ADDENDUM NO. 1

The Construction of City of Fergus Falls Class I C&D Landfill Phase 3B Expansion – City Project #9774 Fergus Falls, MN

Date of Issue: Thursday February 20, 2025

Date of Bid Opening: Tuesday February 25, 2025 @ 2:00 p.m. CST

NOTICE TO ALL PLANHOLDERS:

Please insert this Addendum into your copy of the project Contract Documents.

The following changes and/or additions to the Contract Documents for the project are issued by the Engineer and shall have the same force and effect as though part of the original issue.

GENERAL/SUPPLEMENTARY INFORMATION:

- 1. The information included in this addendum has been provided to characterize the onsite soil materials for potential use on the project. The information detailed below includes exploratory and soil testing from adjacent Phase 3A construction and excavation operations to stockpile material from Phase 1 & 2 construction.
 - a. Phase 3A Construction Documentation. The material to construction Phase 3A was generated from the common excavation/cut of the project. The construction documentation memorandum has been redacted to include only the pertinent soil testing information (onsite clay materials) to reduce file size. **See Attachment A.**
 - b. Material gradations from Phase 1&2 excavation/stockpiling efforts. Please note that the Phase 1 & 2 soil information is limited as those phases were not constructed with a base liner system negating the need for detailed soil characterization. See Attachment B.
 - c. The Engineer will provide electronic surfaces files of the existing and proposed grading available to the CONTRACTOR upon request. To obtain the surface files the CONTRACTOR must submit a completed version of the attached "DISCLAIMER FOR THE USE OF ELECTRONIC MEDIA" form to Aaron Zigan at azigan@houstoneng.com

The provided files were generated and compatible with AutoCAD version 2025 in a .xml format. Houston Engineering, Inc will not manipulate the files in any way to provide compatibility to other software platforms and/or earlier version of AutoCAD. See Disclaimer Form provided in **Attachment C**.

<u>REVISIONS TO THE CONTRACT DOCUMENTS</u>:

- 1. <u>BID FORM</u>: The following revisions have been made to the BID FORM:
 - Revise item 13 Subgrade Correction (CV) to an amount of 6,167 CY
 - Add new item 31 Leachate Collection Repair Coupling with an amount of one (1) by Each
 - Add new item 32 Waste Excavation (LV) with an amount of 500 CY

Replace the Bid Form with the attached revised BID FORM (Rev 1) attached herein. See Attachment D.

REVISIONS TO THE SPECIFICATIONS:

Addendum No. 1 – City Project #9774

1. Section 01120 Special Provisions

- a. **Strikeout** the bulleted information following item B of Section 1.8 WATER FOR DUST CONTROL and **replace** with the following:
 - 3" hydrant meter at \$150.00 plus \$300.00 deposit + monthly fee \$105.75
 - Water usage will be subject to the following fee structure:
 - 0 to 75,000 gallon = \$4.10 / 1000 gallon
 - 75,001 to 300,000 gallon = \$4.49 / 1,000 gallon
 - 300,001 + gallon = \$4.87 / 1,000 gallon
 - If water usage, per the above schedule, results in a fee less than the \$300 deposit, the difference in value will be returned to the Contractor.
 - Example of refund (50,000 gallons = 50 x \$4.10 = \$205.00)
 - Refund = \$300.00 \$205.00 = \$95.00 refund to Contractor
- b. Add the following after Section 1.12 SUBGRADE CORRECTION item A:
 - B. In the event that insufficient quantities of materials, suitable for placement as re-compacted soil barrier layer, are not generated from the proposed common excavation anticipated from this project, alternative materials from onsite sources are available. These materials are located on the northern extents of the facilities property as shown on revised **Sheet C-1**. The CONTRACTOR shall assume these materials will be utilized to satisfy the anticipated volume of subgrade correction. A contract deduct change order, to account for reduced handling and hauling of materials will be processed if subgrade correction is completed utilizing excavated materials from within the common excavation project area. The determination regarding the suitability of the in-situ soil materials excavated from within the extent of the common excavation project area will shall be determined by the OWNER/ENGINEER in consultation with the CONTRACTOR.
- c. Strikeout the replace the second sentence of Section 1.13 GROUNDWATER UNDERDRAIN SYSTEM / GROUNDWATER UNDERDRAIN (PERFORATED) PIPING Part A item #3 with the following:

See spacing provided per perforations identified on Detail C of Sheet D-2

- d. Add the following after PART 1 GENERAL Item 1.16 CONTROL OF WATER:
 - 1.17 ALTERNATIVE CONNECTION TO EXISTING LEACHATE COLLECTION SYSTEM
 - A. The contract documents indicate connection of the existing and proposed leachate collection system via an electrofusion coupler. An electrofusion coupler is preferred if conditions allow for a quality installation. If conditions are not conducive to installation of an electrofusion coupler the Owner will allow for the connection be made via a repair coupling as specified below:
 - 1. ROMAC Industries, Inc. Alpha Restrained Joint Repair coupling or approved equal.
 - B. This connector will be bid as a separate item in the project solicitation documents. If this

connector is utilized a change order will be processed to account for the replacement of the electrofusion coupler from the LEACHATE COLLECTION TRENCH bid item.

- e. Add the following after PART 1 General Item 1.17 ALTERNATIVE CONNECTION TO EXISTING LEACHATE COLLECTION SYSTEM:
 - 1.18 WASTE EXCAVATION (LV)
 - A. This section includes removals of any waste which was discovered as result of excavation of the phase delineation berm and connection of the leachate collection system to facilitate tie-in of the proposed Cell.
 - B. The extent of waste excavation shall be determined with the OWNER/ENGINEER in consultation with the CONTRACTOR. Prior to any waste removal, the CONTRACTOR shall expose the extents of waste requiring removal and provide the ENGINEER with written notice of their intent to remove the waste materials. The CONTRACTOR shall not disturb the waste areas until the ENGINEER has completed a survey of the waste to be removed, and has directed the CONTRACTOR to proceed with the waste removal. Once the waste has been removed, the CONTRACTOR shall allow the ENGINEER to survey the removal area to determine a three-dimensional volume, which will be the basis of payment for the work completed under this special provision.
 - C. Any non-construction and demolition debris waste materials encountered by the CONTRACTOR shall be immediately reported to the ENGINEER and OWNER. Removal and disposal of non-construction and demolition debris waste materials shall be directed and paid for in a change order. The CONTRACTOR is responsible for any wind blow debris generated by waste excavation activities and shall provide means of preventing any wind blow debris from leaving the construction area, along with cleaning up any windblown debris generated by waste excavation activity prior to acceptance of the work.
 - D. Measurement: Work specified in this section will be measured in cubic yards (CY) based upon the engineer's surveyed volume based on a 3-dimensional surface. Payment: Payment will be made for the removed volume of waste in Cubic Yards (CY). Payment for this includes, but is not limited to, excavating, hauling, and placing removed waste into the adjacent Cell (Phase 3A), as directed by the ENGINEER.
- 2. <u>Section 02503 Storm Sewer System</u>
 - a. Add the text following after the last sentence of PART 2 PRODUCTS Section 2.1 item A: In lieu specific plan sheet designations piping shall consist of MNDOT Class III materials.
- 3. Section 02622 Leachate Collection System Piping
 - a. Add the text following to the header of PART 2 PRODUCTS Section 2.1 LEACHATE COLLECTION & CONVEYANCE PIPING: (IPS SIZES)

REVISIONS TO THE PLANS:

- 1. Replace the sheets, provided in Attachment E per the list below with the corresponding sheets per this addendum.
 - C-1 Overall Existing Site

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- C-9 Leachate Plan & Profile
- C-10 Point Schedule

All other requirements and stipulations of the plans and specifications shall remain in effect. The receipt of this addendum shall be acknowledged in the Bidder's Proposal.

HOUSTON ENGINEERING, INC.

By: ______ Dennis McAlpine, P.E. MN Reg. No. 46827

Attachment A - Phase 3A Construction Documentation Report (REDACTED)



Technical Memorandum

То:	Lisa Mojsiej, PE
	Minnesota Pollution Control Agency
	Chris McConn, PE
	Otter Tail County – Solid Waste Director
From:	Dennis McAlpine, PE
	Houston Engineering, Inc.
Сору:	Brain Yavarow, PE
	City Engineer - City of Fergus Falls, MN
Subject:	Fergus Falls LF Phase 3A Expansion
	Construction Activities and Soil Testing Summary
Date:	July 20, 2018
Project:	6018-0006

INTRODUCTION

The purpose of this memorandum is to provide a narrative of the construction activities and associated soil testing operations to document the construction efforts for Phase 3A at the Fergus Falls Class I C&D Landfill Facility (Project). This information is being submitted in advance of the final comprehensive documentation report to advance the MPCA's and Otter Tail County's review and ultimate approval for use of the Project. Remaining construction activities include the electrical work to complete installation of the leachate extraction and loadout pumping system. Upon completion of this work, the final comprehensive documentation report detailing all aspects of construction for Phase 3A expansion, including thickness documentation of the base liner system, asbuilt plans and construction photos will be submitted to the MPCA.

CONSTRUCTION ACTIVITIES

COMMON EXCAVATION

Common excavation operations were initiated in early May 2018. Topsoil materials were stripped with wheeled tractor scrapers and stockpiled adjacent to the excavation area. Within the footprint of the perimeter access road, the contractor discovered a significant volume of highly organic/peat-like (muck) materials. Test-pitting operations performed indicated a thickness of approximately 4-feet of muck material beneath the perimeter access road. The contractor was directed to remove the muck materials and replace with clay-type soil from onsite sources. The excavation of muck materials progressed into the western portion of the Phase 3A. The removal of muck and unsuitable materials from within the Cell boundary of Phase 3A was part of the subgrade correction for the base liner system.



Concurrent with muck excavation operations crews continued with construction of the stormwater pond west of Phase 3A. The materials from the pond excavation were utilized as fill to establish the west perimeter road embankment. Excess materials from excavation operations within the Cell were stockpiled on the eastern portion of the Phase 3A for later use as re-compacted soil barrier layer materials. Excavation operations were completed with two (2) Caterpillar wheeled tractor scrapers supported by two (2) Caterpillar D6 dozers and two (2) excavators.

SUBGRADE CORRECTION

As part of the contract documents and the facilities permit application it was anticipated that approximately 25% of the proposed liner area would require subgrade correction. The correction would accommodate the removal of sandy and/or gravel materials encountered near the landfill base grades.

As previously noted muck materials where encountered within the Cell boundary of Phase 3A. The depth of material encountered ranged from 0.5-feet to 9-feet. The deepest subgrade correction excavation was located near the landfill sump area. Beneath the excavated muck materials in this area, discontinuous sand lenses were exposed draining water into the excavation. As a result, and working in cooperation with the MPCA, a groundwater underdrain system was installed on the western side of Phase 3A to drain the observed water. All muck materials within the Cell were excavated and replaced with clay-type soil materials from onsite sources.

Beyond the limits of the muck excavation within the Cell, additional areas of sandy and/or gravel materials were observed at the elevation of the proposed base grades. To ensure the quality and ultimately the integrity of the proposed liner system, the City elected to conduct a 2.0-foot subgrade correction over the entire base grades (floor) of Phase 3A.

GROUNDWATER UNDERDRAIN SYSTEM

As part of subgrade correction operations, groundwater was encountered while excavating the base grades (floor) of Phase 3A. To alleviate concern of groundwater recharge near the landfill sump area, a groundwater underdrain system was installed. The underdrain system allowed for construction of the base liner system to proceed in dry conditions while providing a method to monitor any in-flow of groundwater adjacent the landfill sump.

The underdrain was installed on June 19, 2018 along the west side of the cell near the sump. The underdrain trench was placed using an excavator. As the trench was excavated, a geotextile fabric was placed with approximately 2-foot of overlap at all seams. A ³/₄-inch diameter rock was then placed in the trench along with the 8-inch perforated pipe. A vertical riser pipe was placed on the south end of the underdrain penetrating the surface of the phase delineation berm. To prevent rock from entering the pipe, a sock was placed over the underdrain piping as it was installed. Once the rock was placed and leveled, the geotextile fabric was wrapped overtop and overlapped before backfilling the trench.





