NE 99th Street / Leichner Landfill Liner Installation Documentation Report

Leichner Landfill
9009 NE 94th Avenue
Vancouver, WA 98662

Presented to:
Mr. Michael Davis
Leichner Landfill Project Manager
Clark County Public Health – Solid Waste Operations
1601 East Fourth Plain Blvd., Building 17
Vancouver, WA 98661

SCS ENGINEERS

04223030.10 | **August 15, 2023**

Prepared by:
SCS Engineers
2405 140th Avenue NE, Suite 107
Bellevue, WA 98005
425-746-4600

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ENGINEERS CERTIFICATION

Based on my professional judgement, on-site documentation of installation activities, laboratory test results, and design drawings, the geomembrane liner system is judged to have been constructed in accordance with the drawings and specifications. Variations from the original design have been documented and included in this report.

8/15/2023

John M. Richards, PE
Project Director / Vice President
SCS Engineers

1.0 EXECUTIVE SUMMARY

This report describes the installation of the geomembrane liner as part of the NE 99th Street extension project through the northern portion of the Leichner Landfill located in Vancouver, Washington. The NE 99th Street project required extending the existing geomembrane liner associated with the final cover system of the northern portion of the landfill waste cell. Approximately 2.15 acres of geomembrane liner (in plan-view, approximately 93,800 square feet [SF]) was installed. The landfill geomembrane liner installation included a prepared subgrade, a 60-mil geomembrane layer placed atop the subgrade, a soil cover layer of varying thickness placed atop the geomembrane, and a turf reinforcement mat and hydroseed applied to the cover layer.

This report serves as certification that the geomembrane liner system was installed in accordance with the design intent of the *NE 99th Street (NE 94th AVE to Vicinity of NE 117th AVE (SR-503)) – CRP-350722 – Volume 1 Construction Drawing*s (March 15, 2022) and the *NE 99th Street (NE 94th AVE to Vicinity of NE 117th AVE (SR-503)) Proposal and Contract Documents (Project Specifications)* (October 2021), issued by Clark County Public Works.

2.0 INTRODUCTION

This report documents construction activities performed in June and July 2023 for the extension of approximately 2.15 acres (93,800 SF) of landfill cover geomembrane liner as part of the NE 99th Street extension project through the northern portion of the Leichner Landfill property. The NE 99th Street project is in the Clark County Right-of-Way (ROW), and part of the project is adjacent to the northern portion of the Leichner Landfill (Landfill), which is owned by Clark County (County) and managed by Clark County Public Health (CCPH). The Landfill is located at 9009 NE 94th Avenue in Vancouver, Washington.

2.1 PROJECT BACKGROUND

The NE 99th Street Extension project and associated site improvements were designed by Clark County Public Works (CCPW) under the direction of Mr. Kenneth A. Lader, PE. Site preparation for the landfill geomembrane liner extension portion of the project began with the placement, grading, and compaction of soil fill that would serve as the subgrade for the proposed NE 99th Street and the geomembrane liner system. This material was placed directly atop an existing geomembrane-lined area for the North stormwater detention pond.

In June of 2023 concerns were raised by CCPH regarding the condition of the soil subgrade. SCS Engineers (SCS) was requested to perform a site inspection of the area that would receive the geomembrane liner to document the means and methods of installation. On June 9, SCS met with staff from CCPW to discuss the project and provide an overview of the inspection activities. Prior to visiting the landfill, SCS reviewed photographs of the work area and provided a memorandum summarizing our initial concerns regarding the condition of the surface to receive the geomembrane liner and the tie-in to the existing Landfill geomembrane cover. A copy of this memorandum is provided in Appendix A.

SCS was subsequently tasked by CCPH to implement a Construction Quality Assurance (CQA) program during the construction of the Leichner Landfill geomembrane liner extension and prepare this report. The purpose of this report is to document that the geomembrane liner system was constructed in accordance with the design intent of *NE 99th Street (NE 94th AVE to Vicinity of NE 117th AVE (SR-503)) – CRP-350722 – Volume 1 Construction Drawings* (March 15, 2022) and the *NE 99th Street (NE 94th AVE to Vicinity of NE 117th AVE (SR-503)) Proposal and Contract Documents (Project Specifications)* (October 2021), issued by CCPW.

2.2 PROJECT DESCRIPTION

The Leichner Landfill geomembrane liner extension project included the following elements:

- Placement and compaction of site soils to form the subgrade layer.
- Installation of Solmax 60-mil smooth geomembrane.
- Placement of clean site soils to form the cover layer for the geomembrane liner. This layer also serves as the foundation for the application of hydroseed and placement of turf reinforcement mat.

2.3 CQA ORGANIZATION

SCS provided third-party CQA services during construction of the landfill geomembrane liner (cover) system. The CQA program provided observation, testing and documentation of the manufactured and

constructed components of the Leichner Landfill geomembrane liner system. SCS verified installation quality by monitoring construction procedures, performing independent material testing, and visually monitoring the work performed by the contractors. CQA services included, but were not limited to the following:

- Clarifying design issues during construction.
- Monitoring the geosynthetic installer's quality control program, installation operations, and seaming operations for the geomembrane used in the liner system construction.
- Reviewing field geomembrane seam testing results and collecting samples for third party laboratory testing.
- Documenting the monitoring and testing results.

2.4 REFERENCE DOCUMENTS

The following reference documents provide background information used in support of this construction documentation report:

- NE 99th Street Project Specifications, issued by CCPW as part of the *NE 99th Street (NE 94th AVE to Vicinity of NE 117th AVE (SR-503)) Proposal and Contract Documents (October 2021)*.
- NE 99th Street (NE 94th AVE to Vicinity of NE 117th AVE (SR-503)) – CRP-350722 – Volume 1 Construction Drawings (March 15, 2022), issued by CCPW

3.0 CONSTRUCTION ROLES AND RESPONSIBILITIES

Key personnel and companies involved with installation of the landfill geomembrane liner system required as part of the NE 99th Street extension project are listed in the following sub-sections. Information regarding the geomembrane manufacturer is included in the relevant sections later in this report.

3.1 CLARK COUNTY PUBLIC WORKS (CCPW)

CCPW is the owner of the NE 99th Street right-of-way.

Street Address:
Clark County Public Works
1300 Franklin St.
Vancouver, WA 98660

Telephone: (564) 397-2446

Contact: Bart Arthur, Construction Engineer

3.2 SCS ENGINEERS

SCS is the CQA engineering firm for this geomembrane liner installation project. SCS was contracted by CCPH and was responsible for implementing a comprehensive CQA program, providing field-engineering services during geomembrane liner system construction, and preparing this report.

Mailing Address:
SCS Engineers
2405 140th Avenue NE, Suite 107
Bellevue, WA 98005

Telephone: (425) 746-4600

Contact: John Richards, PE, Engineer of Record
John Faille, EIT, CQA Manager

3.3 NUTTER CORPORATION

Nutter Corporation (Nutter) was the general contractor contracted by CCPW and is referred to as "Contractor" in the contract documents and technical specifications. Nutter was responsible for construction related to NE 99th Street extension project and associated site improvements. Nutter was responsible for subcontracting the specialty subcontractors required for the installation of the geomembrane liner, as described in this report.

Mailing Address:
Nutter Corporation
7211 NE 43rd Ave., Suite A
Vancouver, WA 98661

Telephone: (360) 601-3953

Contact: Brad Souders, Project Foreman

3.4 ACF WEST GEOSYNTHETICS, INC.

ACF West Geosynthetics, Inc. (ACF West) was subcontracted by Nutter to provide installation of geosynthetic components for the NE 99th Street extension project. ACF West is referred to as "Installer" in this report.

Mailing Address:
ACF West Geosynthetics
Johnson Creek Industrial Park
8951 S.E. 76th Drive
Portland, OR 97206

Telephone: (503) 771-5115

Contact: Jeff Boys, Vice President, COO

3.5 GEOSYNTHETICS CONFORMANCE AND INSTALLATION TESTING

TRI Environmental (TRI), a subsidiary of Texas Research International, Inc. was contracted by SCS to perform third party laboratory testing of the geomembrane liner components.

Mailing Address:
Texas Research International, Inc.
9063 Bee Caves Road
Austin, TX 78733

Telephone: (512) 263-2101

Contact: Jennifer Tenney, Project Manager

3.6 EARTHWORK CONFORMANCE AND INSTALLATION TESTING

Columbia West Engineering, Inc., was contracted by CCPW to perform third party density testing for the soils used to construct NE 99th Street extension, Leichner Landfill geomembrane liner system subgrade, and the associated site improvements.

Mailing Address:
Columbia West Engineering, Inc.
11917 NE 95th Street
Vancouver, WA 98682

Telephone: (360) 823-2900

Contact: BJO, Engineer/Technician

4.0 EARTHWORK

This section describes the earthwork components of the landfill geomembrane liner system and the CQA activities related to earthwork construction. Procedures used for construction monitoring, material quality verification, construction testing of installed materials, and test standards are described below.

4.1 INSTALLATION TESTING

Installation testing was performed to document that soils approved for use, based on acceptance by CCPW, complied with the technical specifications. Soil installation testing performed by Columbia West Engineering, Inc. included in situ moisture and density testing of the subgrade layer. Results of the soil installation testing are presented in Appendix B and summarized in Table 1:

Table 1. Embankment Fill Installation Testing Summary

Test Number	Proctor Data		Nuclear Gauge Test Results			Pass/Fail
	Maximum Dry Density (pcf)	Optimum Moisture Content (%)	Dry Density (pcf)	Moisture Content (%)	Compaction (%)	
1	136.5	7.2	132.4	6.7	97.0	P
2	136.5	7.2	131.7	7.4	96.5	P
3	136.5	7.2	135.5	8.8	99.2	P
4	136.5	7.2	138.3	8.1	100+	P
5	136.5	7.2	134.7	9.0	98.7	P

4.1.1 Nuclear Field Moisture and Density Tests

Nuclear field moisture and density tests were performed on the finished subgrade layer on June 20, 2023. Tests were dispersed throughout the plan dimensions and were chosen without bias.

Moisture and density tests were previously performed in September and October of 2022 but were determined by SCS to not be representative of the final subgrade upon which the geomembrane liner would be deployed. The soil layers that were tested in 2022 had since been disturbed and re-compacted, and/or additional material placed atop the tested surfaces. While not representative of the final subgrade surface, the 2022 results demonstrate that the soil fill below the final surface was placed and compacted in accordance with project specifications. The results of the soil installation testing that occurred in 2022 are presented in Appendix B.

4.2 EMBANKMENT FILL SUBGRADE LAYER

The subgrade layer in the Leichner Landfill geomembrane liner system consists of embankment fill sourced from excavations elsewhere approved by CCPW. The subgrade layer thickness varies from less than 1 inch to greater than 10 feet. Soils were hauled to the fill location in off-road trucks using a temporary roadway constructed on the northern limit of the Landfill and sections of the incomplete NE 99th Street extension. Soils were placed using a Global Positioning Satellite (GPS) system to control the elevation of the installed subgrade layer. Soils were placed in loose lifts and compacted by track walking with a Deere 650K dozer and rolling with an Ingersoll Rand vibratory drum compactor.

During fill placement and compaction operations in June 2023, SCS verified that the following were performed:

- Soils used for embankment fill were placed and compacted in accordance with the project specifications
- Materials not suitable for use as geomembrane line foundation material were removed from the work area.
- Constructed slopes and surfaces complied with the grades shown in the drawings and the tolerances described in the specifications.
- Irreducible objects greater than ½ inch including rocks, wood debris, and pieces of metal were removed prior to placement of geomembrane liner.

4.3 GEOMEMBRANE LINER COVER LAYER

The Leichner Landfill geomembrane liner cover installed as part of the NE 99th Street extension project consists of fill soil sourced approved by CCPW from excavations elsewhere. The geomembrane liner cover layer thickness varies from 1 foot to greater than 2 feet. Soils were hauled to the fill location in off-road trucks using a temporary roadway constructed on the northern limit of the landfill and sections of the incomplete NE 99th Street extension. Soils were placed using a GPS system to control the installed elevation of the cover layer. Soils were placed in loose lifts and compacted by track walking with a Deere 650K dozer and rolling with an Ingersoll Rand vibratory drum compactor.

During cover layer placement and compaction operations in June 2023, SCS verified that the following were performed:

- Soils used for the geomembrane liner cover layer were placed in accordance with the project specifications
- Materials not suitable for use as geomembrane liner cover were removed from the work area.
- Soils used for the geomembrane liner cover were free from irreducible objects greater than ½ inch including rocks and wood debris.

5.0 GEOSYNTHETICS

The goal of the geosynthetics CQA program was to verify that the geosynthetic materials (i.e., Solmax 60-mil HDPE Smooth Geomembrane Liner) delivered to the site conformed to the technical specifications and that proper installation techniques and procedures were used in accordance with the construction drawings and specifications. SCS verified installation quality by monitoring and documenting on-site quality control testing performed by the Installer, performing independent quality assurance testing, and visually inspecting the Installer's work.

5.1 SUBGRADE LAYER INSPECTION

Prior to installation, the subgrade layer was inspected by the Installer to confirm it was acceptable for installation and free of sharp stones, loose soil, and other irregularities that could cause damage to the geomembrane liner during deployment. SCS also verified the following before the geomembrane was installed:

- The surface of the subgrade layer was graded to the tolerances indicated in the technical specifications.
- The Contractor had verified that the subgrade layer was at the correct elevation during placement using GPS.
- The finished surface of the layer was prepared with a smooth drum roller and was free of surface irregularities, loose soil, debris, and protrusions such as sharp stones or other objects that could damage the geomembrane liner.
- There was no significant desiccation cracking in the surface of the subgrade layer.
- The subgrade layer was not overly saturated, and no free water was present on the surface.
- Construction stakes, hubs, and sandbags had been removed.

5.2 GEOMEMBRANE LINER INSTALLATION

The Leichner Landfill geomembrane liner extension was installed in the Landfill area adjacent to the NE 99th Street extension project and associated stormwater conveyance area. It was placed directly over the subgrade layer across the entire area to be lined (approximately 93,800 SF).

5.2.1 Inspection of Materials

The geomembrane material was manufactured in rolls and shipped to the site in trucks and was delivered to the site in rolls approximately 23 feet wide by 560 feet long. The rolls were off-loaded using a forklift and stockpiled at a maximum height of two rolls.

Upon delivery of geomembrane, SCS performed the following:

- Inspected geomembrane rolls for damage that may have occurred during shipping and handling.
- Verified that damaged materials were discarded and not used.
- Verified the geomembrane was stored in an Owner-approved location and was protected from puncture, grease, mud, mechanical abrasions, excessive heat, or other damage.

5.2.2 Surface Preparation

Prior to the placement of geomembrane, SCS and the Installer verified that any corrective actions required to bring the underlying subgrade layer into conformance with the technical specifications and manufacturer's instructions had been taken. If the underlying soil surface remained unacceptable, additional corrective actions were taken before the geomembrane was installed.

5.2.3 Panel Placement

A panel layout drawing was submitted by the Installer to CCPW for approval prior to installation. The drawing showed the proposed layout of the panels including the panel orientation and field seams. During installation, SCS maintained panel installation logs which were used for verification of the quality assurance/quality control (QA/QC) package submitted by the Installer at the end of the project. A copy of the QA/QC package will be provided to CCPW by the installer at a future date. A copy of this report will be requested once it is available.

Geomembrane rolls were transported to the deployment locations using a telescopic handler forklift with a spreader bar and installed by unrolling or pulling the geomembrane over the surface by hand. Panels were installed up-slope and adjusted into place as needed prior to welding the seams. Adjacent panels were overlapped and prepared for welding.

During panel placement, SCS performed the following work:

- Developed a numbering system to identify panel numbers, field seams, and destructive test locations.
- Verified that the Installer maintained an up-to-date panel layout drawing showing panel numbers, seam numbers, test locations, and repair locations.
- Observed the geomembrane liner sheet surface as it was deployed, marking areas requiring repair and defects in workmanship or materials, as appropriate.
- Verified repairs, if required, were made in accordance with the specifications.
- Verified methods used to deploy the geomembrane liner did not cause damage to the material and minimized wrinkles.
- Observed that no damage to the underlying bedding layer, such as rutting occurred during deployment.
- Verified no more panels were deployed than could be seamed on the same day.
- Confirmed that equipment used for installing the geomembrane liner did not leak fuel onto the geomembrane liner.
- Verified panels were held down to prevent movement by the wind during seaming.
- Confirmed that the geomembrane liner was not dragged across an abrasive surface.
- Verified that the geomembrane liner was not welded in the presence of excess moisture (fog, dew, mist, etc.).
- Confirmed that the geomembrane liner was not welded when the air temperature was less than 40°F, greater than 120°F, or when frost was on the ground.
- Verified that crews working on the geomembrane liner did not wear shoes that could damage or engage in activities that could damage the geomembrane liner.

- Verified that the geomembrane liner terminations were secured in the anchor trenches and covered with approved soil cover material.

5.2.4 Welding Seams

During panel placement, adjacent panels were overlapped a minimum of 4 inches and fusion welded using a double-tracked fusion welding machine (wedge welder). For repairs, and in areas where the fusion welder could not be used, an extrusion welder was used. Before the start of geomembrane liner production seaming operations, each welder and welding apparatus were tested (trial weld). SCS verified that the Installer quantitatively tested each trial weld for peel adhesion and bonded seam strength. The results of the peel and shear tests were required to meet minimum specified requirements and were recorded on a trial weld log form.

During seaming of geomembrane panels, both SCS and the Installer completed CQA and QA/QC tasks. These included, but were not limited to, the following:

- Performed trial welds for each welder and welding machine, including recording of equipment settings and results of quantitative field testing of trial welds.
- Inspected the placed panels prior to seaming to identify manufacturer defects or damage from handling or placement of the material.
- Recorded the conditions under which each weld was performed (weather, temperature, presence of precipitation, etc.).
- Verified that equipment used for seaming did not damage the geomembrane liner.
- Visually inspected each weld.
- Verified extrusion welders were purged prior to beginning a weld until the heat-degraded extrudate was removed (extrusion welding only).
- Confirmed seam grinding had been completed less than 30 minutes before seam welding, and the upper sheet was beveled (extrusion welding only).
- Verified the ambient temperature 6 inches above the geomembrane surface was between 40°F and 120°F.
- Verified ends of old welds, more than 5 minutes old, were ground to expose new material before restarting a weld (extrusion welding only).
- Verified contact surfaces of the sheets were clean and free of dust, grease, dirt, debris, and moisture prior to welding.
- For cross seams, verified the seam was ground to a smooth incline prior to welding (fusion welding only).
- Confirmed the edges of adjacent panels overlapped a minimum of 3 inches for extrusion weld seams and a minimum of 4 inches for hot wedge weld seams.
- Verified no solvents or adhesives were present in the seam area.
- Confirmed procedures used to temporarily hold panels together did not damage the panels and did not prevent installation testing.
- Verified the weld area was wiped clean with a towel or rag while welding progressed.

5.2.5 Non-destructive Seam Testing

The Installer performed non-destructive geomembrane testing to locate discontinuities or holes in the seams using air channel pressure testing. Air channel pressure testing was performed over the entire length of wedge-welded seams.

Pressure testing was used to test the air channel created from the double hot wedge welding technique. First, both ends of the air channel are sealed. A pressure feed device (needle equipped with a pressure gauge) was then inserted into the channel. Air was pumped into the channel to a minimum pressure of 60 psi and the pressure was allowed to stabilize for a short period. The air chamber was checked for sustained pressure for 5 minutes without losing more than 2 psi. Following a passing pressure test, the opposite end of the tested seam was punctured to release the air and the gauge was checked for zero pressure.

SCS verified and documented that the Installer's QA/QC testing complied with the technical specifications, located seam defects, and documented repairs if required. If failures were identified, SCS documented the failed area and informed the Installer of the required repairs.

During non-destructive testing, SCS performed the following work:

- Verified testing equipment met technical specifications.
- For double-tracked fusion welds, observed that the non-destructive testing performed by the Installer, included, but was not limited to performing air channel pressure testing over the entire length of the seam:
- Observed continuity testing and documented the results.
- Identified failed areas by marking the areas with a waterproof marker compatible with the geomembrane liner and informed the Installer of required repairs.
- Verified repairs were completed and tested in accordance with the technical specifications.

5.2.6 Destructive Seam Testing

Destructive seam testing was performed at a minimum frequency of one test per 500 linear feet of seam. The Installer removed seam samples at locations directed by SCS. If SCS suspected a seam did not meet specified requirements or the destructive testing showed a failure, the sampling frequency was increased. Samples were shipped to TRI Environmental for analysis following field-testing of the collected samples.

Two types of destructive tests, i.e., peel adhesion (peel) and bonded seam strength (shear), were performed on the seams of the installed geomembrane liner. These tests evaluate seam strength and long-term performance. Shear strength measures the continuity of tensile strength through the seam and into the geomembrane liner sheet. Peel strength determines the quality of the welds. Destructive tests were performed concurrently with seaming operations.

During seaming operations, the following were considered for identifying destructive seam test locations:

- The Installer was not informed in advance of SCS selecting the destructive sample locations.

- Each sample was marked with an identifying number containing the upper and lower panel numbers, destructive test number, project name, and date.
- Sample locations were documented (see Appendix C).
- Sample locations, weather conditions, and reason sample was taken (e.g., random sample, visual appearance, result of a previous failure, etc.) were documented (see Appendix C).

Samples were approximately 12 inches wide by 20 inches long with the weld centered on the length of the sample. The SCS CQA Monitor observed sample cutting. Samples were shipped by SCS to TRI Environmental for peel and shear strength testing. Additionally, samples were field-tested by the Installer using a calibrated tensiometer capable of quantitatively measuring shear and peel strengths. Each sample was tested twice for peel and bonded seam strength. For double wedge welding, both welds were tested. SCS reviewed the test results from both the laboratory and field tests for passing criteria based on the technical specifications. These results are presented in Appendix B.

Eleven (11) destructive seam tests were performed as part of the Leichner Landfill geomembrane liner installation project. Test locations and results of field and laboratory testing are included in Appendix B.

A single destructive test (DS-10) resulted in failure. DS-10 was collected on June 28, 2023 from the northeast area of the geomembrane liner between panels P-63 and P-64. A summary of the failed weld and the procedures used to repair the failed weld are described below:

- The collected sample passed initial field testing, but failed laboratory testing.
- Additional samples were collected approximately 10 feet to the north and south of the original test location and re-tested in the field. Both failed field testing in a manner matching the failure mode seen in the lab results (non-film tearing bond).
- The geosynthetics installer decided to perform an extrusion weld repair on the entire failed seam, approximately 100 feet long. Typically, a failed seam is repaired using capping. However, due to the seam passing the air pressure test and the manner in which the seam failed testing (i.e., the outside weld failed in the dual-weld seam), it was determined that an extrusion weld would address the failed seam.
- Samples taken from the seam repaired using extrusion welding technique passed field testing. All test locations were patched. With this repair the destructive seam requirements were met, and no further testing was required.

5.2.7 Placement of Cover Soil Over Geomembrane Liner

During placement of soil cover materials over the geomembrane liner, temperature changes or creep can cause wrinkles to develop in the geomembrane. Where wrinkles could potentially fold over, SCS verified these areas were allowed to contract by temperature reduction or were physically “walked out.” Where this was not possible the contractor cut the geomembrane liner to remove the excess material and installed patches over the cut portions of geomembrane liner (see 5.2.8 Geomembrane Liner Repairs).

5.2.8 Geomembrane Liner Repairs

Repairs to the geomembrane liner were made when necessary due to flaws in the material or seams, destructive tests, cuts, holes and penetrations, or intersecting panels. Geomembrane liner repairs were performed in accordance with best industry practices.

During repair operations, SCS verified and documented the use of the following methods:

- Patching: used to repair holes or tears and destructive sample locations, with the patch extended at least 6 inches beyond the edge of the defect.
- Extrusion: used to repair small defects (less than ½-inch in the largest dimension) in the panels and seams, with the geomembrane surface ground no more than 30 minutes prior to the repair.
- Capping: used to repair failed welds or to cover seams where welds or bonded sections could not be non-destructively tested.
- Removal: used to remove excess material (wrinkles, fish-mouths, intersections, etc.) from the installed geomembrane.

6.0 DOCUMENTATION

Successful implementation of the quality assurance plan depended on thorough monitoring, documentation of construction activities, and testing. Documentation consisted of daily record keeping, testing and installation reports, progress reports, photographic records, and this construction report.

6.1 DAILY RECORDKEEPING

Daily records were kept consisting of construction progress, and observation and test data sheets. Field reports were prepared by SCS to summarize ongoing construction activities and discussions with the Contractor. At a minimum, daily reports included the following:

- Date, project name, project number, and location.
- A description of ongoing construction for the day.
- Items of discussion and names of parties involved.
- A brief description of tests and observations, identified as passing or failing, or, in the event of failure, a re-test.
- Areas of non-conformance and required corrective actions, if applicable.
- Summary of materials received and quality documentation.
- Follow-up information on previously reported problems or deficiencies.

Copies of the daily record-keeping forms are in Appendix D for reference.

6.2 PHOTOGRAPHS

Construction activities were photographed and selected photos are included in Appendix D.

6.3 CONSTRUCTION RECORDS

Construction records and sample archives will be retained by the Owner for an indeterminate period.

7.0 MODIFICATIONS DURING CONSTRUCTION

This section describes modifications to the design of the Leichner Landfill geomembrane liner system or scope of work made during construction. No change orders were issued during this project. Minor design modifications or repairs that did not substantially affect the construction are not discussed.

7.1 MODIFICATIONS DUE TO CHANGES IN EXISTING CONDITIONS

Changes to the project discussed in this section were made at the request of the Owner, Engineer, or Contractor due to changes or differences in the existing conditions from what is shown in the project drawings or described in the specifications. These changes were made to allow for completion of the geomembrane liner construction consistent with the methods in the construction drawing and project specifications.

7.1.1 Tie-in of New Geomembrane Liner to Existing Landfill Cover Liner

In the northeast corner of the Landfill and southeast end of the geomembrane liner system extension, the Construction Drawings show approximately 200 feet of the edge of the new geomembrane liner as being connected to or "tied-in" to the existing Landfill cover system geomembrane liner using extrusion welding. During excavation activities to expose the existing Landfill cover system geomembrane liner it was discovered that the Landfill cover system liner elevation was at a significantly lower elevation than the new geomembrane liner associated with the geomembrane liner system extension. Additionally, it was found that the existing Landfill cover system geomembrane liner was constructed with an approximately 1-foot layer of sand atop it to allow water to drain downslope off the Landfill. Connecting the new geomembrane liner to the existing cover system geomembrane liner using extrusion welding would interrupt that path and create a watertight trough. This would cause water to pool atop the Landfill cover system liner at the tie-in and potentially further upslope of the Landfill.

SCS and CCPW determined that using a modified anchor trench for this section of tie-in would secure the new geomembrane liner and allow unimpeded movement of water off the Landfill cover system liner. The modified anchor trench consisted of the following:

- A 1-foot minimum layer of clean sand placed in the bottom of the trench formed through exposure of the existing Landfill system cover liner.
- Installation of the new geomembrane liner to the top of the sand layer.
- Backfilling the trench using material excavated from the trench placed in 1-foot lifts and thoroughly compacted. The trench was filled to the design grades in the Construction Drawings.

During the process of exposing the existing cover system liner in the northeast corner of the Landfill, two corrugated plastic pipes were found approximately 2 feet above the existing Landfill cover system liner. It was assumed that these pipes had been installed to facilitate the drainage of stormwater off the Landfill cover liner. To provide drainage continuity, the following measures were taken:

- A 1-foot layer of clean sand was placed in the bottom of the trench on the existing Landfill cover system liner.

- A layer of geotextile was placed atop the sand layer extending 5 feet on both sides of the pipes along the trench.
- The exposed ends of the pipes were saw-cut to be flush with the side of the trench.
- A layer of 1.5-inch minus gravel was placed on top of the geotextile up to a minimum of 4 inches above the tops of the pipes.
- Excess geotextile was wrapped around the gravel layer and the trench backfilled with soil and compacted.

8.0 CONCLUSIONS

The purpose of the Leichner Landfill geomembrane liner extension is to ensure stormwater is routed away from the Landfill and does not enter the covered Landfill waste cell. As a landfill that lacks a bottom liner system it is critical that surface water is not allowed to enter the waste cell where it can percolate through the waste before entering the groundwater as leachate. Previously this was met through the use of geomembrane lined stormwater detention ponds directly north of the Landfill. However, the extension of NE 99th Street necessitated the filling-in of the geomembrane lined stormwater ponds and thus eliminated part of the existing stormwater management system for the Landfill. In place of the detention ponds a stormwater conveyance system was constructed as part of the NE 99th Street extension. Stormwater from the landfill that was previously routed into the detention ponds would be routed into the stormwater conveyance system. To ensure water routed away from the Landfill and the NE 99th Street roadway did not enter the Landfill waste cell the existing Landfill geomembrane cover liner was extended to the north and into the stormwater conveyance system constructed over the existing detention ponds.

Approximately 2.15 acres of geomembrane liner (93,800 SF) was installed as part of the Landfill cover liner extension. The geomembrane liner installation included the following, from bottom to top:

- Prepared subgrade
- 60-mil geomembrane liner.
- Soil cover layer of varying thickness,
- Turf reinforcement mat.
- Hydroseed applied to the cover layer.

To ensure the purpose of the Leichner Landfill geomembrane liner extension was met a CQA program was implemented by SCS during construction. The CQA program included observation and testing of the constructed components of the geomembrane liner and documented the work as it was completed in general accordance with the design intent presented in the Construction Drawings and Technical Specifications. Modifications to the design are presented in Section 7.0 above. Implementation of this CQA program was successful, no modifications to the CQA testing program were required for this project.

Appendix A

Construction Memorandums

June 22, 2023
File No. 04223030.10

Mr. Michael Davis
Leichner Landfill Project Manager
Clark County Public Health-Solid Waste Operations
Vancouver, WA 98662

Subject: **NE 99th Street / Leichner Landfill Liner Installation**

Dear Mr. Davis:

This letter summarizes observations and findings of an inspection performed by SCS Engineers (SCS) on June 9th of the area associated with the NE 99th Street project where new geomembrane liner is to be installed between the existing geomembrane of the Leichner Landfill cover system and the extension of NE 99th Street. SCS performed the inspection at the request of Clark County Public Health (CCPH).

On June 9, SCS met with staff from Clark County Public Works (CCPW) to discuss the project and provide an overview of the inspection activities. Prior to visiting the landfill, SCS reviewed photographs of the work area and sent you an email summarizing our initial concerns regarding the condition of the surface to receive the geomembrane and the tie-in to the existing Landfill cover. It is our understanding that work stopped immediately on Wednesday June 7th when our concerns were first raised about the project.

Summary of Observations and Recommendations

The subgrade soil contains many irreducible objects greater than ½ inch that the specifications indicate are not allowed. These objects include rocks, wood debris, and pieces of metal. (See the items circled in Photos 1 and 2, below). The stormwater pipe inlets are surrounded by what appears to be 1-inch crushed rock. Fractured rock of any size is not acceptable per specifications.

- Fine grading and compaction are required to meet the requirements of the specification for much of the area to be covered by the geomembrane.
- Compaction, in accordance with the specifications, is required for all areas that are to be covered with the geomembrane liner. Some areas have already been graded and rolled with a smooth drum compactor. Compaction testing will need to be performed to verify subgrade is compacted to at least 95 percent of the maximum dry density (MDD).

Photo 1 – Soil with irreducible objects greater than ½ inch.

Photo 2 – Soil includes rocks, wood debris, and metal.

The existing liner has not been cleared of overlying soils or prepared to weld the new geomembrane liner for tie-in (see Photo 3). Rock, dirt, vegetation, and other materials are present on the existing liner.

- Rock, dirt, vegetation, and other materials must be removed using hand tools to prevent damage. The surface of the existing liner must be clean and dry, and inspected before the new liner material can be installed.

There is damage to the existing liner that needs to be addressed (see the circled items in the Photos 3 and 4). This raises a question regarding the condition of the existing liner downslope, into the bottom of the former pond. Without inspection documentation of the placement of the fill soils, we do not know the condition of the buried liner (i.e., if there is damage at the top of slope where it is relatively flat, there is reason to believe that there is also damage along the fill slope).

- Provide inspection documentation for the existing liner prior to fill soils replacement.

Photo 3 – Existing landfill liner with overlying soil that needs to be removed and visible damage that needs to be repaired prior to installing new liner material.

Photo 4 – Existing landfill liner with visible damage that needs to be repaired prior to installing new liner material.

In Photo 4, above, the area behind and to the right of the manhole has been rolled with a smooth drum, but the surface does not appear to be uniform or properly compacted. When properly compacted, the individual passes by the compactor should not be visible (i.e., the small soil ridges formed at the edge of each pass of the roller drum).

- Prior to installation of the new liner material the surface of the soil must be smooth and uniform.

With respect to the elevation of the stormwater collection pipes, SCS believes that the inlets are too high above the liner to drain the stormwater and prevent ponding of water on the liner (Photo 5). According to Clark County, the liner will be approximately 12 inches below the invert of the inlets. At a minimum, this will result in saturated soil sitting atop the liner. In at least one area, the planned tie-in mark on the existing liner may be at, or below the same elevation as the storm pipe inlet invert. This condition would cause stormwater to saturate the covering soils over the existing landfill cover liner.

- Survey stormwater collection pipes and adjacent drainage areas, and adjust elevations to minimize ponding water on the liner.

Photo 5 – Inlet to stormwater collection pipe will be about 12 inches above the surface that will receive the new geomembrane liner.

The grading does not visually appear to provide sufficient slope for adequate flow of water over the liner into the stormwater collection pipes (see Photo 6). This is especially concerning in the NE corner of the landfill. According to Clark County, drainage will be provided by final grading of an approximately 12-inch layer of (vegetated) soil atop the liner.

- Survey stormwater collection pipes and adjacent drainage areas, and adjust elevations to facilitate drainage and minimize ponding water on the liner.

Photo 6 - Grading appears to be inadequate for surface water drainage into the stormwater collection pipes.

