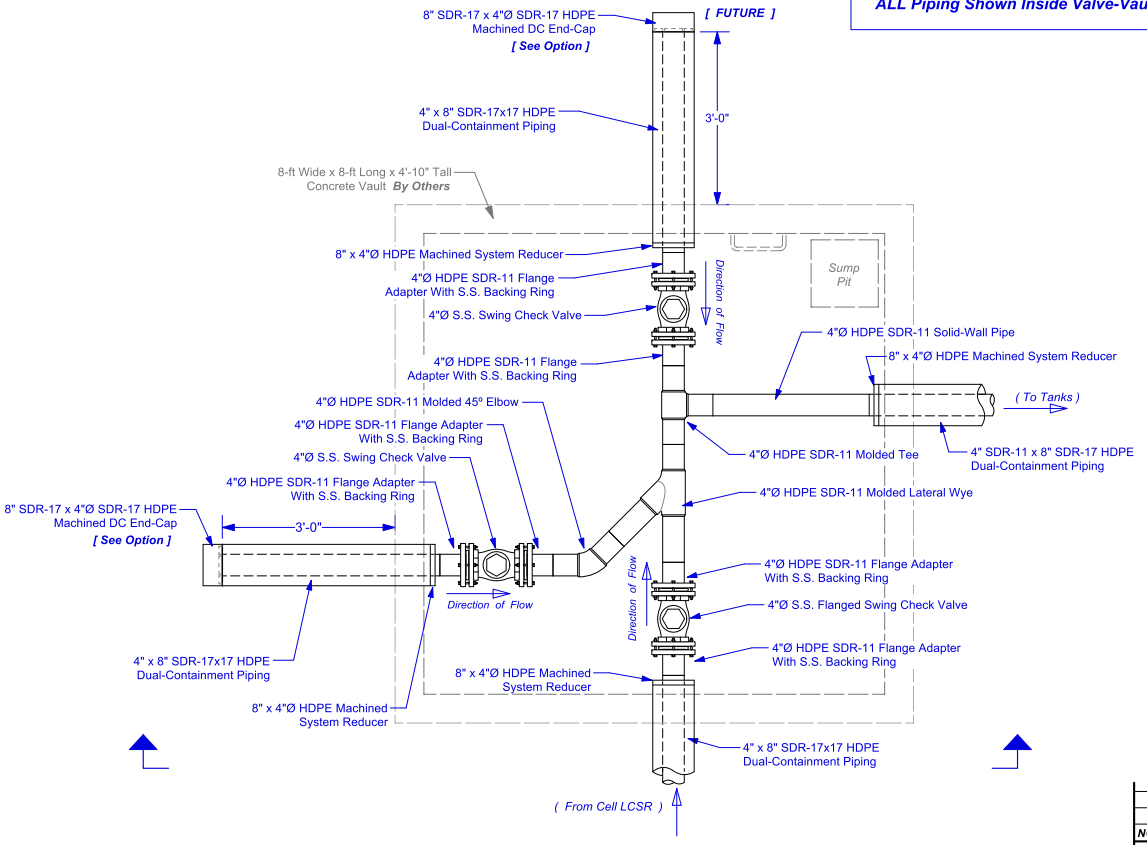


Elevation View Layout

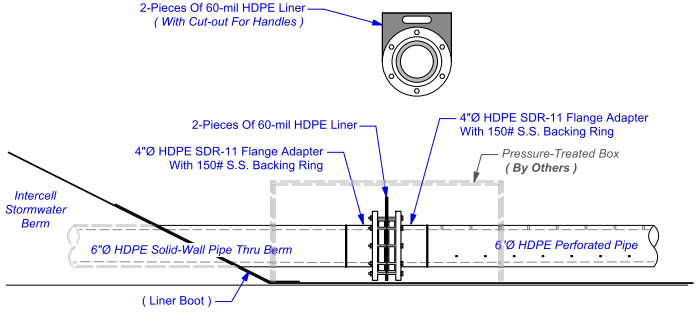


OPTION

NOTE :
ALL Piping Shown Inside Valve-Vault Will Be Field installed



Plan View Layout



Leachate Pipe Connection Detail

NO.	DATE	BY

REVISIONS

Plastic Fusion Fabricators, Inc.
Sustainable environmental containment ™
3455 Stanwood Blvd. - Huntsville, Alabama 35811
Tel: 256-852-0378 / Fax: 256-852-0388 / http://www.plasticfusion.com