The City will continue to monitor the level of water in the vertical riser pipe and pump as necessary to mitigate the potential for a head condition within the groundwater underdrain system. Details regarding operation and monitoring of the system will be provided with future documentation.

RE-COMPACTED SOIL BARRIER LAYER

Placement of the soil barrier layer occurred prior to the installation of the groundwater underdrain system along the west slope of phase 3A. Soil barrier layer construction was initiated on June 9, 2018. Originally, the plans and specifications denoted two separate methods for the construction of the soil barrier layer depending on the base soil suitability. All unsuitable material would be removed and replaced with a 2-foot recompacted soil barrier layer. All suitable material would be scarified and recompacted in place a minimum of 8-inches below the surface. Initially it was estimated that 25% of the soil barrier layer would be considered unsuitable material and require the 2-foot correction. However, during construction it was determined that the subgrade correction would occur over the entire base (floor) of Phase 3A. The northern side-slope of the Cell was constructed utilizing the 8-inch re-compacted in-place method.

The soil barrier layer construction was completed in multiple lifts with each lift having a compacted depth of 6inches. Soil barrier material was hauled from the adjacent stockpile comprised of select materials previously excavated from the Cell. The select materials were chosen based on soil properties and source test results.

The soil barrier layer materials were placed in (loose) lifts using two scrapers. Once placed the liner material was disced and watered. The material was allowed to absorb the water prior to compacting. The base grades in phase 3A were compacted using a sheep's-foot vibratory compactor. Multiple passes were competed prior to observing compaction tests.

Each lift was tested on a 100-foot grid as specified in the minimum testing requirements. Tests performed on each lift included atterberg limits, particle size distribution, soil classification, percentage fines, density, moisture, proctors, and permeability. Samples were taken for each lift at a location determined on the grid where a moisture/density test had occurred. Samples were obtained randomly throughout the different lifts.

SAND DRAINAGE LAYER

Following installation of the soil barrier layer, the sand drainage layer was installed. The sand drainage layer consisted of a 12-inch layer of sand. The sand was hauled onto the project site and then deposited into stockpiles adjacent to landfill cell. Extra care was taken to avoid contaminating the sand with the existing native materials. The sand was installed by an excavator loading an off-road truck that remained in the cell to reduce the amount of native material being tracked into the cell.

LEACHATE STORAGE, COLLECTION & CONVEYNACE SYSTEMS

STORAGE SYSTEM

The leachate tank and manway access arrived onsite on May 16, 2018. Upon arrival the tank and manway were visually inspected for defects in construction. Except for a few minor coating chips, the tank and manway were in excellent condition. The areas where the outer coating was chipped showed no damage to the fiberglass. Communication with the tank supplier confirmed that the tank integrity would not be affected by the



scrapped coating. In addition, the tank vacuum was inspected and found to adequately hold pressure between the inner and outer walls.

The tank and manway components were unloaded from the delivery trucks by utilizing the hoisting hooks provided. The unloading and temporary staging of the tank and manway resulted in no physical damage to either component.

The excavation for the tank was completed prior to the delivery of the tank. The excavation was separated from the landfill road by utilizing construction cones provided by the City of Fergus Falls. There were not safety concerns during the entire excavation process. The excavation was completed utilizing safety benches to mitigate concerns with slope failure. Throughout the tank installation process no water was encountered in the excavation.

Prior to placing the tank, the subgrade was compacted using ramex and jumping jack compactors. Onsite sand was used for bedding of the tank. The hoisting hooks were once again used to lower the tank into the excavation with a truck crane. Once lowered into the excavation the tank remained strapped to the crane while the first few lifts of sand backfill were added. Once the sand reached an elevation where it could support the tank, the straps were unhooked, and the crane was removed. Extra care was taken when compacting around the tank not to strike or damage the tank. Only small compactors such as a jumping jack and ramex compactors were used near the tank. The manway was secured to the tank utilizing the manufacture provided bolt set. The piping connecting into the manway included a dual walled HDPE piping. The inverts and bearings were set to plan grades.

COLLECTION SYSTEM

The leachate collection trench was excavated to grade on June 21, 2018. Trench excavation was completed by using gps (machine controlled) equipment. The trench was sloped to allow leachate to drain to a sump located within the cell on the west edge. Once completed, a non-woven geotextile filter fabric was placed in the trench. The geotextile fabric was installed to provide a 3-foot overlap at all transitions. The specifications originally required washed stone to be installed within the trench however, a ³/₄-inch diameter rock was installed due to availability. To mitigate the potential for the smaller rock particles clogging the perforations of the collection pipe, a geotextile pipe wrap was placed around the leachate collection pipe. The rock was placed such that there would be 4 inches of rock between the pipe and the fabric to allow sediment to be deposited beneath the pipe.

The leachate collection pipe specified was an 8-inch HDPE. The leachate collection pipe was fused together outside of the cell. Visual inspection of the fusions showed no flaws. The leachate collection pipe was transported into Phase 3A by dragging the pipe across the work area. No damage to the pipe occurred during the transportation into Phase 3A. A tee was placed in the leachate collection pipe that runs along the west edge of the cell. The tee will serve as an access port to the leachate collection pipe. Cleanouts have been installed along north edge of the landfill and within the riser structure. In addition to the 8-inch HDPE leachate collection pipe, an 18-inch HDPE riser pipe was installed to pump leachate to the underground leachate storage tank. The leachate pipe was backfilled with ³/₄-inch diameter rock. The rock was spread evenly throughout the trench and leveled with an excavator. Once fully filled with ³/₄-inch diameter rock, the trench was covered with the same geotextile as used previously. The fabric was overlapped in the same manner as before.





CONVEYANCE SYSTEM

The leachate piping outside of the landfill cell consisted of dual walled HDPE. The piping was routed from the landfill Phase 3A to an underground leachate collection tank. The piping was such that if there was a puncture in the internal pipe, the leachate would be collected and routed to the downstream manhole. For this reason, the internal pipe did not terminate at the manhole structures while the external pipe terminated at each manhole.

Installation of the leachate riser structure began on July 12, 2018. Before the riser structure could be set in place the contractor excavated a trench between the leachate sump riser discharge pipe and the access manhole. The penetration in the rear wall of the riser structure was enlarged to accommodate the angle of the 18-inch HDPE riser pipe intersecting the structure. The pump string was assembled onsite with 130' of 2-inch flexible hose and safety cable. A stainless-steel pitless adapter was installed approximately 6-feet down the 18-inch riser pipe using an 8-foot work pipe.

CONSTRUCTION QUALITY ASSURANCE

The soil materials were tested to verify that the Phase 3A liner and associated components at the Fergus Falls Class I C&D Landfill Facility were constructed in substantial conformance with the project specifications.

In accordance with the project specifications, the Contractor was required to provide source test data for the materials used to construct Phase 3A (source testing or construction quality control (CQC) tests). The materials were tested for the parameters identified in the project specifications. In instances where CQC test results revealed consistent results, the Engineer reduced the CQC testing frequency, relieving the Contractor of further testing obligations for the specific material type.

Houston Engineering, Inc. and its subconsultants (Braun Intertec and Soil Engineering Testing) on behalf of the City, conducted assurance testing of placed materials (confirmation testing or construction quality assurance (CQA) tests) for the required parameters as indicated in the testing procedures in the project specifications.

CONTROLLED FILL

As a requirement of the project specifications, controlled fills were tested to ensure adequate density was attained to support construction of various project features. These areas primarily included the western embankment of the perimeter access road and portions of the landfill base grades as a component of the muck excavation and subgrade correction operations. A summary of the controlled fill tests observed as a component of Phase 3A construction is included in **Attachment A**.

RE-COMPACTED SOIL BARRIER LAYER

The Contractor provided six (6) test to satisfy the soil barrier layer CQC requirements for Atterberg limits, particle size distribution, soil classification, percentage of fines. The contractor tests were extracted from locations throughout the site. One of the six tests locations (west borrow pit) produced failing results. Only the material

6901 EAST FISH LAKE RD, STE 140 | MAPLE GROVE, MN 55369

HoustonEngineering Inc.



that passed the project specifications was used for the soil barrier layer. The Contractor also provided six (6) tests throughout the site to satisfy the soil barrier layer CQC test requirements for standard proctor and permeability. Three of the permeability samples failed the initial testing. Materials from these areas were not utilized for liner construction.

The CQA testing resulted in many of the moisture/density tests being within the testing parameters. Areas that were not within testing parameters were reworked. The reconstruction effort required additional CQA testing to satisfy the nuclear density and moisture, and the permeability test requirements for the soil barrier layer for the base liner system. The CQA test results to characterize the material were not duplicated with the reconstruction effort. The cause of the reworking was not a product of unsuitable materials but rather a construction technique (low moisture).

In total, fifty-four (54) nuclear density and moisture content tests were observed and documented throughout Phase 3A Expansion (side-slope and base liner), for both the initial construction and reconstruction efforts. Seven (7) nuclear density and moisture tests were duplicated to satisfy the project specified CQA testing requirements. Two (2) failures were documented. The failing areas coincided with grid-point locations H-13 lift 2 (test #29) and H-13 lift 4 (test #43). Other areas that were failing but outside of the 2-ft barrier layer were represented by grid-point locations F-15 (test #122), H-15 (test# 123), and J-13 (test 125). These areas were all re-worked and re-tested. In total, forty-nine (49) passing nuclear density and moisture tests were observed and documented.

A total of fourteen (14) CQA permeability samples (in-place) were extracted and analyzed to satisfy the soil barrier layer CQA requirements. Of the twelve permeability tests, only one test failed. Two tests were resampled at the failure point along grid-point J-13 lift 4. Results of the retests indicated acceptable results.

A summary of the required tests and the actual tests taken for the soil barrier layer is provided below. Individual results for the tests are included in **Attachment B**.

Test	CQC Anticipated Tests	CQC Tests Taken	CQA Anticipated Tests	CQA Tests Taken
Atterberg Limits (ASTM D4318)	2	4	8	10
Particle Size Distribution (ASTM D422)	2	4	8	10
Soil Classification (ASTM D2487)	2	4	8	10
Percentage of Fines (ASTM D1140)	2	4	8	10
Nuclear Density & Moisture (ASTM D6938)	Contractors Discretion	0	38	54

RE-COMPACTED SOIL BARRIER LAYER TEST SUMMARY Fergus Falls Landfill Phase 3A Expansion



Test	CQC Anticipated Tests	CQC Tests Taken	CQA Anticipated Tests	CQA Tests Taken
Standard Proctor (ASTM D698)	2	4	3	3
Permeability (ASTM D5084)	2	5	6	14

SAND DRAINAGE LAYER

The Contractor provided three (3) tests to satisfy the sand drainage layer CQC requirements for permeability, particle size distribution and soil classification. The results were consistent with the project specifications. Samples were taken randomly from the stockpile over the construction of the sand drainage layer. The Owner extracted and analyzed three (3) CQA tests for permeability, all of which were consistent with the project specifications. The Owner extracted and analyzed a total of three (3) CQA tests for particle size distribution and soil classification. All the samples were within the project specifications. Samples were taken randomly throughout the construction of the sand drainage layer.

A summary of the required tests and the actual tests taken for the sand drainage layer is provided below. Individual test results are included in ATTACHMENT C.

Test	CQC Anticipated Tests	CQC Tests Taken	CQA Anticipated Tests	CQA Tests Taken
Permeability (ASTM D2434)	2	3	3	3
Particle Size Distribution				
(ASTM D422)	2	3	3	3
Soil Classification (ASTM				
D2487)	2	3	3	3

SAND DRAINAGE LAYER TEST SUMMARY Fergus Falls Landfill Phase 3A Expansion

LEACHATE COLLECTION ROCK

The Contractor provided passing CQC test data for particle size distribution and soil classification as required. The Owner extracted and analyzed one (1) sample for particle size distribution and soil classification. The results were consistent with project specifications. A portion of the aggregate was replaced around the sump to increase permeability and reduce the probability of the unit clogging. No tests were completed on the larger aggregate.



A summary of the required tests and the test results for the leachate collection rock is provided below. Individual results are included in **ATTACHMENT D**.