The road directly south of the project area consists of a roughly 1 foot layer of railroad ballast placed directly on top of the liner. This is now being driven over by large construction vehicles.

- Remove railroad ballast, inspect liner for damage, repair as needed, and cover with appropriate material as described in the specifications. In addition, cease using the road for construction related activities.

We understand that the liner crew is available from June 15th through the 22nd and that is when the contractor wants to perform the work.

- Before liner installation begins, we recommend that a preconstruction meeting lead by SCS be conducted.

The Contractor proposed a method of joining the new geomembrane liner to the existing liner by not cutting the existing liner and that the tie-in with the new material be performed using extrusion welding methods. This is not an acceptable method for many reasons. The main reasons being the condition of the existing liner and that double fusion welding provides a better seam.

- SCS recommends seam welding using double fusion welding methods.

The contractor proposed joining the new geomembrane liner to the existing liner at a lower elevation than what is shown on the plans and was marked via surveying at the site. Performing the tie-in at a lower elevation would create a grade reversal between the existing liner and the drainage swale. In profile this would form a “W” shape where one valley is the swale and the other is the dip where the liner drops down in elevation to connect to the existing liner.

- There must be a continuous downward grade from the tie-in to the storm collector inlet to prevent water ponding. SCS recommends connecting the existing liner at the location and elevation shown on the plans.

Closing

Overall, our impression from the June 9th inspection is that major work remains to be completed to prepare the subgrade for liner installation. The integrity of the existing liner is questionable as a result of the filling process, and the stormwater system will likely lead to water being trapped atop the newly installed liner.

If you have any questions or comments, please contact the undersigned at (425) 301-6521.

Sincerely,

John Faille, EIT
Staff Engineer
SCS Engineers

John M. Richards, PE
Project Director / Vice President
SCS Engineers

cc: Greg Helland, SCS
Louis Caruso, SCS

Appendix B

Testing Results

B-1 In-Place Moisture/Density Test Results

B-2 Geomembrane Destructive Seam Test Results

B-1

In-Place Moisture/Density Test Results

11917 NE 95th Street, Vancouver, Washington 98682
Phone: 360-823-2900
www.columbiawestengineering.com

Jack

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Columbia West Engineering, Inc

FIELD AND DAILY ACTIVITY REPORT

PROJECT	CLIENT	REPORT NO.	
NE 99th Street Improvements NE 94th Avenue – Vicinity of NE 117th Avenue/SR503 Clark County, Washington	Clark County Dept. of Public Works 1300 Franklin Street, 4th Floor Vancouver, WA 98666-9810	22046-062023-GS1 CRP NO. 350722 INSPECTOR/TECHNICIAN – CERTIFICATION NO. BJO	
CONTRACTOR(S)	PROJECT REPRESENTATIVE(S)	WEATHER/CONDITIONS	PAGE
Nutter Corp.	John Tuininga	Cloudy, 50s°F	1 of 1

TYPE OF FIELD OBSERVATION PERFORMED

Density Testing [BI #18 RAM #87]

DESCRIPTION OF DAILY ACTIVITIES AND GEOTECHNICAL OBSERVATIONS

Columbia West was onsite as requested to conduct density testing on an onsite-mixed 1:1 aggregate blend placed for embankment fill. Test results met project specifications. For approximate locations and test results see *Field Compaction Report 22046-062023-CT1.*

INSPECTOR/TECHNICIAN

COLUMBIA WEST ENGINEERING, INC. authorized signature

06-22-23
ISSUE DATE

11917 NE 95th Street, Vancouver, Washington 98682
Phone: 360-823-2900
www.columbiawestengineering.com

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FIELD COMPACTION REPORT

PROJECT	CLIENT	REPORT NO.
NE 99th Street Improvements NE 94th Avenue – Vicinity of NE 117th Avenue/SR503 Clark County, Washington	Clark County Dept. of Public Works 1300 Franklin Street, 4th Floor Vancouver, WA 98666-9810	22046-062023-CT1
		DATE: 06-20-23
		WEATHER: Cloudy, 50s°F
CRP NO. / BID ITEM NO.: 350722 / BI #18	CONTRACTOR / FOREMAN: John Tuininga	ENGINEER/TECHNICIAN: BJO; PAGE: 1 of 1

COMPACTION TEST DATA

			NUCLEAR GAUGE TEST RESULTS			PROCTOR DATA			COMPACTION		
TEST NO.	TEST DEPTH Feet	ROD DEPTH[1] Inches	WET DENSITY Pcf	DRY DENSITY pcf	MOISTURE %	MAXIMUM DRY DENSITY pcf	OPTIMUM MOISTURE CONTENT %	LAB ID	%	MEETS SPECS[2]	TESTED MATERIAL, TEST DESCRIPTION AND LOCATION
1	0	12	141.3	132.4	6.7	136.5	7.2	S22-0933	97.0	S	Embankment Fill NE 99th Street STA 30+00, 60' South of CL
2	0	12	141.5	131.7	7.4	136.5	7.2	S22-0933	96.5	S	Embankment Fill NE 99th Street STA 29+00, 60' South of CL
3	0	12	147.3	135.5	8.8	136.5	7.2	S22-0933	99.2	S	Embankment Fill NE 99th Street STA 28+00, 60' South of CL
4	0	12	149.5	138.3	8.1	136.5	7.2	S22-0933	100+	S	Embankment Fill NE 99th Street STA 31+00, 120' South of CL
5	0	12	146.8	134.7	9.0	136.5	7.2	S22-0933	98.7	S	Embankment Fill NE 99th Street STA 32+00, 60' South of CL

NOTES

[1]ROD DEPTH:
0 = Backscatter
2 – 12 = Direct Transmission (in inches below ground surface)

[2]MEETS SPECS:
S = satisfactory, meets compaction specifications
U = unsatisfactory, does not meet compaction specifications

Unless otherwise noted, percent compaction is based upon laboratory determination of maximum dry density for the sample noted. Tests performed per ASTM D6938 or AASHTO T310, in accordance with project specifications. Test results apply only for the location and date tested. This report may not be reproduced except in full without prior written authorization by Columbia West Engineering, Inc. Sampling conducted in accordance with QSP 7.3.1.

ADDITIONAL REMARKS
Test depth recorded as approximate depth relative to finished grade.

TECHNICIAN/INSPECTOR:

DATE OF ISSUE:
06-22-23

COMPACTION SPECIFICATIONS
95% MDD AASHTO T180

TESTED MATERIALS AND SOURCES
S22-0933: 1:1 aggregate blend, onsite mixed Daybreak reject, Mountain Top screenings, sampled from grade, NE 99th Street, STA 26+00

GAUGE SERIAL NO.	GAUGE MODEL
69973	3430
MOISTURE STANDARD	DENSITY STANDARD
606	1850

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ıcouver, Washington 98682

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FIELD COMPACTION REPORT

,ch Street Improvements /4th Avenue – Vicinity of NE 117th .enue/SR503 /lark County, Washington	CLIENT Clark County Dept. of Public Works 1300 Franklin Street, 4th Floor Vancouver, WA 98666-9810	REPORT NO. 22046-093022-CT1	
		DATE 09-30-22	
		WEATHER Clear, 70s°F	
CRP NO. / BID ITEM NO. 350722 / BI #18	CONTRACTOR / FOREMAN John Tuininga	ENGINEER/TECHNICIAN ABS	PAGE 1 of 1

COMPACTION TEST DATA

			NUCLEAR GAUGE TEST RESULTS			PROCTOR DATA			COMPACTION		
TEST NO.	TEST DEPTH Feet	ROD DEPTH[1] Inches	WET DENSITY Pcf	DRY DENSITY pcf	MOISTURE %	MAXIMUM DRY DENSITY pcf	OPTIMUM MOISTURE CONTENT %	LAB ID	%	MEETS SPECS[2]	TESTED MATERIAL, TEST DESCRIPTION AND LOCATION
1	-8.5	12	143.4	133.7	7.3	136.5	7.2	S22-0933	98.0	S	Structural Roadway Fill NE 99th Street, Approximate STA 31+00 10' North of Center Line
2	-8.5	12	146.7	137.0	6.4	136.5	7.2	S22-0933	100+	S	Structural Roadway Fill NE 99th Street, Approximate STA 30+00 10' North of Center Line
3	-8.5	12	139.9	131.6	5.6	136.5	7.2	S22-0933	96.4	S	Structural Roadway Fill NE 99th Street, Approximate STA 29+00 10' South of Center Line
4	-8.5	12	141.6	133.4	6.7	136.5	7.2	S22-0933	97.7	S	Structural Roadway Fill NE 99th Street, Approximate STA 28+00 10' South of Center Line
5	-9	6	139.8	131.0	7.6	136.5	7.2	S22-0933	96.0	S	Structural Roadway Fill NE 99th Street, Approximate STA 26+00 10' South of Center Line
6	-8.5	12	144.6	134.4	7.5	136.5	7.2	S22-0933	98.5	S	Structural Roadway Fill NE 99th Street, Approximate STA 25+50 10' South of Center Line
7	-9	6	148.0	138.5	5.6	136.5	7.2	S22-0933	100+	S	Structural Roadway Fill NE 99th Street, Approximate STA 24+00 5' South of Center Line
8	-8.5	12	141.7	134.2	6.8	136.5	7.2	S22-0933	98.3	S	Structural Roadway Fill NE 99th Street, Approximate STA 23+00 5' South of Center Line
9	-9	6	142.8	133.8	7.5	136.5	7.2	S22-0933	98.0	S	Structural Roadway Fill NE 99th Street, Approximate STA 22+00 15' South of Center Line

NOTES

[1]ROD DEPTH:
0 = Backscatter
2 – 12 = Direct Transmission (in inches below ground surface)

[2]MEETS SPECS:
S = satisfactory, meets compaction specifications
U = unsatisfactory, does not meet compaction specifications

Unless otherwise noted, percent compaction is based upon laboratory determination of maximum dry density for the sample noted. Tests performed per ASTM D6938 or AASHTO T310, in accordance with project specifications. Test results apply only for the location and date tested. This report may not be reproduced except in full without prior written authorization by Columbia West Engineering, Inc. Sampling conducted in accordance with QSP 7.3.1.

ADDITIONAL REMARKS

Test depth recorded as approximate depth relative to finished subgrade elevation.

TECHNICIAN/INSPECTOR:	DATE OF ISSUE: 10-04-22 ok JMA

COMPACTION SPECIFICATIONS	95% MDD AASHTO T180
TESTED MATERIALS AND SOURCES	S22-0933: 1:1 aggregate blend, onsite mixed Daybreak reject, Mountain Top screenings, sampled from grade NE 99th Street, STA 26+00
GAUGE SERIAL NO. / GAUGE MODEL	71268 / 3430
MOISTURE STANDARD / DENSITY STANDARD	654 / 2464

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NE 95th Street, Vancouver, Washington 98682
one: 360-823-2900
ww.columbiawestengineering.com

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FIELD COMPACTION REPORT

PROJECT	CLIENT	REPORT NO.	
NE 99th Street Improvements NE 94th Avenue – Vicinity of NE 117th Avenue/SR503 Clark County, Washington	Clark County Dept. of Public Works 1300 Franklin Street, 4th Floor Vancouver, WA 98666-9810	22046-101222-CT1	
		DATE: 10-12-22	
		WEATHER: Sunny, 60s°F	
CRP NO. / BID ITEM NO.: 350722 / BI #18	CONTRACTOR / FOREMAN: John Tuininga	ENGINEER/TECHNICIAN: BSP	PAGE: 1 of 1

COMPACTION TEST DATA

			NUCLEAR GAUGE TEST RESULTS			PROCTOR DATA			COMPACTION		
TEST NO.	TEST DEPTH Feet	ROD DEPTH[1] Inches	WET DENSITY Pcf	DRY DENSITY pcf	MOISTURE %	MAXIMUM DRY DENSITY pcf	OPTIMUM MOISTURE CONTENT %	LAB ID	%	MEETS SPECS[2]	TESTED MATERIAL, TEST DESCRIPTION AND LOCATION
1	-4	12	136.9	129.7	5.5	136.5	7.2	S22-0933	95.0	S	Structural Roadway Fill NE 99th Street, Approximate STA 31+00 10' South of Center Line
2	-4	12	142.0	134.1	5.9	136.5	7.2	S22-0933	98.2	S	Structural Roadway Fill NE 99th Street, Approximate STA 29+00 20' South of Center Line
3	-4	12	146.2	135.9	7.5	136.5	7.2	S22-0933	99.6	S	Structural Roadway Fill NE 99th Street, Approximate STA 27+00 Center Line
4	-4	12	143.7	134.5	6.9	136.5	7.2	S22-0933	98.5	S	Structural Roadway Fill NE 99th Street, Approximate STA 26+00 20' South of Center Line
5	-4	12	147.4	136.9	7.7	136.5	7.2	S22-0933	100+	S	Structural Roadway Fill NE 99th Street, Approximate STA 24+00 20' South of Center Line

NOTES

[1]ROD DEPTH:
0 = Backscatter
2 – 12 = Direct Transmission (in inches below ground surface)

[2]MEETS SPECS:
S = satisfactory, meets compaction specifications
U = unsatisfactory, does not meet compaction specifications

Unless otherwise noted, percent compaction is based upon laboratory determination of maximum dry density for the sample noted. Tests performed per ASTM D6938 or AASHTO T310, in accordance with project specifications. Test results apply only for the location and date tested. This report may not be reproduced except in full without prior written authorization by Columbia West Engineering, Inc. Sampling conducted in accordance with QSP 7.3.1.

ADDITIONAL REMARKS

Test depth recorded as approximate depth relative to finished subgrade elevation.

TECHNICIAN/INSPECTOR:	DATE OF ISSUE:
Brandon Pabst	10-17-22

COMPACTION SPECIFICATIONS	
95% MDD AASHTO T180	
TESTED MATERIALS AND SOURCES	
S22-0933: 1:1 aggregate blend, onsite mixed Daybreak reject, Mountain Top screenings, sampled from grade	
GAUGE SERIAL NO. 33767	GAUGE MODEL 3440
MOISTURE STANDARD 662	DENSITY STANDARD 1867

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ıcouver, Washington 98682

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FIELD COMPACTION REPORT

JECT	CLIENT	REPORT NO.	
NE 99th Street Improvements NE 94th Avenue – Vicinity of NE 117th Avenue/SR503 Clark County, Washington	Clark County Dept. of Public Works 1300 Franklin Street, 4th Floor Vancouver, WA 98666-9810	22046-101722-CT1	
		DATE: 10-17-22	
		WEATHER: Overcast, 50s°F	
CRP NO. / BID ITEM NO.: 350722 / BI #18	CONTRACTOR / FOREMAN: John Tuininga	ENGINEER/TECHNICIAN: BJO	PAGE: 1 of 1

COMPACTION TEST DATA

			NUCLEAR GAUGE TEST RESULTS			PROCTOR DATA			COMPACTION		
TEST NO.	TEST DEPTH Feet	ROD DEPTH[1] Inches	WET DENSITY Pcf	DRY DENSITY pcf	MOISTURE %	MAXIMUM DRY DENSITY pcf	OPTIMUM MOISTURE CONTENT %	LAB ID	%	MEETS SPECS[2]	TESTED MATERIAL, TEST DESCRIPTION AND LOCATION
1	-3.5	12	144.2	135.7	6.2	136.5	7.2	S22-0933	99.4	S	Structural Roadway Fill NE 99th Street, Approximate STA 23+00 20' South of Center Line
2	-3.5	12	147.1	138.1	6.5	136.5	7.2	S22-0933	100+	S	Structural Roadway Fill NE 99th Street, Approximate STA 24+00 20' North of Center Line
3	-4	12	141.5	134.3	5.4	136.5	7.2	S22-0933	98.4	S	Structural Roadway Fill NE 99th Street, Approximate STA 26+00 20' South of Center Line
4	-4	12	145.9	136.9	6.5	136.5	7.2	S22-0933	100+	S	Structural Roadway Fill NE 99th Street, Approximate STA 28+00 10' South of Center Line

NOTES

[1]ROD DEPTH:
0 = Backscatter
2 – 12 = Direct Transmission (in inches below ground surface)

[2]MEETS SPECS:
S = satisfactory, meets compaction specifications
U = unsatisfactory, does not meet compaction specifications

Unless otherwise noted, percent compaction is based upon laboratory determination of maximum dry density for the sample noted. Tests performed per ASTM D6938 or AASHTO T310, in accordance with project specifications. Test results apply only for the location and date tested. This report may not be reproduced except in full without prior written authorization by Columbia West Engineering, Inc. Sampling conducted in accordance with QSP 7.3.1.

ADDITIONAL REMARKS

Test depth recorded as approximate depth relative to finished subgrade elevation.

TECHNICIAN/INSPECTOR:	DATE OF ISSUE:
	10-20-22

COMPACTION SPECIFICATIONS: 95% MDD AASHTO T180

TESTED MATERIALS AND SOURCES: S22-0933: 1:1 aggregate blend, onsite mixed Daybreak reject, Mountain Top screenings, sampled from grade

GAUGE SERIAL NO.	GAUGE MODEL
31447	3430
MOISTURE STANDARD	DENSITY STANDARD
592	.1768

COLUMBIA WEST ENGINEERING, INC. authorized signature

B-2

Geomembrane Destructive Seam Test Results

Date: 2023-06-20

Mail To:
Jack Faille
SCS Engineers

, ,

Bill To:

SCS Engineers

e-mail:
jfaille@scsengineers.com jrichards@scsengineers.com ghelland@scsengineers.com

Dear Mr. Faille,

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

Project:	**Leichner LF NE 99th Street**
TRI Job Reference Number:	**78308**
Material(s) Tested:	(4) Heat Fusion Weld Seam(s)
Test(s) Requested:	SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

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

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

Nicole Saucedo

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

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: SCS Engineers
Project: Leichner LF NE 99th Street

Material: 60 mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 78308

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-1 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	118	116	114	112	118	**116**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	136	124	111	134	139	**129**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	147	151	151	150	154	**151**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-2 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	127	130	118	128	129	**126**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	116	116	120	115	118	**117**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	159	153	154	156	148	**154**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: SCS Engineers
Project: Leichner LF NE 99th Street

Material: 60 mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 78308

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-3 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	114	120	122	121	121	**120**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	105	114	113	107	107	**109**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	151	156	152	154	146	**152**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-4 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	136	126	131	137	143	**135**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	119	113	136	142	153	**133**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	149	154	148	147	159	**151**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

Date: 2023-06-29

Mail To:
Jack Faille
SCS Engineers

Bill To:

SCS Engineers

, ,

e-mail:
jfaille@scsengineers.com jrichards@scsengineers.com ghelland@scsengineers.com

Dear Mr. Faille,

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

Project:	**Leichner LF NE 99th Street**
TRI Job Reference Number:	**78399**
Material(s) Tested:	(7) Heat Fusion Weld Seam(s)
Test(s) Requested:	SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

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

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

Jennifer Tenney
Project Manager
Geosynthetic Services Division
http://www.geosyntheticstestinc.com

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: SCS Engineers
Project: Leichner LF NE 99th Street

Material: 60 mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 78399

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-5 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	114	118	114	113	113	**114**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	114	128	125	123	134	**125**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	156	154	153	147	155	**153**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-6 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	145	147	135	105	111	**129**
Peel Incursion (%)	<5	<5	<5	35	85	
Peel Locus Of Failure Code	SE	SE	SE	AD-BRK	AD-BRK	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	128	130	77	55	68	**92**
Peel Incursion (%)	30	<5	100	100	100	
Peel Locus Of Failure Code	AD-BRK	SE	AD	AD	AD	
Peel NSF Failure Code	FTB	FTB	NON-FTB	NON-FTB	NON-FTB	
Shear						**Shear**
Shear Strength (ppi)	155	157	142	153	155	**152**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: SCS Engineers
Project: Leichner LF NE 99th Street

Material: 60 mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 78399

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-7 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	129	133	135	131	129	**131**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	135	136	144	131	145	**138**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	146	151	152	155	152	**151**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-8 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	112	151	137	148	113	**132**
Peel Incursion (%)	35	25	<5	<5	85	
Peel Locus Of Failure Code	AD-BRK	AD-BRK	SE	SE	AD-BRK	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	133	125	122	117	126	**125**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	151	145	150	149	153	**150**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: SCS Engineers
Project: Leichner LF NE 99th Street

Material: 60 mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 78399

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-9 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	97	103	114	108	110	**106**
Peel Incursion (%)	25	<5	<5	<5	30	
Peel Locus Of Failure Code	AD-BRK	SE	SE	SE	AD-BRK	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	117	123	125	113	125	**121**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	155	151	152	155	152	**153**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-10 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	59	71	61	45	46	**56**
Peel Incursion (%)	100	100	100	100	100	
Peel Locus Of Failure Code	AD	AD	AD	AD	AD	
Peel NSF Failure Code	NON-FTB	NON-FTB	NON-FTB	NON-FTB	NON-FTB	
Side: B						**Peel B**
Peel Strength (ppi)	133	145	142	144	134	**140**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	148	153	152	152	156	**152**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: SCS Engineers
Project: Leichner LF NE 99th Street

Material: 60 mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 78399

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DS-11 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	141	144	140	146	153	**145**
Peel Incursion (%)	<5	100	100	<5	<5	
Peel Locus Of Failure Code	SE	AD	AD	SE	SE	
Peel NSF Failure Code	FTB	NON-FTB	NON-FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	143	154	139	132	153	**144**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	154	151	155	166	159	**157**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

Appendix C

Geomembrane Installation Documentation

C-1 Geomembrane Panel Logs

C-2 Geomembrane Submittals

C-1

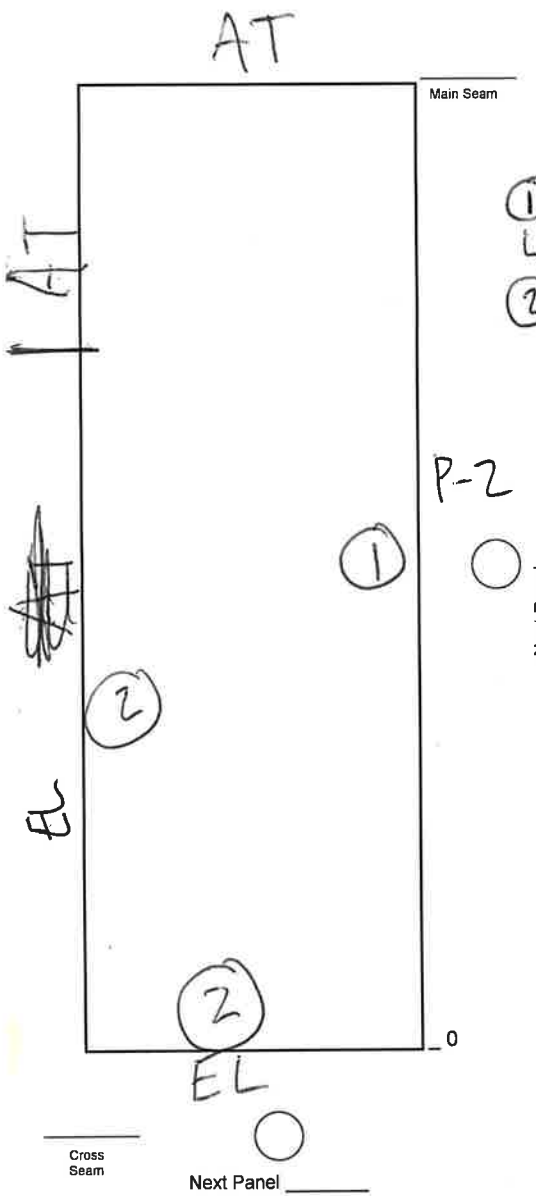
Geomembrane Panel Logs

GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N↑	P-1	0101-206373	6-15-23	
	Smooth / Texture	Lot No. PPE821320	Deploy Time 09:00	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-15-23	9:23			JH-13	13	860T S=7
2	6-15	1001			JH	13	860 7

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-15	20'	Air	GM	P
6-15	72'	Air	GM	P
6-16		〃	〃	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE _____ DATE 6-15-23

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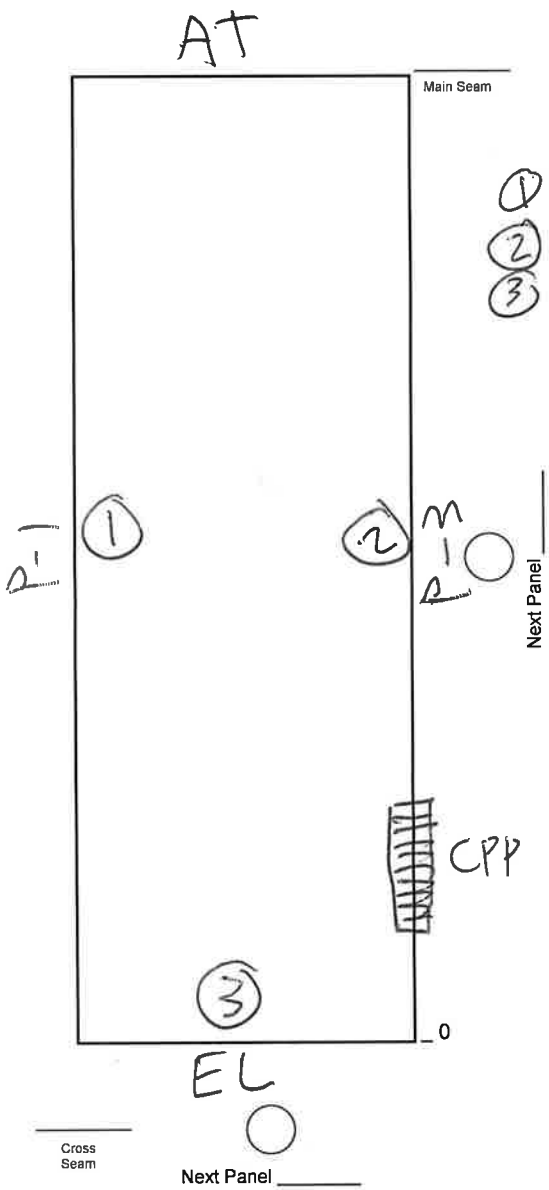
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-2	0101-206373	6-15-23	
	Smooth / Texture	Lot No. PPE821320	Deploy Time 09:10	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-15-23	9:23			JH	13	860 T S=7
2	6-15-23	9:33			JH	13	T=860 S=7
3	6-15	1001			JH	"	"

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-15	20' & 72'	Air	GM	P
6-15	59' & 34'	Air	GM	P
6-16		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE M. J. DATE 6-15-23

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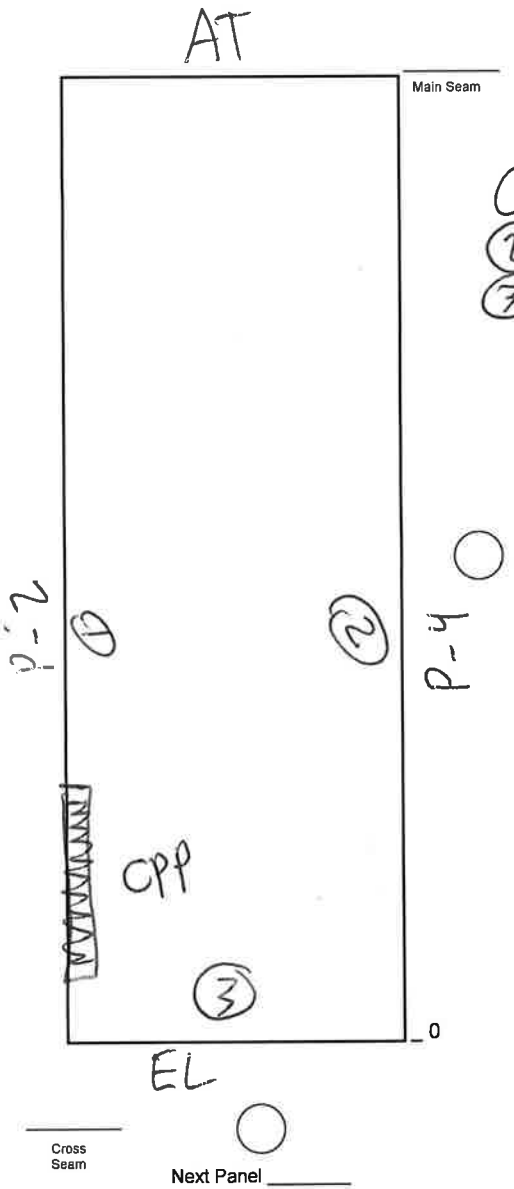
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No. P-3		Roll No. 11 6373	Deploy Date 6-15-23	Panel Location
N ↑	Smooth	Texture	Lot No. 11 1320	Deploy Time 09:20	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-15-23	9:33			JH	13	T=860 S=7
2	6-15-23	9:46			JH	13	T=860 S=7
3	6-15	pm			"	"	"

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-15	59'+ 34'	Air	GM	P
6-15	13'+ 91'	Air	GM	P
6-16		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE Matt Dr DATE 6-15-23

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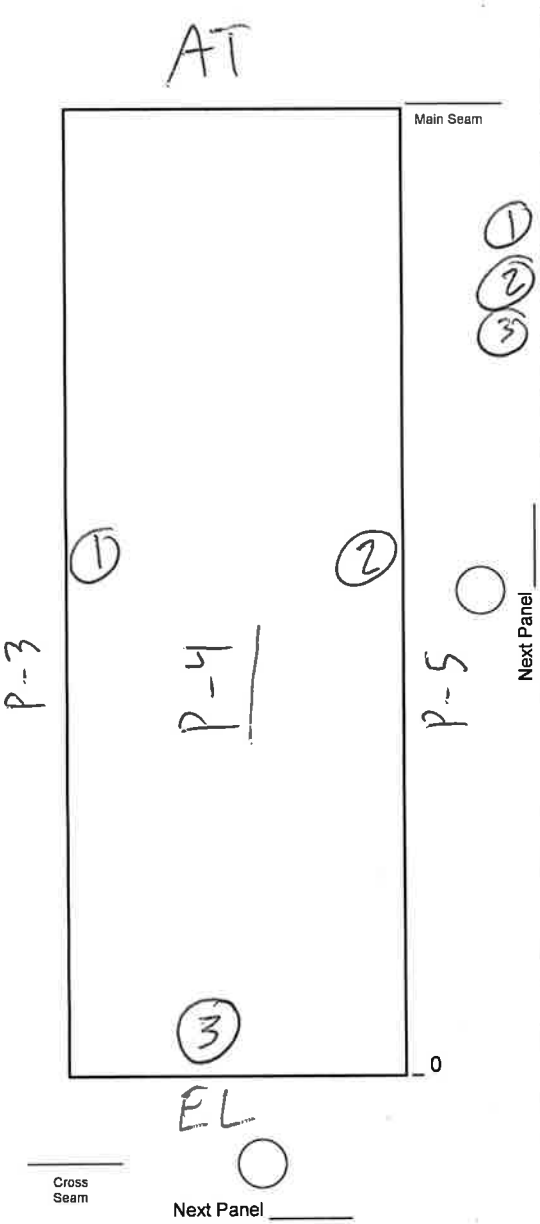
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-4	" 6373	6-15-23	
	Smooth / Texture	Lot No. " 1320	Deploy Time 09:30	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-15-23	9:46			JH	13	T=860 S=7
2	6-15-23	10:01			JH	13	T=860 S=7
3	6-15	10:01			"	"	"

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-15	13+91'	Air	GM	P
6-15	101	Air	GM	P
6-16		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE M. Jen DATE 6-15-23

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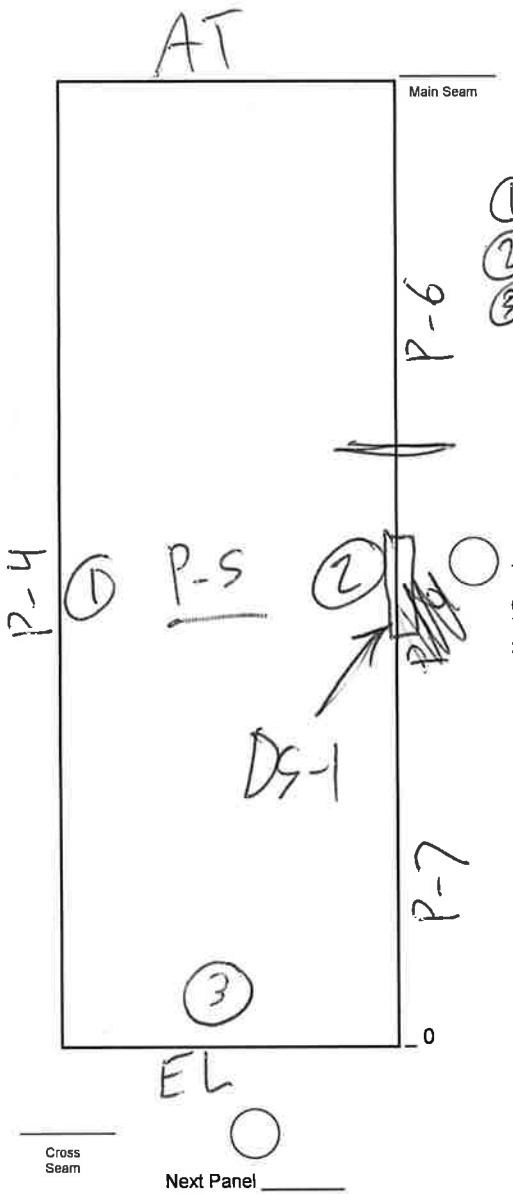
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
NA	P-5	6373	6-15-23	
	Smooth / Texture	Lot No. 1320	Deploy Time 09:40	

Seam Welding / **Seam Leak Testing**

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
1	6-15	10:01			JH	13	T=860 S=7	6-15	101'	Air	DM	P
2	6-15	10:21			JH	13	T=860 S=7	6-15	67' & 30'	Air	DM	P
3	6-15	10:01			"	"	"	6-16		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding / **Repair Leak Testing**

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings	Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail
DS-1	6-16-23	P