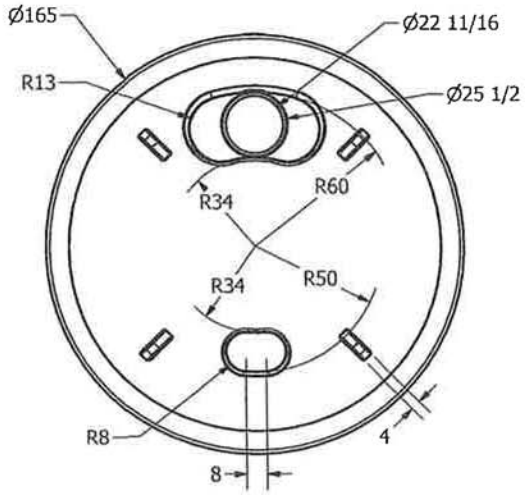
Dumey Contracting, Inc. - Craighead Co. Solid Waste Disposal
Legacy Landfill, Cell 5 Construction / Jonesboro, AR
HDPE Piping System Layout for Valve-Vault Details

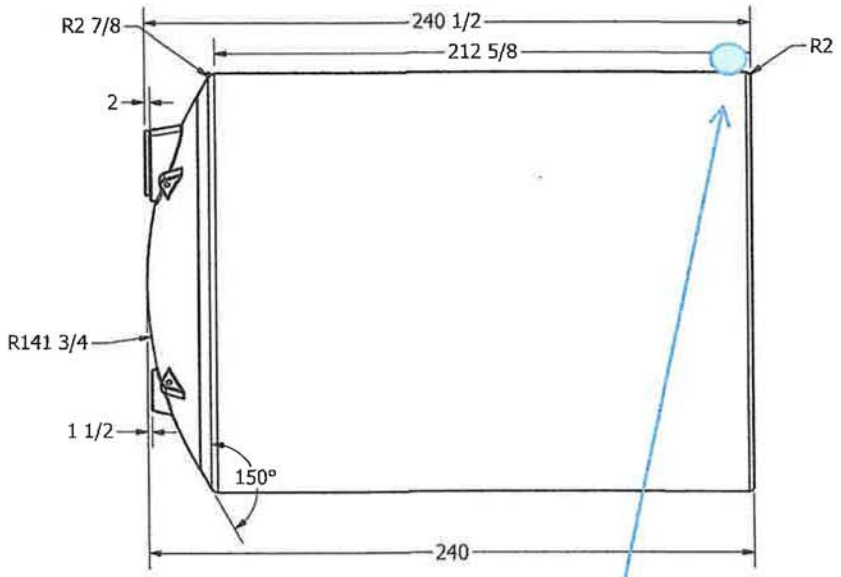
Drawn By: J. Yoder (Draftsman / Designer)	Date: 8-12-2025	PFF Drawing No: 04037-0066 c	Scale: 3/8"=1'-0"
Customer Approval:	Date:	PFF Job No: 500066	Sheet: 3 of 3

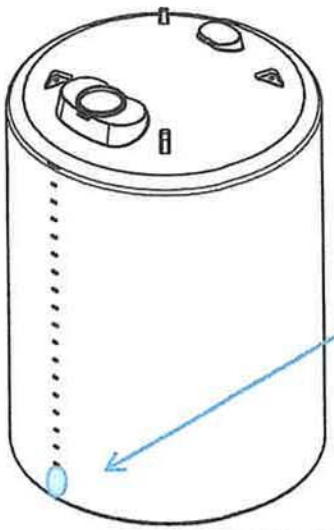
Rev. 0

PFF Drawing Form C (17 x 22)