Test	CQC Anticipated Tests	CQC Tests Taken	CQA Anticipated Tests	CQA Tests Taken
Permeability (ASTM D2434)	1	0	0	0
Particle Size Distribution (ASTM D422)	1	1	0	0
Soil Classification (ASTM D2487)	1	1	0	0

LEACHATE COLLECTION ROCK TESTING SUMMARY Fergus Falls Landfill Phase 3A Expansion



ATTACHMENT A - CONTROLLED FILL



PROJECT: Fergus Falls Landfill PH3A Project No.: 6018-006 Location: Fergus Falls, MN

Required Tests:

Source Conformance

Date	Source = S Conformance = C	Test #	Retest of #	Proctor Identification	Grid Location	Northing	Easting	Elevation (ft)	Dry Density (pcf)	Moisture Content (%)	Maximum Dry Density (MDD) (pcf)	Optimum Moisture Content (%)	Compaction (%)	Specified Compaction (% MDD)	Pass/Fail	Notes
				Specificatio	on Requirements					0-5% above optimum				95% MDD		
5/2/2018	s	1		P-01	Roadway 150' W of E Entrance Road			-7	115.7	16.8	114.3	15.1	101	95	Pass	
5/2/2018	s	2		P-01	Roadway 500' W of E Entrance Road			-10	113.7	17.2	114.3	15.1	99	95	Pass	
6/5/2018	с	1		P-02		157033.351	406291.150	1225.3	109.9	12.1	109.2	18.9	101	95	Pass	
6/5/2018	с	2		P-02		156898.484	406320.938	1225.7	108.9	13.8	109.2	18.9	100	95	Pass	
6/5/2018	с	3		P-02		156993.157	406424.362	1227.2	109.3	13.9	109.2	18.9	100	95	Pass	
6/5/2018	с	4		P-02		156960.942	406464.770	1228.0	109.9	15.6	109.2	18.9	101	95	Pass	
6/5/2018	с	5		P-02		156883.886	406438.199	1228.4	109.9	13.7	109.2	18.9	101	95	Pass	
6/5/2018	с	6		P-02		156924.047	406409.691	1225.5	105.5	17.5	109.2	18.9	97	95	Pass	
6/5/2018	с	7		P-01		156948.091	406331.882	1222.9	96.3	16.6	118.1	13.6	82	95	Fail	retested in #12
6/5/2018	с	8		P-01		156971.891	406398.877	1224.7	113.3	14.7	118.1	13.6	96	95	Pass	
6/5/2018	с	9		P-01		156969.421	406423.992	1224.4	114.8	16.0	118.1	13.6	97	95	Pass	
6/5/2018	с	10		P-01		157016.101	406301.622	1222.7	110.3	18.6	118.1	13.6	93	95	Fail	retested in #34
6/5/2018	с	11		P-01		157031.361	406420.618	1227.5	116.5	15.0	118.1	13.6	99	95	Pass	
6/5/2018	с	12	7	P-01		156948.091	406331.882	1222.9	113.1	14.7	118.1	13.6	96	95	Pass	
6/5/2018	c	13		P-01	Middle of W. edge of Phase 3A				116.3	15.7	118.1	13.6	98	95	Pass	
6/5/2018	с	34	10	P-01		157016.101	406301.622	1222.7	115.6	15.8	118.1	13.6	98	95	Pass	



3900 Roosevelt Road Suite 113 Saint Cloud, MN 56301

Phone: 320-253-9940

Field Compaction Report

Report Date: 5/9/2018 Test Method: ASTM D6938

Client:

Riley Bros. Construction Inc. PO Box 535 Morris, MN 56267

Project:

B1802562 Fergus Falls Phase 3A (Baseliner) & Phase 1&2 (Final Cover) <Blank> Fergus Falls, MN 18600

	Test Results															
Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maxim Dry Der (pcf	um nsity)	In Plac Moistur (%)	e In Place Dry Density (pcf)	Prob Dept (in)	e h	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
1		5/7/18	P-01	В	CL	15.1	114.:	3	16.8	115.7	12		101	95	0/5	A
2	2 5/7/18 P-01 B CL 15.1 114.3 17.2 113.7									12		99	95	0/5	A	
	Test Information															
Test #	Test Loo	cation						Ele	evation	Reference		I	Gau Vake / Model / S	ge SN / Calibrated	Field Tech	nician
1	Roadwa	y -: 150' W (of E End of Entra	nce Road.					-7.0	Final Grade = 0			Troxler / 343	0 / 66178 /	Foucault, J	eff
2 Roadway -: 500' W of E End of Entrance Road10.0 Final Grade = 0											Troxler / 343	0 / 66178 /	Foucault, J	eff		
Remarks Comments																
A: Test results comply with specifications Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.																

sufferf

Brett Gruber 05/09/2018



PO Box 485 West Fargo, ND 58078 Phone: 701-232-8701

526 10th Street NE, Suite 300

Field Compaction Report

Report Date: 6/15/2018 Test Method: ASTM D6938

Client:

Houston Engineering, Inc. 1401 21st Avenue North Fargo, ND 58102

Project:

B1802554 Fergus Falls C & D Landfill <Blank> Fergus Falls, MN

	Test Results													
Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maxin Dry De (pc	num ensity f)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Remark
1		6/5/18	P-02	В	CL	18.9	109	.2	12.1	109.9	12	12 101		А
2		6/5/18	P-02	В	CL	18.9	109	109.2		108.9	12	100	95	A
3		6/5/18	P-02	В	CL	18.9	109	.2	13.9	109.3	12	100	95	A
4		6/5/18	P-02	В	CL	18.9	109	.2	15.6	109.9	12	101	95	A
5		6/5/18	P-02	В	CL	18.9	109	.2	13.7	109.9	12	101	95	А
6		6/5/18	P-02	В	CL	18.9	109	.2	17.5	105.5	12	97	95	А
7		6/5/18	P-01	А	CL	13.6	118	5.1	16.6	96.3	12	82	95	В
8		6/5/18	P-01	A	CL	13.6	118	.1	14.7	113.3	12	96	95	A
							Test	Inforr	nation					
Test #	Test Loo	cation						Eleva	tion Ref	erence	Ма	Gauge ke / Model / SN	/ Calibrated	Field Technician
1	Impervio N157033 E 40629	ous Fill: Corr 3.351, 1.150	rection Area Contr	rol Fill:				1,22	5.3			Troxler / 3430 /	31146 /	McManus, Sean
2	Impervio N156898 E 40632	ous Fill: Corr 3.484, 0.938	rection Area Cont	rol Fill:				1,22	5.7			Troxler / 3430 /	31146 /	McManus, Sean
3	Impervio N 15699 E 40642	us Fill: Corr 3.157, 4.362	rection Area Contr	rol Fill:				1,22	7.2			Troxler / 3430 /	31146 /	McManus, Sean
4	Impervio N 15696 E 40646	ous Fill: Corr 0.942, 4.770	rection Area Contr	rol Fill:				1,228.0				Troxler / 3430 /	31146 /	McManus, Sean
5	Impervio N 15688 E 40643	us Fill: Corr 3.886, 8.199	rection Area Contr	rol Fill:				1,22	8.4			Troxler / 3430 /	31146 /	McManus, Sean
6	6 Impervious Fill: Correction Area Control Fill: N 156924.047, E 406409.691							1,22	5.5			Troxler / 3430 /	31146 /	McManus, Sean
7	7 Impervious Fill: Correction Area Control Fill: N 156948.091, E 406331.882							1,22	2.9			Troxler / 3430 /	31146 /	McManus, Sean
8	8 Impervious Fill: Correction Area Control Fill: N 156971.891, E 406398.877							1,22	4.7			Troxler / 3430 /	31146 /	McManus, Sean



PO Box 485 West Fargo, ND 58078 Phone: 701-232-8701

526 10th Street NE, Suite 300

Field Compaction Report

Report Date: 6/15/2018 Test Method: ASTM D6938

Client:

Houston Engineering, Inc. 1401 21st Avenue North Fargo, ND 58102

Project:

B1802554 Fergus Falls C & D Landfill <Blank> Fergus Falls, MN

Remarks	Comments
A: Test results comply with specifications	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.
B: Test results do not comply with specifications	



PO Box 485 West Fargo, ND 58078 Phone: 701-232-8701

526 10th Street NE, Suite 300

Field Compaction Report

> Report Date: 6/15/2018 Test Method: ASTM D6938

Client:

Houston Engineering, Inc. 1401 21st Avenue North Fargo, ND 58102

Project:

B1802554 Fergus Falls C & D Landfill <Blank> Fergus Falls, MN

	Test Results													
Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)		In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Remark
9		6/5/18	P-01	A	CL	13.6	118	, 3.1	16.0	114.8	12	97	95	А
10		6/5/18	P-01	А	CL	13.6	118	3.1	18.6	110.3	12	93	95	В
11		6/5/18	P-01	А	CL	13.6	118	3.1	15.0	116.5	12	99	95	А
12	7	6/13/18	P-01	А	CL	13.6	118	3.1	14.7	113.1	12	96	95	A
13		6/13/18	P-01	А	CL	13.6	118	3.1	15.7	116.3	12	98	95	A
34	10	6/14/18	P-01	А	CL	13.6	118	3.1	15.8	115.6	12	98	95	A
							Test	Inform	nation					
Test #	Test Loo	cation						Eleva	ation Refe	rence	Ма	Gauge ke / Model / SN	/ Calibrated	Field Technician
9	 Impervious Fill: Correction Area Control Fill: N 156969.421, E 406423.992 								24.4			Troxler / 3430 /	31146 /	McManus, Sean
10	Impervio N 15701 E 40630	us Fill: Corr 6.101, 1.622	ection Area Conti	ol Fill:				1,222.7				Troxler / 3430 /	31146 /	McManus, Sean
11	Impervio N 15703 E 40642	us Fill: Corr 1.361, 0.618	ection Area Conti	ol Fill:				1,22	27.5			Troxler / 3430 /	31146 /	McManus, Sean
12	Impervio N 15694 E 40633	us Fill: Corr 8.091, 1.882	ection Area Conti	ol Fill:				1,22	2.9		Troxler / 3430 / 31146 /			McManus, Sean
13	Impervio Middle o	us Fill: Corr f W. edge o	ection Area Conti f Phase 3.	ol Fill								Troxler / 3430 /	31146 /	McManus, Sean
34	 Impervious Fill: Correction Area Control Fill: N 157016.101, E 406301.622 							1,22	2.7			Troxler / 3430 /	31146 /	McManus, Sean
		Rem	arks			(Comme	ents						
A: Test results comply with specifications Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. B: Test results do not comply with specifications Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.							noted as cy.				. /			
														Suff flyn

Brett Gruber 06/15/2018

PROJECT: Fergus Falls Landfill PH3A

Project No.: 6018-006

Location: Fergus Falls, MN

Required Tests:

Source Standard Proctor, Classification, Particle Size Distribution, & Atterberg Limit - 1 per source Conformance Standard Proctor - 1 per source # Tests
1 each
1

Controlled Fill Classification, Partice Size Distribution, Percentage Fines, Atterberg Limits & Proctor Tests

				Standard	l Proctor			Gradation											Soil Classification		
Test No.	Source = S Conformance = C	Gridpoint Location	Date Sample Tested	Max Dry Density (pcf)	Optimum MC%	1"	3/4"	1/2"	3/8"	#4	#10	#20	#40	#60	#100	#200	Pass/ Fail	Liquid Limit (LL)	Plasticity Index (PI)	Pass/ Fail	Soil Type
	Specification	Requirements																	PI<20		
W18-000856-S3 W18-000854-S3	S	West Borow Pit, -8'	5/2/2018	114.9	15.9%		100.0%	96.0%	96.0%	91%	87%	81%	70%	59%	48%	40%	N.A.	22	9	Pass	SC
W18-000856-S4 W18-000854-S4	S	Entrance Road	5/2/2018	110.6	15.7%		100.0%	99%	98.0%	89%	88%	84%	80%	75%	68%	61%	N.A.	34	20	Fail	CL
W18-002261-S1 W18-002258-S1	с	Control Fill	6/5/2018	118.1	13.6%	100.0%	99.0%	97%	94.0%	89.0%	81%	75%	70%	65%	58%	51%	N.A.	29	16	Pass	CL
W18-002261-S2 W18-002258-S2	с	Control Fill	6/5/2018	109.2	18.9%	100.0%	98.0%	97%	95%	93%	90%	83%	76%	72%	66.0%	62%	N.A.	48	34	Fail	CL