Comments

455' of ~~Seam~~ seam up to this. No TI

INSPECTOR'S SIGNATURE M. J. DATE 6-16-23

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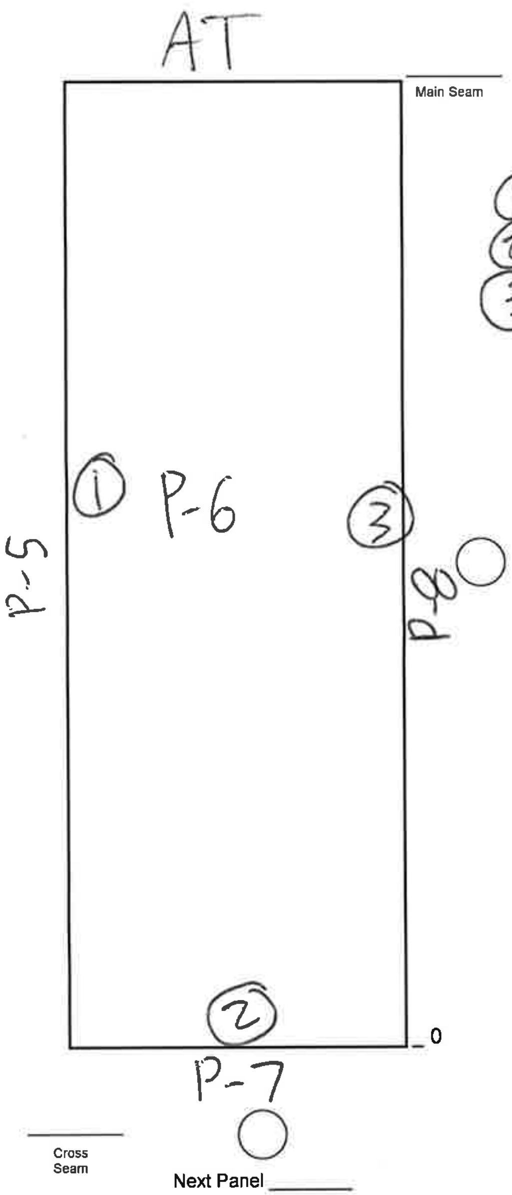
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No. P-6		Roll No. " 6373	Deploy Date 6-15-23	Panel Location
N ↑	Smooth (circled)	Texture	Lot No. " 1320	Deploy Time 10:00	

Seam Welding / **Seam Leak Testing**

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
①	6-15	10:21			JH	13	T=860 S=7	6-15	30'	Air	GM	P
②	6-15	10:15			JH	13	T=860 S=7	6-15	21'	Air	GM	P
③	6-15	10:36			JH	13	T=860 S=7	6-15	30'	Air	GM	P

*Indicate Seam: Main = M or Cross = X

Repair Welding / **Repair Leak Testing**

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings	Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE [signature]

DATE 6-15-23

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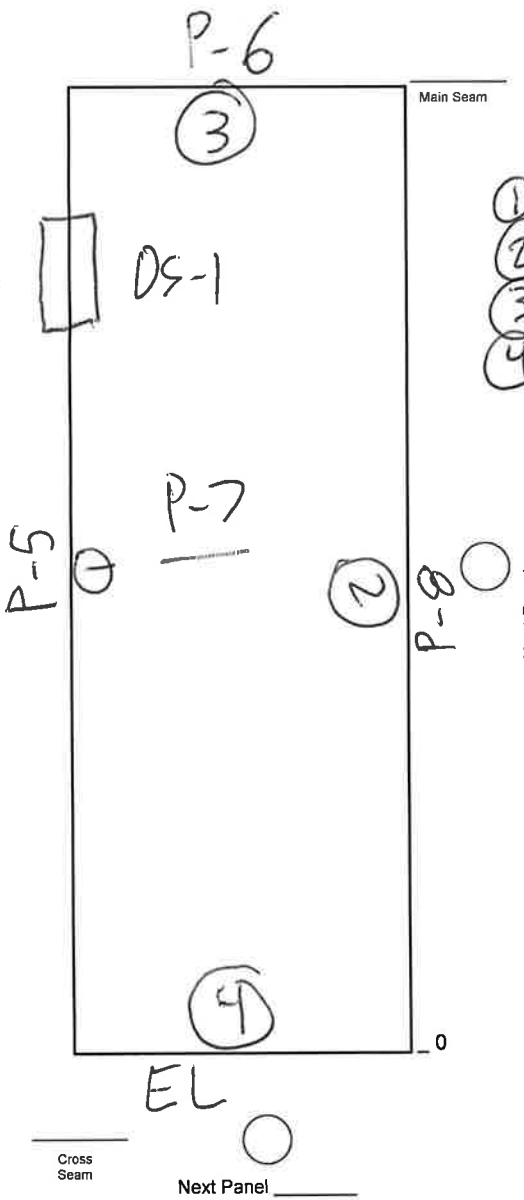
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-7	6366	6-15-23	
	Smooth / Texture	Lot No.	Deploy Time 10:00	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-15	10:21			JH	13	T=860 S=7
2	6-15	10:36			JH	13	T=860 S=7
3	6-15	10:15			JH	13	T=860 S=7
4	6-16	1200			"	"	"

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-15	67'	Air	GM	P
6-15	67'	Air	GM	P
6-15	21'	Air	GM	P
6-16		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail
DS-1	6-16-23	P

Comments

INSPECTOR'S SIGNATURE Jon T. Hu DATE 6-16-23

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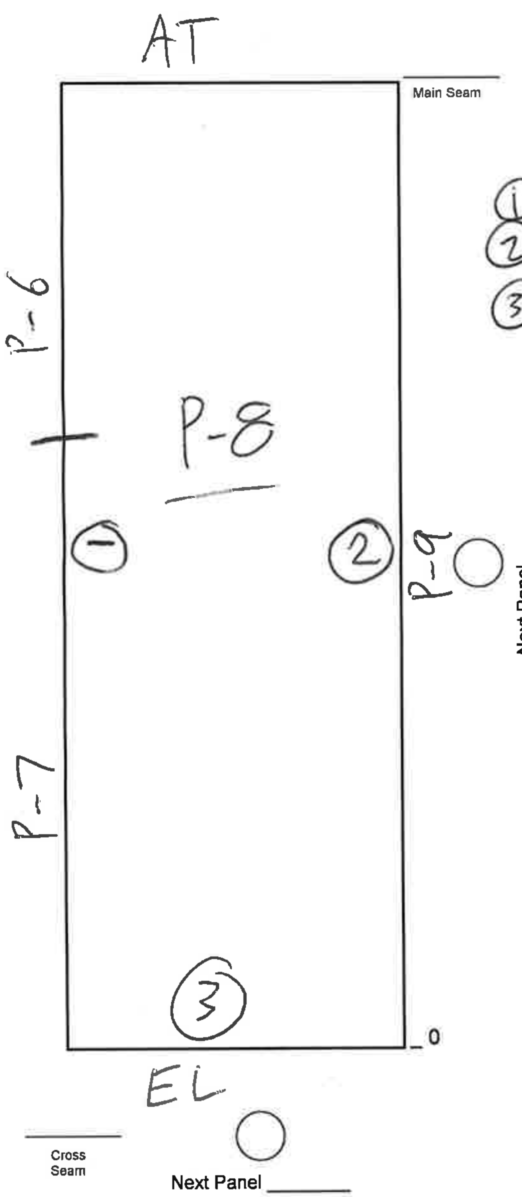
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.		Roll No.	Deploy Date	Panel Location
N ↑	P-8		6366	6-15-23	
	Smooth (circled)	Texture	Lot No.	Deploy Time 10:30	

Seam Welding / **Seam Leak Testing**

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
1	6-15	10:36			JH	13	T=860 S=7	6-15	30'+67'	Air	GM	P
2	6-15	10:48			JH	13	T=860 S=7	6-15	10'+83'	Air	GM	P
3	6-16	1200			"	"	"	6-16		"	"	P

*Indicate Seam: Main = M or Cross = X

Next Panel

Repair Welding / **Repair Leak Testing**

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings	Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE [signature]

DATE 6-16-23

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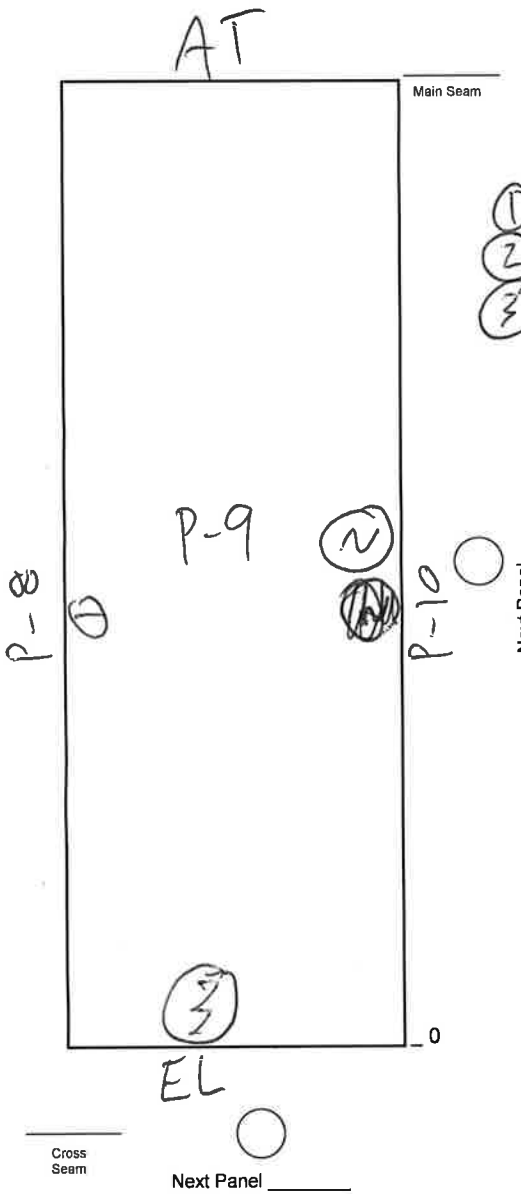
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-9	6366	6-15-23	
	Smooth / Texture	Lot No.	Deploy Time 10:40	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No. 13	Mach Settings
1	6-15	10:48			JH	~~T=860 S=7~~	T=860 S=7
2	6-15	11:00			JH	13	T=860 S=7
3	6-16	1200			"	"	"

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-15	10+83'	Air	GM	P
6-15	96'	Air	GM	P
6-16		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE Am T. Jr DATE 6-16-23

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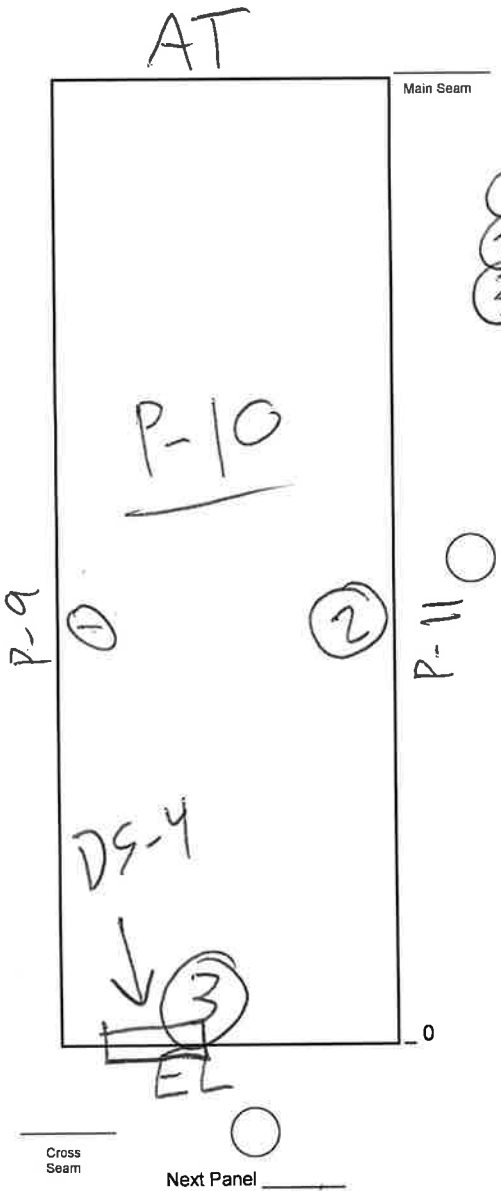
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-10	6366	6-15-23	
	Smooth / Texture	Lot No.	Deploy Time 10:50	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-15	11:00			JH	13	T=860 S=7
2	6-15	11:12			JH	13	T=860 S=7
3	6-16	1200			"	"	"

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-15	96'	Air	GM	P
6-15	96'	Air	GM	P
6-16		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail
DS-4	6-16	P

Comments

635' DS-3 → DS-4 (Tie-in)
Σ = 1443 + 635 = 2078'

INSPECTOR'S SIGNATURE _____ DATE 6-16-23

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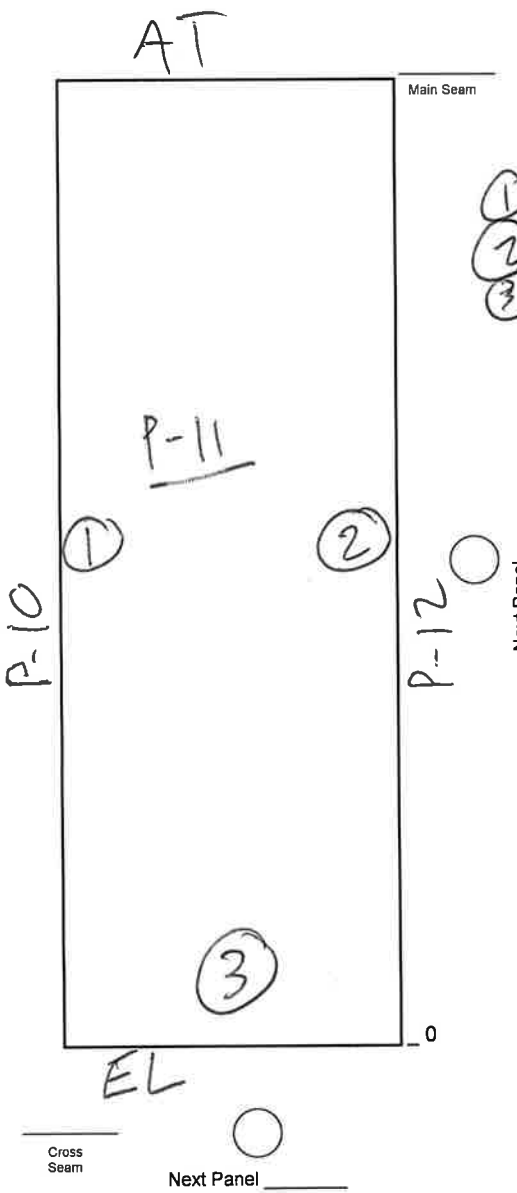
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-11	6366	6-15-23	
	Smooth / Texture	Lot No.	Deploy Time 11:05	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-15	11:12			JH	13	T=860 S=7
2	6-15	11:24			JH	13	T=860 S=7
3	6-16	1200			"	"	"

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-15	96'	Air	GM	P
6-15	75'	Air	GM	P
6-16		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE M. J. DATE 6-16-23

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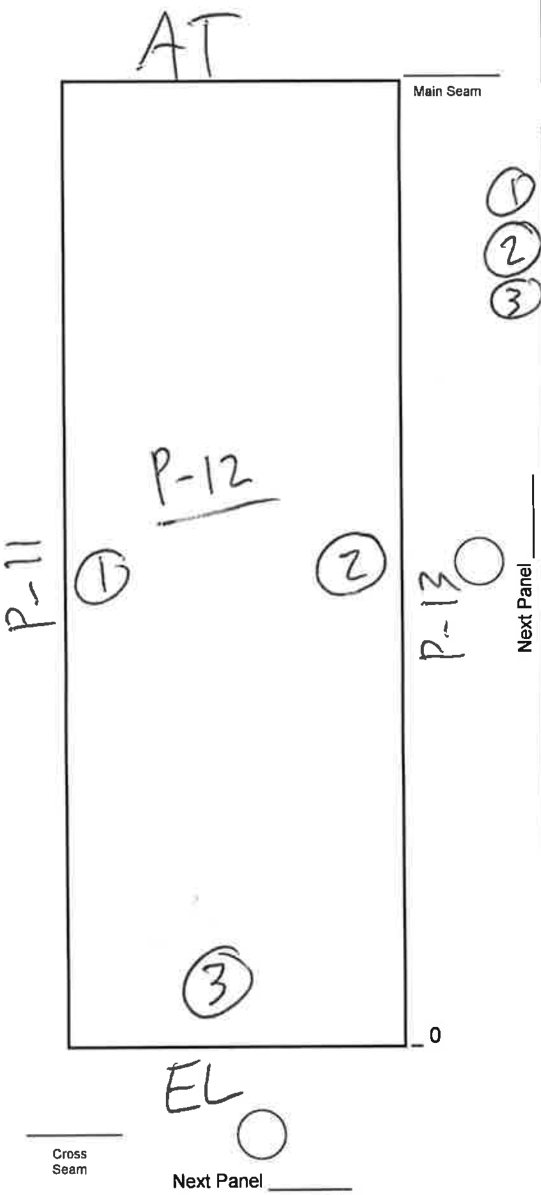
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.		Roll No.	Deploy Date	Panel Location
N ↑	P-12		6366	6-15-23	
	Smooth (circled)	Texture	Lot No.	Deploy Time 11:10	

Seam Welding / **Seam Leak Testing**

Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
① 6-15	11:24			JH	13	T=860 S=7	6-15	75'	Air	GM	P
② 6-15	11:45			JH	13	T=860 S=7	6-15	54'	Air	GM	P
③ 6-16	12:00			"	"	"	6-16		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding / **Repair Leak Testing**

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings	Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE [signature] DATE 6-16-23

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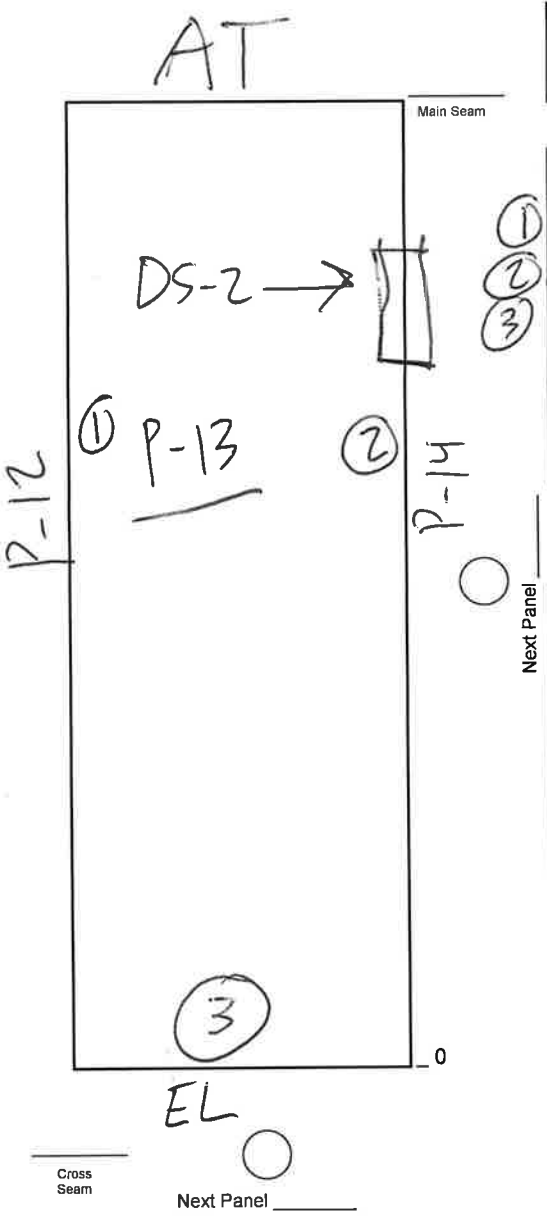
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N↑	P-13	0101-206372	6-15-23	
	Smooth / Texture	Lot No. PPE~~D13~~82320	Deploy Time 11:40	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
①	6-15	11:45			JH	13	T=860 S=7
②	6-15	11:53			JH	13	T=860 S=7
③	6-16	1200			"	"	"

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-15	54'	Air	GM	P
6-15	54'	Air	GM	P
6-16		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail
DS-2	6-16-23	P

Comments

547' DS-1→DS-2 (+455' before DS-1)
Σ=1002'

INSPECTOR'S SIGNATURE Ann T. Jue DATE 6-16-23

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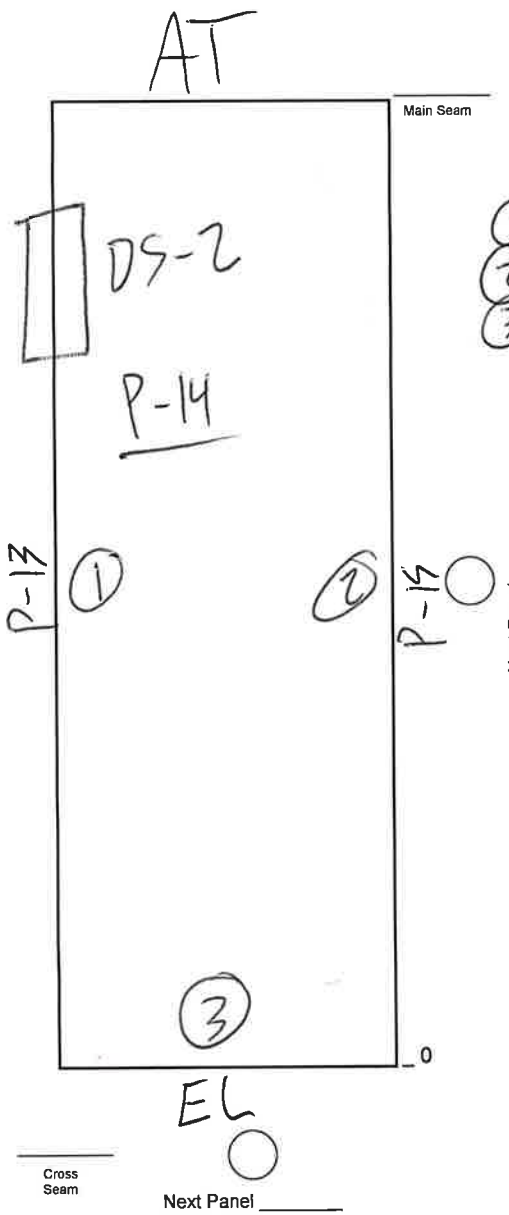
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-14	6372	6-15-23	
	Smooth / Texture	Lot No. 1320	Deploy Time 11:45	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-15	11:53			JH	13	T=860 S=7
2	6-15	12:05			JH	13	T=860 S=7
3	6-16	1200			"	"	"

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-15	54'	Air	GM	P
6-15	54'	Air	GM	P
6-16		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail
DS-2	6-16-23	P

Comments

INSPECTOR'S SIGNATURE Jon T. Hall DATE 6-16-23

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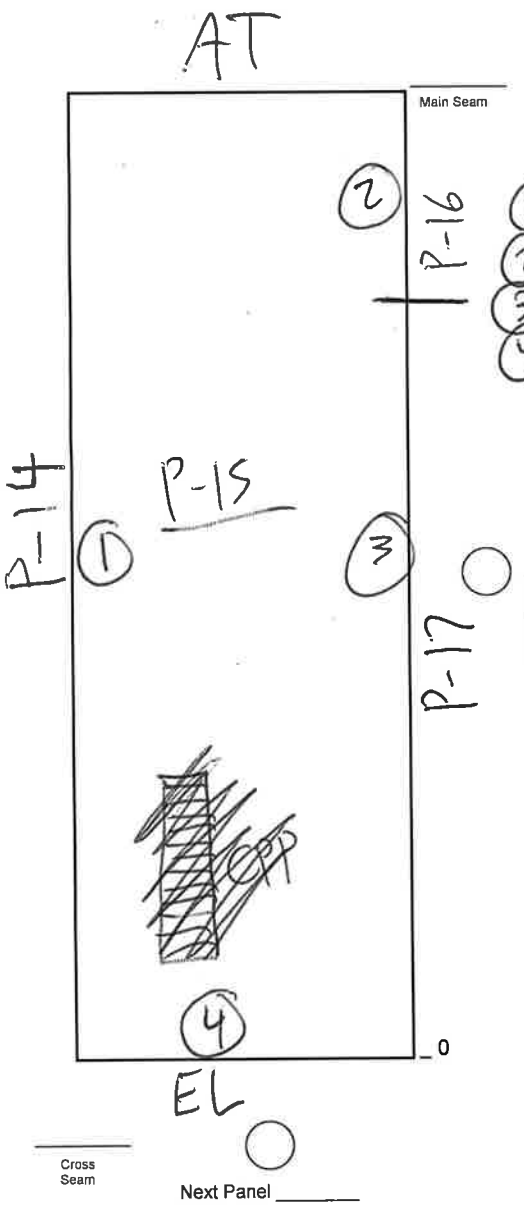
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-15	" 6372	6-15	
	Smooth / Texture	Lot No. " 1320	Deploy Time 11:55	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-15	12:05			JH	13	T=860 S=7
2	6-15	12:21			JH	13	T=860 S=7
3	6-15	12:21			JH	13	T=860 S=7
4	6-16	1200			"	"	"

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-15	54'	Air	GM	P
6-15	15'	Air	GM	P
6-15	59'	Air	GM	P
6-16		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE _____ DATE 6-16-23

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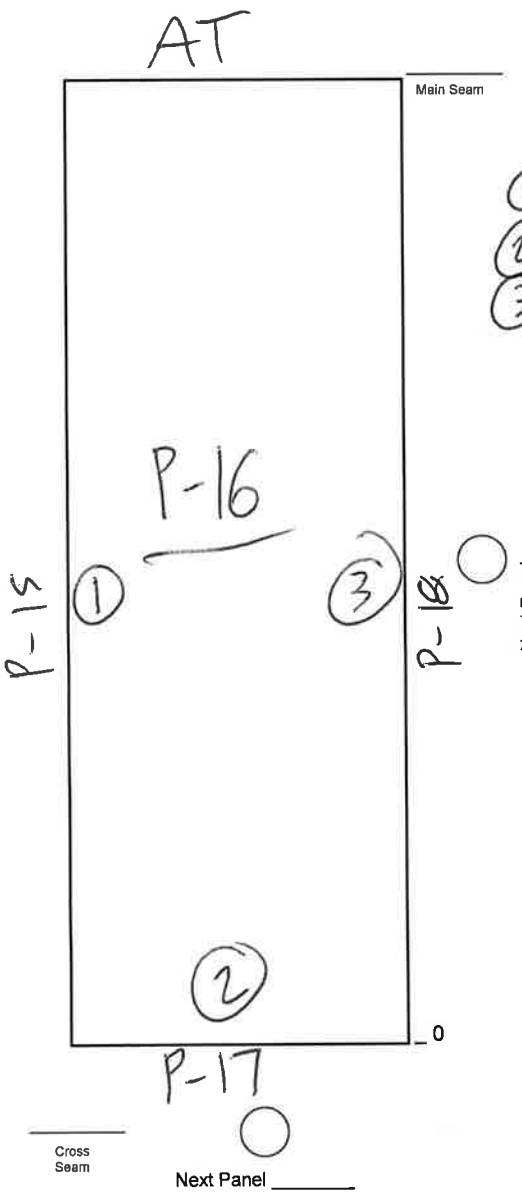
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-16	6366	6-15-23	
	Smooth / Texture	Lot No.	Deploy Time 12:00	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-15	12:24			JH	13	T=860 S=7
2	6-15	12:15			"	"	"
3	6-15	12:41			"	"	"

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-15	15'	Air	GM	P
"	22'	"	"	P
"	15'	"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE M. Jze DATE 6-15-23

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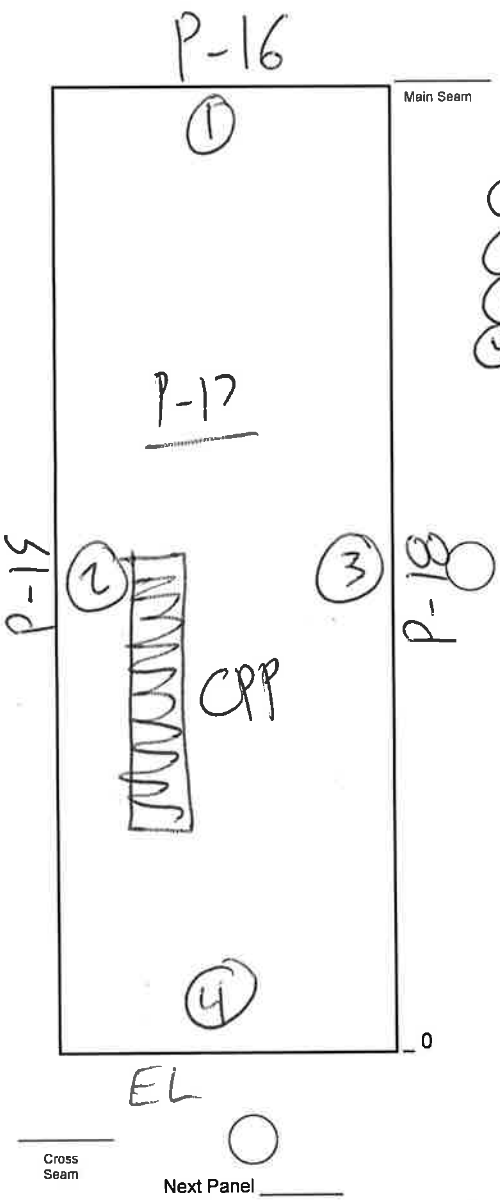
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.		Roll No.	Deploy Date	Panel Location
N ↑	P-17		6372	6-15-23	
	Smooth (circled)	Texture	Lot No.	Deploy Time 12:10	

Seam Welding / **Seam Leak Testing**

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
1	6-15	12:15			JH	13	T=860 S=7	6-15	22'	Air	GM	P
2	"	12:21			"	"	"	"	60'	"	"	P
3	"	12:41			"	"	"	"	60'	"	"	P
4	6-16	1200			"	"	"	6-16		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding / **Repair Leak Testing**

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings	Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test / **Comments**

Sample No.	Date Removed	Pass/ Fail	Comments

INSPECTOR'S SIGNATURE [signature] DATE 6-16-23

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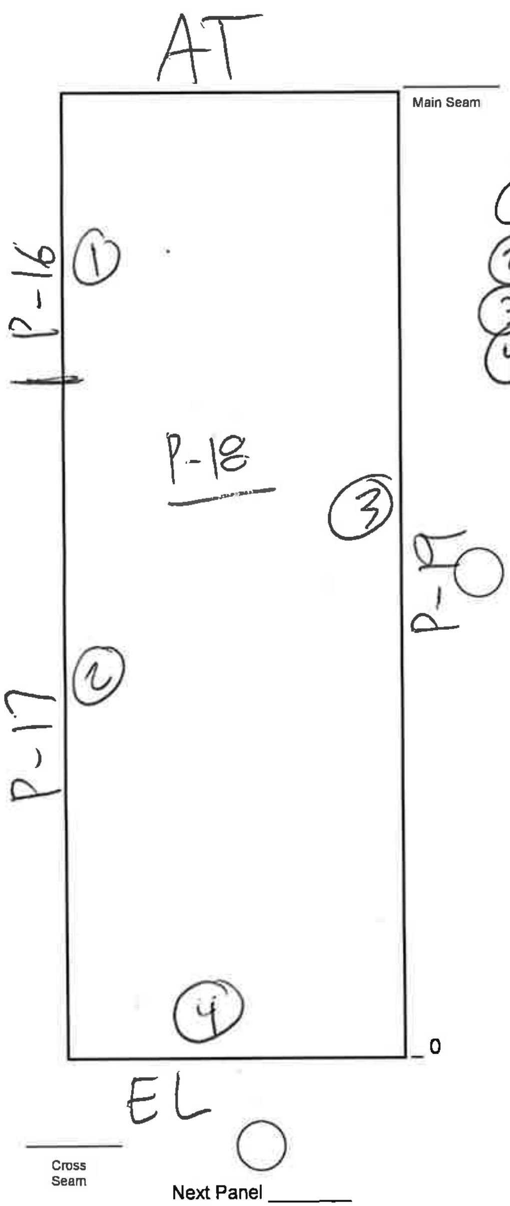
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation: N ↑	Panel No. P-18		Roll No. 6372	Deploy Date 6-15-23	Panel Location
	Smooth (circled)	Texture	Lot No.	Deploy Time 12:30	

Seam Welding / **Seam Leak Testing**

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
1	6-15	12:41			JH	13	T=860 S=7	6-15	15'	Air	GM	P
2	"	12:41			"	"	"	"	60'	"	"	P
3	"	12:51			"	"	"	"	75'	"	"	P
4	6-16	1200			"	"	"	6-16		"	"	P

*Indicate Seam: Main = M or Cross = X

Next Panel

Repair Welding / **Repair Leak Testing**

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings	Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE [signature] DATE 6-16-23

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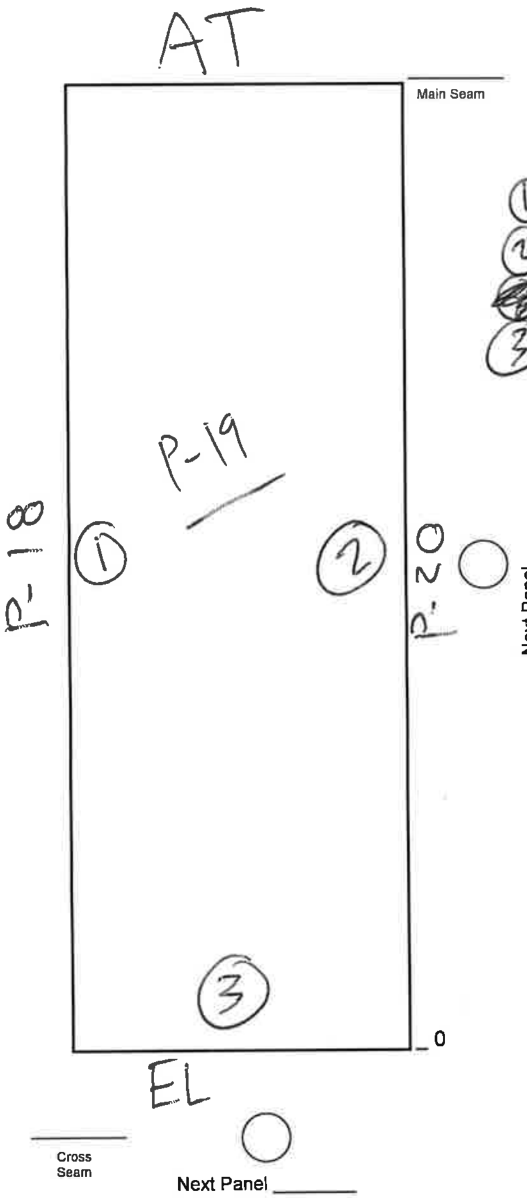
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-19	6372	6-15-23	
	(Smooth) / Texture	Lot No.	Deploy Time 12:40	