TANK 1





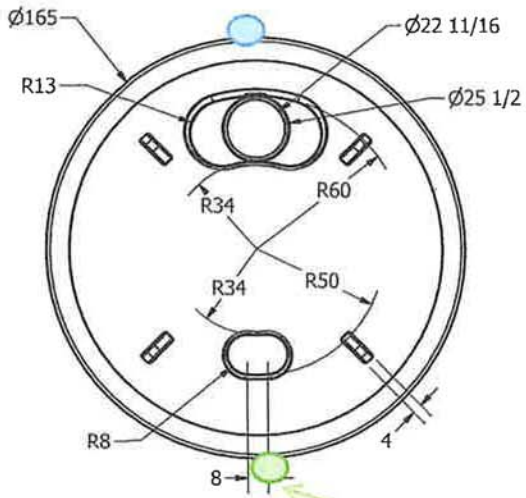


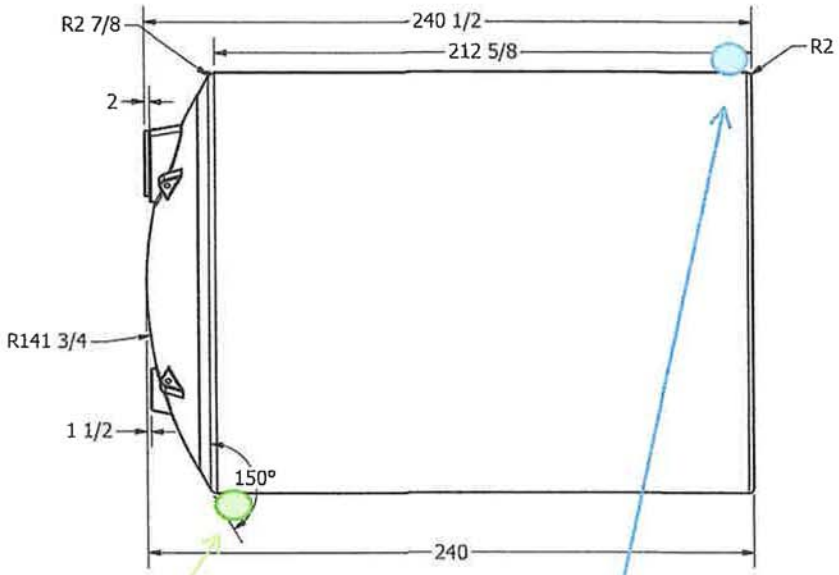
3"

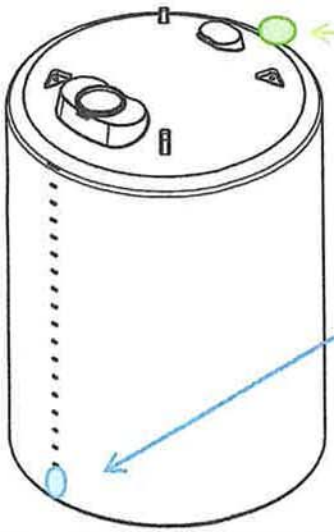
2" Bottom Drain Low Max at 0°

DRAWN Jerry Paulson	10/12/2010	NORWESCO, INC., ST. BONIFACIUS, MN
CHECKED		TITLE: 20,000 GALLON VERTICAL TANK X 165 DIAMETER
QA		
MFG		
APPROVED		SIZE B / DWG NO / REV
		SCALE: 1/48 / SHEET 1 OF 2

TANK 2







3" High Max at 180°

2" Bottom Drain Low Max at 0°

3"

DRAWN Jerry Paulson	10/12/2010	NORWESCO, INC., ST. BONIFACIUS, MN	
CHECKED		TITLE	
QA		20,000 GALLON VERTICAL TANK X 165 DIAMETER	
MFG			
APPROVED		SIZE B	DWG NO / REV
		SCALE: 1/48	SHEET 1 OF 2

LEGACY LANDFILL

BOTTOM LINER CELL 5 CQA

Jonesboro, Arkansas - 2026

January 2026

Olsson Project No. 025-04399