Mater	ial Test R	leport	Report No: MAT:W18-000856-S3						
Client:	Larry Swann Riley Bros. Construc PO Box 535 Morris, MN, 56267 B1802562 Fergus Falls Phase	ction Inc. 3A (Baseliner) & Phase 1&	2 (Final Cover)	andrew Lage					
TR:	Fergus Falls, MN, Adam Nistler, anistle	er@braunintertec.com		Laboratory Coordinator Date of Issue: 5/7/2018					
Sample D	etails			Atterberg Limit:					
Sample IE Alternate Sampled Sampling Date Sam Date Subr): Sample ID: By: Method: pled: mitted:	W18-000856-S3 P-03 Sean McManus In place 5/2/2018 5/2/2018		Liquid Limit: 22 Plastic Limit: 13 Plasticity Index: 9 Linear Shrinkage (%): N/A					
Specificat	tion:	ASTM D 422		Sample Description:					
Source: Material T Sample Lo	ype: ocation:	Existing Material Soil Barrier Layer West Borrow Pit, -8'		USCS Classification: Clayey Sand (SC), Brown					
				Grading: ASTM D 422 - 07					
% Pa 100 90 80 50 50 10 10 10	Ssing	No.200 No.200 No.200 No.200 No.200 Sieve	20.6 im 20.6 im 8.8 im 6.3 im 1.3 im 1.3 im 1.3 im 1.3 im 1.3 im 1.3 im 1.3 im 1.3 im 1.3 im 1.2	Drying by. Natural Date Tested: 5/4/2018 Sieve Size % Passing Limits ¾in (19.0mm) 100 ½in (12.5mm) 96 3/8in (9.5mm) 96 3/8in (9.5mm) 96 No.4 (4.75mm) 91 No.10 (2.0mm) 87 No.20 (850µm) 81 No.40 (425µm) 70 No.60 (250µm) 59 No.100 (150µm) 48 No.200 (75µm) 40 31.8 µm 32.2 20.6 µm 28.1 12.1 µm 24.0 8.8 µm 18.6 6.3 µm 15.8 3.1 µm 12.1 1.3 µm 8.8					
	GRAVEL	SAND	FINES						
(0.0%)	Coarse Fine (0.0%) (9.5%)	Coarse Medium Fi (3.6%) (17.3%) (29)	ne Silt Cla .6%) (25.7%) (14.3	y D85: 1.4846 D60: 0.2615 D50: 0.1620 y D30: 0.0252 D15: 0.0054 D10: 0.0018 Cu: 146.67 Cc: 1.36					



Material Test Report

Client:	Larry Swann Riley Bros. Construction Inc.
	PO Box 535
Project:	Morris, MN, 56267 B1802562 Fergus Falls Phase 3A (Baseliner) & Phase 1&2 (Final Cover)
TR:	Fergus Falls, MN, Adam Nistler, anistler@braunintertec.com

Sample Details

W18-000856-S3 P-03 Sean McManus In place 5/2/2018 5/2/2018 ASTM D 422 Existing Material Soil Barrier Layer
Soil Barrier Layer West Borrow Pit, -8'

Other Test Results

Description	Method	Result	Limits
Finer than 75µm (%)	ASTM C 117 - 04	47	
Test Method		А	
Date Tested		5/3/2018	
Dispersion device	ASTM D 422 - 07		
Dispersion time (min)			
Shape			
Hardness			
Liquid Limit	ASTM D 4318 - 05	22	
Method		Method B	
Plastic Limit		13	
Plasticity Index		9	
Sample history		Air-dried	
Material retained on 425µm (No. 40) (%)		30.3	
Date Tested		5/4/2018	

Comments

N/A

andrew Sage

Andrew Lage Laboratory Coordinator Date of Issue: 5/7/2018



Comments

BRAUN

INTERTEC

Form No: 110031, Report No: PTR:W18-000854-S3



Material Test Report							Report No: MAT:W18-000856-S Issue No:	
Client: Project:	Larry Swann Riley Bros. C PO Box 535 Morris, MN, 5 B1802562 Fergus Falls	onstructio 6267 Phase 3A	on Inc. A (Baselin	er) & Phas	e 1&2 (Fin	al Cover)		Andrew Lage
TR:	Fergus Falls, Adam Nistler,	MN, , anistler@	@braunint	ertec.com				Laboratory Coordinato Date of Issue: 5/7/2018
Sample D	etails							Atterberg Limit:
Sample ID Alternate Sampled Sampling Date Sam Date Subi	D: Sample ID: By: Method: pled: mitted:		W18-00 P-04 Sean M In place 5/2/2013 5/2/2013	0856-S4 cManus 8 8				Liquid Limit: 34 Plastic Limit: 14 Plasticity Index: 20 Linear Shrinkage (%): N/A
Specificat	tion:		ASTM E) 422 Material				Sample Description:
Material T Sample L	Source:Existing MaterialMaterial Type:Soil Barrier LayerSample Location:Entrance Road							USCS Classification: Sandy Lean Clay (CL), Brown
								Grading: ASTM D 422 - 07
% Pa 100 90 80 60 50 40 20 10	ussing	No.4	No.20	Sieve	30 im 13.4 im	3.m+	12 Jm	Drying by: Natural 5/4/2018 Sieve Size % Passing Limits ¾in (19.0mm) 100 ½in (12.5mm) 99 3/8in (9.5mm) 98 No.4 (4.75mm) 89 No.10 (2.0mm) 88 No.20 (850µm) 84 No.40 (425µm) 80 No.60 (250µm) 75 No.100 (150µm) 68 No.200 (75µm) 61 30.0 µm 49.8 19.4 µm 45.0 11.6 µm 38.7 8.4 µm 30.9 3.0 µm 25.0 1.2 µm 19.7
COBBLES	GRAV	EL		SAND		FII	NES	$\neg \parallel$
(0.0%)	Coarse (0.0%) (– Fine 10.6%)	Coarse (1.8%)	Medium (7.9%)	Fine (18.9%)	Silt (31.8%)	Clay (28.9%	D85: 1.0777 D60: 0.0703 D50: 0.0308 D30: 0.0054 D15: 0.0005 D10: 0.0002



Material Test Report

Client:	Larry Swann
	Riley Bros. Construction Inc.
Project:	Morris, MN, 56267 B1802562
	Fergus Falls Phase 3A (Baseliner) & Phase 1&2 (Final Cover)
TR:	Adam Nistler, anistler@braunintertec.com

Sample Details

W18-000856-S4 P-04 Sean McManus In place 5/2/2018 5/2/2018 ASTM D 422 Existing Material Soil Barrier Layer Entrance Road

Other Test Results

Description	Method	Result	Limits
Finer than 75µm (%)	ASTM C 117 - 04	62	
Test Method		А	
Date Tested		5/3/2018	
Dispersion device	ASTM D 422 - 07		
Dispersion time (min)			
Shape			
Hardness			
Liquid Limit	ASTM D 4318 - 05	34	
Method		Method B	
Plastic Limit		14	
Plasticity Index		20	
Sample history		Air-dried	
Material retained on 425µm (No. 40) (%)		20.3	
Date Tested		5/4/2018	

Comments

N/A

Report No: MAT:W18-000856-S4

Issue No: 1

andrew Sage

Andrew Lage Laboratory Coordinator Date of Issue: 5/7/2018

Braun Intertec Corporation
526 10th Street NE, Suite 300
West Fargo, ND 58078
Phone: 701.232.8701

Client: Larry Swann Riley Bros. Construction Inc. PO Box 535 Morris, MN, 56267 Project: B1802562 Fergus Falls Phase 3A (Baseliner) & Phase 1&2 (Final Cover)	Andrew Lage
Fergus Falls, MN, TR: Adam Nistler, anistler@braunintertec.com	Laboratory Coordinator Date of Issue: 5/7/2018
Sample DetailsSample ID:W18-000854-S4Alternate Sampled:Date Sampled:5/2/2018Date SubmineSampled By:Sean McManusSampling MSource:Existing MaterialMaterial:Material:Soil Barrier LayerSpecification:Specification:General InformationLocation:Entrance Road	ample ID: P-04 tted: 5/2/2018 lethod: In place
Date Tested: 5/4/2018 Drv Density - Moisture Content Relationship	Test Results
	ASTM D 698 - 07 Maximum Dry 110.6 Density (lbf/ft ³): Corrected Maximum 110.6 Dry Density (lbf/ft ³): Optimum Moisture 15.7 Content (%): Corrected Optimum 15.7 Moisture Content (%): Method: A Preparation Method: Moist Specific Gravity (Fines): 2.65 Specific Gravity Method: Assumed Retained Sieve No 4 4 (4.75mm) (%): Passing Sieve No 4 96 (4.75mm) (%): Visual Description: USCS Classification: Sandy Lean Clay (CL), Brown

Comments

BRAUN



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Braun Intertec Corporation 526 10th Street NE, Suite 300 West Fargo, ND 58078 Phone: 701.232.8701

Material Test Report						Report	No: MAT:W18-	002261-S1 Issue No: 1			
Client: Dennis McAlpine Houston Engineering, Inc. 6901 E. Fish Lake Rd Maple Grove, MN, 55369 Project: B1802554 Fergus Falls C & D Landfill							K	Indrew .	Lage		
TR:	Fergus Falls Brett Gruber	, MN, , bgruber	@braunint	ertec.com						Laboratory Date of Issue:	Coordinator 6/15/2018
Sample D	Details								Atterberg Lir	nit:	
Sample II Alternate Sampled Sampling Date Sam Date Sub	D: Sample ID: By: Method: pled: mitted:		W18-00 P-01 Sean M In place 6/5/201 6/5/201	2261-S1 cManus 8 8					Lio Pla Plasti Linear Shri	quid Limit: 29 astic Limit: 13 city Index: 16 nkage (%): N/A	
Specifica	tion:		ASTM [In Place) 422 					Sample Desc	cription:	
Material 1 Sample L	Гуре: .ocation:		Soil Bar Controll	rier Layer Fill					USCS Classifi Lean Clay (CL	cation: Sandy), Brown	
Dortiolo S	Sizo Diatrib	ution							Grading: AST	M D 422 - 07	
% Pa 100	assing	No.4	No.20 No.20	001.0N Sieve	32.3 µm 20.8 µm	12.3 m 8.8 m 6.3 m	3.2 µm		Drying by: Date Tested: Sieve Size 1in (25.0mm) ¾in (19.0mm) ½in (12.5mm) 3/8in (9.5mm) No.4 (4.75mm) No.4 (4.75mm) No.10 (2.0mm) No.40 (425µm) No.40 (425µm) No.40 (425µm) No.40 (425µm) No.40 (425µm) No.40 (425µm) No.40 (150µm) No.40 (150µm) No.200 (75µm) 32.3 µm 20.8 µm 12.3 µm 3.2 µm 1.3 µm	Natural 6/11/2018 % Passing 100 99 97 94) 89) 81) 75) 70) 65 n) 55) 51 30.2 27.6 21.9 18.8 15.6 11.2 7.4	Limits
COBBLES	GRAV Coarse	/EL Fine	Coarse	SAND Medium	Fine	Sil	FINES	ay	D85: 3.0423 D30: 0.0312	D60: 0.1771 D	950: 0.0711 910: 0.0024
(0.0%)	(1.1%)	(9.9%)	(7.8%)	(11.5%)	(18.4%)	(37.6	5%) (13	.8%)	Cu: 73.54	Cc: 2.29	



Project: B1802554

Sample Details

Client:

TR:

Material Test Report

6901 E. Fish Lake Rd Maple Grove, MN, 55369

Houston Engineering, Inc.