Seam Welding / **Seam Leak Testing**

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
①	6-15	1251			JH	13	T=860 S=7	6-15	75'	Air	GM	P
②	6-15	13:00			"	"	"	"	75'	"	"	P
[struck out]												
③	6-16	1200			"	"	"	6-16		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding / **Repair Leak Testing**

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings	Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE [illegible] DATE 6-16-23

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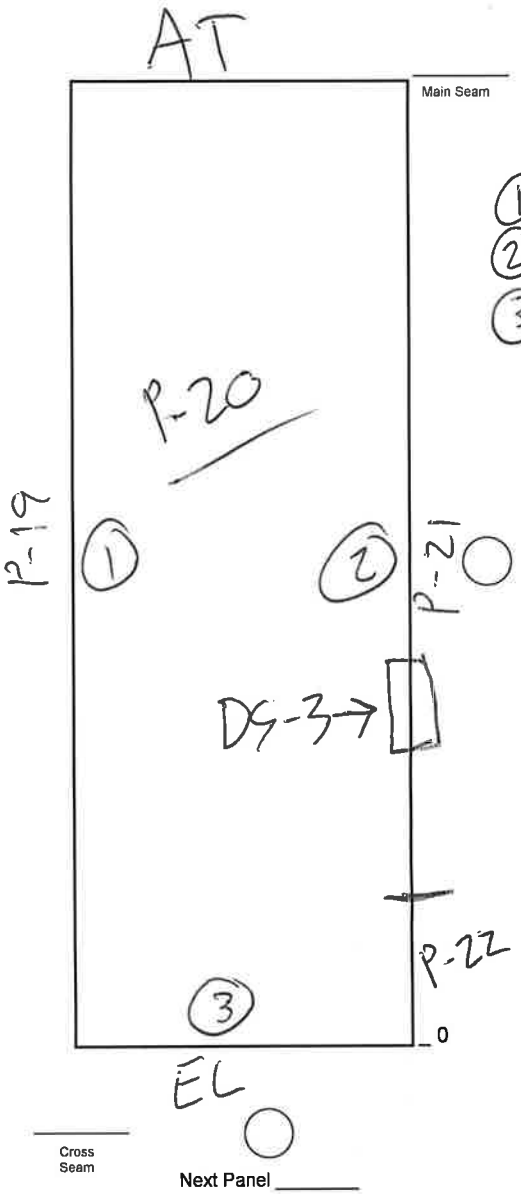
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-20 (Smooth / Texture)	6372	6-15-23	
		Lot No.	Deploy Time 12:50	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-15	13:00			JH	13	T=860 S=7
2	"	13:15			"	"	"
3	6-16	1200			"	"	"

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-15	75'	Air	GM	P
"	75'	"	"	P
6-16		"	"	P

*Indicate Seam: Main = M or Cross = X

Next Panel

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail
DS-3	6-16-23	P

Comments

441' DS-2 → DS-3 (L = 1443')

INSPECTOR'S SIGNATURE _____ DATE 6-16-23

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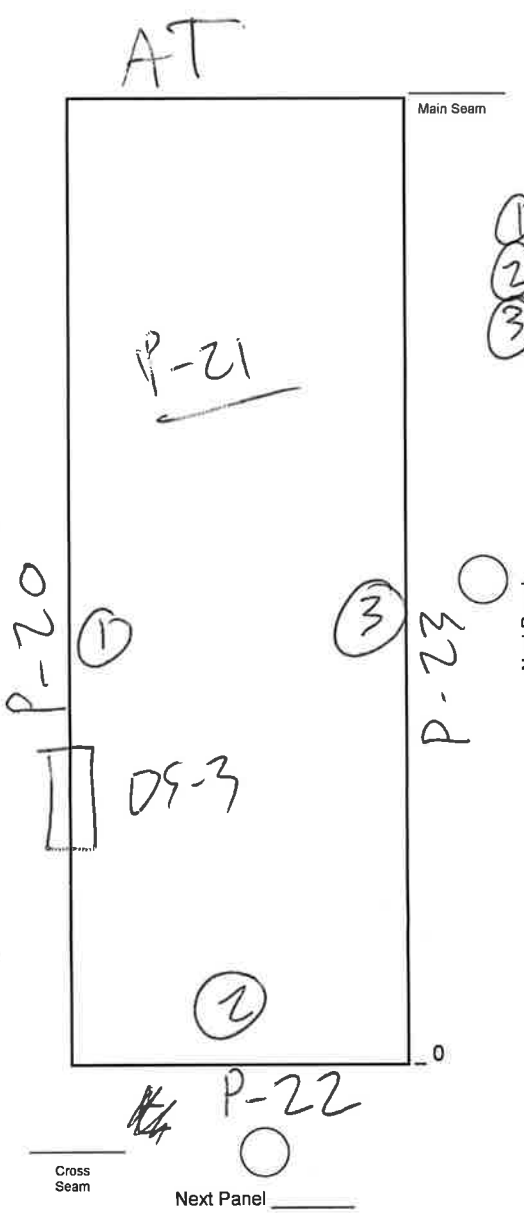
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
NT	P-21	6372	6-15-23	
	Smooth / Texture	Lot No.	Deploy Time 13:05	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-15	13:15			JH	13	T=860 S=7
2	"	13:09			"	"	"
3	"	13:25			"	"	"

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-15	75'	Air	GM	P
"	" 22'	"	"	P
"	~~"~~ 75'	"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail
DS-3	6-16-23	P

Comments

INSPECTOR'S SIGNATURE Jon T. Olson DATE 6-16-23

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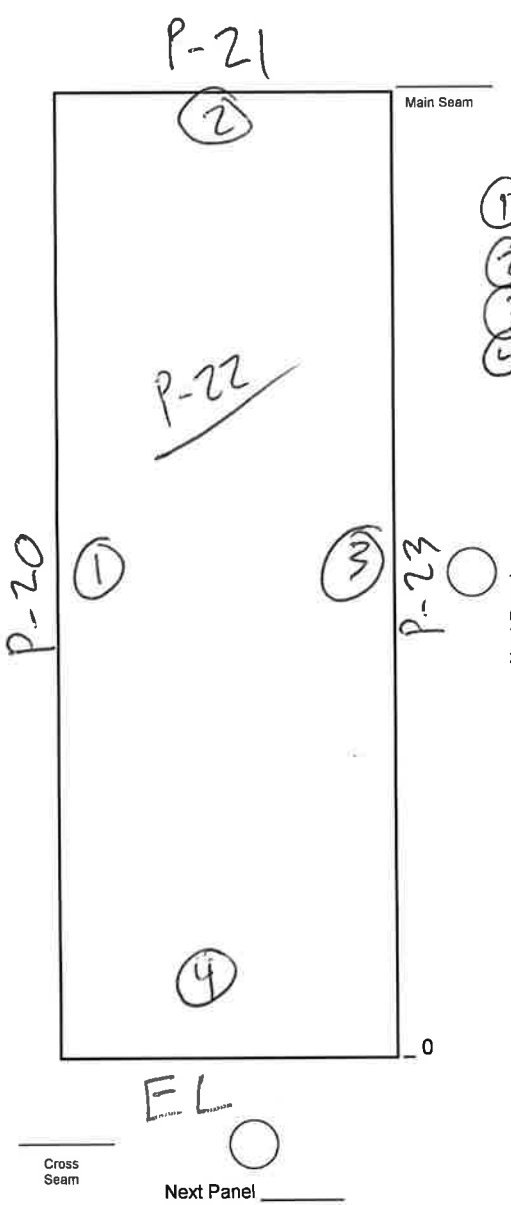
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-22	6376	6-15-23	
	Smooth / Texture	Lot No.	Deploy Time 13:05	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-15	13:15			JH	13	I=86 S=7
2	"	13:09			"	"	"
3	"	13:25			"	"	"
4	6-16	1200			JH	"	"

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-15	15'	Air	GM	P
"	22'	"	"	P
"	15'	"	"	P
6-16		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE Jon T. Hein DATE 6-16-23

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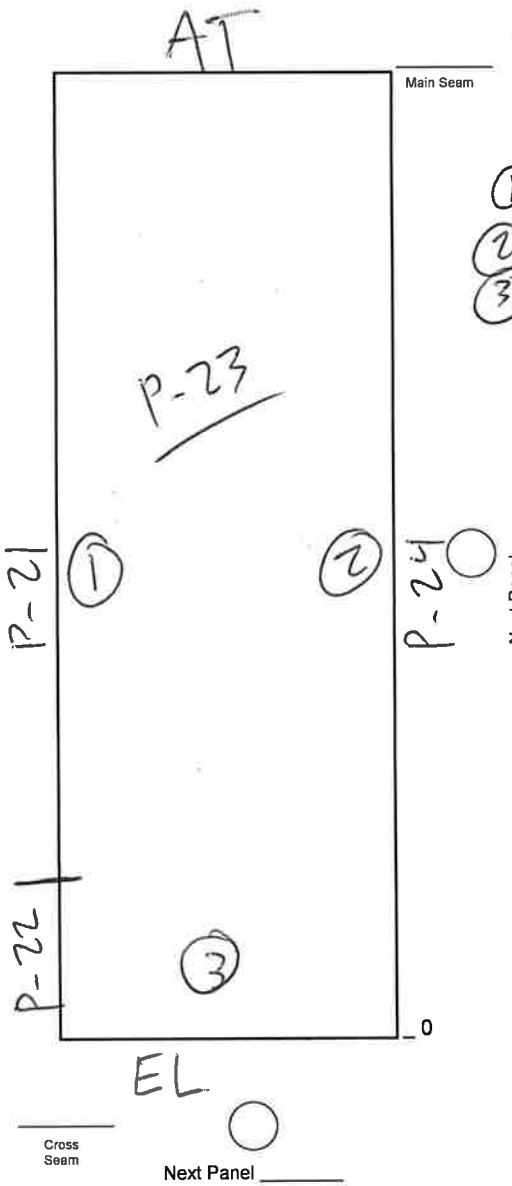
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-23	6376	6-15-23	
	Smooth / Texture	Lot No.	Deploy Time 13:20	

Seam Welding / **Seam Leak Testing**

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
1	6-15	13:25			JH	13	T=860 S=7	6-15	75'	Air	GM	P
2	"	13:34			"	"	"	"	75'	Air	GM	P
3	6-16	1200			"	"	"	6-16		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding / **Repair Leak Testing**

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings	Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE Jon T. Zinn DATE 6-16-23

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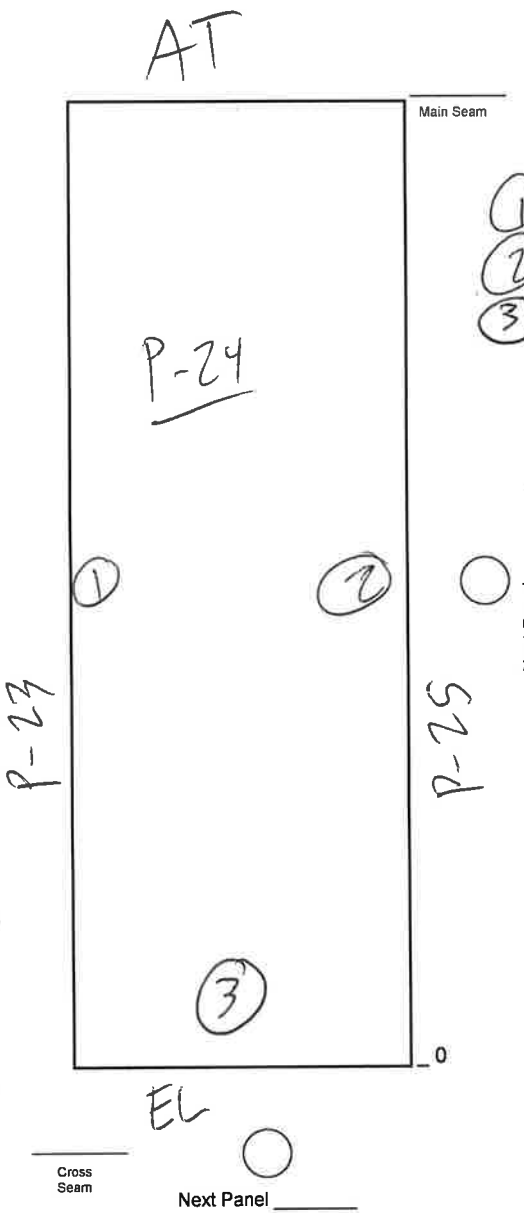
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation: N ↑	Panel No. P-24	Roll No. 6376	Deploy Date 6-15-23	Panel Location
	Smooth / Texture	Lot No.	Deploy Time 13:20	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-15	13:34			JH	13	T=860 S=7
2	6-15	13:43			"	"	"
3	6-16	1200			JH	"	"

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-15	73'	Air	BM	P
"	73'	"	"	P
6-16		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE Jm T. Zin DATE 6-16-23

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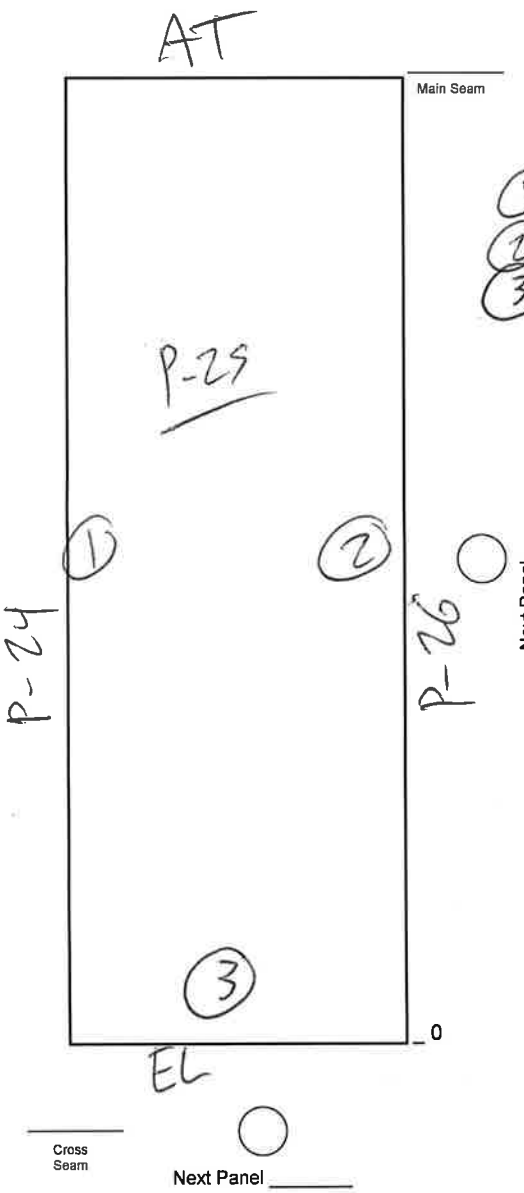
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation: N ↑	Panel No. P-25	Roll No. 6376	Deploy Date 6-15-23	Panel Location
	Smooth / Texture	Lot No.	Deploy Time 13:30	

Seam Welding / **Seam Leak Testing**

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
1	6-15	13:43			JH	13	T=860 S=7	6-15	73'	Air	GM	P
2	"	13:51			"	"	"	"	73'	Air	GM	P
3	6-16	1200			JH	13	"	6-16		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding / **Repair Leak Testing**

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings	Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE Jon T. Thun DATE 6-16-23

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GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS

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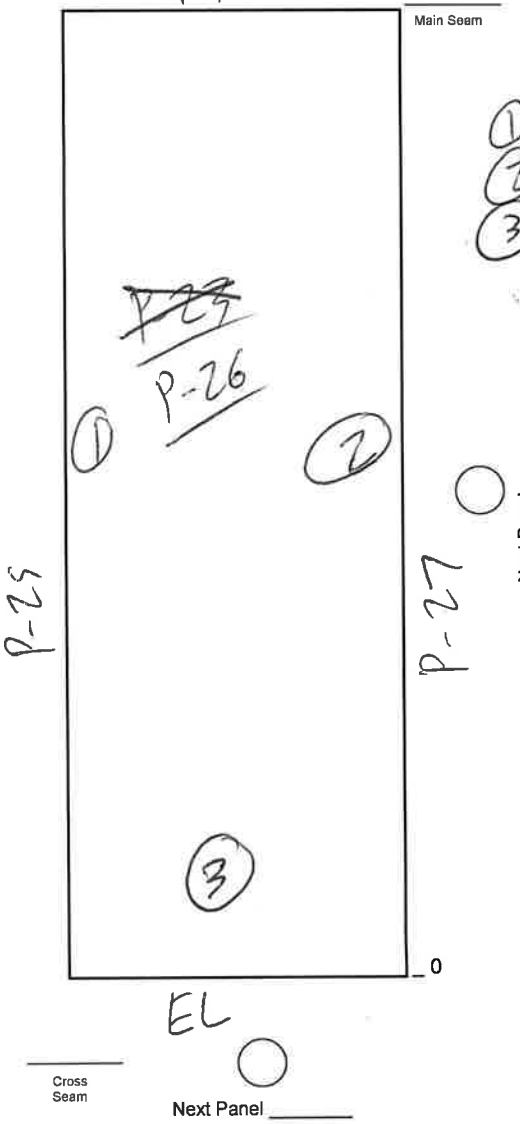

Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N↑	P-26	6376	6-15-23	
	Smooth / Texture	Lot No.	Deploy Time 13:40	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-15	13:51			JH	13	T=860 S=7
2	"	14:01			JH	13	"
3	6-16	1200			"	"	"

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-15	73'	Air	GM	P
6-15	73'	Air	GM	P
6-16		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE _____ DATE 6-16-23

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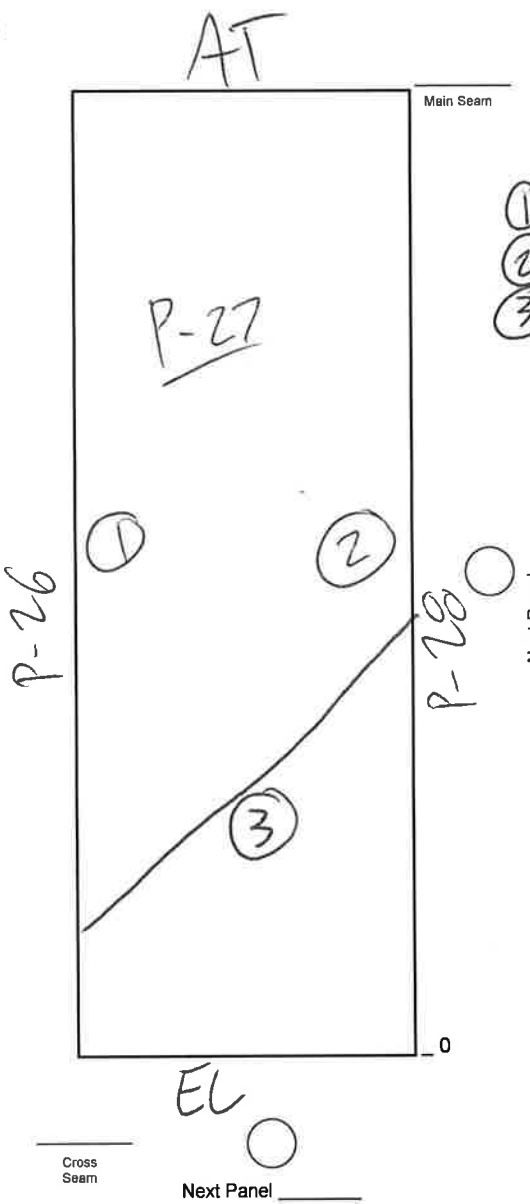
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N↑	P-27	6376	6-15-23	
	Smooth / Texture	Lot No.	Deploy Time 13:50	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-15	14:01			JH	13	T=860 S=7
2	6-15	14:08			"	"	"
3	6-16	1200			"	"	"

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-15	73'	Air	GM	P
6-15	27	"	"	P
6-16		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE Jon T. Gin DATE 6-16-23

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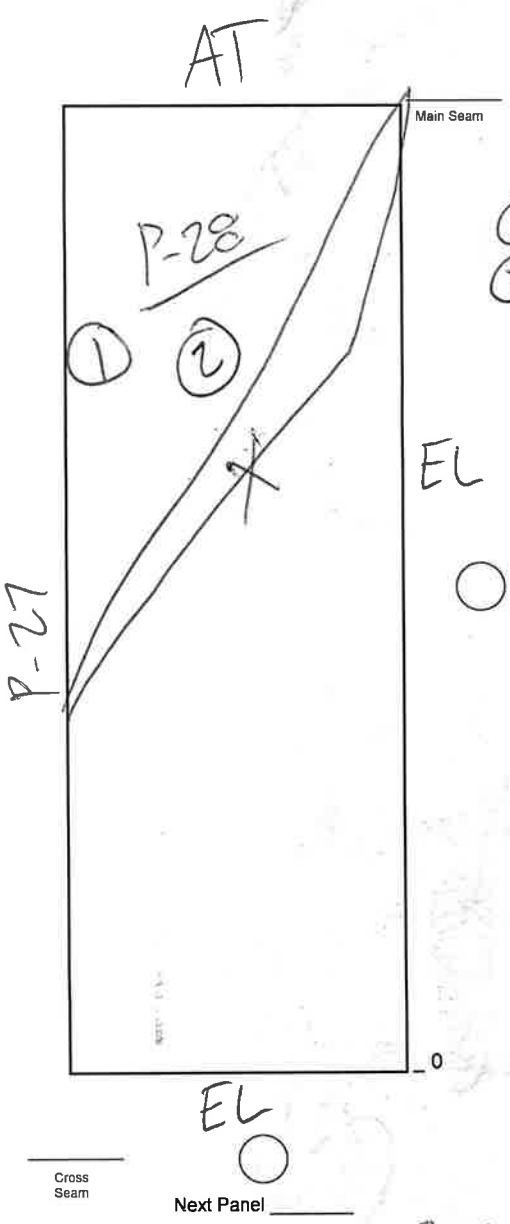
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No. P-28	Roll No. 6376	Deploy Date 6-15-23	Panel Location
N↑	Smooth / Texture	Lot No:	Deploy Time 14:00	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-15	14:08			JH	13	T=660 S=7
2	6-16	1200			JH	13	"

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-15	27'	Air	GM	P
6-16		Air	GM	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE M. Zein DATE 6-16-23

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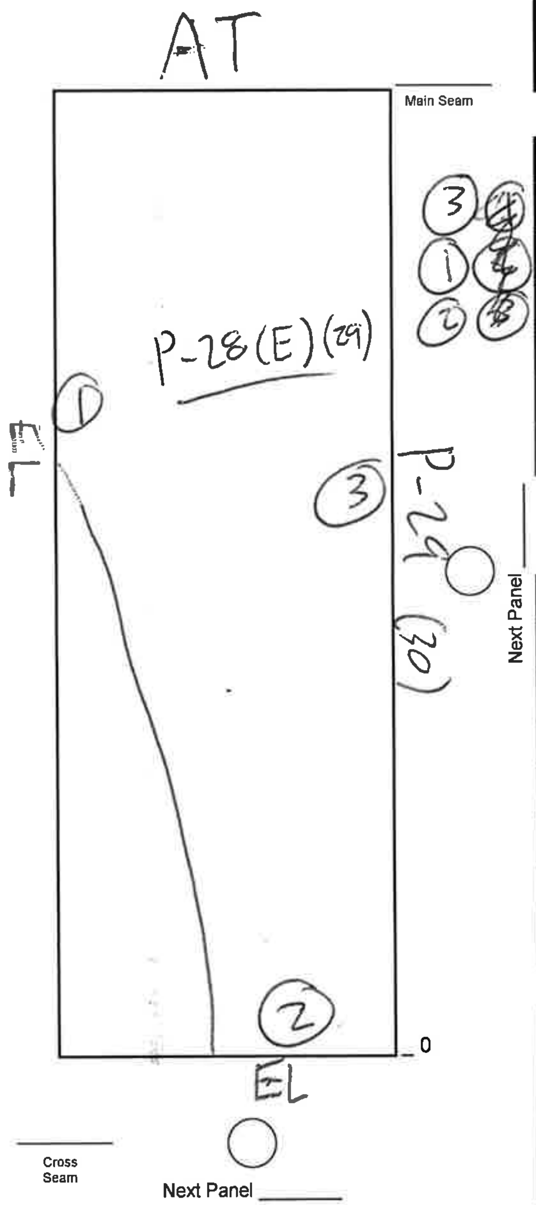
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.		Roll No.	Deploy Date	Panel Location
N ↑	P-28 (E) (29)		6376	6-22-23	
	Smooth (circled)	Texture	Lot No.	Deploy Time 0800	

Seam Welding / **Seam Leak Testing**

Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-22	0902			JH	13	860 6.5	6-22		Air	GM	P
6-23	0845			JH	13		6-23		Air	GM	P
"	"			"	"	"	"		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding / **Repair Leak Testing**

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings	Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE [signature]   DATE 6-23-23

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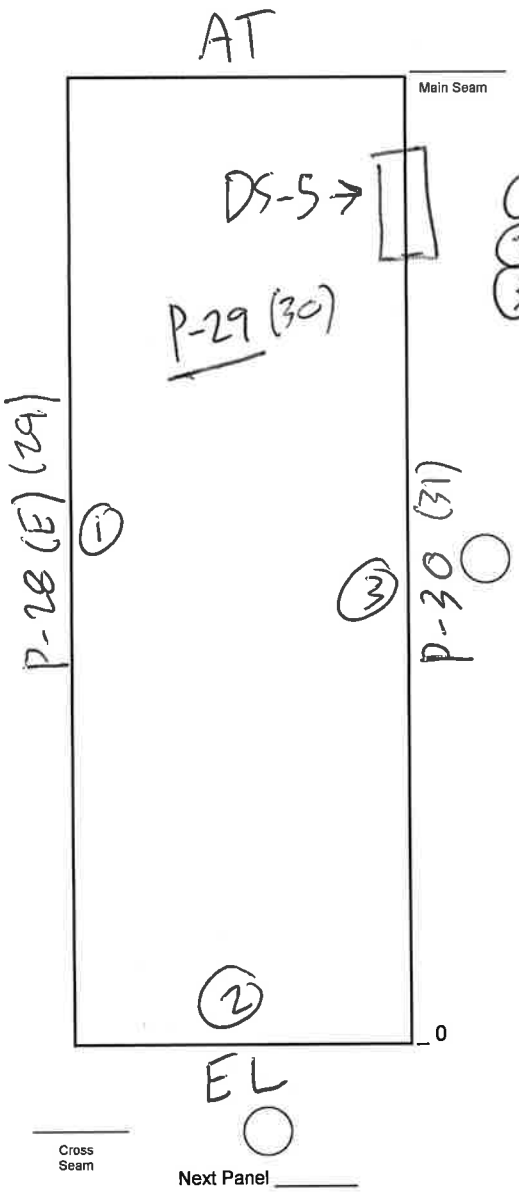
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-29 (30)	6376	6-22-23	
	(Smooth) / Texture	Lot No.	Deploy Time 0810	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-22	0902			JH	13	960 6.5
2	6-23	~~0902~~	0846		JH	13	" "
3	6-22	0929			JH	13	860 6.5

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-22		Air	GM	P
6-23		Air	GM	P
6-22		Air	GM	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail
DS-5	6-23-23	P

Comments

DS-6 → DS-5 = 541'
Σ = 541' + 2716 = 3257'

INSPECTOR'S SIGNATURE Jon T. Davis DATE 6-23-23

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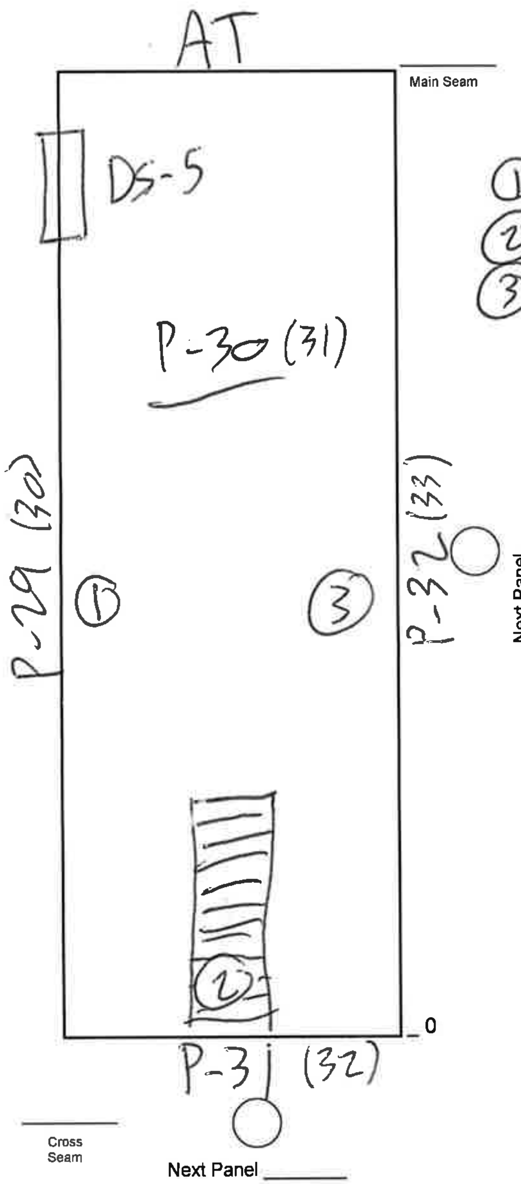
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.		Roll No.	Deploy Date	Panel Location
N ↑	P-30 (31)		6376	6-22-23	
	Smooth (circled)	Texture	Lot No.	Deploy Time 0820	

Seam Welding / **Seam Leak Testing**

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
1	6-22	0929			JH	13	860 6.5	6-22		Air	GM	P
2	"	0921			JH	13	"	6-22		"	"	P
3	"	0937			JH	13	"	6-22		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding / **Repair Leak Testing**

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings	Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail
DS-5	6-23-23	P

Comments

INSPECTOR'S SIGNATURE [signature] DATE 6-23-23

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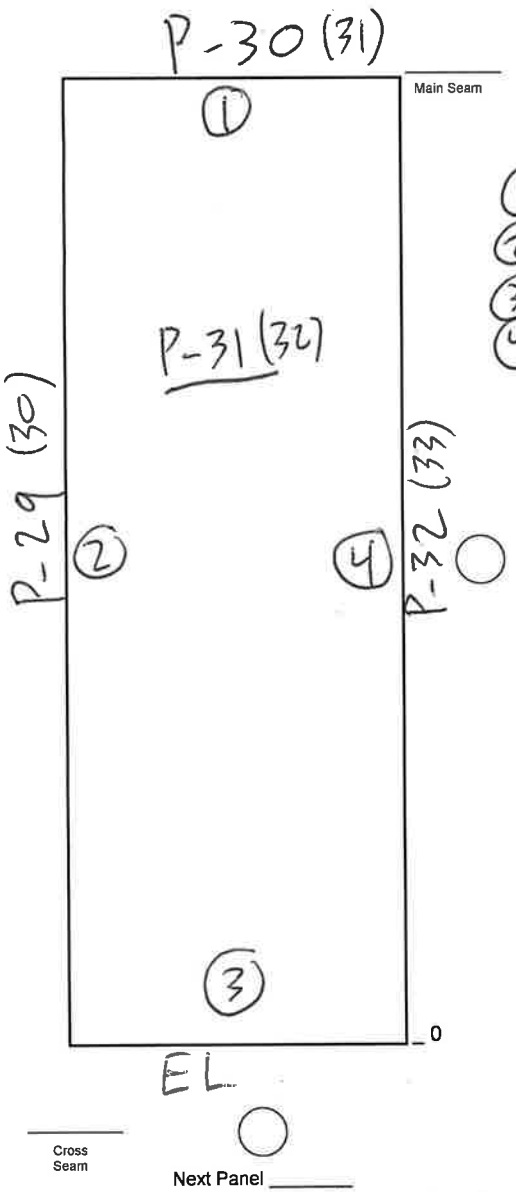
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-31 (32)	6371	6-22-23	
	Smooth / Texture	Lot No.	Deploy Time 0840	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-22	0921			JH	13	860 6.5
2	"	0929			JH	13	"
3	6-23	0845			JH	13	860 6.5
4	"	0937			JH	13	860 6.5

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-22		Air	GM	P
"		"	"	P
6-23		"	"	P
6-22		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE Jon T. Hall DATE 6-23-23

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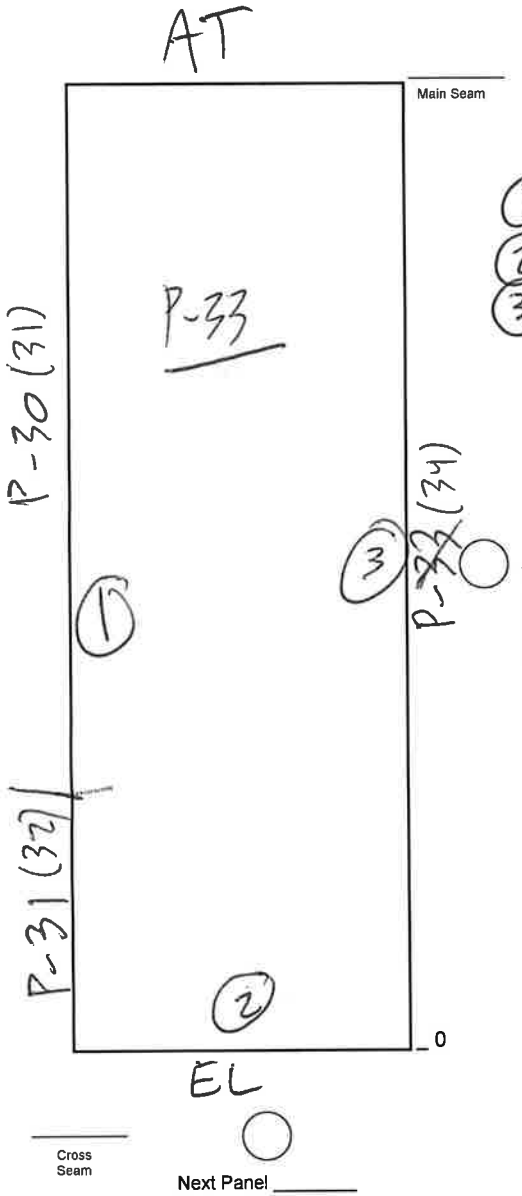
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-32 (33)	6371	6-22-23	
	Smooth / Texture	Lot No.	Deploy Time 0900	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	
1	6-22	0937			JH	13	960	6.5
2	6-23	0845			JH	13	960	6.5
3	6-22	0946			JH	13	860	6.5

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-22		Air	GM	P
6-23		Air	GM	P
6-22		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE Jon T. Date DATE 6-23-23

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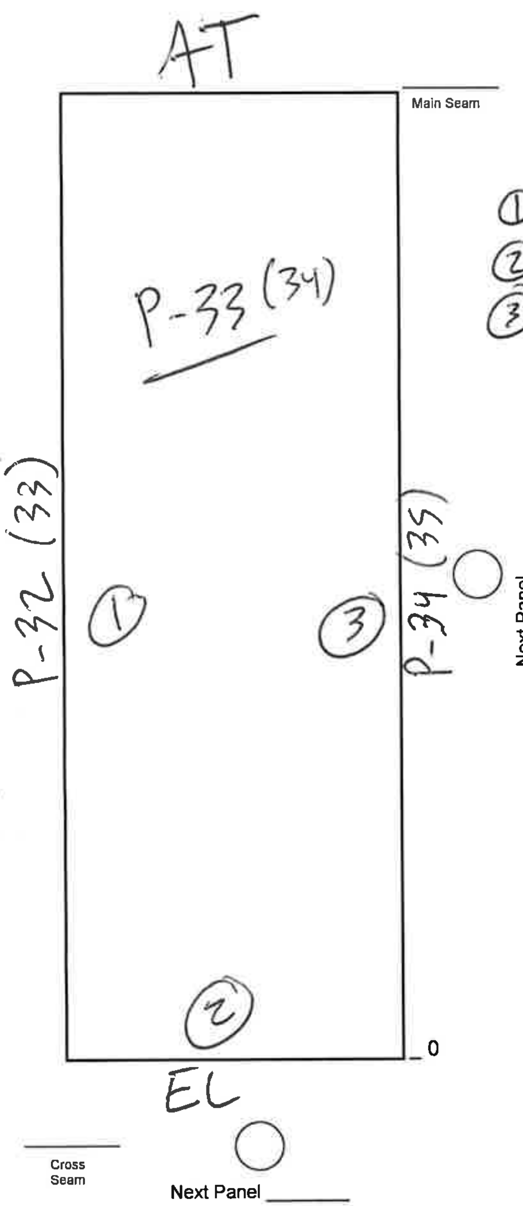
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.		Roll No.	Deploy Date	Panel Location
N↑	P-33 (34)		6371	6-22-23	
	Smooth (circled)	Texture	Lot No.	Deploy Time 0920	

Seam Welding / **Seam Leak Testing**

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
①	6-22	0946			JH	13	860 6.4	6-22		Air	GM	P
②	6-23	0845			JH	13	"	6-23		Air	GM	P
③	6-22	0948			JH	13	860 6.5	6-22		Air	GM	P

*Indicate Seam: Main = M or Cross = X

Repair Welding / **Repair Leak Testing**

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings	Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE [signature]

DATE 6-23-23

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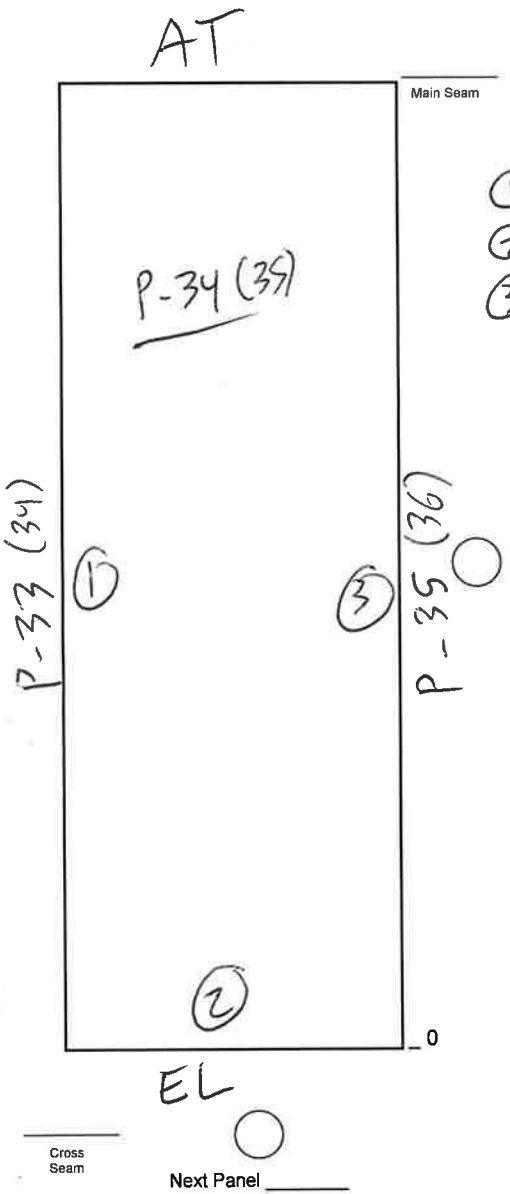
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-34 (35)	6371	6-22-23	
	Smooth / Texture	Lot No.	Deploy Time 1000	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
1	6-22	0948			JH	13	860 6.5	6-22		Air	GM	P
2	6-23	0845			JH	13	860 6.5	6-23		"	"	P
3	6-22	1016			JH	13	860 6.5	6-22		"	"	P

Seam Leak Testing

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE Jon T. Hu DATE 6-23-23

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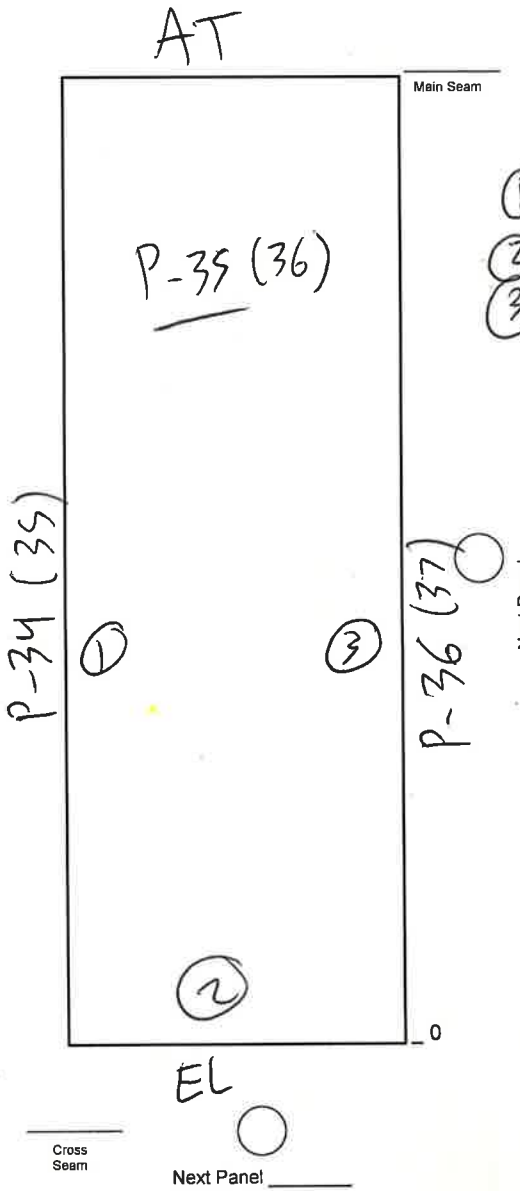
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
NA	P-35 (36)	6371	6-22-23	
	Smooth / Texture	Lot No.	Deploy Time 1010	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-22	1016			JH	13	860 6.5
2	6-23	0845			JH	13	"
3	6-22	1024			JH	13	860 6.5

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-22		Air	GM	P
6-23		"	"	P
6-22		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE M. Bre DATE 6-23-23

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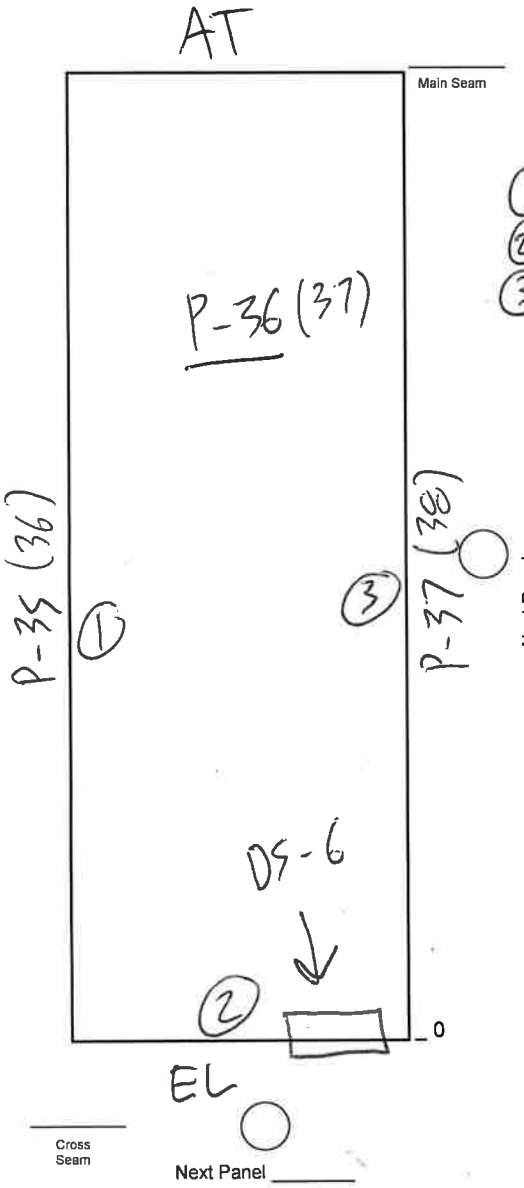
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-36 (37)	6371	6-22-23	
	Smooth / Texture	Lot No.	Deploy Time 1010	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-22	1024			JH	13	860 6.5
2	6-23	0814			JH	13	"
3	6-22	1030			JH	13	"

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-22		Air	GM	P
6-23		"	"	P
6-22		"	"	P

*Indicate Seam: Main = M or Cross = X

Next Panel

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail
DS-6	6-23-22	P

Comments

DS-4 → DS-6 = 638'
Σ = 638' + ~~1439~~ = 2716'
2078

INSPECTOR'S SIGNATURE [signature] DATE 6-23-23

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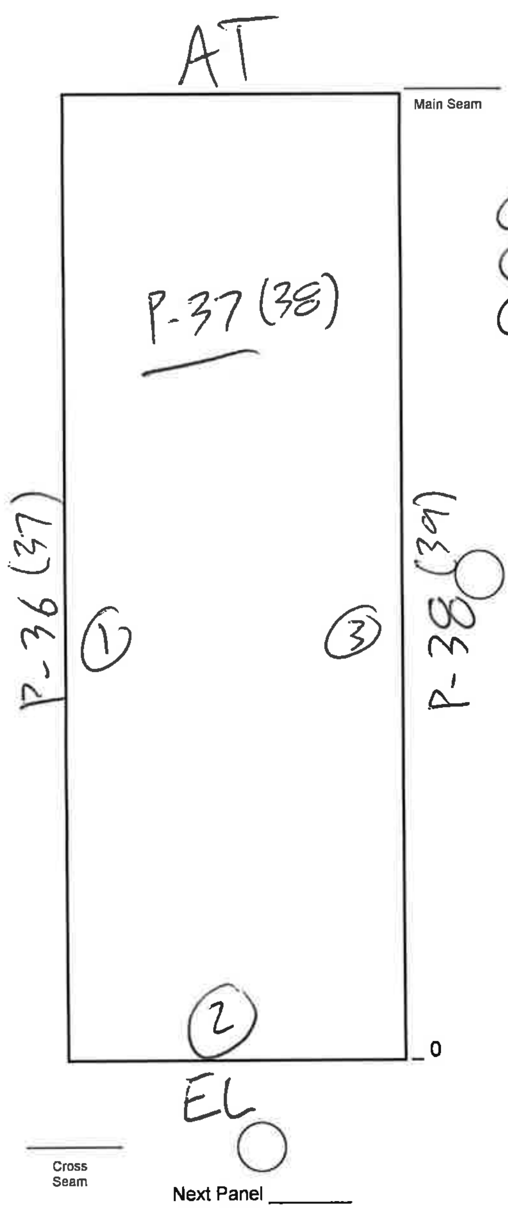
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No. P-37 (38)		Roll No. 6371	Deploy Date 6-22-23	Panel Location
N ↑	Smooth (circled)	Texture	Lot No.	Deploy Time 10:20	

Seam Welding / **Seam Leak Testing**

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
1	6-22	10:30			JH	13	860 6.5	6-22		Air	GM	P
2	6-23	0845			JH	13	"	6-23		"	"	P
3	6-22	1039			JH	13	"	6-22		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding / **Repair Leak Testing**

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings	Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test / **Comments**

Sample No.	Date Removed	Pass/ Fail	Comments

INSPECTOR'S SIGNATURE [signature] DATE 6-23-23

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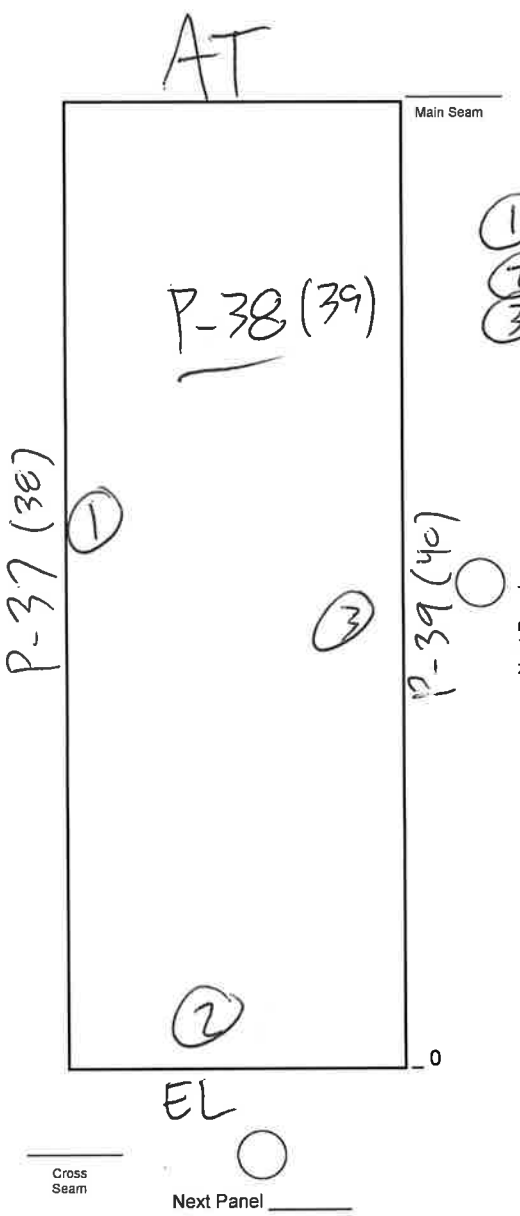
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-38 (39)	6371	6-22-23	
	Smooth / Texture	Lot No.	Deploy Time 1030	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-22	1039			JH	13	860 6.5
2	~~6-22~~	0845	6-23		JH	13	860 6.5
3	6-22	1050			JH	13	860 6.5

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-22		Air	GM	P
6-23		"	"	P
6-22		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE Jm T. Dan DATE 6-23-23

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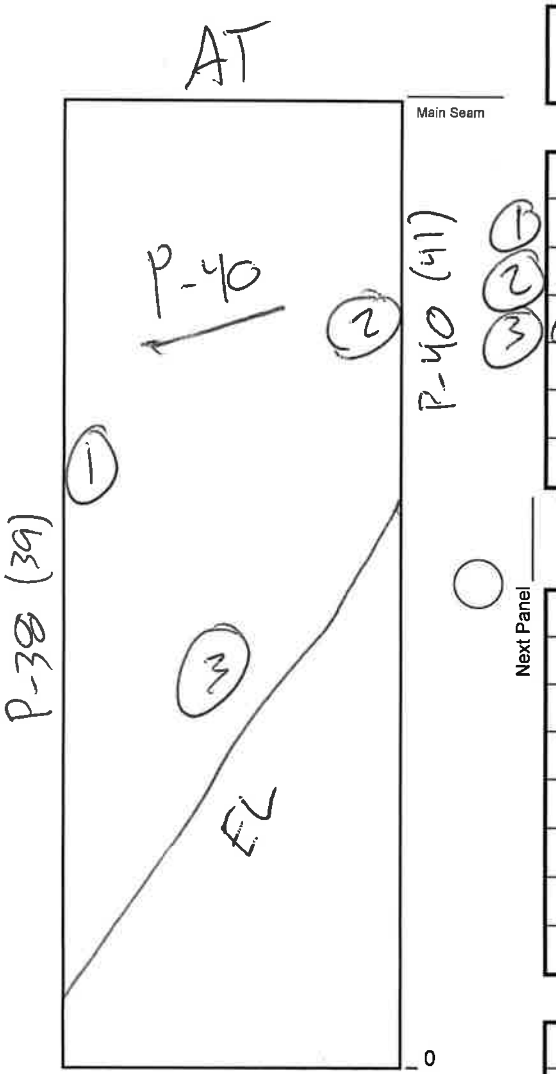
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Cross Seam

Next Panel ____

Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N↑	P-39 (P40)	6371	6-22-23	
	Smooth (circled) / Texture	Lot No.	Deploy Time: 10:40	

Seam Welding / **Seam Leak Testing**

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
1	6-22	1050			JH	13	860 6.5	6-22		Air	GM	P
2	6-22	1102			JH	13	860 6.5	6-22		"	"	P
3	6-23	0845			JH	13	"	6-23		"	"	P

*Indicate Seam: Main = M or Cross = X

Next Panel

Repair Welding / **Repair Leak Testing**

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings	Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test / **Comments**

Sample No.	Date Removed	Pass/ Fail	Comments

INSPECTOR'S SIGNATURE [signature] DATE 6-23-23

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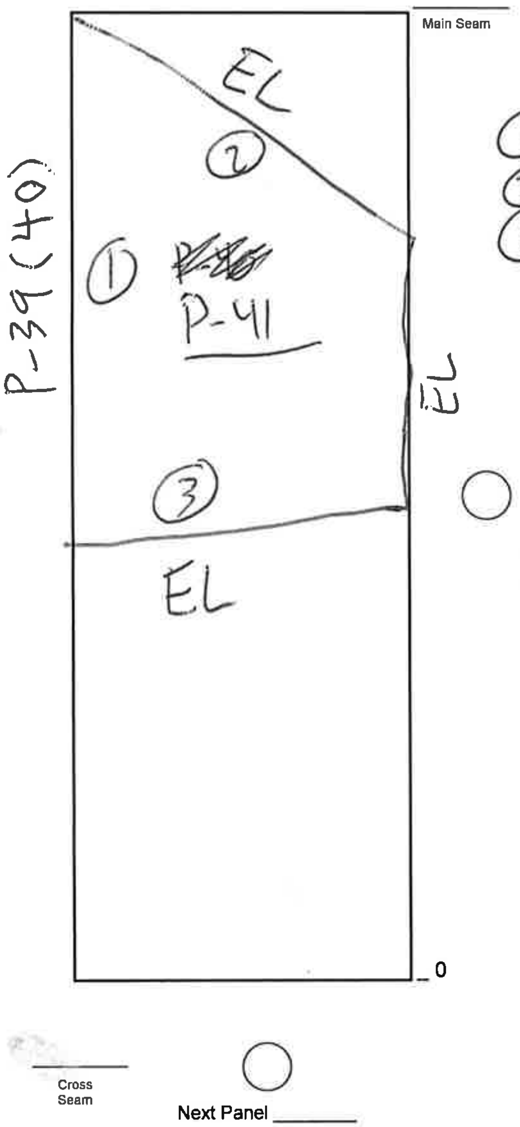
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS

Panel Orientation:	Panel No.		Roll No.	Deploy Date	Panel Location
NT	P-~~40~~41		6371	6-22-23	
	(Smooth)	Texture	Lot No.	Deploy Time 1050	



Seam Welding | **Seam Leak Testing**

Seam	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
1	6-22	1102			JH	13	860 6.5	6-23		Air	GM	P
2	6-23	0845			JH	13	860 6.5	6-23		"	"	P
3	6-23	0845			JH	13	860 6.5	6-23		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding | **Repair Leak Testing**

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings	Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test | **Comments**

Sample No.	Date Removed	Pass/ Fail	Comments

INSPECTOR'S SIGNATURE [signature]   DATE 6-23-23

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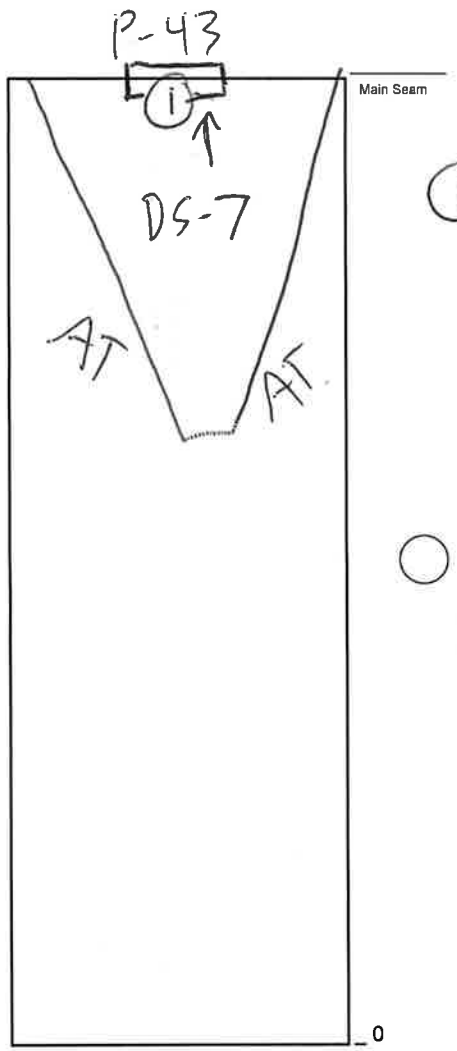
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No. P-42	Roll No. 6371	Deploy Date 6-26-23	Panel Location
N ↑	Smooth / Texture	Lot No.	Deploy Time 0900	

Seam Welding / **Seam Leak Testing**

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
1	6-26	P:27			GM	13	860 7.0	6-28		Air	GM	P

*Indicate Seam: Main = M or Cross = X

Next Panel

Repair Welding / **Repair Leak Testing**

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings	Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test / **Comments**

Sample No.	Date Removed	Pass/ Fail	
DS-7	6-28-23	P	DS-5 → DS-7 = 114'
			E = 3257' + 114' = 3371'

INSPECTOR'S SIGNATURE Ann T. Dix DATE 6-28-23

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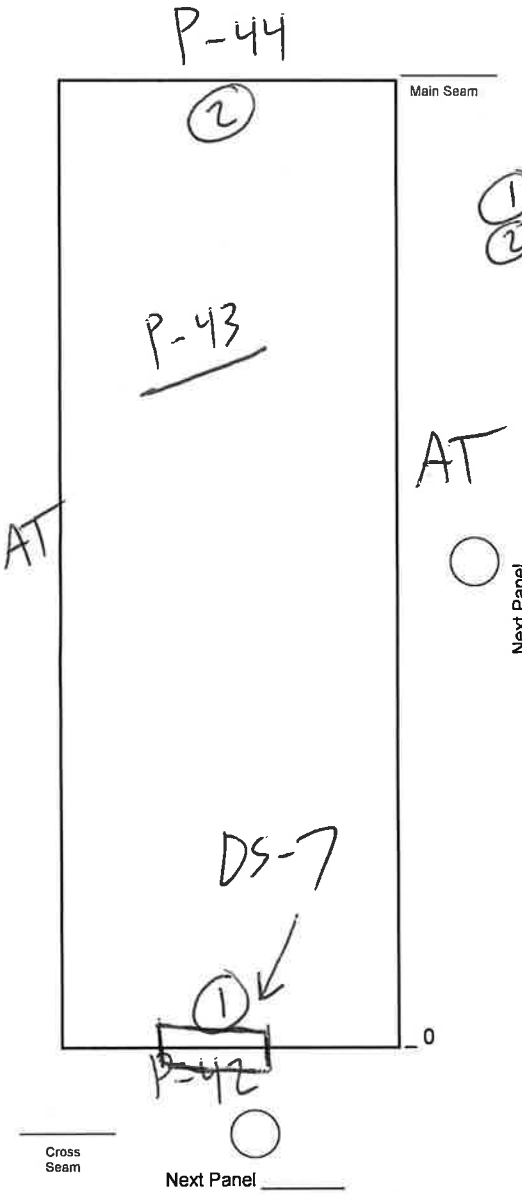
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.		Roll No.	Deploy Date	Panel Location
N ↑	P-43		6371	6-26-23	
	Smooth (circled)	Texture	Lot No.	Deploy Time 0910	

Seam Welding / **Seam Leak Testing**

Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
(1) 6-26	10:27			GM	13	860 7.0	6-28		Air	GM	P
(2) 6-26	10:33			GM	13	860 7.0	6-28		Air	GM	P

*Indicate Seam: Main = M or Cross = X

Repair Welding / **Repair Leak Testing**

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings	Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test / **Comments**

Sample No.	Date Removed	Pass/ Fail	Comments
DS-7	6-28-23	P	

INSPECTOR'S SIGNATURE [signature] DATE 6-28-23

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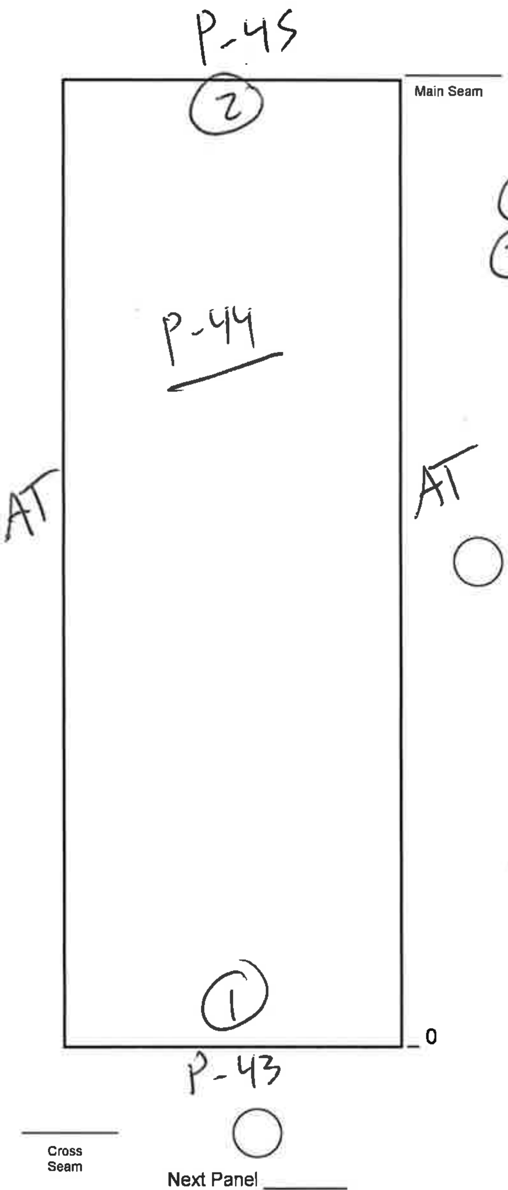
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.		Roll No.	Deploy Date	Panel Location
N ↑	P-44		6371	6-26-23	
	(Smooth)	Texture	Lot No.	Deploy Time 0940	

Seam Welding / **Seam Leak Testing**

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
1	6-26	10:33			GM	13	860 7.0	6-28		Air	GM	?
2	6-26	10:42			GM	13	860 7.0	6-28		Air	GM	?