Fergus Falls C & D Landfill

Brett Gruber, bgruber@braunintertec.com

Dennis McAlpine

Fergus Falls, MN,

Braun Intertec Corporation 526 10th Street NE, Suite 300 West Fargo, ND 58078 Phone: 701.232.8701

> Report No: MAT:W18-002261-S1 Issue No: 1

Andrew Lage

Andrew Lage Laboratory Coordinator Date of Issue: 6/15/2018

Sample ID: Alternate Sample ID: Sampled By: Sampling Method: Date Sampled: Date Submitted: Specification: Source: Material Type: Sample Location:

P-01 Sean McManus In place 6/5/2018 6/5/2018 ASTM D 422 In Place Soil Barrier Layer Controll Fill

W18-002261-S1

Other Test Results

Description	Method	Result	Limits
Finer than 75µm (%)	ASTM C 117 - 04	53	
Test Method		A	
Date Tested		6/8/2018	
Dispersion device	ASTM D 422 - 07		
Dispersion time (min)			
Shape			
Hardness			
Liquid Limit	ASTM D 4318 - 05	29	
Method		Method B	
Plastic Limit		13	
Plasticity Index		16	
Sample history		Air-dried	
Date Tested		6/11/2018	

Comments

N/A

BRAUN	Braun Intertec Corporation 526 10th Street NE, Suite 300 West Fargo, ND 58078 Phone: 701.232.8701
Proctor Report	Issue No: 1
Client: Dennis McAlpine Houston Engineering, Inc. 6901 E. Fish Lake Rd Maple Grove, MN, 55369 Project: B1802554 Fergus Falls C & D Landfill Fergus Falls, MN, TR: Brett Gruber, bgruber@braunintertec.com	Andrew Lage Andrew Lage Laboratory Coordinator Date of Issue: 6/15/2018
Sample DetailsSample ID:W18-002258-S1Alternate SaDate Sampled:6/5/2018Date SubmitSampled By:Sean McManusSampling MeSource:In PlaceMaterial:Soil Barrier LayerSpecification:General InformationLocation:Control FillDate Tested:6/8/2018	mple ID: P-01 ted: 6/5/2018 ethod: In place
Dry Density - Moisture Content Relationship	Test Results
	ASTM D 698 - 07 Maximum Dry 118.1 Density (lbf/ft ³): Corrected Maximum 118.1 Dry Density (lbf/ft ³): Optimum Moisture 13.6 Content (%): Corrected Optimum 13.6 Moisture Content (%): Method: B Preparation Method: Moist Specific Gravity (Fines): 2.65 Specific Gravity Method: Assumed Retained Sieve 3/8" (9.5mm) 7 (%): Passing Sieve 3/8" (9.5mm) 93 (%): Visual Description: USCS Classification: Sandy Lean Clay (CL), Brown

Comments N156969.421 E406423.992 Elev. 1224.4'



Mater	ial Test	Report					Report No: MAT:W18-002261-S2 Issue No: 1			
Client: Project:	Dennis McAlpin Houston Engine 6901 E. Fish La Maple Grove, M B1802554 Fergus Falls C &	e ering, Inc. ke Rd N, 55369 & D Landfill					Andrew Lage Andrew Lage			
тр.	Fergus Falls, MI	N,	Laboratory Coordinator							
Sample D	etails		lenec.com			I	Atterberg Limit:			
Sample IE Alternate Sampled Sampling Date Sam Date Subi	D: Sample ID: By: Method: .pled: mitted:	W18-00 P-02 Sean M In place 6/5/201 6/5/201	02261-S2 IcManus 8 8 8				Liquid Limit: 48 Plastic Limit: 14 Plasticity Index: 34 Linear Shrinkage (%): N/A			
Specificat Source:	tion:	ASTM I In Place) 422 9				Sample Description:			
Material T Sample L	Type: ocation:	Soil Ba Control		USCS Classification: Sandy Lean Clay (CL), Brown						
Particle S	Size Distributio	วท					Grading: ASTM D 422 - 07			
% Pa 100	ussing	No.4	-02-ON Sieve	No.400			Drying by: Natural Date Tested: 6/11/2018 Sieve Size % Passing Limits 1in (25.0mm) 100 ¾in (19.0mm) 98 ½in (12.5mm) 97 3/8in (9.5mm) 95 No.4 (4.75mm) 93 No.10 (2.0mm) 90 No.20 (850µm) 83 No.40 (425µm) 76 No.60 (250µm) 72 No.100 (150µm) 66 No.200 (75µm) 62			
COBBLES	GRAVEL		SAND		FINES	(61.6%)				
(0.0%)	Coarse Fi (1.6%) (5.0	ne Coarse 0%) (3.0%)	Medium (14.1%)	Fine (14.7%)	Silt	Clay	D85: 1.0610 D60: 0.0592 D50: 0.0132 D30: 0.0007 D15: 0.0001 D10: 0.0000			



Project: B1802554

Sample Details

Client:

TR:

Material Test Report

6901 E. Fish Lake Rd Maple Grove, MN, 55369

Houston Engineering, Inc.

Fergus Falls C & D Landfill

Brett Gruber, bgruber@braunintertec.com

Dennis McAlpine

Fergus Falls, MN,

Braun Intertec Corporation 526 10th Street NE, Suite 300 West Fargo, ND 58078 Phone: 701.232.8701

> Report No: MAT:W18-002261-S2 Issue No: 1

Andrew Lage

Andrew Lage Laboratory Coordinator Date of Issue: 6/15/2018

W18-002261-S2 Sample ID: P-02 Alternate Sample ID: Sean McManus Sampled By: In place Sampling Method: 6/5/2018 Date Sampled: 6/5/2018 Date Submitted: ASTM D 422 Specification: In Place Source: Soil Barrier Layer Material Type: Controll Fill Sample Location:

Other Test Results

Description	Method	Result	Limits
Finer than 75µm (%)	ASTM C 117 - 04	64	
Test Method		А	
Date Tested		6/7/2018	
Dispersion device	ASTM D 422 - 07		
Dispersion time (min)			
Shape			
Hardness			
Liquid Limit	ASTM D 4318 - 05	48	
Method		Method B	
Plastic Limit		14	
Plasticity Index		34	
Sample history		Air-dried	
Date Tested		6/11/2018	

Comments

N/A



Comments N157033.351 E406291.150 Elev.1225.3'

BRAUN

INTERTEC



ATTACHMENT B - RE-COMPACTED SOIL BARRIER LAYER



PROJECT: Fergus Falls Landfill PH3A Project No.: 6018-006 Location: Fergus Falls, MN

Soil Barrier Layer Compaction Tests (Density & Moisture)

tests

Required Tests:

Source At CONTRACTORS discretion

Conformance 100ft grid per lift (4 per acre) = 38

Date	Source = S Conformance = C	Test #	Retest #	Proctor Identification	Grid Location	Elevation (ft)	Lift #	Dry Density (pcf)	Moisture Content (%)	Maximum Dry Density (MDD) (pcf)	Optimum Moisture Content (%)	Moisture Deviation (%)	Compaction (%)	Specified Compaction (% MDD)	Pass/Fail	Notes
	Specification Requirements								0-5% above optimum					95% MDD		
6/14/2018	с	14		P-04	J15		1	110.7	16.9	111.8	15.3	1.6	99	95	Pass	
6/14/2018	с	15		P-04	J13		1	112.1	15.3	111.8	15.3	0.0	100	95	Pass	
6/14/2018	с	16		P-04	J11		1	114.9	15.8	111.8	15.3	0.5	103	95	Pass	
6/14/2018	с	17		P-04	H13		1	107.4	18.2	111.8	15.3	2.9	96	95	Pass	
6/14/2018	с	18		P-04	H15		1	110.1	16.6	111.8	15.3	1.3	98	95	Pass	
6/14/2018	с	19		P-04	H11		1	110.8	16.9	111.8	15.3	1.6	99	95	Pass	
6/14/2018	с	20		P-04	F11		1	109.7	16.1	111.8	15.3	0.8	98	95	Pass	
6/14/2018	с	21		P-04	F13		1	108.1	17.0	111.8	15.3	1.7	97	95	Pass	
6/14/2018	с	22		P-04	F15		1	114.5	15.7	111.8	15.3	0.4	102	95	Pass	
6/14/2018	с	23		P-04	H13		1	112.8	15.8	111.8	15.3	0.5	101	95	Pass	
6/14/2018	с	24		P-04	J15		2	111.1	16.9	111.8	15.3	1.6	99	95	Pass	
6/14/2018	с	25		P-04	H15		2	108.8	16.3	111.8	15.3	1.0	97	95	Pass	
6/14/2018	с	26		P-04	F13		2	113.7	15.7	111.8	15.3	0.4	102	95	Pass	
6/14/2018	с	27		P-04	F15		2	113.3	15.3	111.8	15.3	0.0	101	95	Pass	
6/14/2018	с	28		P-04	F11		2	109.4	16.7	111.8	15.3	1.4	98	95	Pass	
6/14/2018	с	29		P-04	H13		2	111.2	14.1	111.8	15.3	-1.2	99	95	Fail	Retested in 45
6/14/2018	с	30		P-04	H11		2	110.9	15.4	111.8	15.3	0.1	99	95	Pass	
6/14/2018	с	31		P-04	F11		2	112.9	15.8	111.8	15.3	0.5	101	95	Pass	
6/14/2018	с	32		P-04	J13		2	113.1	16.6	111.8	15.3	1.3	101	95	Pass	
6/14/2018	с	33		P-04	J11		2	109.7	15.3	111.8	15.3	0.0	98	95	Pass	
6/15/2018	с	35		P-04	F15		3	112.6	16.3	111.8	15.3	1.0	101	95	Pass	
6/15/2018	с	36		P-05	F15		4	112.7	16.7	110.5	16.7	0.0	102	95	Pass	
6/15/2018	с	37		P-05	H15		4	111.0	17.5	110.5	16.7	0.8	100	95	Pass	
6/15/2018	с	38		P-04	H15		3	111.6	16.3	111.8	15.3	1.0	100	95	Pass	
6/15/2018	с	39		P-05	J15		4	110.5	19.5	110.5	16.7	2.8	100	95	Pass	
6/15/2018	с	40		P-04	J15		3	114.1	17	111.8	15.3	1.7	102	95	Pass	

PROJECT: Fergus Falls Landfill PH3A Project No.: 6018-006 Location: Fergus Falls, MN

Soil Barrier Layer Compaction Tests (Density & Moisture)

tests

38

Required Tests:

Source At CONTRACTORS discretion Conformance 100ft grid per lift (4 per acre) =

Date	Source = S Conformance = C	Test #	Retest #	Proctor Identification	Grid Location	Elevation (ft)	Lift #	Dry Density (pcf)	Moisture Content (%)	Maximum Dry Density (MDD)	Optimum Moisture Content	Moisture Deviation (%)	Compaction (%)	Specified Compaction (%	Pass/Fail	Notes
				Specification Require	ements				0-5% above optimum	(per)	(76)			95% MDD		
6/15/2018	с	41		P-05	J13		4	110.5	20.1	110.5	16.7	3.4	100	95	Pass	
6/15/2018	с	42		P-04	J13		3	115.5	15.5	111.8	15.3	0.2	103	95	Pass	
6/15/2018	с	43		P-05	H13		4	110.9	15.2	110.5	16.7	-1.5	100	95	Fail	Not Retested
6/15/2018	с	44		P-05	H13		3	111.0	17.4	110.5	16.7	0.7	100	95	Pass	
6/15/2018	с	45	29	P-04	H13		2	114.6	16.1	111.8	15.3	0.8	103	95	Pass	
6/15/2018	с	46		P-05	F13		4	113.6	17.5	110.5	16.7	0.8	103	95	Pass	
6/15/2018	с	47		P-04	F13		3	114.0	16.6	111.8	15.3	1.3	102	95	Pass	
6/15/2018	с	48		P-05	F11		4	110.6	17.70	110.5	16.7	1.0	100	95	Pass	
6/15/2018	с	49		P-04	F11		3	113.7	16	111.8	15.3	0.7	102	95	Pass	
6/15/2018	с	50		P-05	H11		4	110.8	17	110.5	16.7	0.3	100	95	Pass	
6/15/2018	с	51		P-04	H11		3	112.3	16.1	111.8	15.3	0.8	100	95	Pass	
6/15/2018	с	52		P-05	F11		4	109.5	18.9	110.5	16.7	2.2	99	95	Pass	
6/15/2018	с	53		P-04	F11		3	113.4	15.3	111.8	15.3	0.0	101	95	Pass	
6/15/2018	с	54		P-04	Н9		Finished Grade side slopes	112.2	16.8	111.8	15.3	1.5	100	95	Pass	
6/15/2018	с	55		P-04	F9		Finished Grade side slopes	111.3	15.8	111.8	15.3	0.5	100	95	Pass	
6/15/2018	с	56		P-04	E13		Finished Grade side slopes	117.1	16.4	111.8	15.3	1.1	105	95	Pass	
6/21/2018	с	122		P-06	F15		Тор	112.6	16.2	112.9	16.9	-0.7	100	95	Fail	
6/21/2018	с	123		P-06	H15		Тор	114.1	16.2	112.9	16.9	-0.7	101	95	Fail	
6/21/2018	с	124		P-06	J15		Тор	113.2	17	112.9	16.9	0.1	100	95	Pass	
6/21/2018	с	125		P-06	J13		Тор	114.2	16.5	112.9	16.9	-0.4	101	95	Fail	
6/21/2018	с	126		P-06	J11		Тор	112.5	16.9	112.9	16.9	0.0	100	95	Pass	
6/21/2018	с	127		P-06	H11		Тор	113.9	17	112.9	16.9	0.1	101	95	Pass	
6/21/2018	с	128		P-06	F11		Тор	109.9	17.7	112.9	16.9	0.8	97	95	Pass	
6/21/2018	с	129		P-06	F13		Тор	114.3	17.2	112.9	16.9	0.3	101	95	Pass	
6/21/2018	с	130		P-06	H13		4	112.4	16.9	112.9	16.9	0.0	100	95	Pass	
6/21/2018	с	131		P-06	Sump		4	111.5	18.4	112.9	16.9	1.5	99	95	Pass	

PROJECT: Fergus Falls Landfill PH3A Project No.: 6018-006 Location: Fergus Falls, MN

Soil Barrier Layer Compaction Tests (Density & Moisture)

tests
Source At CONTRACTORS discretion

Required Tests:

Conformance 100ft grid per lift (4 per acre) = 38

Date	Source = S Conformance = C	Test #	Retest #	Proctor Identification	Grid Location	Elevation (ft)	Lift #	Dry Density (pcf)	Moisture Content (%)	Maximum Dry Density (MDD) (pcf)	Optimum Moisture Content (%)	Moisture Deviation (%)	Compaction (%)	Specified Compaction (% MDD)	Pass/Fail	Notes
Specification Requirements									0-5% above optimum					95% MDD		
7/18/2018	с	132		P-06	J13		4	107.3	21.2	112.9	16.9	4.3	95.03985828	95	Pass	
7/18/2018	с	133		P-06	J13		Тор	108.6	21.2	112.9	16.9	4.3	96.19131975	95	Pass	


Phase 3A

Report Date: 6/19/2018 Test Method: ASTM D6938

Client:

Houston Engineering, Inc. 1401 21st Avenue North Fargo, ND 58102

Project:

							Te	est R	esults						
Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maxim Dry Den (pcf)	um nsity)	In Place Moisture (%)	e In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
14		6/14/18	P-04	А	CL	15.3	111.8	8	16.9	110.7	6	99	95	0/5	A
15		6/14/18	P-04	А	CL	15.3	111.8	8	15.3	112.1	6	100	95	0/5	A
16		6/14/18	P-04	А	CL	15.3	111.8	8	15.8	114.9	6	103	95	0/5	A
17		6/14/18	P-04	А	CL	15.3	111.8	8	18.2	107.4	6	96	95	0/5	А
18		6/14/18	P-04	А	CL	15.3	111.8	8	16.6	110.1	6	98	95	0/5	А
19		6/14/18	P-04	А	CL	15.3	111.8	8	16.9	110.8	6	99	95	0/5	А
20		6/14/18	P-04	А	CL	15.3	111.8	8	16.1	109.7	6	98	95	0/5	A
21		6/14/18	P-04	А	CL	15.3	111.8	8	17.0	108.1	6	97	95	0/5	A
							Test	t Info	ormation						
Test #	Test Loo	cation						Ele	evation F	Reference		Gau Make / Model / S	ge SN / Calibrated	d Field Tech	nician
14	Mass Gr Layer: G	ading :: Pha rid J15, Lift	ase 3A Soil Barrie #1	er								Troxler / 343	0 / 31146 /	McManus,	Sean
15	Mass Gr	ading :: Pha	ase 3A Soil Barrie	er Layer: G	rid J13, Lift #1							Troxler / 343	0 / 31146 /	McManus,	Sean
16	Mass Gr Layer: G	ading :: Pha rid J11, Lift	ase 3A Soil Barrie #1	er								Troxler / 343	0 / 31146 /	McManus,	Sean
17	Mass Gr Layer: G	ading :: Pha rid H13, Lift	ase 3A Soil Barrie t #1	er								Troxler / 343	0 / 31146 /	McManus,	Sean
18	Mass Gr Laver: G	ading :: Pha	ase 3A Soil Barrie t #1	er								Troxler / 343	0 / 31146 /	McManus,	Sean
19	Mass Gr Laver: G	ading :: Pha	ase 3A Soil Barrie t #1	er								Troxler / 343	0 / 31146 /	McManus,	Sean
20	Mass Gr Layer: G	ading :: Pha rid F11, Lift	ase 3A Soil Barrie #1	er								Troxler / 343	0 / 31146 /	McManus,	Sean
21	Mass Gr Layer: G	ading :: Pha rid F13, Lift	ase 3A Soil Barrie #1	er								Troxler / 343	0 / 31146 /	McManus,	Sean
		Rem	arks				Comme	ents			·			•	
A: Test	results c	omply with	specifications		Tests are "Direct "Backscatter". G	Transmission' auge calibratio	' (Method A n data on fil) unle: le with	ss probe dep the testing a	oth is noted as agency.					



Phase 3A

Report Date: 6/19/2018 Test Method: ASTM D6938

Client:

Houston Engineering, Inc. 1401 21st Avenue North Fargo, ND 58102

Project:

							Те	est R	esults						
Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maxim Dry Der (pcf	um nsity)	In Place Moisture (%)	e In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
22		6/14/18	P-04	А	CL	15.3	111.	8	15.7	114.5	6	102	95	0/5	A
23		6/14/18	P-04	А	CL	15.3	111.	8	15.8	112.8	6	101	95	0/5	A
24		6/14/18	P-04	А	CL	15.3	111.	8	16.9	111.1	6	99	95	0/5	A
25		6/14/18	P-04	А	CL	15.3	111.	8	16.3	108.8	6	97	95	0/5	A
26		6/14/18	P-04	А	CL	15.3	111.	8	15.7	113.7	6	102	95	0/5	А
27		6/14/18	P-04	A	CL	15.3	111.8	8	15.3	113.3	6	101	95	0/5	A
28		6/14/18	P-04	А	CL	15.3	111.8	8	16.7	109.4	6	98	95	0/5	A
29		6/14/18	P-04	A	CL	15.3	111.	8	14.1	111.2	6	99	95	0/5	A
							Tes	t Info	ormation						
Test #	Test Loo	cation						Ele	evation	Reference		Gau Make / Model / S	ge SN / Calibrated	Field Tech	nician
22	Mass Gr Layer: G	ading :: Pha rid F15, Lift	ase 3A Soil Barrie #1	er								Troxler / 343	0 / 31146 /	McManus,	Sean
23	Mass Gr Layer: G	ading :: Pha rid H13, Lift	ase 3A Soil Barrie #1	er								Troxler / 343	0 / 31146 /	McManus,	Sean
24	Mass Gr Layer: G	ading :: Pha rid J15, Lift	ase 3A Soil Barrie #2	er								Troxler / 343	0 / 31146 /	McManus,	Sean
25	Mass Gr Layer: G	ading :: Pha rid H15, Lift	ase 3A Soil Barrie #2	er								Troxler / 343	0 / 31146 /	McManus,	Sean
26	Mass Gr Laver: G	ading :: Pha rid F13, Lift	ase 3A Soil Barrie #2	er								Troxler / 343	0 / 31146 /	McManus,	Sean
27	Mass Gr	ading :: Pha	ase 3A Soil Barrie	er Layer: G	rid F15, Lift #2							Troxler / 343	0 / 31146 /	McManus,	Sean
28	Mass Gr Layer: G	ading :: Pha	ase 3A Soil Barrie #2	er								Troxler / 343	0 / 31146 /	McManus,	Sean
29	Mass Gr Layer: G	ading :: Pha rid H13, Lift	ase 3A Soil Barrie #2	er								Troxler / 343	0 / 31146 /	McManus,	Sean
		Rem	arks				Comme	ents			•			•	
A: Test	results c	omply with	specifications		Tests are "Direct "Backscatter". G	Transmission' auge calibratio	' (Method A n data on fi) unles le with	ss probe dep the testing	oth is noted as agency.					



Phase 3A

Report Date: 6/19/2018 Test Method: ASTM D6938

Client:

Houston Engineering, Inc. 1401 21st Avenue North Fargo, ND 58102

Project:

		-					Test	t Results		-				
Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Densit (pcf)	n In Plac ty Moistur (%)	e In Place Pe Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
30		6/14/18	P-04	A	CL	15.3	111.8	15.4	110.9	6	99	95	0/5	А
31		6/14/18	P-04	A	CL	15.3	111.8	15.8	112.9	6	101	95	0/5	А
32		6/14/18	P-04	A	CL	15.3	111.8	16.6	113.1	6	101	95	0/5	А
33		6/14/18	P-04	A	CL	15.3	111.8	15.3	109.7	6	98	95	0/5	А
35		6/15/18	P-04	А	CL	15.3	111.8	16.3	112.6	6	101	95	0/5	А
36		6/15/18	P-05	А	CL	16.7	110.5	16.7	112.7	6	102	95	0/5	А
37		6/15/18	P-05	А	CL	16.7	110.5	17.5	111.0	6	100	95	0/5	А
38		6/15/18	P-04	А	CL	15.3	111.8	16.3	111.6	6	100	95	0/5	А
							Test Ir	nformatior	n					
Test # 30	Test Loo Mass Gr	cation ading :: Pha	ase 3A Soil Barrie	r				Elevation	Reference		Gau Make / Model / S Troxler / 343	ge SN / Calibratec 0 / 31146 /	Field Tech McManus, S	nician Sean
31	Layer: G Mass Gr Layer: G	irid H11, Lift ading :: Pha irid F11, Lift	: #2 ase 3A Soil Barrie #2	r							Troxler / 343	0 / 31146 /	McManus,	Sean
32	Mass Gr Layer: G	ading :: Pha irid J13, Lift	ase 3A Soil Barrie #2	r							Troxler / 343	0 / 31146 /	McManus,	Sean
33	Mass Gr Layer: G	ading :: Pha irid J11, Lift	ase 3A Soil Barrie #2	er							Troxler / 343	0 / 31146 /	McManus,	Sean
35	Mass Gr	ading :: Pha	ase 3A Soil Barrie	er Layer: Gr	id F15, 3rd Lift.						Troxler / 343	0 / 66187 /	Foucault, J	eff
36	Mass Gr	ading :: Pha	ase 3A Soil Barrie	er Layer: Gr	ids F15, 4th Lift.						Troxler / 343	0 / 66187 /	Foucault, J	eff
37	Mass Gr	ading :: Pha	ase 3A Soil Barrie	er Layer: Gr	ids H15, 4th Lift.						Troxler / 343	0 / 66187 /	Foucault, J	eff
38	Mass Gr	ading :: Pha	ase 3A Soil Barrie	er Layer: Gr	ids H15, Lift #3.						Troxler / 343	0 / 66187 /	Foucault, J	eff
		Rem	arks				Comment	ts						
A: Test	results c	omply with s	specifications		Tests are "Direct "Backscatter". G	Transmission' auge calibratio	' (Method A) ui n data on file w	nless probe de vith the testing	epth is noted as agency.					