*Indicate Seam: Main = M or Cross = X

Repair Welding / **Repair Leak Testing**

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings	Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test / **Comments**

Sample No.	Date Removed	Pass/ Fail	Comments

INSPECTOR'S SIGNATURE [signature]   DATE 6-26-23

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GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS

Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-45 (Smooth)	6347	6-26-23	
	Texture	Lot No.	Deploy Time 0950	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-26	10:42			GM	13	860 7.0
2	6-26	10:53			GM	13	860 7.0

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-28		Air	GM	P
6-28		Air	GM	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE Ann P. Zinn DATE 6-28-23

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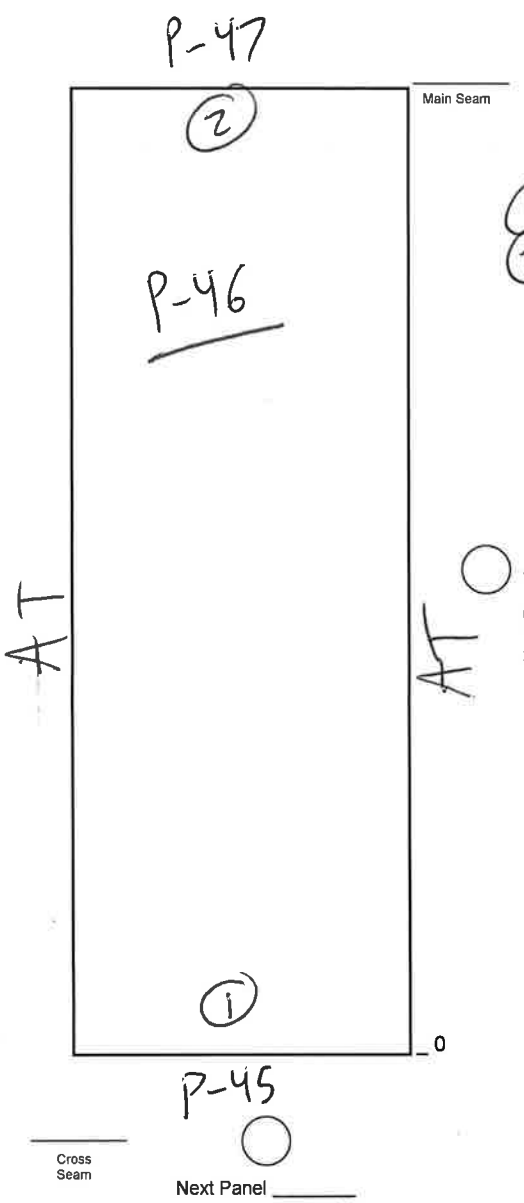
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
NT	P-46	6347	6-26-23	
	Smooth / Texture	Lot No.	Deploy Time 1000	

Seam Welding / **Seam Leak Testing**

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
1	6-26	1053			GM	13	80 7.0	6-28		Air	GM	P
2	6-26	1107			GM	13	80 7.0	"		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding / **Repair Leak Testing**

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings	Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test / **Comments**

Sample No.	Date Removed	Pass/ Fail	

INSPECTOR'S SIGNATURE M. Zen DATE 6-28-23

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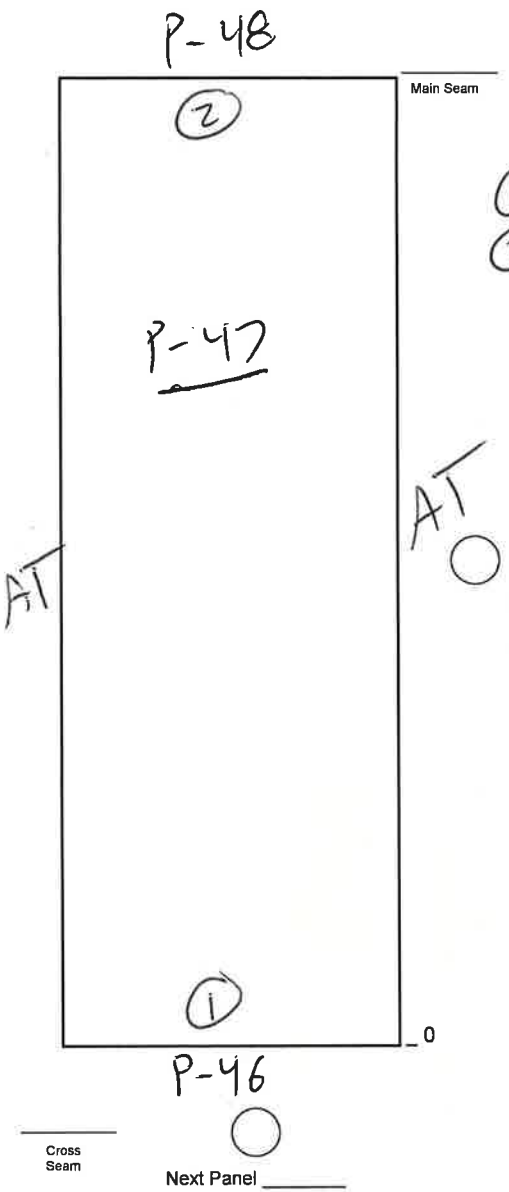
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No. P-47	Roll No. 6347	Deploy Date 6-26-23	Panel Location
N ↑	(Smooth) / Texture	Lot No.	Deploy Time 1010	

Seam Welding / **Seam Leak Testing**

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
1	6-26	1107			GM	13	E60 7.0	6-28		Air	GM	P
2	6-26	1120			GM	13	E60 7.0	"		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding / **Repair Leak Testing**

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings	Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE Jon T. Ahn DATE 6-28-23

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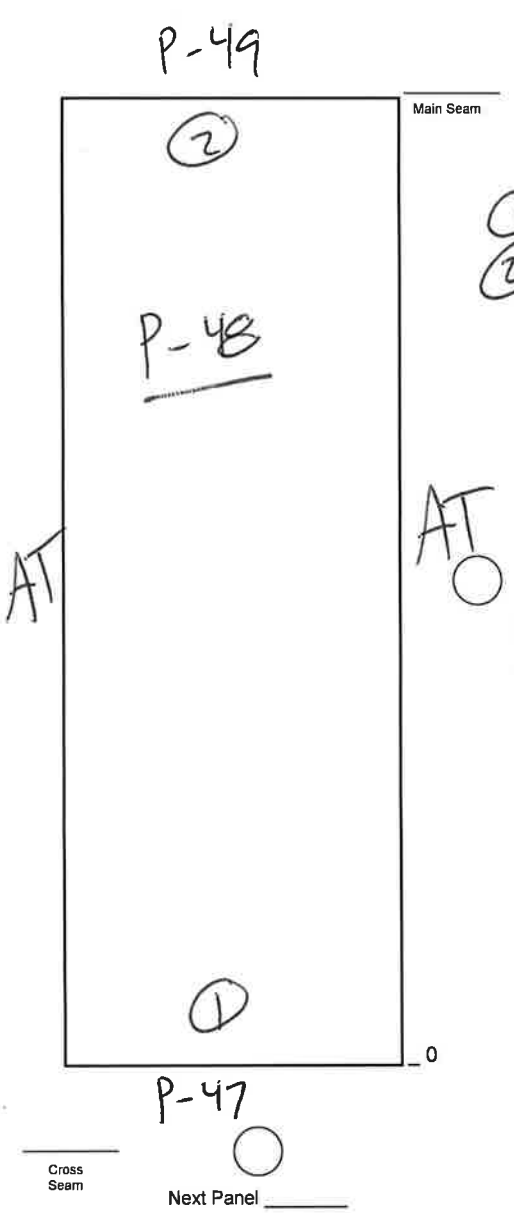
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No. P-48	Roll No. 6347	Deploy Date 6-26-23	Panel Location
NT	Smooth / Texture	Lot No.	Deploy Time 0730	

Seam Welding / **Seam Leak Testing**

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
1	6-26	1120			GM	13	E60 7.0	6-28		Air	GM	P
2	6-26	1136			GM	13	E60° 7.0	6-28		Air	GM	P

*Indicate Seam: Main = M or Cross = X

Next Panel

Repair Welding / **Repair Leak Testing**

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings	Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE M. T. Date 6-28-23

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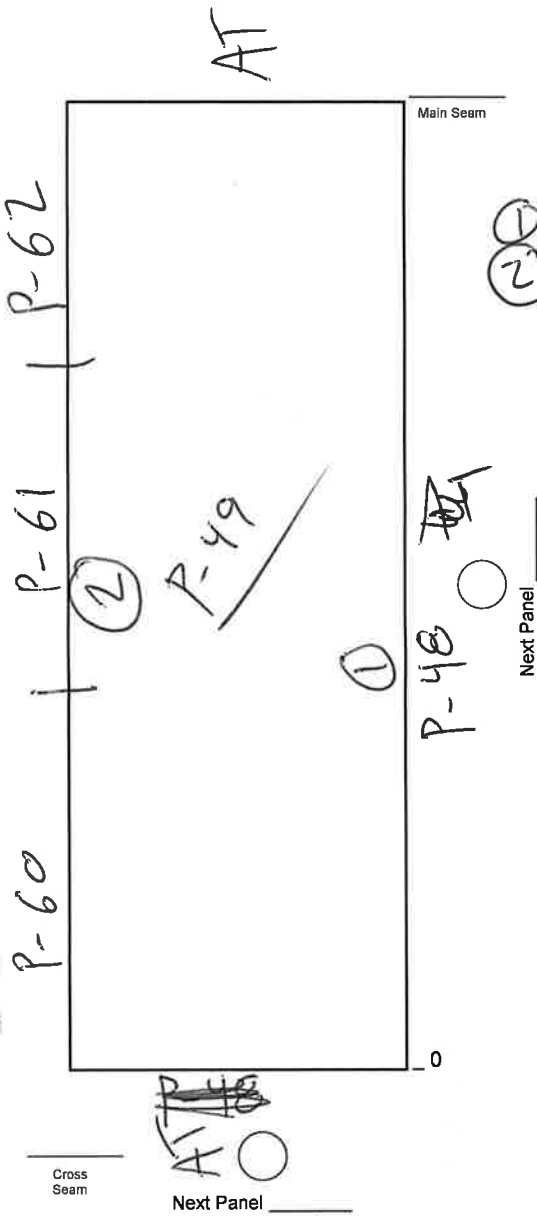
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ←	P-49	6347	6-26-23	
	Smooth / Texture	Lot No.	Deploy Time 1100	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-26	1136			GM	13	860 7.0
2	6-27	815			GM	13	860 7.0

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-28		Air	GM	P
6-28		Air	GM	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE _____ DATE 6-28-23

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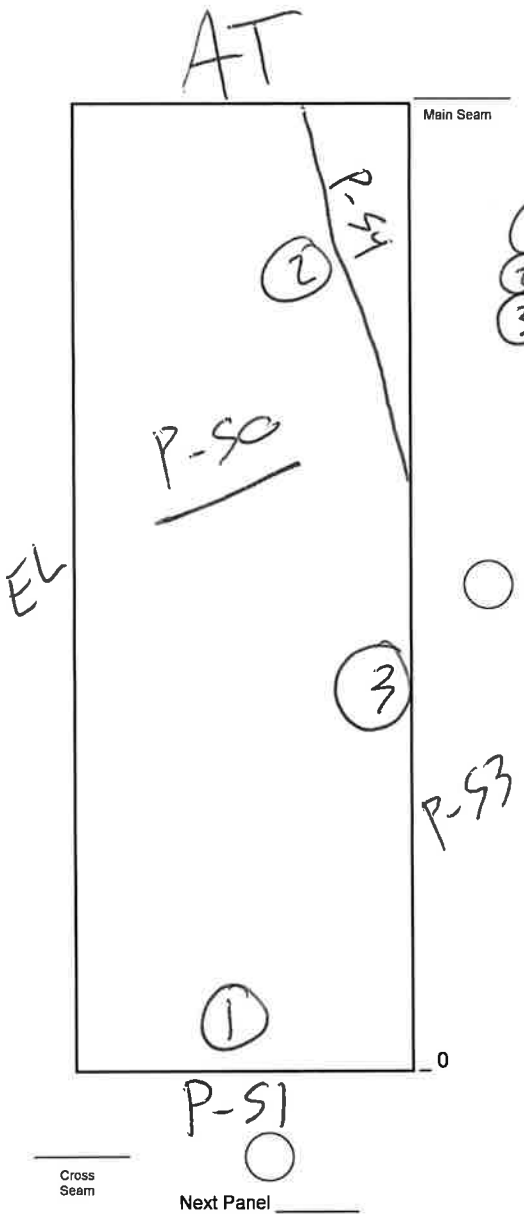
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
NT	P-50	6347	6-26-23	
	Smooth / Texture	Lot No.	Deploy Time 1140	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-26	1214			GM	13	860 7.0
2	6-26	1236			GM	13	860 7.0
3	6-26	1324			GM	13	860 7.0

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-27		Air	GM	P
↓		↓	↓	P
↓		↓	↓	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE _____ DATE 6-27-23

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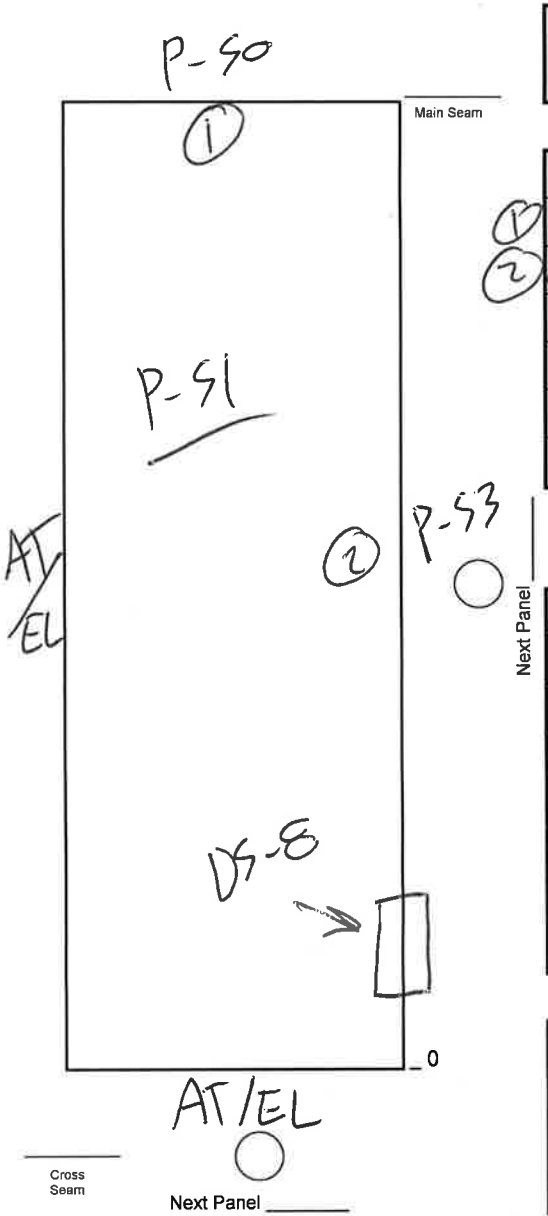
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-51	6347	6-26-23	
	Smooth / Texture	Lot No.	Deploy Time 1200	

Seam Welding / **Seam Leak Testing**

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
1	6-26	1214			GM	13	860 7.0	6-27		Air	GM	P
2	6-26	1324			GM	13	860 7.0	6-27		Air	GM	P

*Indicate Seam: Main = M or Cross = X

Repair Welding / **Repair Leak Testing**

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings	Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail
DS-8	6-28-23	P

Comments

DS-7 → DS-8 = 259'
Σ = 259' + 3371' = 3630'

INSPECTOR'S SIGNATURE _____ DATE 6-28-23

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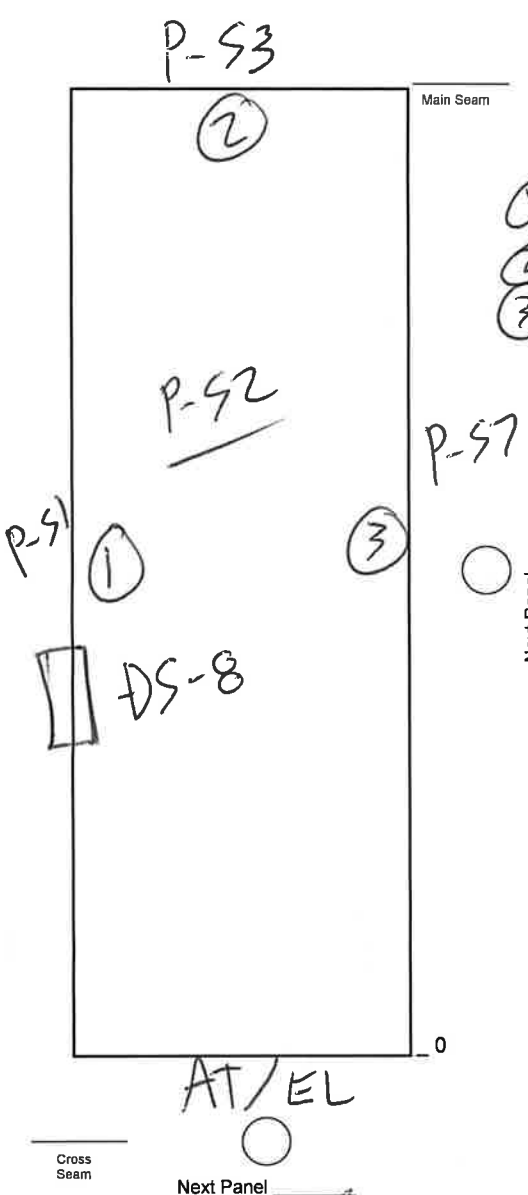
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-52	6347	6-26-23	
	Smooth / Texture	Lot No.	Deploy Time 1215	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
1	6-26	1324			GM	13	860 7.0	6-27		Air	GM	P
2	6-26	1313			GM	13	860 7.0	↓		↓	↓	P
3	6-26	1347			GM	13	860 7.0	↓		↓	↓	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Seam Leak Testing

Date	Test Type	Tech	Pass/ Fail

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail
DS-8	6-28-23	P

Comments

INSPECTOR'S SIGNATURE Jon T. Zinn DATE 6-28-23

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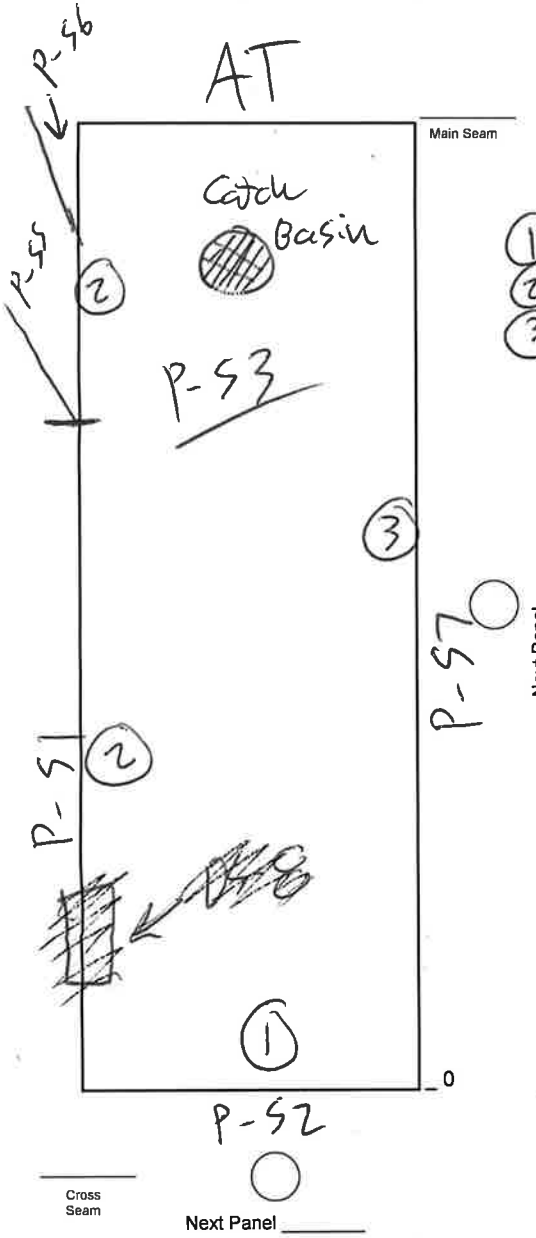
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-53	6363	6-26-23	
	Smooth / Texture	Lot No.	Deploy Time 1250	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-26	1313			GM	13	860 7.0
2	6-26	1324			GM	13	860 7.0
3	6-26	1347			GM	13	860 7.0

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-27		Air	GM	P
↓		↓	↓	P
↓		↓	↓	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail
[redacted]		

Comments

INSPECTOR'S SIGNATURE [signature] DATE 6-27-23

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GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS

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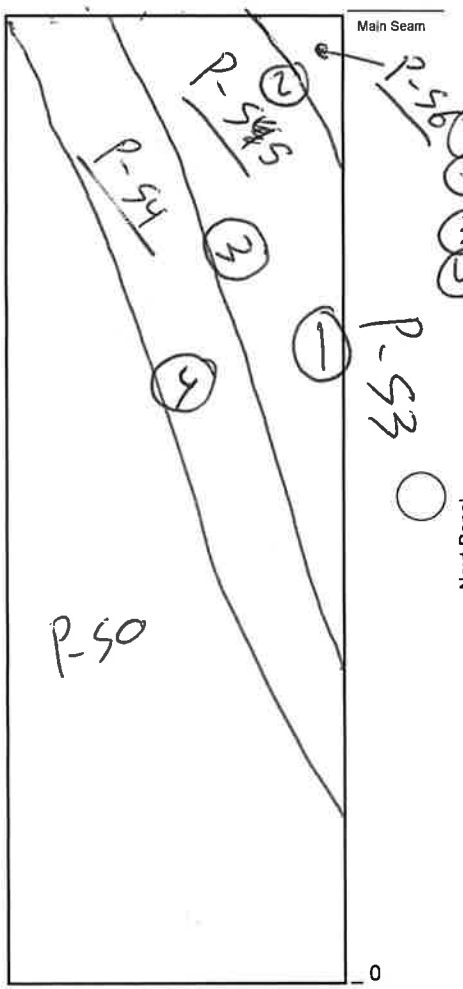

Cross Seam

Next Panel

Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-54, P-55, P-56	6363	6-26-23	
	Smooth / Texture	Lot No.	Deploy Time 1200	

Seam Welding

Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
6-26	1324			GM	13	860 7.0
6-26	1309			GM	13	860 7.0
6-26	1248			GM	13	860 7.0
6-26	1236			GM	13	860 7.0

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-27		Air	GM	P
↓		↓	↓	P
				P
				P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE _____ DATE 6-27-23

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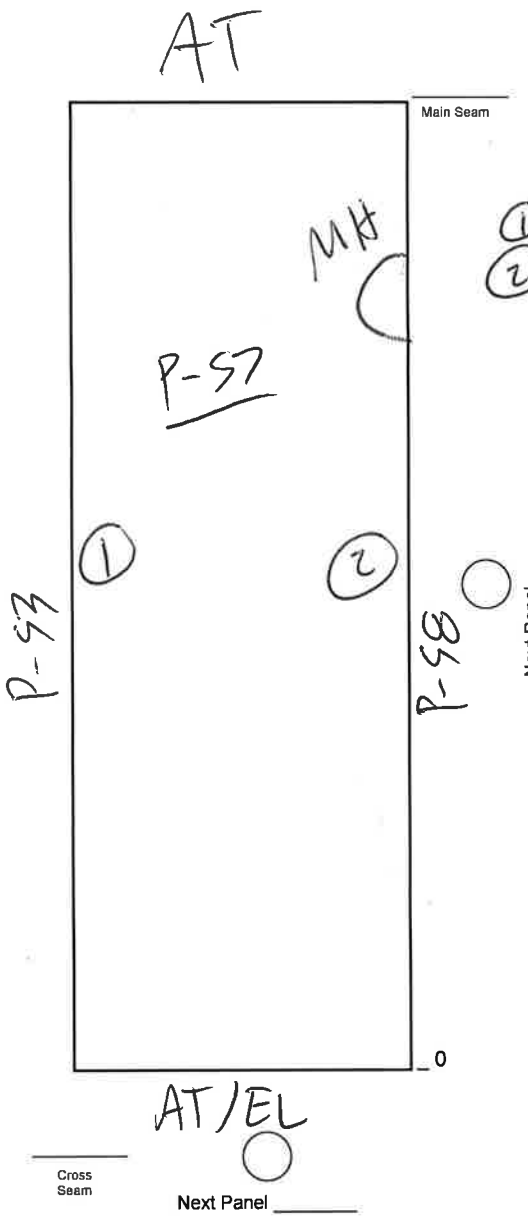
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-57	6363	6-26-23	
	Smooth / Texture	Lot No.	Deploy Time 13:30	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-26	1347			GM	13	E60 7.0
2	6-26	1410			GM	13	E60 7.0

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-27		Air	GM	P
6-27		Air	GM	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE Jon T. Zin DATE 6-27-23

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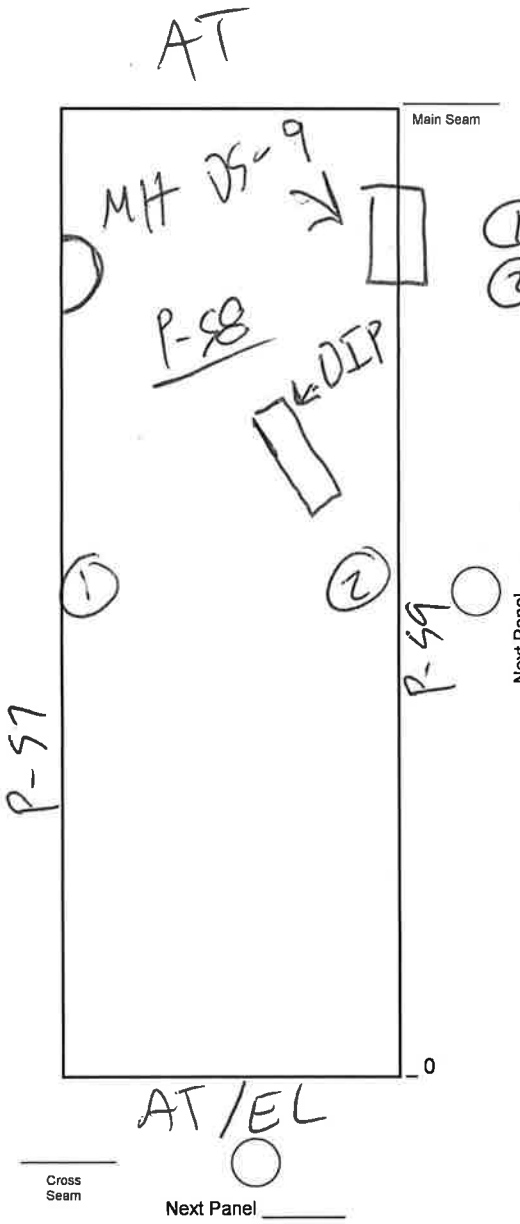
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-58	6363	6-26-23	
	Smooth / Texture	Lot No.	Deploy Time 1300	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-26	1410			GM	13	860 7.0
2	6-26	1409			GM	13	860 7.0

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-27		Air	GM	P
~~6-26~~	6-27	Air	GM	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail
DS-9	6-28	P

Comments

DS-8 → DS-9 = 601'
Σ = 601' + 3630' = 4231'

INSPECTOR'S SIGNATURE _____ DATE 6-28-23

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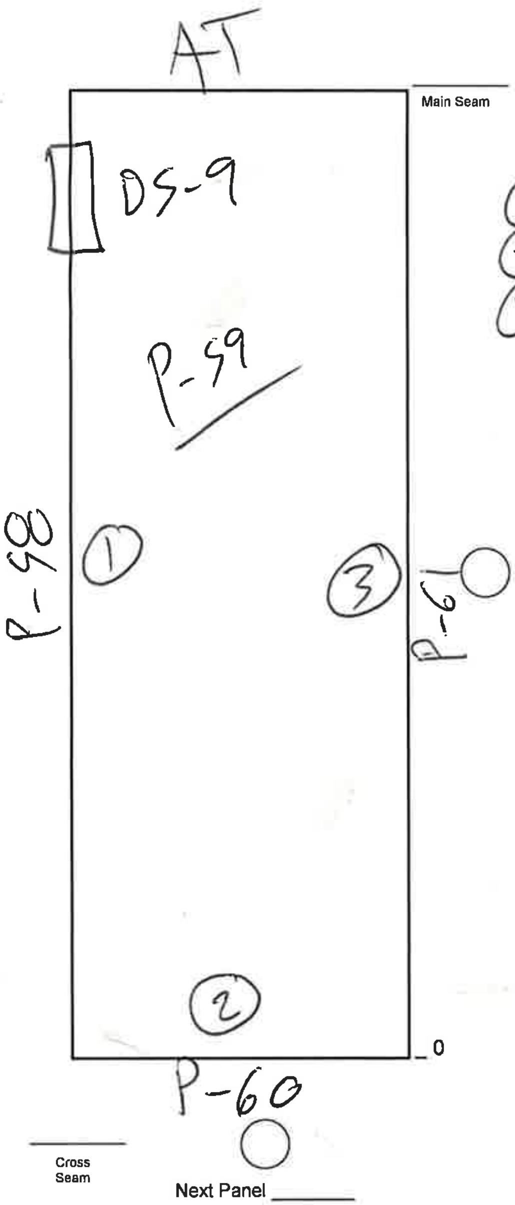
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	P-59	Roll No.	6363	Deploy Date	6-26-23	Panel Location
N ↑	(Smooth)	Texture	Lot No.		Deploy Time	1400	

Seam Welding / **Seam Leak Testing**

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
1	6-26	1409			GM	13	860 7.0	[illegible]	6-27	Air	GM	P
2	6-26	1447			GM	13	"	←	6-28	↓	↓	P
3	6-26	1352			GM	13	"	" ←	6-28	↓	↓	P

*Indicate Seam: Main = M or Cross = X

Repair Welding / **Repair Leak Testing**

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings	Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test / **Comments**

Sample No.	Date Removed	Pass/ Fail	Comments
DS-9	6-28-23	P	

INSPECTOR'S SIGNATURE [signature] DATE 6-28-23 ☐ CHECK (✓) HERE IF REVERSE SIDE IS USED

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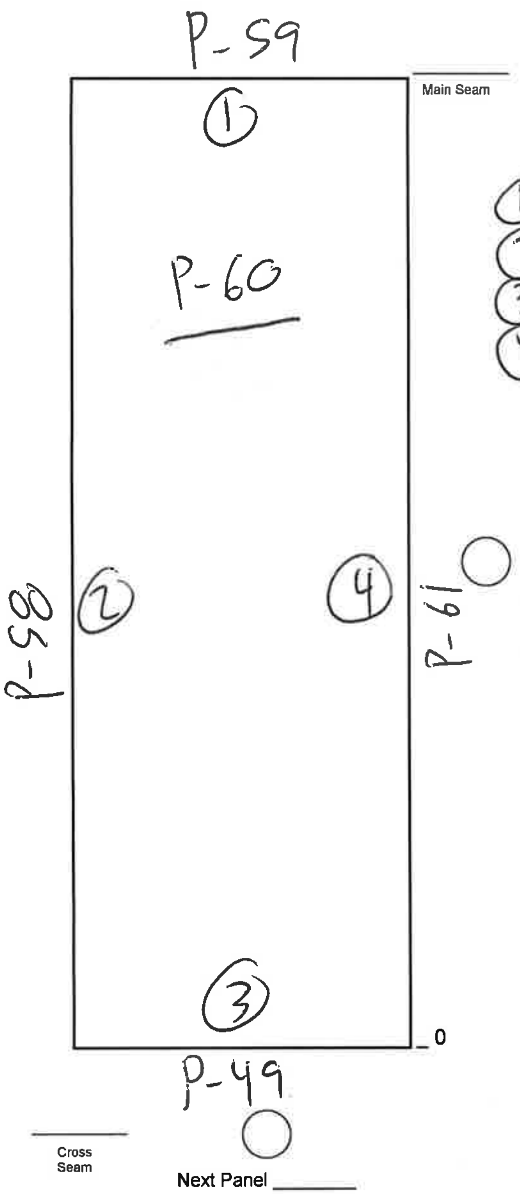
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.		Roll No.	Deploy Date	Panel Location
N ↑	P-60		6377	6-26-23	
	(Smooth)	Texture	Lot No.	Deploy Time 1400	

Seam Welding / **Seam Leak Testing**

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
1	6-26	1447			GM	13	860 7.0	6-28		Air	GM	P
2	6-26	1509			"	"	"	"		↓	↓	P
3	6-27	815			GM	13	"	"				P
4	6-26	1452			"	"	"	"				P

*Indicate Seam: Main = M or Cross = X

Repair Welding / **Repair Leak Testing**

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings	Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE [signature]

DATE 6-~~26~~ 22-23

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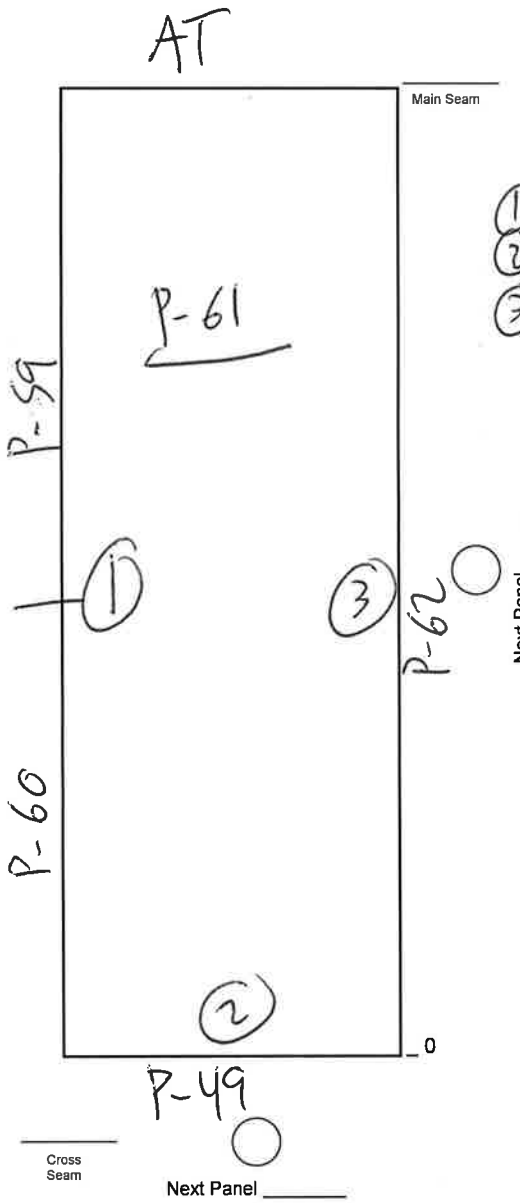
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-61	6377	6-26-23	
	Smooth / Texture	Lot No.	Deploy Time 1410	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-26	1452			GM	13	86 7.0
2	6-27	815			"	"	"
3	6-26	1531			"	"	"

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-28		Air	GM	P
"		"	"	P
"		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE Jm T. Mc DATE 6-28-23

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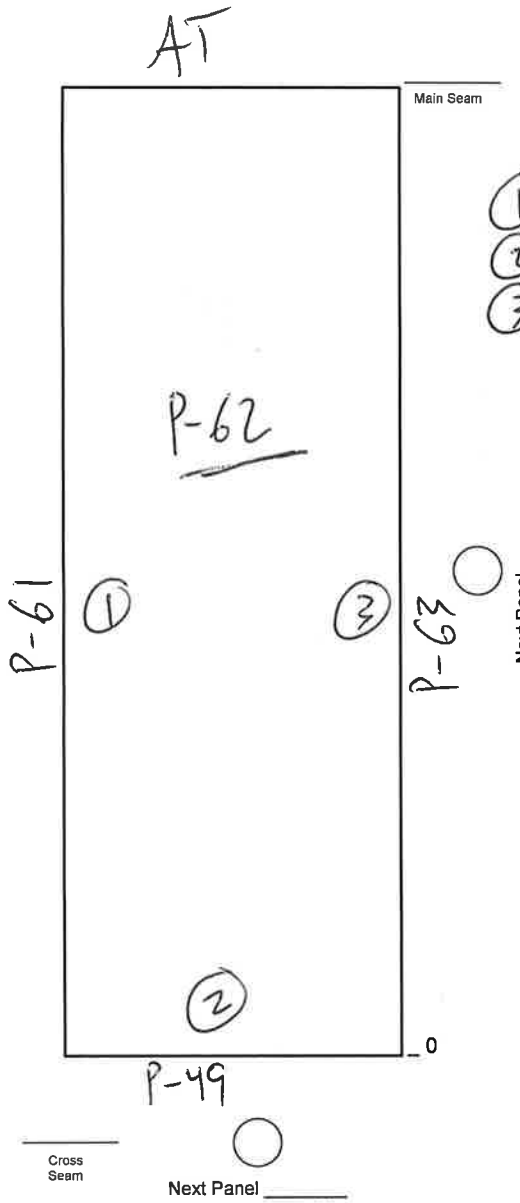
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-62	6377	6-26-23	
	Smooth / Texture	Lot No.	Deploy Time 1430	

Seam Welding / **Seam Leak Testing**

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
1	6-26	1531			GM	17	80 7.0	6-28		Air	GM	P
2	6-27	815			"	"	"	6-28		Air	GM	P
3	6-26	1553			"	"	"	6-28		Air	GM	P

*Indicate Seam: Main = M or Cross = X

Repair Welding / **Repair Leak Testing**

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings	Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE [signature] DATE 6-28-23

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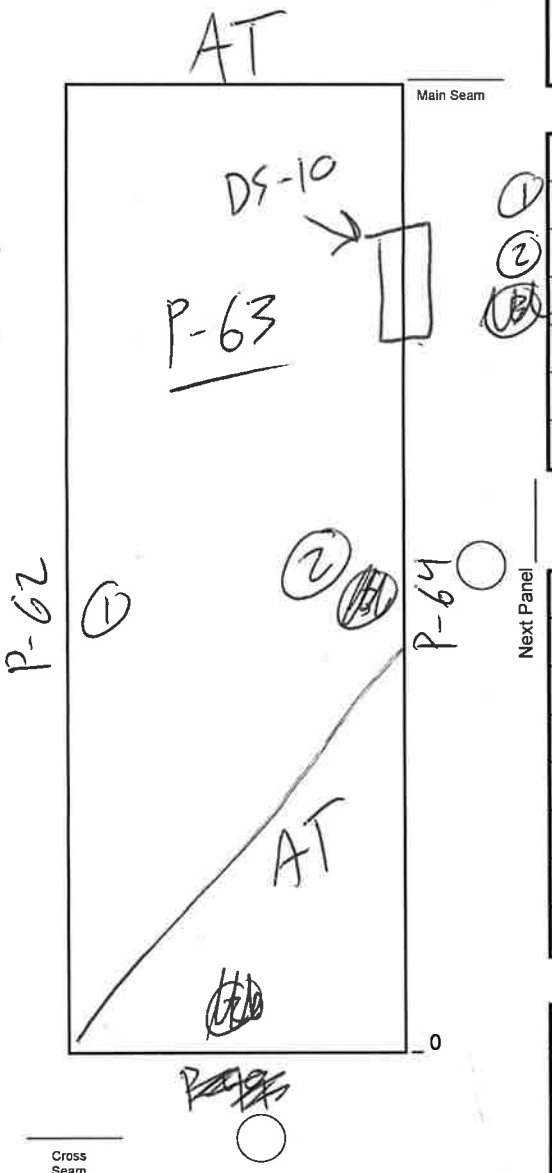
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-63	6377	6-26-23	
	Smooth / Texture	Lot No.	Deploy Time 1500	

Seam Welding

Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
6-26	1553			GM	13	860 7.0
6-27	856			"	"	"

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-28		Air	GM	P
6-28		Air	GM	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail
DS-10	6-28-23	F

Comments

ACF West repairs entire seam.
DS-9 → DS-10 = 741'
Σ = 741 + 4231' = 4972'
Remaining seam = 290'

INSPECTOR'S SIGNATURE [signature] DATE 6-28-23

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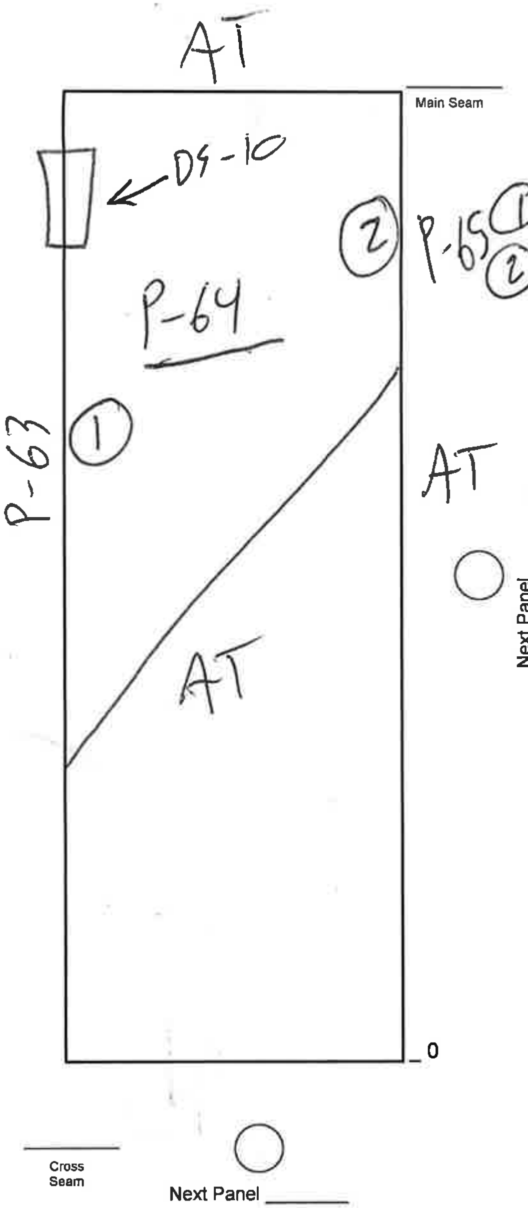
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.		Roll No.	Deploy Date	Panel Location
N ↑	P-64		6345	6-27-23	
	Smooth (circled)	Texture	Lot No.	Deploy Time 0800	

Seam Welding / **Seam Leak Testing**

Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
① 6-27	0856			GM	13	860-7.0	6-28		Air	GM	P
② 6-27	1100			"	"	"	6-28		Air	GM	P

*Indicate Seam: Main = M or Cross = X

Repair Welding / **Repair Leak Testing**

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings	Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test / **Comments**

Sample No.	Date Removed	Pass/ Fail	Comments
DS-10	6-28-23	F	ACF West repairs entire seam

INSPECTOR'S SIGNATURE [signature] DATE 6-28-23

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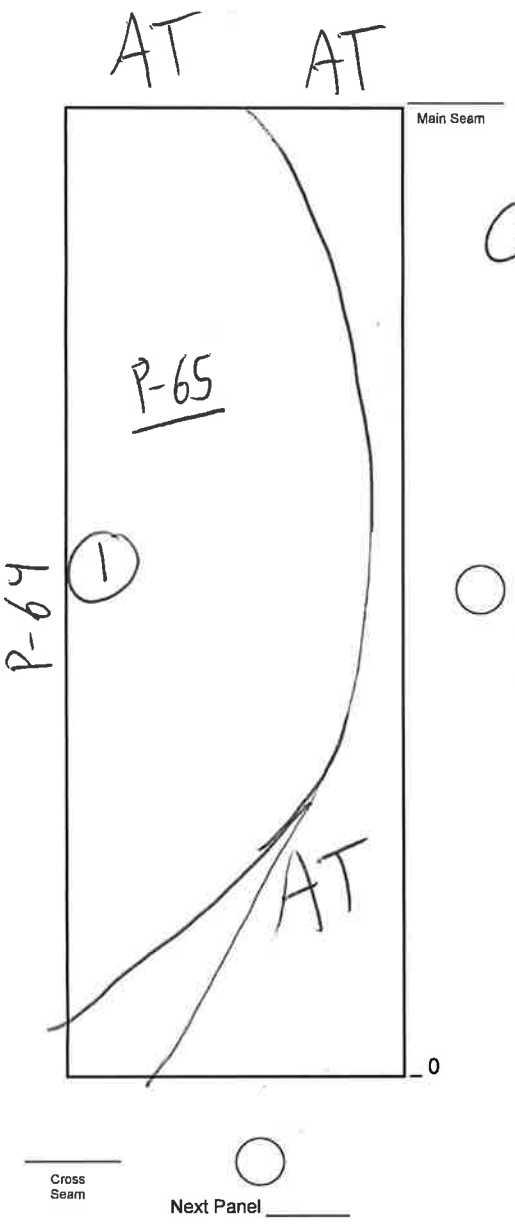
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No. P-65 ~~P-95~~	Roll No. 6345	Deploy Date 6-27-23	Panel Location
NT	Smooth / Texture	Lot No.	Deploy Time 900	

Seam Welding / **Seam Leak Testing**

Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-27	1100			GM	13	860 7.0	6-28		Air	GM	P

*Indicate Seam: Main = M or Cross = X

Next Panel

Repair Welding / **Repair Leak Testing**

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings	Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test / **Comments**

Sample No.	Date Removed	Pass/ Fail	

INSPECTOR'S SIGNATURE M T. Rec DATE 6-6 6-28-23

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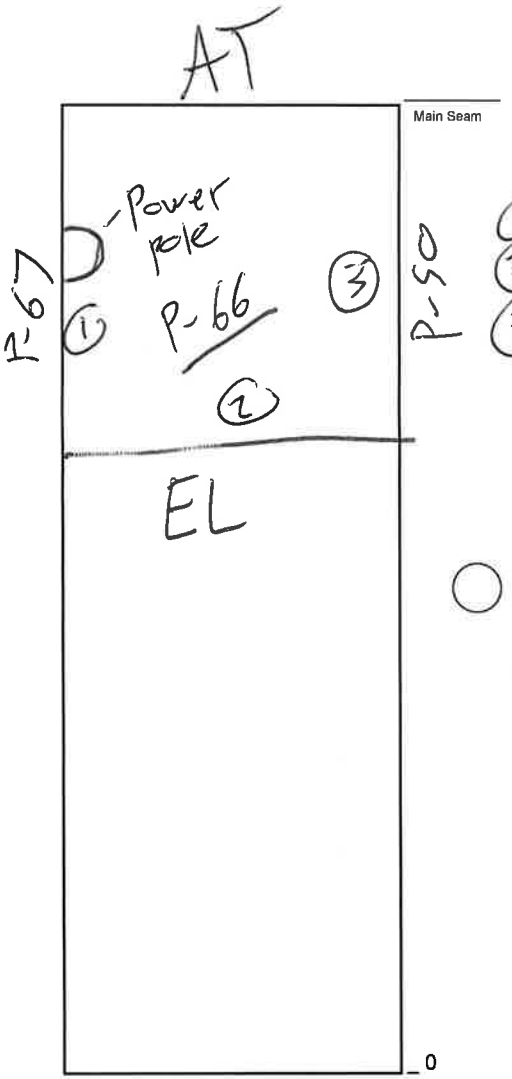
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-66	63-15	6-27-23	
	Smooth / Texture	Lot No.	Deploy Time 0900	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-27	1004			GM	13	860 7.0
2	6-27	1237			GM	13	860 7.0
3	6-27	1320			GM	13	860 7.0

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-28		Air	GM	P
↓		↓	↓	P
↓		↓	↓	P

*Indicate Seam: Main = M or Cross = X

Next Panel ○

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE Jay T. Zie DATE 6-28-23

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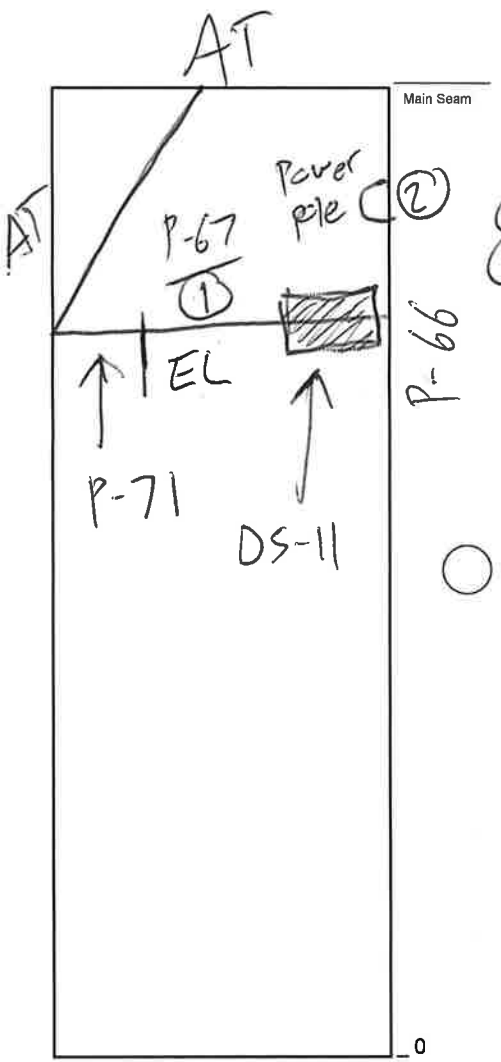
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-67	6345	6-27-23	
	Smooth / Texture	Lot No.	Deploy Time 0900	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-27	1237			GM	13	860 7.0
2	6-27	1004			GM	13	860 7.0

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-28		Air	GM	P
"		"	"	P

*Indicate Seam: Main = M or Cross = X

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail
DS-11	6-28-23	P

Comments

INSPECTOR'S SIGNATURE M. Dan DATE 6-28-23

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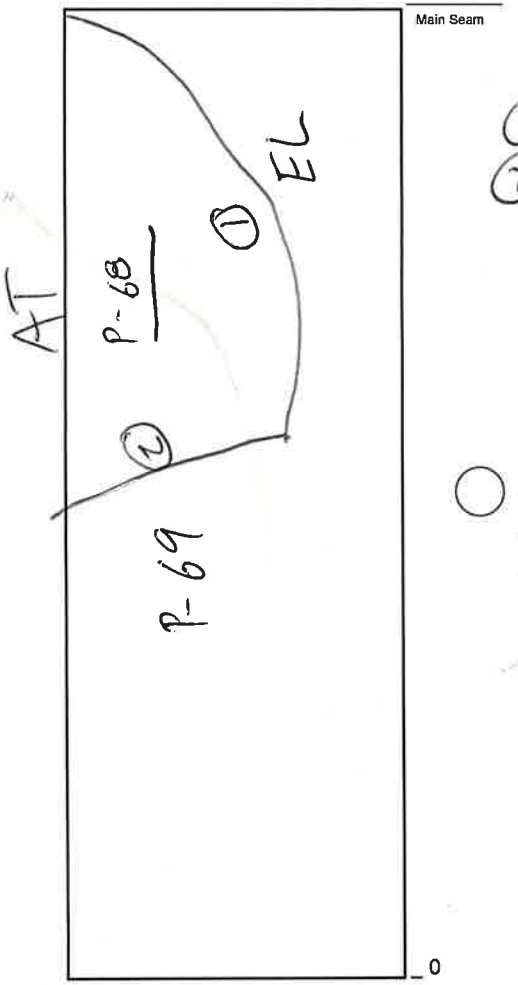
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS

Panel Orientation:	Panel No. P-68	Roll No. 6345	Deploy Date 6-27-23	Panel Location
N ←	Smooth / Texture	Lot No.	Deploy Time 11:50	



Seam Welding / **Seam Leak Testing**

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
1	6-27	1203			GM	13	860 7.0	6-28		Air	GM	P
2	6-27	1208			GM	13	860 7.0	6-28		Air	GM	P

*Indicate Seam: Main = M or Cross = X

Next Panel

Repair Welding / **Repair Leak Testing**

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings	Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test / **Comments**

Sample No.	Date Removed	Pass/ Fail	

INSPECTOR'S SIGNATURE M. Zu DATE 6-28-23

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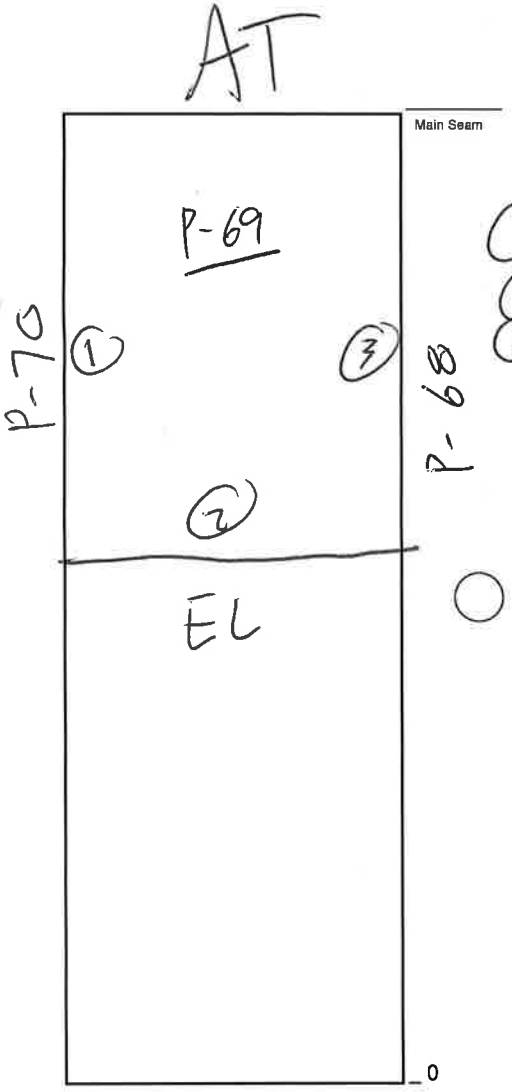
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-69	6345	6-27-23	
	Smooth (circled) / Texture	Lot No.	Deploy Time 0900	

Seam Welding

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings
1	6-27	0940			GM	13	860 7.0
2	6-27	1203			GM	13	860 7.0
3	6-27	1008			GM	13	860 7.0

Seam Leak Testing

Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
6-28		Air	GM	P
6-28		Air	GM	P
6-28		Air	GM	P

*Indicate Seam: Main = M or Cross = X

Next Panel

Repair Welding

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings

Repair Leak Testing

Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test

Sample No.	Date Removed	Pass/ Fail

Comments

INSPECTOR'S SIGNATURE Jon T. Zin DATE 6-28-23

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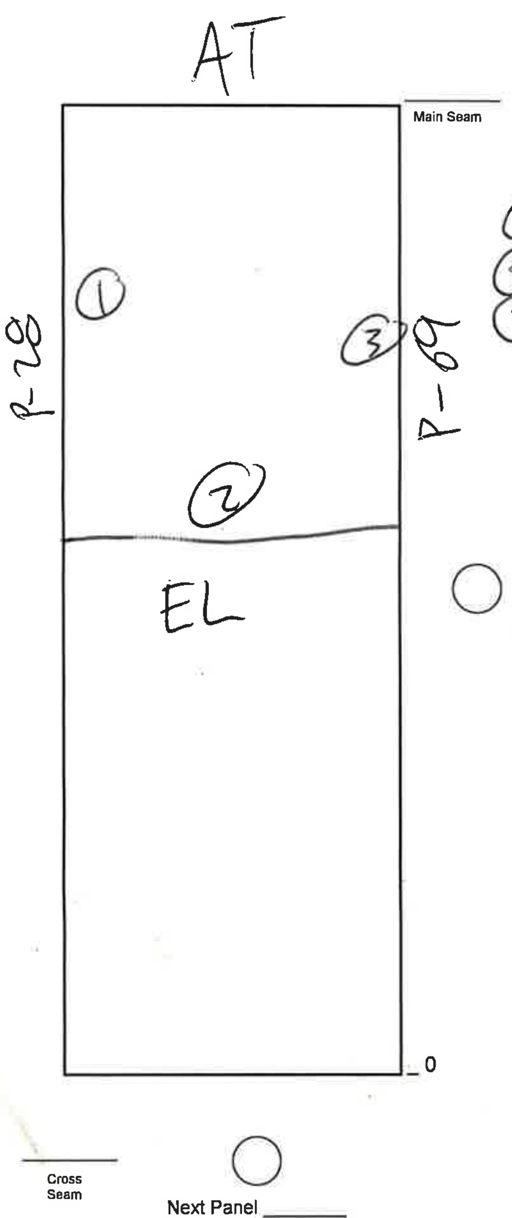
GEOMEMBRANE PANEL/SEAM LOG

CONSTRUCTION INSPECTION FORM
PROJECT NO. 04223030.10

LEICHNER LANDFILL
NE 99TH ST CONSTRUCTION

SCS ENGINEERS



Panel Orientation:	Panel No.	Roll No.	Deploy Date	Panel Location
N ↑	P-70	6345	6-27-23	
	(Smooth) / Texture	Lot No.	Deploy Time 0900	

Seam Welding / **Seam Leak Testing**

	Date	Time	Amb Temp	Loc.*	Tech	Mach No.	Mach Settings	Date	Distance Tested and Loc.*	Test Type	Tech	Pass/ Fail
1	6-27	1040			GM	13	860 7.0	6-28		Air	GM	P
2	6-27	1203			↓	↓	↓	↓		↓	↓	P
3	6-27	0940			↓	↓	↓	↓		↓	↓	P

*Indicate Seam: Main = M or Cross = X

Repair Welding / **Repair Leak Testing**

Date	Time	Amb Temp	Repair No.	Tech	Mach No.	Mach Settings	Date	Test Type	Tech	Pass/ Fail

Destructive Seam Sample Lab Test / **Comments**

Sample No.	Date Removed	Pass/ Fail	Comments

INSPECTOR'S SIGNATURE [signature]   DATE 6-28-23

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C-2

Geomembrane Submittals

Bid Item 24

SOLMAX

Technical data sheet

HDPE Series, 60 mil Black, Smooth

PROPERTY	TEST METHOD	FREQUENCY(1)	UNIT Imperial	1101438
SPECIFICATIONS				
Thickness (min. avg.)	ASTM D5199	Every roll	mils	60.0
Thickness (min.)	ASTM D5199	Every roll	mils	54
Resin Density	ASTM D1505	1/Batch	g/cc	> 0.932
Melt Index - 190/2.16 (max.)	ASTM D1238	1/Batch	g/10 min	1.0
Sheet Density	ASTM D792	Every 10 rolls	g/cc	≥ 0.940
Carbon Black Content	ASTM D4218	Every 2 rolls	%	2.0 - 3.0
Carbon Black Dispersion	ASTM D5596	Every 10 rolls	Category	Cat. 1 & Cat. 2
OIT - standard (avg.)	ASTM D3895	1/Batch	min	100
Tensile Properties (min. avg) (2)	ASTM D6693	Every 2 rolls		
Strength at Yield			ppi	132
Elongation at Yield			%	13
Strength at Break			ppi	243
Elongation at Break			%	700
Tear Resistance (min. avg.)	ASTM D1004	Every 5 rolls	lbf	42
Puncture Resistance (min. avg.)	ASTM D4833	Every 5 rolls	lbf	120
Dimensional Stability	ASTM D1204	Certified	%	± 2
Stress Crack Resistance (SP-NCTL)	ASTM D5397	1/Batch	hr	500
Oven Aging - % retained after 90 days	ASTM D5721	Per formulation		
HP OIT (min. avg.)	ASTM D5885		%	80
UV Res. - % retained after 1600 hr	ASTM D7238	Per formulation		
HP-OIT (min. avg.)	ASTM D5885		%	50
Low Temperature Brittleness	ASTM D746	Certified	°F	- 106
SUPPLY SPECIFICATIONS(Roll dimensions may vary ±1%)				
Roll Dimension - Width	-		ft	22.5
Roll Dimension - Length	-		ft	560
Area (Surface/Roll)	-		ft^2	12600

NOTES

1. Testing frequency based on standard roll dimensions and one batch is approximately 180,000 lbs (or one railcar).
2. Machine Direction (MD) and Cross Machine Direction (XMD or TD) average values should be on the basis of 5 specimens each direction.

* All values are nominal test results, except when specified as minimum or maximum.
* The information contained herein is provided for reference purposes only and is not intended as a warranty of guarantee. Final determination of suitability for use contemplated is the sole responsibility of the user. SOLMAX assumes no liability in connection with the use of this information.

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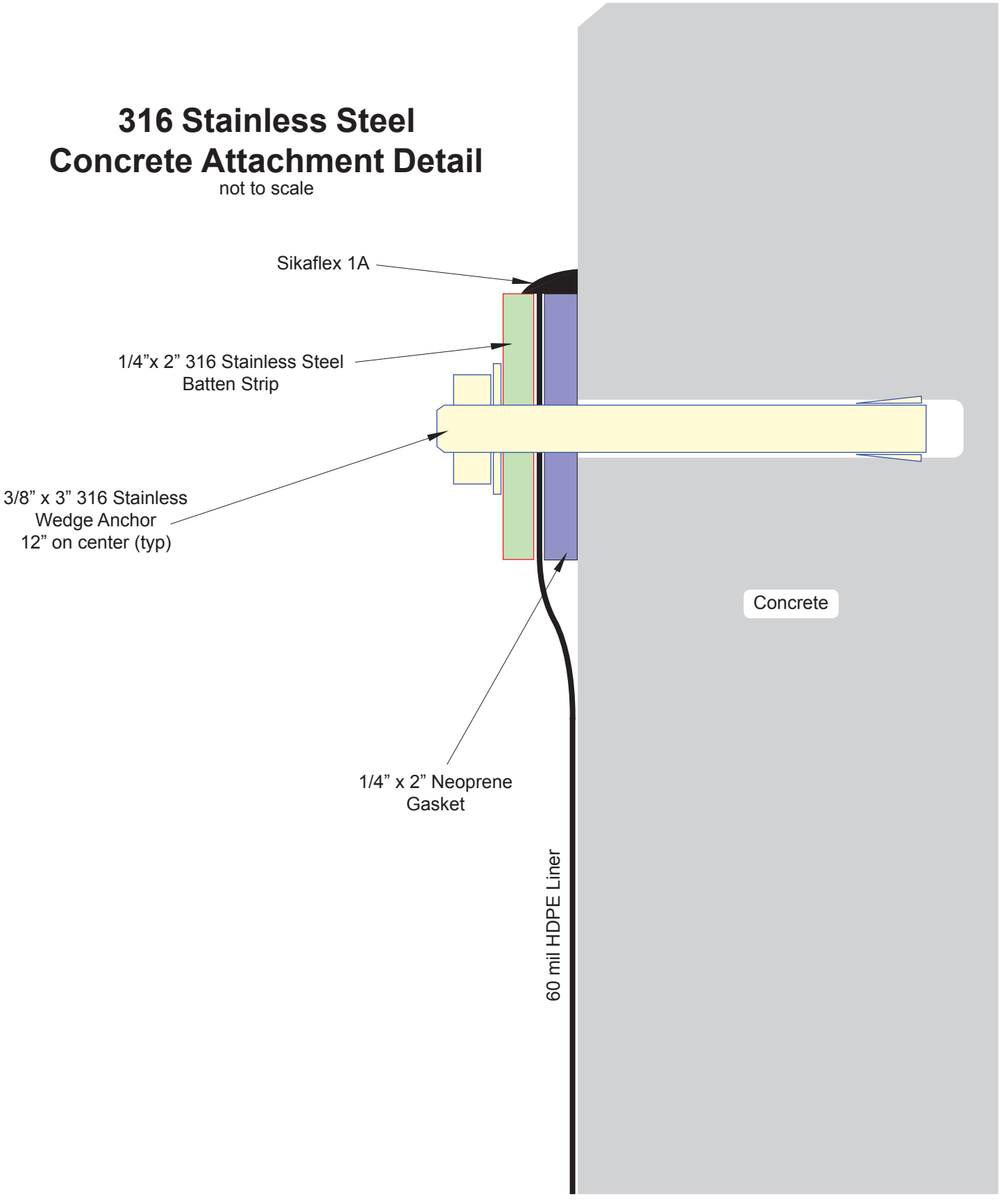
SOLMAX.COM

Revision date: 31-May-2018

ACF WEST CONSTRUCTION COMPANY, INC.
8951 SE 76th Drive, Portland, OR 97206 503-802-0319 Fax: 503-517-9096

316 Stainless Steel Concrete Attachment Detail

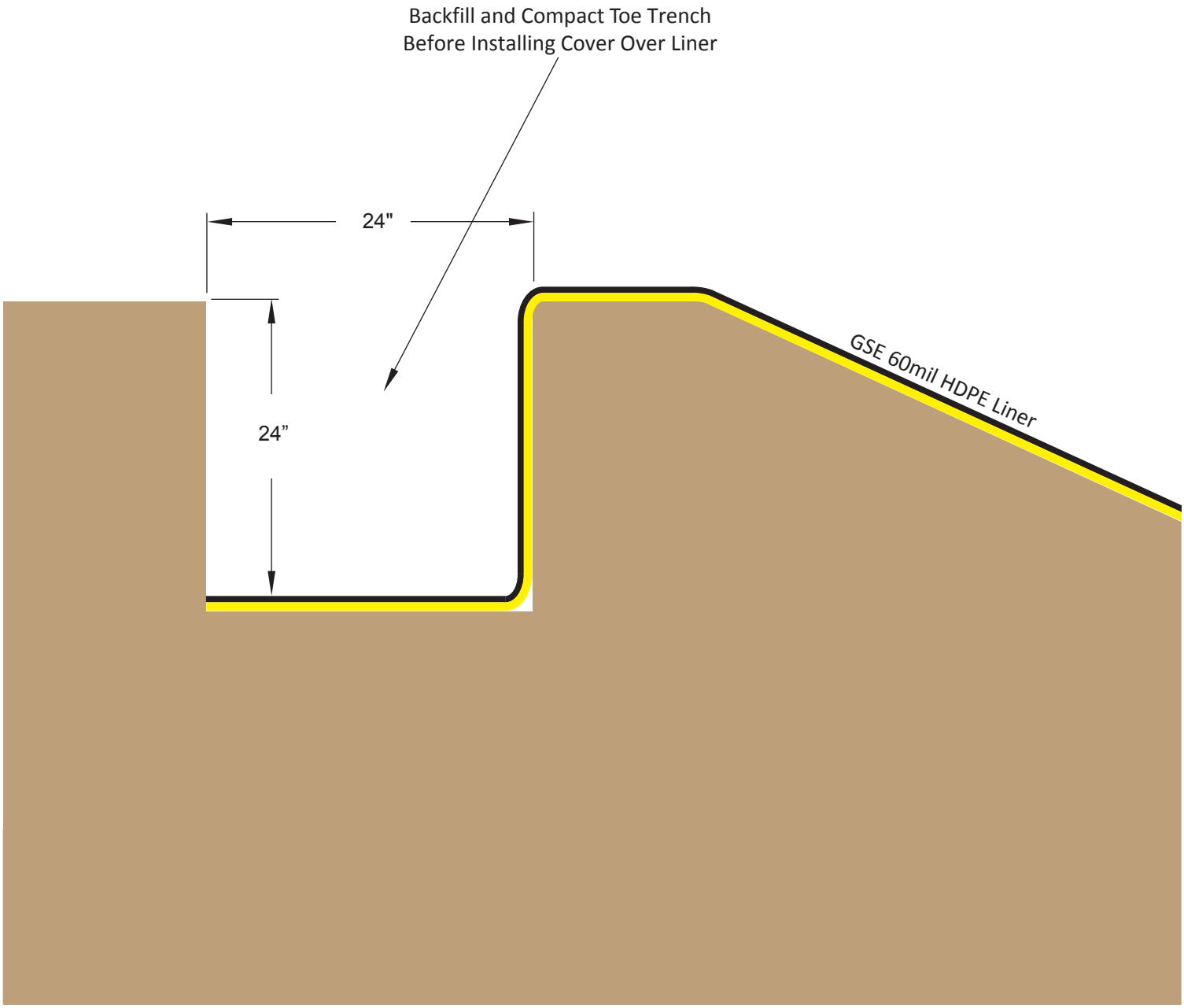
not to scale



ACF WEST CONSTRUCTION COMPANY, INC.
8951 SE 76th Drive, Portland, OR 97206 503-802-0319 Fax: 503-517-9096

Typical HDPE Anchor Trench Detail

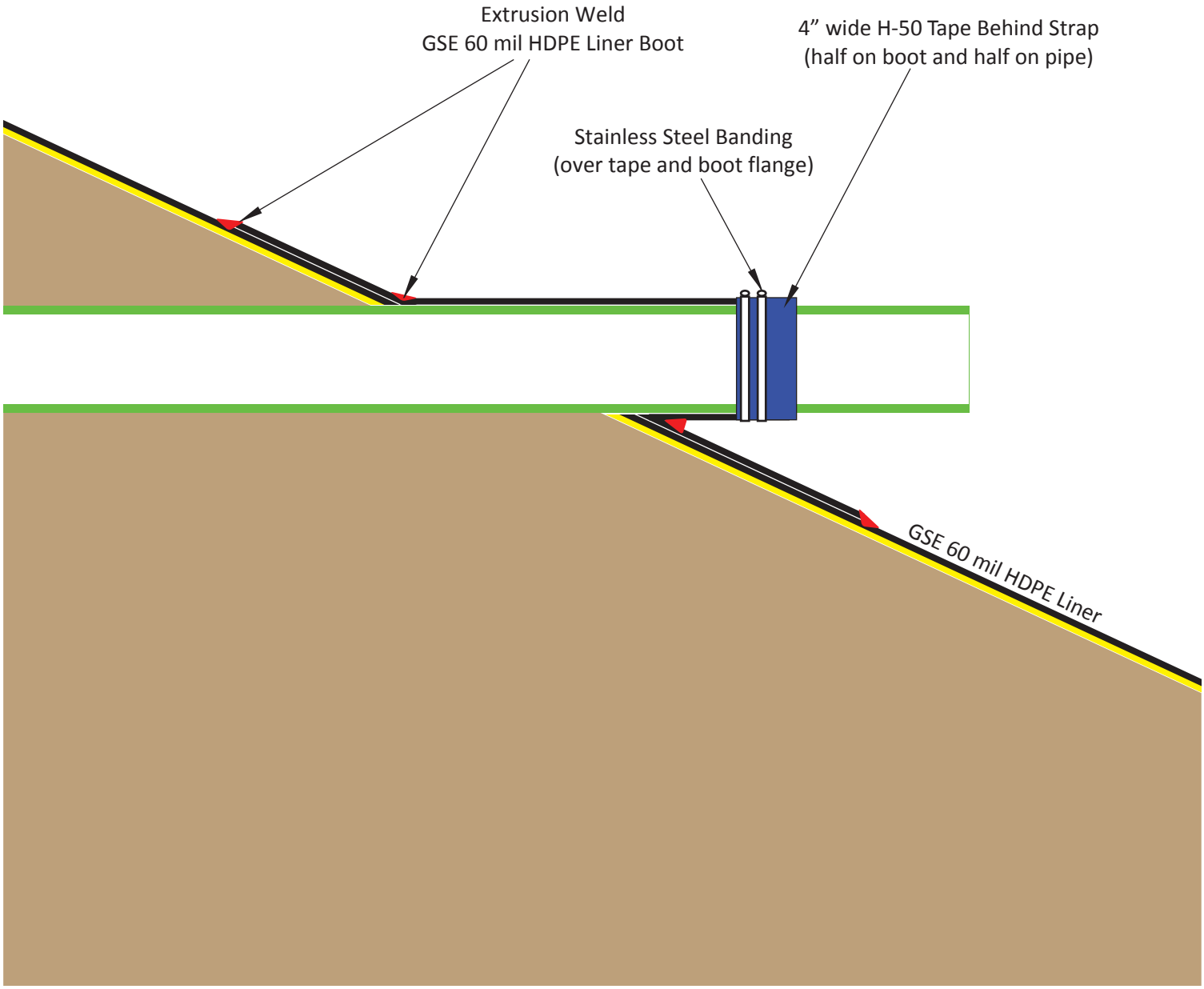
not to scale



ACF WEST CONSTRUCTION COMPANY, INC.
8951 SE 76th Drive, Portland, OR 97206 503-802-0319 Fax: 503-517-9096