Phase 3A

Report Date: 6/19/2018 Test Method: ASTM D6938

Client:

Houston Engineering, Inc. 1401 21st Avenue North Fargo, ND 58102

Project:

							Test	Results						
Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Densit (pcf)	y Moistu (%)	ce In Place re Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
39		6/15/18	P-05	А	CL	16.7	110.5	19.5	110.5	6	100	95	0/5	A
40		6/15/18	P-04	А	CL	15.3	111.8	17.0	114.1	6	102	95	0/5	A
41		6/15/18	P-05	А	CL	16.7	110.5	20.1	110.5	6	100	95	0/5	A
42		6/15/18	P-04	А	CL	15.3	111.8	15.5	115.5	6	103	95	0/5	A
43		6/15/18	P-05	А	CL	16.7	110.5	15.2	110.9	6	100	95	0/5	A
44		6/15/18	P-05	А	CL	16.7	110.5	17.4	111.0	6	100	95	0/5	A
45		6/15/18	P-04	А	CL	15.3	111.8	16.1	114.6	6	103	95	0/5	A
46		6/15/18	P-05	А	CL	16.7	110.5	17.5	113.6	6	103	95	0/5	А
							Test In	formatio	า					
Test #	Test Lo	cation					E	levation	Reference		Gau Make / Model / S	ge SN / Calibrated	I Field Tech	nician
39	Mass Gr	ading :: Pha	ase 3A Soil Barrie	er Layer: Gr	10S J15, Lift #4.						Troxler / 343	0/66187/	Foucault, J	en off
40	Mass Gr	ading .: Pha	ise 3A Soil Barrie	r Layer: G	ride 113, Litt #3.						Troxler / 343	0/66187/	Foucault, J	off
41	Mass Gr	ading File	ise 3A Soil Barrie	ar Laver: Gi	rids 113, Lift #3						Troxler / 343	0/66187/	Foucault, J	off
43	Mass Gr	ading .: The	se 3A Soil Barrie	er Laver: Gi	rids H13 Lift #4						Troxler / 343	0 / 66187 /	Foucault J	eff
44	Mass Gr	ading :: Pha	ase 3A Soil Barrie	er Laver: Gr	rids H13, Lift #3.						Troxler / 343	0 / 66187 /	Foucault, J	eff
45	Mass Gr	ading :: Pha	ase 3A Soil Barrie	er Laver: Gr	rids H13. Lift #2.						Troxler / 343	0 / 66187 /	Foucault, J	eff
46	Mass Gr	ading :: Pha	ase 3A Soil Barrie	er Laver: Gr	rids F13, Lift #4.					Troxler / 343	0 / 66187 /	Foucault, J	eff	
		Rem	arks	,			Comment	s						
A: Test	results c	omply with s	specifications		Tests are "Direct "Backscatter" G	Transmission	" (Method A) ur n data on file w	iless probe d	epth is noted as					



Phase 3A

Report Date: 6/19/2018 Test Method: ASTM D6938

Client:

Houston Engineering, Inc. 1401 21st Avenue North Fargo, ND 58102

Project:

B1802554 Fergus Falls C & D Landfill <Blank> Fergus Falls, MN

						-	Tes	t Results				-			-
Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximur Dry Densi (pcf)	n In Pla ity Moist (%	ace ure)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
47		6/15/18	P-04	A	CL	15.3	111.8	16.	6	114.0	6	102	95	0/5	А
48		6/15/18	P-05	A	CL	16.7	110.5	17.	7	110.6	6	100	95	0/5	A
49		6/15/18	P-04	A	CL	15.3	111.8	16.	0	113.7	6	102	95	0/5	A
50		6/15/18	P-05	A	CL	16.7	110.5	17.	0	110.8	6	100	95	0/5	A
51		6/15/18	P-04	A	CL	15.3	111.8	16.	1	112.3	6	100	95	0/5	А
52		6/15/18	P-05	A	CL	16.7	110.5	18.	9	109.5	6	99	95	0/5	А
53		6/15/18	P-04	А	CL	15.3	111.8	15.	3	113.4	6	101	95	0/5	А
							Test I	nformatio	on						
Test #	Test Lo	cation						Elevation	R	Reference		Gau Make / Model / S	ge SN / Calibrated	Field Tech	nician
47	Mass Gr	ading :: Pha	ase 3A Soil Barrie	er Layer: Gi	rids F13, Lift #3.							Troxler / 343	0 / 66187 /	Foucault, J	eff
48	Mass Gr	ading :: Pha	ase 3A Soil Barrie	er Layer: Gi	rids F11, Lift #4.							Troxler / 343	0 / 66187 /	Foucault, J	eff
49	Mass Gr	ading :: Pha	ase 3A Soil Barrie	er Layer: Gi	rids F11, Lift #3.							Troxler / 343	0 / 66187 /	Foucault, J	eff
50	Mass Gr	ading :: Pha	ase 3A Soil Barrie	er Layer: Gi	rids H11, Lift #4.							Troxler / 343	0 / 66187 /	Foucault, J	eff
51	Mass Gr	ading :: Pha	ase 3A Soil Barrie	er Layer: Gi	rids H11, Lift #3.							Troxler / 343	0 / 66187 /	Foucault, J	eff
52	Mass Gr	ading :: Pha	ase 3A Soil Barrie	er Layer: Gi	rids F11, Lift #4.							Troxler / 343	0 / 66187 /	Foucault, J	eff
53	Mass Gr	ading :: Pha	ase 3A Soil Barrie	er Layer: Gi	rids F - 11, 3rd Lif	ít.					Troxler / 343	0 / 66187 /	Foucault, J	eff	
		Rem	arks				Commen	ts							
A: Tes	Remarks Comments Test results comply with specifications Tests are "Direct Transmission" (Method A) unless probe depth is noted "Backscatter". Gauge calibration data on file with the testing agency.														

suffer

Brett Gruber 06/19/2018



3900 Roosevelt Road Suite 113

Saint Cloud, MN 56301 Phone: 320-253-9940 Phase 3A Side Slopes

Report Date: 6/20/2018 Test Method: ASTM D6938

Client:

Houston Engineering, Inc. 1401 21st Avenue North Fargo, ND 58102

Project:

B1802554 Fergus Falls C & D Landfill <Blank> Fergus Falls, MN

							Та	t Deculto							
	1	1			1	1	Tes	st Results							
Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximu Dry Dens (pcf)	m In Pla sity Moist (%)	ice ire	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
54		6/15/18	P-04	А	CL	15.3	111.8	16.8	3	112.2	12	100	95	0/5	А
55		6/15/18	P-04	А	CL	15.3	111.8	15.8	3	111.3	12	100	95	0/5	А
56	56 6/15/18 P-04 A CL 15.3 111.8 16.4 11											105	95	0/5	А
							Test	Informatio	n						
Test #	Test Lo	cation						Elevation	Re	ference		Gau Make / Model / S	ge SN / Calibrated	Field Tech	nician
54	Impervic	ous Fill: Pha	se 3A Side Slope	s, Grids H9).			100.0	Fin	ished Grade = 1	00	Troxler / 343	0 / 66187 /	Foucault, Jo	eff
55	Impervic	ous Fill: Pha	se 3A Side Slope	s: Grids F9).			100.0	Fin	ished Grade = 1	00	Troxler / 343	0 / 66187 /	Foucault, Jo	eff
56	56 Impervious Fill: Phase 3A Side Slopes: Grids E13. 100.0 Finish											Troxler / 343	0 / 66187 /	Foucault, Jo	eff
		Rem	arks												
A: Test	results c	omply with	specifications		Tests are "Direct "Backscatter". G	Transmission' auge calibration	' (Method A) n data on file	unless probe with the testi	depth	is noted as ency.					

suffer

Brett Gruber 06/20/2018



Field Compaction Report

Phase 3A Soil Barrier Lay Report Date: 6/26/2018 Test Method: ASTM D6938

Client:

Houston Engineering, Inc. 1401 21st Avenue North Fargo, ND 58102

Project:

							Tes	t Results							
Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximun Dry Densi (pcf)	n In Pla ity Moist (%	ace ure)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
122		6/21/18	P-06	А	CL	16.9	112.9	16.	2	112.6	12	100	95	0/5	A
123		6/21/18	P-06	А	CL	16.9	112.9	16.	2	114.1	12	101	95	0/5	А
124		6/21/18	P-06	А	CL	16.9	112.9	17.	0	113.2	12	100	95	0/5	А
125		6/21/18	P-06	А	CL	16.9	112.9	16.	5	114.2	12	101	95	0/5	А
126		6/21/18	P-06	А	CL	16.9	112.9	16.	9	112.5	12	100	95	0/5	А
127		6/21/18	P-06	А	CL	16.9	112.9	17.	0	113.9	12	101	95	0/5	A
128		6/21/18	P-06	А	CL	16.9	112.9	17.	7	109.9	12	97	95	0/5	А
129		6/21/18	P-06	А	CL	16.9	112.9	17.	2	114.3	12	101	95	0/5	А
							Test I	nformatio	on						
Test #	Test Lo	cation						Elevation	R	eference		Gau Make / Model / S	ige SN / Calibrated	Field Tech	nician
122	Impervic	ous Fill: Pha	se 3A Soil Barrie	r Layer: Gri	ds F15, Lift #4.			100.0	Fi	inished Grade = '	100	Troxler / 343	0 / 66187 /	Foucault, J	eff
123	Impervic	ous Fill: Pha	se 3A Soil Barrie	r Layer: Gri	ds H15, Lift #4.			100.0	Fi	inished Grade = '	100	Troxler / 343	0 / 66187 /	Foucault, J	eff
124	Impervic	ous Fill: Pha	se 3A Soil Barrie	r Layer: Gri	ds J15, Lift #4.			100.0	Fi	inished Grade = '	100	Troxler / 343	0 / 66187 /	Foucault, J	eff
125	Impervic	ous Fill: Pha	se 3A Soil Barrier	r Layer: Gri	ds J13, Lift #4.			100.0	Fi	inished Grade = '	100	Troxler / 343	0 / 66187 /	Foucault, J	eff
126	Impervic	ous Fill: Pha	se 3A Soil Barrier	Layer: Gri	ds J11, Lift #4.			100.0	Fi	inished Grade = '	100	Troxler / 343	0 / 66187 /	Foucault, J	eff
127	Impervic	ous Fill: Pha	se 3A Soil Barrier	r Layer: Gri	ds H11, Lift #4.			100.0	Fi	inished Grade = '	100	Troxler / 343	0 / 66187 /	Foucault, J	eff
128	Impervic	ous Fill: Pha	se 3A Soil Barrier	r Layer: Gri	ds F11, Lift #4.			100.0	Fi	inished Grade = '	100	Troxler / 343	0 / 66187 /	Foucault, J	eff
129	Impervic	ous Fill: Pha	se 3A Soil Barrier	r Layer: Gri	ds F13, Lift #4.			100.0	Fi	inished Grade = ²	100	Troxler / 343	0 / 66187 /	Foucault, J	eff
A: Test	t results c	Rem comply with s	arks specifications		Tests are "Direct	t Transmission' auge calibratio	Commen " (Method A) u n data on file y	i ts Inless probe with the testi	dept	th is noted as					



3900 Roosevelt Road Suite 113

Saint Cloud, MN 56301 Phone: 320-253-9940

Field Compaction Report

Phase 3A Soil Barrier Lay Report Date: 6/26/2018 Test Method: ASTM D6938

Client:

Houston Engineering, Inc. 1401 21st Avenue North Fargo, ND 58102

Project:

							Tes	st Results	5						
Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximur Dry Dens (pcf)	m In Pl ity Moist (%	ace ture	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
130		6/21/18	P-06	А	CL	16.9	112.9	16.	9	112.4	12	100	95	0/5	А
131		6/21/18	P-06	А	CL	16.9	112.9	18.	4	111.5	12	99	95	0/5	A
							Test I	Informati	on						
Test #	Test Loo	cation						Elevation	R	eference		Gau Make / Model / S	ge SN / Calibrated	d Field Tech	nician
130	Impervio	us Fill: Pha	se 3A Soil Barrie	r Layer: Gri	ds H13, Lift #4.			100.0	Fi	inished Grade = 1	00	Troxler / 343	0 / 66187 /	Foucault, J	eff
131	130Impervious Fill: Sump Pit Floor.97.0Finished C97.0Finished C											Troxler / 343	0 / 66187 /	Foucault, J	eff
	Remarks Comments														
A: Tes	Remarks Comments est results comply with specifications Tests are "Direct Transmission" (Method A) unless probe depth is noted "Backscatter". Gauge calibration data on file with the testing agency.														