Typical HDPE Boot Detail (Slope)

not to scale

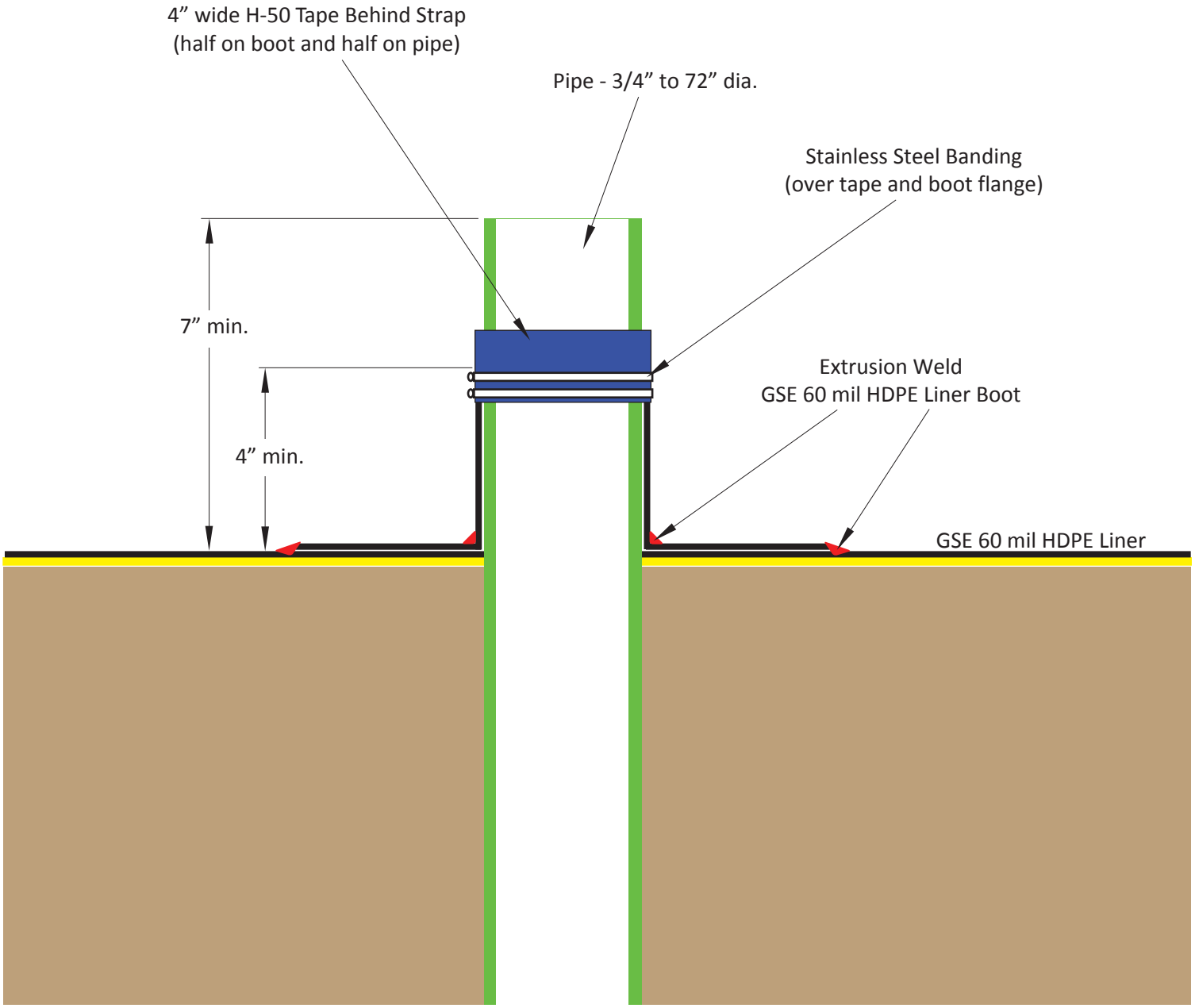


ACF WEST CONSTRUCTION COMPANY, INC.
8951 SE 76th Drive, Portland, OR 97206 503-802-0319 Fax: 503-517-9096

Typical HDPE Boot Detail

(90 Degree)

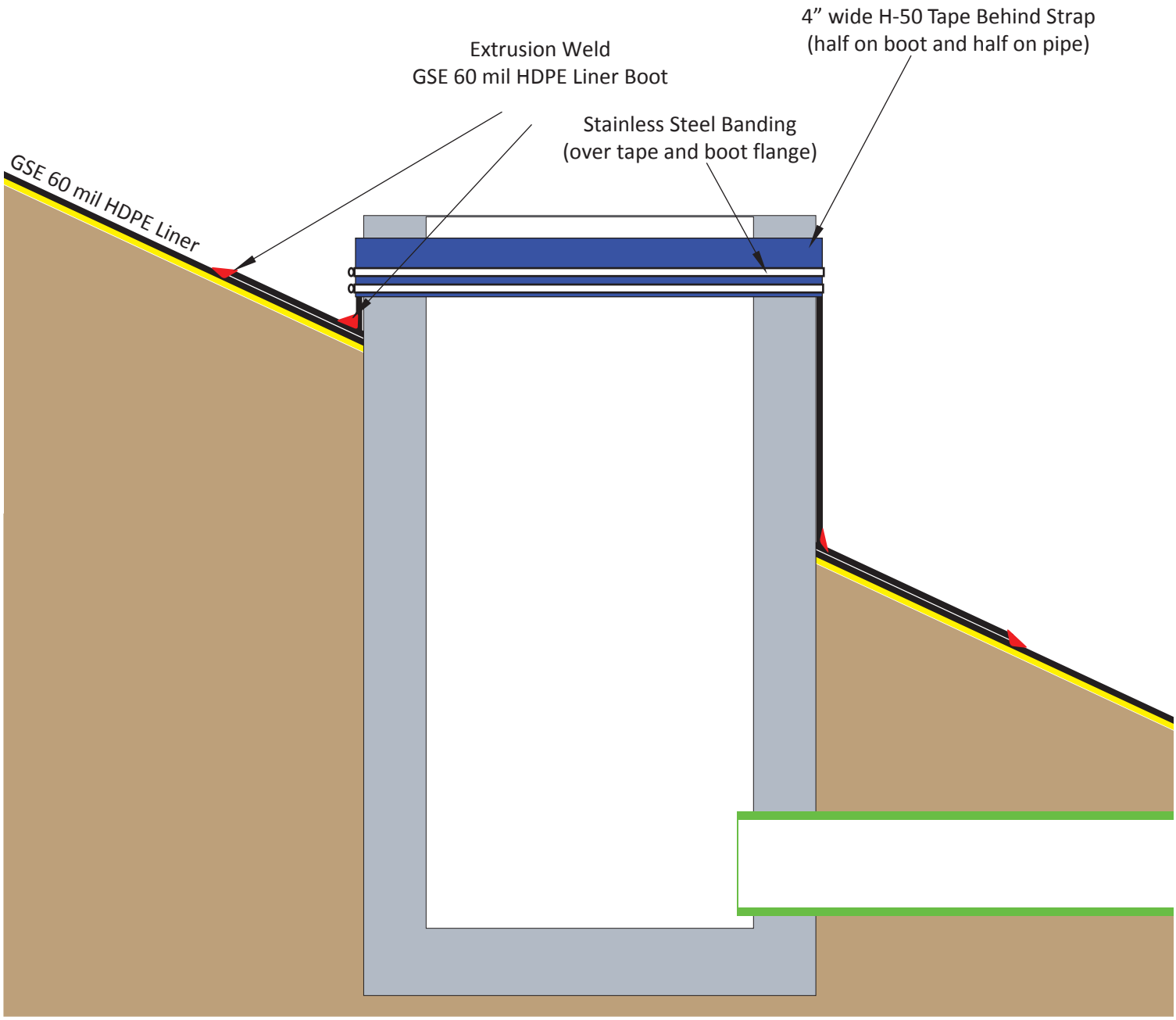
not to scale



ACF WEST CONSTRUCTION COMPANY, INC.
8951 SE 76th Drive, Portland, OR 97206 503-802-0319 Fax: 503-517-9096

Typical HDPE Manhole Boot Detail (Slope)

not to scale



Appendix D

CQA Documentation

D-1 Daily Field Logs

D-2 Construction Photographs

D-1

Daily Field Logs

ENGINEER'S FIELD REPORT

Site: Leichner LF
Project Name: NE 99th St.
Project No.: 04223030.10

SCS ENGINEERS

INSPECTOR: J. Faille	DATE: 6-15-23	FIELD REPORT No. 1

Work in Progress: Liner installation moving W → E, Nutter preparing subgrade in advance of liner crew.

Time	Description	Action	Inform
10:20	Arrive onsite, meet with CCPW, Luke (ACF West QAQC person) and welder J.H. (#13)		
11:00	Discuss anchor trench backfill w/ ACFW foreman Hans. Native material excavated from trench acceptable for backfill. Verified w/ TB.		
12:50	Walk area being prepped for liner. Some solid objects > 0.5" present, mainly crushed rock. Marked improvement over previously observed SG. * Observed that where new liner will tie-in to existing ~~&~~ the grading has created a trench up to 1' deep at tie-in. will confirm if this will be filled-in.		
1350	Call w/ Mike, provided update		
1450	Conversation w/ Bart then Hans. Mini-"trench" @ tie-in will remain, potential for ponding. ACFW will work on tie-in and penetrations Friday, no weekend work. Will likely return Thursday 6-22.		
15:20	ACFW secures liner, completes air testing, departs		

Attachments:

Action Code:

V	-	Item to Verify	R	-	Respondent	QA	-	Quality Assurance Consultant
I	-	Information Needed	E	-	Engineer	D		Driller
CI	-	Cost Impact	EC	-	Earthwork Contractor	S	-	Supplier
SI	-	Schedule Impact	GC	-	Geosynthetic Contractor			

Inspector's Signature _____

ENGINEER'S FIELD REPORT

Site:
Project Name:
Project No.:

SCS ENGINEERS

INSPECTOR: J. Faille	DATE: 6-15-23	FIELD REPORT No. 1

Work in Progress:

6

Time	Description	Action	Inform
1600	Perform site walk and observe subgrade work in progress. Segment 3 (W→E) prep underway, compaction performed with smooth drum roller. Surface is free of large rocks and other objects.		
	Concerns - Subgrade yet to be lined, contains fractured rock ranging 1" minus.		
	- SG soil is not moisture conditioned and appears very dry.		
	- No compaction tests performed and no test results provided.		
	- A "mini ditch" exists between prepared SG and tie-in location. This will be a local low spot in liner where water/saturated soil can collect.		
	Changes - SW collector inlets are now flush with liner. Collector inlet 1 (W→E) moved north, is now below existing liner tie-in elevation.		
16:30	Depart site.		

Attachments:

Action Code:

V	-	Item to Verify	R	-	Respondent	QA	-	Quality Assurance Consultant
I	-	Information Needed	E	-	Engineer	D		Driller
CI	-	Cost Impact	EC	-	Earthwork Contractor	S	-	Supplier
SI	-	Schedule Impact	GC	-	Geosynthetic Contractor			

Inspector's Signature J. Faille

ENGINEER'S FIELD REPORT

Site: Leichner LF
Project Name: NE 99th ST.
Project No.: 04223030.10

SCS ENGINEERS

INSPECTOR: J. Faille	DATE: 6-16-23	FIELD REPORT No. 2

Work in Progress:

Liner tie-in in first 2 "zones" (W→E) and work around penetrations.

Time	Description	Action	Inform
0730	Arrive onsite, work underway preparing for tie-in and penetration welding.		
0900	Tie-in welding begins. Fusion weld per plans/spec.		
0930	Meet with CCPW (Bart & Luke?) to discuss project. Issues w/ SG identified and acknowledged (fractured rock, rock > 9", compaction testing). + "mini-trench". CCPW instructs Nutter to address ALL issues. Compaction testing expected today or soon after.		
0950	Spoke w/ Gary (ACF West QC person), informed that 3 destructs were marked and are ready. Tie-in underway, no issues encountered. Liner fusion welded per plans.		
1110	Speak w/ Hans. Schedule moving forward is dependent on weather and other job that will be worked on Monday & Tues weather dep. Estimated 5 days of liner work remain @ LLF.		
11:28	Nutter ~~prepping~~ prepping SG for compaction testing, applying water.		

Attachments:

Action Code:

V	-	Item to Verify	R	-	Respondent	QA	-	Quality Assurance Consultant
I	-	Information Needed	E	-	Engineer	D		Driller
CI	-	Cost Impact	EC	-	Earthwork Contractor	S	-	Supplier
SI	-	Schedule Impact	GC	-	Geosynthetic Contractor			

Inspector's Signature J. Faille

ENGINEER'S FIELD REPORT

Site:
Project Name:
Project No.:

SCS ENGINEERS

INSPECTOR: J. Faille	DATE: 6-16-23	FIELD REPORT No. 2

Work in Progress:

11

Time	Description	Action	Inform
1145	Meet w/ Bart ~~Lee~~ @ NE corner of landfill. He inquires if liner cut & tie-in location can be moved up-slope to avoid trench and excavation (current tie-in location is deep). Bart provides compaction test results for roadway and surrounding soils. Tests are all >95% MDD but liner SG is disturbed/compacted and may be different material or mix of materials. Testing will take place Tuesday.		
1400	Extrusion work (patching & protrusions) continues. Fourth destruct DS-4 removed from tie-in. Trial welds (fusion & extrusion) verified, ~~now~~ values ~~passed~~ exceed requirements. Nutter continuing to prep subgrade. Fractured rock being removed (raked out) from 3rd zone (W→E)		
	Note from yesterday regarding ~~the~~ storm collector inverts being ~~flush~~ at liner grade was incorrect. Liner was sitting above SG and appeared to be flush, that is not the case.		

Attachments:

Action Code:

V	-	Item to Verify	R	-	Respondent	QA	-	Quality Assurance Consultant
I	-	Information Needed	E	-	Engineer	D		Driller
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SI	-	Schedule Impact	GC	-	Geosynthetic Contractor			

Inspector's Signature J. Faille

ENGINEER'S FIELD REPORT

Site:
Project Name:
Project No.:

SCS ENGINEERS

INSPECTOR: J. Faille	DATE: 6-16-23	FIELD REPORT No. 2

Work in Progress:

//

Time	Description	Action	Inform
1420	Seep observed @ SW area of zone 1 (NW corner of LF). Two plastic culverts under road atop liner.		
1620	ACFW preparing to depart, securing liner for weekend. Sand bags and soil used. Nutter continues to work on SG prep at E end (zone 4). Fractured rock removed from around storm collector. Some rock still present, will verify if acceptable. Weathering has exposed additional rock that was flush with surface.		
1645	Depart LLF		

Attachments:

Action Code:

V	-	Item to Verify	R	-	Respondent	QA	-	Quality Assurance Consultant
I	-	Information Needed	E	-	Engineer	D		Driller
CI	-	Cost Impact	EC	-	Earthwork Contractor	S	-	Supplier
SI	-	Schedule Impact	GC	-	Geosynthetic Contractor			

Inspector's Signature

ENGINEER'S FIELD REPORT

Site: NE 99th St.
Project Name: Leichner LF
Project No.: 04223030.10

SCS ENGINEERS

INSPECTOR: J. Faille	DATE: 6-22-23	FIELD REPORT No. 3

Work in Progress:

SG preparation, exposure of existing liner, panel installation.

Time	Description	Action	Inform
0730	Arrive onsite & meet with John (CCPW). Exposure of existing liner @ E end of site showed it to be anywhere from 1'-6' below SG of liner area. Discussion ~~as to~~ at tie-in via fusion welding or tuck per plans. Existing liner appears to have been damaged in many spots while being uncovered. SG prep continues, fractured rock & rock > 0.5" present. Nutter addressing by tossing clean soil over rock and compacting.		
1010	Meeting w/ CCPW to discuss liner installation @ SE end/area of LF. See email for pictures & details.		
1130	Meet w/ CCPW & Brad (Nutter Super). Communicate SCS suggested solution to tie-in issue. Agreed. -1' sand over ex. liner, tuck liner when continuous grade cannot be achieved. Backfill & compact thoroughly. Drain pipes 5' both directions place GT over sand, ~~E~~encapsulate w/drain rock, ~~ge~~GT, then tuck new liner. In		

Attachments: areas where SG ≥ 1.5' from ex. liner sand layer will be thinned to ensure new liner secured.

Action Code:

V	-	Item to Verify	R	-	Respondent	QA	-	Quality Assurance Consultant
I	-	Information Needed	E	-	Engineer	D		Driller
CI	-	Cost Impact	EC	-	Earthwork Contractor	S	-	Supplier
SI	-	Schedule Impact	GC	-	Geosynthetic Contractor			

Inspector's Signature _____

ENGINEER'S FIELD REPORT

Site: ~~Old~~ Leichner LF
Project Name: NE 99 ST.
Project No.: 24223030.10

SCS ENGINEERS

INSPECTOR: J. Faille	DATE: 6-22-23	FIELD REPORT No. 3

Work in Progress:

11

Time	Description	Action	Inform
1324	ACFW performing repairs on ex. liner in SE area. Nutter exposing liner for repair. Patches and other work continuing on new liner.		
1509	Conversation w/ Nutter. Change order "close enough" for work to resume per prescribed changes. ACFW continuing to repair/patch ex. liner in trench before sand can be placed. Nutter continuing to prepare sub-grade. No updates from CCPW.		
608	ACF West departs for the day. Liner secured and job site cleaned up. Nutter continuing work, digging AT along E end of work area.		
1630	CCPW + engineers onsite to evaluate project, right away major issues *potentially* identified. Grade appears to be incorrect, trapping water in some places. They will convene and determine what, if any, changes will be made moving forward.		

Attachments:

Action Code:

V	-	Item to Verify	R	-	Respondent	QA	-	Quality Assurance Consultant
I	-	Information Needed	E	-	Engineer	D		Driller
CI	-	Cost Impact	EC	-	Earthwork Contractor	S	-	Supplier
SI	-	Schedule Impact	GC	-	Geosynthetic Contractor			

Inspector's Signature _____

ENGINEER'S FIELD REPORT

Site: "
Project Name: "
Project No.: "

SCS ENGINEERS

INSPECTOR: J. Faille	DATE: 6-22-23	FIELD REPORT No. 3

Work in Progress:

"

Time	Description	Action	Inform
1640	Meet w/ Nutter, anchor trench position unclear along NE corner of ~~Site~~ liner area. Review plans and determine a straight line from current trench position (E edge) to endpoint of north AT.		
1650	Depart LLF		
1645 - Correction - ACF West was departing LLF			

Attachments:

Action Code:

V	-	Item to Verify	R	-	Respondent	QA	-	Quality Assurance Consultant
I	-	Information Needed	E	-	Engineer	D		Driller
CI	-	Cost Impact	EC	-	Earthwork Contractor	S	-	Supplier
SI	-	Schedule Impact	GC	-	Geosynthetic Contractor			

Inspector's Signature

ENGINEER'S FIELD REPORT

Site: Leichner LF NE 99th St.
Project Name:
Project No.: 04223030.10

SCS ENGINEERS

INSPECTOR: J. Faille	DATE: 6-23-23	FIELD REPORT No. 4

Work in Progress: - Re-grading of NE corner of site. Filling in low spot.
- ACF West working on testing, patching, and CPP boots.

Time	Description	Action	Inform
0900	Arrive onsite, meet w/ Haus. No new liner will be installed today due to regrading work and ~~for~~ existing liner not being ready for tucking of new.		
0940	Meet w/ John (CCPW) to discuss work. Plan is that Nutter will fill in low spot in NE corner & cover exposed ADS CPP. Grade will be 2% towards storm CB on E&W. So far Nutter & CCPW are clear on plan for liner & SG moving forward.		
1000	DS-5 & DS-6 marked, will be available Monday to ship out.		
1243	- Perform site walk. Re-grading underway, sand has been placed ~~in~~ atop EL and is being spread/compacted. ACF West continuing repair work. Will resume liner install Monday 07:30.		
1300	- Depart NE 99th St.		

Attachments:

Action Code:

V	-	Item to Verify	R	-	Respondent	QA	-	Quality Assurance Consultant
I	-	Information Needed	E	-	Engineer	D		Driller
CI	-	Cost Impact	EC	-	Earthwork Contractor	S	-	Supplier
SI	-	Schedule Impact	GC	-	Geosynthetic Contractor			

Inspector's Signature: J. Faille

ENGINEER'S FIELD REPORT

Site: LLF
Project Name: NE 99th ST.
Project No.: 04223030.10

SCS ENGINEERS

INSPECTOR: J. Faille	DATE: 6-26-23	FIELD REPORT No. 5

Work in Progress:

SG Prep, liner installation @ E end.

Time	Description	Action	Inform
0730	Arrive onsite. Nutter and ACF west preparing to begin work for day. Sand is placed on EL but rock burrito has not been constructed @ NE corner of LLF. Grading complete just south of NE 99th St.		
0805	Speak w/ Nutter, ACF west, & CCPW - all members clear on what will happen moving forward. - Exposed LF drain pipe will be racked and wrapped (1.5" round rock). Protrusions will be taped, wrapped (w/GMB) and steel banded.		
1030	Discussion w/ Nutter, GM will be installed right up to and slightly under sidewalk (E end)		
1619	ACF West wrapping up securing liner for night. All available ~~panels~~ liner deployed, crew short by about 60'. Additional liner will arrive tomorrow. Drain burrito installed, modified tuck underway. Liner being trimmed to far-toe of trench on LF side.		
1630	Depart LLF		

Attachments:

Action Code:

V	-	Item to Verify	R	-	Respondent	QA	-	Quality Assurance Consultant
I	-	Information Needed	E	-	Engineer	D		Driller
CI	-	Cost Impact	EC	-	Earthwork Contractor	S	-	Supplier
SI	-	Schedule Impact	GC	-	Geosynthetic Contractor			

Inspector's Signature

ENGINEER'S FIELD REPORT

Site: LLF
Project Name: NE 99th Street
Project No.: 04223030.10

SCS ENGINEERS

INSPECTOR: J. Faille	DATE: 6-27-23	FIELD REPORT No. 6

Work in Progress: Liner installation - far East end and North edge along future 99th sidewalk.

Time	Description	Action	Inform
1000	Arrive onsite, check on progress w/ Haus. Begin updating panel logs.		
1030	DS-10 marked, this should be last destruct.		
1200	Meet w/ Bart w/ CCPW. I identify issue with Filling over wrinkles in liner, Bart requests information he can provide/enforce to Nutter to ensure liner is filled over properly.		
1500	Discussion w/ Brad (Nutter) and John (CCPW) topsoil excavation will begin shortly, will be stockpiled near W end of zone 1. operators instruded to keep objects (grass, rocks, wood) out of fill material. Nutter & CCPW clear about wrinkles, aknowledge that folding/creasing is not allowed and that cutting and capping wrinkles may be neccessary. Destructs will be shipped out today (current plan)		
1630	ACF Depart's for day. Cover soil being placed in stockpiles looks good. Some rocks present but very few if any rocks, no construction materials or waste present.		

Attachments: 16:40 - Depart NE 99th St.

Action Code:

V	-	Item to Verify	R	-	Respondent	QA	-	Quality Assurance Consultant
I	-	Information Needed	E	-	Engineer	D		Driller
CI	-	Cost Impact	EC	-	Earthwork Contractor	S	-	Supplier
SI	-	Schedule Impact	GC	-	Geosynthetic Contractor			

Inspector's Signature J. Faille

12 6-28-23 LLF/NE 99th 1/2

0940 - Arrive onsite
- Filling operations underway, soil is good but many wrinkles present.

1020 - Conversation w/ Brad, Brad (Nutter), and John (CCPW).
B-Brad angry that work has stopped, I explain I do not have stop-work authority.
B-Brad orders work to resume. Proceeding with building fat road through center (W→E) and spreading N and S. B-Brad says Bart (CCPW) want allow them to spread soil S→N because they aren't allowed to drive on access road.
- DS-11 marked, all destructs marked.

1130 - Meet Braydon Raposo w/ SCS onsite and begin orientation and training. Will meet BR back onsite Thursday 8:00 AM.

6-28-23 2/2 13

1300 - Discussion w/ Bart. Walk site and show condition of liner. CCPW wants to know why ACF West did not install liner in such a way as to avoid excessive wrinkling.

1433 - FoNan up w/ Bart. Nutter will resume filling @ 6:30 AM Thursday. They will fill from S to N and will cut and cap any wrinkles that cannot be walked out.

1636 - ACF West Departs NE 99th.
- Destruct samples provided prior to departure.

1640. SCS departs NE 99th.

Rite in the Rain.

6-29-23 NE 99th St. 1/4

0630 - Arrive onsite, no work being performed, proceed to inspect liner.

0646 - Liner is smooth, ideal for filling / spreading work with very little chance of folding. T= 57°F per FISO, 61°F NOAA.
* Check overnight low *

Lucas Bar 564 653 2374 M
John Tunninga 360-635-2479

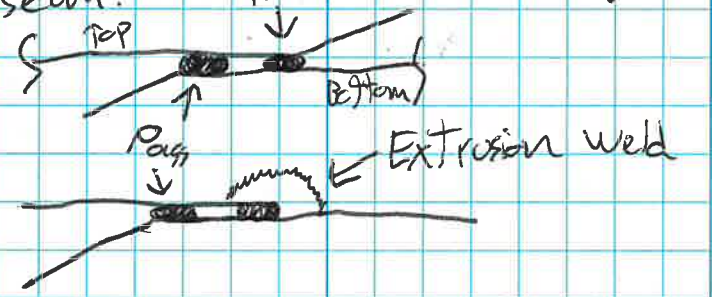
0940 - Discussion w/ Bart and John T w/ CCPW. They are informed that SCS is unavailable Friday and Monday, CCPW will provide coverage. I will assist remotely if needed. Soil placement looks good, operators rolling soil w/ dozer and placing with mini-ex. Liner expanding rapidly as day heats up. Fill soils looks good.

6-29-23 2/4

we will
- Inform CCPW
- Write email
- Train CCPW staff

1219 - Destructive seam lab results received, all good except DS-10, which had side A peel strength of 56 (avg) and Non-FTB NSF failure code for all 5 coupons.

1300 - Discussion w/ Jeff, Hans & JR. Two field coupons taken NS of DS-10 failed peel tests, decision is to repair entire seam. ACF West proposes cutting excess off fusion weld, grinding, then extrusion welding seam.



16 6-29-23 NE 99th St. 3/4

1400 - Extrusion welding repair of DS-10 seam going well. Sample pulled for field verification of weld ~~strength~~ strength. Weld visually appears excellent.

1435 - Repair of DS-10 weld nearly complete. Liner is being trimmed, grinded, and welded as described prior.

Soil placement @ W end continues. Some large wrinkles have developed and one is beginning to fold over.

1441 - Nutter operator Bristo made aware of large wrinkles present near mound (21-M-22), said not much more soil will go over there. Advised to not move any more soil in that area until morning when liner has contracted.

6-29-23 4/4 17

1600 - Hans provides test coupons from DS-10, P_1 = 105 psi, P_2 = 109 psi, Shear = 147 psi

- Repair complete, looks good.

1620 - ACF West has departed, soil placement continues. Soil being spread from W → E with soil being stockpiled in "zone 2" just N of access road. Wrinkles are present and some are being folded over. ↑ likely

- Brief conversation w/ Bristo (dozer operator). He states that no more soil will be pushed ~~East~~ East, they will focus on fine grading and stockpiling.

1630 - SCS departs LLF

Rite in the Rain

ENGINEER'S FIELD REPORT

NE 99th Street Construction
Leichner Landfill
Project No. 04223030.10

SCS ENGINEERS

INSPECTOR: B. Rapozo	DATE: 7/5/23	FIELD REPORT No.

Work in Progress: Liner covering near ~~East~~ corner

Time	Description	Action	Inform
0645	Arrived onsite, met with John and crew; will begin work on ~~tarp~~ liner covering at 0730 post-safety meeting.		
0812	Spoke with John: There was confusion with the crew on a starting time. Still waiting for dozer operator. John (CCPW) mentioned a liner was ripped on thursday at the base of the Western Knob hill. They are planning to continue covering in case of another rip to allow ACF West to fix any additional ~~rips at the same time~~ BR damage that may occur.		
0940	Observed a 6-inch tear in old liner on the Eastern most mound near corner. Nutter crew member said to mention it to Jeff. Texted Jack from SCS regarding the tear		
1045	Spoke with John and Luke (CCPW) regarding old liner tears. Will need to speak to Mike Davis about this. - John mentioned a meeting tomorrow (7/6) with Mike and Bart about construction of the surface road along the drainage.		
1105	Called Steve about old liner repairs; he said this would be in the discussion tomorrow		

Attachments:

Action Code:

V	-	Item to Verify	R	-	Respondent	QA	-	Quality Assurance Consultant
I	-	Information Needed	E	-	Engineer	D		Driller
CI	-	Cost Impact	EC	-	Earthwork Contractor	S	-	Supplier
SI	-	Schedule Impact	GC	-	Geosynthetic Contractor			

Inspector's Signature B Rapozo

ENGINEER'S FIELD REPORT (CONTINUATION PAGE)

NE 99th Street Construction
Leichner Landfill
Project No. 04223030.10

SCS ENGINEERS

INSPECTOR: B. Rapozo	DATE: 7/5/23	FIELD REPORT No.

Time	Description	Action	Inform
1240	Liner beggining to fold at Eastern ditch in multiple places.		
1250	Spoke with Luke, he believes these won't be an issue as soil with fill any gaps along the ditch		
1330	Crew used excavator to grip the cut edges and flatten the wrinkles.		
1403	Crew straightened out large wrinkles via pulling the liner from the tapered corner using the escavator.		
1540	Crew covered soil up to far corner.		
1650	Beginning cleanup		
1730	Departing site with Nutter		

ENGINEER'S FIELD REPORT

NE 99th Street Construction
Leichner Landfill
Project No. 04223030.10

SCS ENGINEERS

INSPECTOR: B. Rapozo	DATE: 7/6/23	FIELD REPORT No.

Work in Progress: Covering liner; developing grade

Time	Description	Action	Inform
0745	Met with liner crew, beginning work on covering liner North of service road		
0810	Discused a noticable, large wrinkle on Eastern edge of the service road. Will likely be unable to flatten it out and may need to cut ~~of~~ out the excess material and seated once they develop the road.		
0828	Sharp plant roots, trash in latest soil deliveries.		
0842	Small fold found sticking up from the dirt near Western edge of the undeveloped service road. Took photos and will discuss soon.		
1002	Spoke with John and Luke regarding fold. John theorized folding occured due to the location being a high point and a hinge between two slopes.		
1022	Mike Davis, Melissa from CCPH, and Simon joined Bart, John, Luke, and I for discussion over soil, the service road and wrinkles in the liner. Simon (SCS) also present. - Melissa noted sharp rocks in the material near meeting site. Unusual as recent loads have been clean besides previously noted. Cleaning rocks out of material and photographing		

Attachments:

Action Code:

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I	-	Information Needed	E	-	Engineer	D		Driller
CI	-	Cost Impact	EC	-	Earthwork Contractor	S	-	Supplier
SI	-	Schedule Impact	GC	-	Geosynthetic Contractor			

Inspector's Signature BRapozo

ENGINEER'S FIELD REPORT (CONTINUATION PAGE)

NE 99th Street Construction
Leichner Landfill
Project No. 04223030.10

SCS ENGINEERS

INSPECTOR: B. Rapozo	DATE: 7/6/23	FIELD REPORT No.

Time	Description	Action	Inform
1058	Latest soil deliveries: - Dry relative to earlier loads - Large compressed dirt mounds, can be mistaken as rocks		
1200	Spoke with Jack (SCS) updating him on the progress - Wrote an email detailing situation to everyone - Noted progress on coverage. As of noon the liner has been entirely covered. Crew is working on developing drainage relief and filling remaining material in ditches		
1524	Spoke with Tiffany Andrews (SCS) on the phone about snapping photos of the drainpipes		
1555	Sent photos of all the drainpipes to John, Greg, Jack, Louis and Tiffany. Slighty exposed liner under pipe second from the Western most drainpipe.		
1607	Departing site.		

7/20/23 99th St Drainage 1130 Sunny 75°F

Eastern Most:
No gap between dirt and invert (bottom of pipe)

2nd: Drainpipe has no gap
new pipe installed by Steve has 3.5 in gap

3rd: Exposed liner under pipe
Pipe ↔ Liner separation of 6.5 in

Steve's pipe has 7.0 in separation

4th: No gap between liner, dirt, and drainpipe

Steve's pipe has ~4.0 in separation

Scale: 1 square = _____

Scale: 1 square = _____

D-2

Construction Photographs

June 15th, 2023: Deployment of geomembrane liner over prepared subgrade.

June 15th, 2023: Preparation of subgrade for liner deployment.

June 22nd, 2023: Stormwater ponding on liner after weekend rains.

June 22nd, 2023: Exposed existing Landfill cover liner in northeast corner of Landfill.

June 22nd, 2023: Detail of sand layer atop Landfill cover liner.

June 22nd, 2023: Exposed corrugated plastic drain pipes above Landfill cover liner.

June 22nd, 2023: Repairs to existing Landfill cover liner.

June 23rd, 2023: Sand layer placed atop exposed existing Landfill cover liner.

June 26th, 2023: Preparation of subgrade for geomembrane deployment in northeast corner of Landfill.

June 26th, 2023: Installation of drain rock around exposed corrugated plastic drain pipes.

June 26th, 2023: Geomembrane deployed in northeast corner of Landfill (east end of stormwater conveyance liner system).

June 27th, 2023: Large wrinkles developing in deployed liner due to thermal expansion of HDPE.

June 27th, 2023: Geomembrane cover layer soil.

June 27th, 2023: Storm collector pipe penetration HDPE boot.

June 28th, 2023: Placement of cover layer soil.

June 29th, 2023: Spreading of cover layer soil, wrinkles in geomembrane being "walked" to anchor trench where extra material can be removed.

June 29th, 2023: Deployed liner ready for placement of cover soil. Picture taken at 6:40 AM when air and surface temperature of HDPE liner coolest.

June 29th, 2023: HDPE boot sealing concrete manhole penetration in liner.

June 29th, 2023: Repair and patching of seam containing failed DS-10 destructive sample.

July 5th, 2023: Placement of cover soil layer in northeast corner of Landfill.

July 6th, 2023: Compaction of cover layer soil.

July 6th, 2023: Completed cover soil layer awaiting installation of turf reinforcement mat and hydroseed application.

July 20th, 2023: HDPE culvert installed to convey stormwater off of landfill underneath perimeter access road.