3900 Roosevelt Road Suite 113

Saint Cloud, MN 56301 Phone: 320-253-9940

Field Compaction Report

Report Date: 7/20/2018 Test Method: ASTM D6938

Client:

Houston Engineering, Inc. 1401 21st Avenue North Fargo, ND 58102

Project:

B1802554 Fergus Falls C & D Landfill <Blank> Fergus Falls, MN

							Tes	st Results							
Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximu Dry Dens (pcf)	m In Pla ity Moistu (%)	ce In Place re Dry Densit (pcf)	y I	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
132		7/18/18	P-06	A	CL	16.9	112.9	21.2	107.3		6	95	95	0/5	А
133		7/18/18	P-06	A	CL	16.9	112.9	21.2	108.6		12	96	95	0/5	А
	Test Information														
Test #	Test Loo	cation						Elevation	Reference			Gau Make / Model / S	ge SN / Calibrated	I Field Tech	nician
132	Mass Gr Layer: G	ading :: Pha rid J13, Lift	ase 3A Soil Barrie #4	r								Troxler / 343	0 / 31146 /	McManus,	Sean
133	Cayer: Grid J13, Lift #4 33 Mass Grading :: Phase 3A Soil Barrier Layer: Grid J13, Lift #4											Troxler / 343	0 / 31146 /	McManus,	Sean
		Rem	arks												
A: Test	results c	omply with s	specifications		Tests are "Direct	epth is noted as									

suffer

Brett Gruber 07/20/2018

Houston Engineering, Inc.

PROJECT: Fergus Falls Landfill PH3A

Project No.: 6018-006

Location: Fergus Falls, MN

Required Tests:

Conformance Standard Proctor - 1 test per 5000 CY

Classification, Particle Size Distribution, & Atterberg Limit - 1 test per 2 acre per lift

Source Standard Proctor, Classification, Particle Size Distribution, & Atterberg Limit - 1 test per 5000 CY

				Standard	d Proctor								G	radation						Atterberg		Soil Classification
Test No.	Source = S Conformance = C	Gridpoint Location	Date Sample Tested	Max Dry Density (pcf)	Optimum MC%	1.5"	1"	3/4"	1/2"	3/8"	#4	#10	#20	#40	#60	#100	#200	Pass/ Fail	Liquid Limit (LL)	Plasticity Index (PI)	Pass/ Fail	Soil Type
	Specification	Requirements									I	Min 50% pa	ssing #200,	Max 5% gi	ravel				LL>=25	PI>=12		
W18-000856-S1 W18-000854-S1	s	Cell Floor, -5'	5/2/2018	114.3	15.1%			100.0%	91%	86%	83%	79%	74%	68%	61%	54%	N.A.	Pass	28	15	Pass	CL
W18-000856-S2 W18-000854-S2	s	East Borrow Pit	5/2/2018	108.7	18.3%			100.0%	96.0%	85%	81%	79%	75%	71%	66%	61%	N.A.	Pass	41	28	Pass	CL
W18-002243-S1 W18-002240-S1	s	SE Stockpile	6/5/2018	112.6	15.0%		100.0%	91%	91.0%	91%	87%	83%	80%	76%	70%	61%	51%	Pass	30	19	Pass	CL
W18-002243-S2 W18-002240-S2	s	West Stockpile	6/5/2018	120.1	11.9%						100%	98%	93%	86%	80%	71%	64%	Pass	29	17	Pass	CL
W18-002582-S1 W18-002348-S1	с	H11	6/14/2018	111.8	15.3%	-			100.0%	98%	96%	94%	91%	87%	81%	73%	66%	Pass	38	25	Pass	CL
W18-002641-S1 W18-002380-S1	с	H13, lift 4	6/15/2018	110.5	16.7%					99%	98%	96%	92%	88%	84%	78%	71%	Pass	43	27	Pass	CL
W18-002694-S1 W18-002617-S1	с	J13, lift 4	6/21/2018	112.9	16.9%				100.0%	97.0%	95%	93%	86%	79%	74%	68%	61%	Pass	36	16	Pass	CL
W18-002935-S4	с	Lift #2	6/14/2018						100%	99.0%	95%	90%	85%	78%	70%	62%	54%	Pass	31	17	Pass	CL
W18-002935-S5	с	J13, lift #2	6/14/2018			-	100.0%	98.0%	98%	98.0%	94.0%	90%	85%	78%	70%	61%	52%	Pass	31	16	Pass	CL
W18-002935-S6	с	F15, lift #1	6/14/2018			100.0%	96.0%	96.0%	96.0%	96.0%	93.0%	89%	84%	79%	72%	66%	57%	Pass	32	17	Pass	CL
W18-002947-S1	с	J13, final Lift	6/15/2018			-				100.0%	95.0%	88%	85%	80%	75%	67%	61%	Pass	32	18	Pass	CL
W18-002947-S2	с	H15, lift #3	6/15/2018							100.0%	94.0%	86%	82%	76%	71%	64%	58%	Pass	33	19	Pass	CL
W18-002947-S3	с	J11, lift #3	6/15/2018							100.0%	98.0%	96%	91%	85%	78%	69%	61%	Pass	29	17	Pass	CL
W18-002947-S4	с	F13, final Lift	6/21/2018							100.0%	97.0%	95%	91%	86%	80%	71%	63%	Pass	32	18	Pass	CL

Soil Barrier Layer Classification, Partice Size Distribution, Percentage Fines, Atterberg Limits & Proctor Tests

Tests 2 each 2 8 each



							none: 701.232.8701		
Mater	ial Test R	leport					Repor	t No: MAT:W	18-000856-S1 Issue No: 1
Client: L F Project: E	Larry Swann Riley Bros. Construc PO Box 535 Morris, MN, 56267 31802562 Fergus Falls Phase	ction Inc. 3A (Baseliner	·) & Phase	e 1&2 (Fin	al Cover)		C	Indrew	Sage Andrew Lage
F TR: A	Fergus Falls, MN, Adam Nistler, anistle	er@brauninter	rtec.com					Laborate Date of Iss	ory Coordinator ue: 5/7/2018
Sample D	etails						Atterberg L	imit:	
Sample ID Alternate Sampled I Sampling Date Sam Date Subr): Sample ID: By: Method: pled: nitted:	W18-000 P-01 Sean McI In place 5/2/2018 5/2/2018	856-S1 Manus				L P Plas Linear Sh	iquid Limit: 2 lastic Limit: 1 ticity Index: 1 rinkage (%): N	28 3 5 N/A
Specificat	ion:	ASTM D	422				Sample Des	scription:	
Material T Sample Lo	ype: ocation:	Existing N Soil Barrie Cell Floor	naterial er Layer r, -5'				USCS Classi (CL), Brown	fication: Sandy	Lean Clay
							Grading: AS	3TM D 422 - 07	
% Pa: 100 90 	ssing			<u> </u>			Sieve Size 1⁄2in (12.5mm 3/8in (9.5mm No.4 (4.75mr No.10 (2.0mr No.20 (850µr No.40 (425µr No.60 (250µr No.100 (150µ No.200 (75µr 29.8 µm 19.4 µm 11.6 µm 8.4 µm 6.0 µm 3.0 µm	% Passing) 10 n) 8 n) 8 n) 7 n) 7 n) 7 n) 8 m) 8 10 m) 8 11 36 31 31 31 31 31 31 31 31 31 31 31 31 31	g Limits 00 91 36 33 79 74 58 51 54 .4 53 .2 55 .7 .9 .3
	9,51 37,81 No.	01.0N 02.0N 2.0A 2.0A 2.0A	0.00 No.100 No.200	29.8 µr 19.4 µr	11.6 µn 8.4 µn 6 µn 3 µn	1.3 µn			
COBBLES	GRAVEL		SAND		FIN	IES		D60· 0 130/	
(0.0%)	Coarse Fine (0.0%) (14.4%)	Coarse (3.0%)	Medium (8.9%)	Fine (19.9%)	Silt (31.7%)	Clay (22.1%)) D30: 0.0104	D15: 0.0017	D10: 0.0008



Material Test Report

Client:	Larry Swann Riley Bros. Construction Inc. PO Box 535
Project:	Morris, MN, 56267 B1802562 Fergus Falls Phase 3A (Baseliner) & Phase 1&2 (Final Cover)
TR:	Fergus Falls, MN, Adam Nistler, anistler@braunintertec.com

Report No: MAT:W18-000856-S1

Issue No: 1

andrew Sage

Andrew Lage Laboratory Coordinator Date of Issue: 5/7/2018

Sample Details

Sample ID [.]	W18-000856-S1
Alternate Sample ID	P-01
Sampled By:	Sean McManus
Sampling Method:	In place
Date Sampled:	5/2/2018
Date Submitted:	5/2/2018
Specification:	ASTM D 422
Source:	Existing Material
Material Type:	Soil Barrier Layer
Sample Location:	Cell Floor, -5'

Other Test Results

Description	Method	Result	Limits
Finer than 75µm (%)	ASTM C 117 - 04	55	
Test Method		A	
Date Tested		5/3/2018	
Dispersion device	ASTM D 422 - 07		
Dispersion time (min)			
Shape			
Hardness			
Liquid Limit	ASTM D 4318 - 05	28	
Method		Method B	
Plastic Limit		13	
Plasticity Index		15	
Sample history		Air-dried	
Material retained on 425µm (No. 40) (%)		26.3	
Date Tested		5/4/2018	

Comments

Proctor Report	Issue No: 1
Client: Larry Swann Riley Bros. Construction Inc.	
Morris, MN, 56267 Project: B1802562 Fergus Falls Phase 3A (Baseliner) & Phase 1&2 (Final Cover)	Andrew Lage
Fergus Falls, MN, TR: Adam Nistler, anistler@braunintertec.com	Laboratory Coordinator Date of Issue: 5/7/2018
Sample DetailsSample ID:W18-000854-S1Alternate SampleDate Sampled:5/2/2018Date Submitted:Sampled By:Sean McManusSampling MethoSource:Existing MaterialMaterial:Soil Barrier LayerSpecification:General InformationLocation:Cell Floor, -5'Date Tested:5/4/2018	ple ID: P-01 d: 5/2/2018 nod: In place
Dry Density - Moisture Content Relationship	est Results
Dry Density (lbf/ft ³) 115.0 114.0	Maximum Dry 114.3 Density (lbf/ft³): 114.3 Dry Density (lbf/ft³): 114.3 Dry Density (lbf/ft³): 15.1 Dotimum Moisture 15.1 Corrected Optimum 15.1 Corrected Optimum 15.1 Moisture Content 8 Preparation Method: Moist Specific Gravity (Fines): 2.65 Specific Gravity Method: Assumed Retained Sieve 3/8" (9.5mm) 5 %): 95 "isual Description: USCS Classification: Sandy Lean Clay (CL), Brown

Comments



							FI	IUNE. 701.232.0701		
Mater	rial Te	est R	eport	t		Report N	Report No: MAT:W18-000856-S2 Issue No: 1			
Client: Project:	Larry Swar Riley Bros. PO Box 53 Morris, MN B1802562 Fergus Fall	n Construct 5 , 56267 s Phase 3	ion Inc. A (Baselin	er) & Phas	e 1&2 (Fin	al Cover)		Am	udreu t	Andrew Lage
TR:	Fergus Falls, MN, Adam Nistler, anistler@braunintertec.com							Laboratory Coordinator Date of Issue: 5/7/2018		
Sample D	Details							Atterberg Limi	t:	
Sample II Alternate Sampled Sampling Date Sam Date Sub	D: Sample ID By: Method: apled: mitted:	:	W18-00 P-02 Sean M In place 5/2/201 5/2/201	00856-S2 IcManus 8 8				Liqu Plasi Plastici Linear Shrink	iid Limit: 41 tic Limit: 13 ty Index: 28 cage (%): N/A	ι.
Specifica	tion:		ASTM I	D 422				Sample Descri	ption:	
Source: Material 1 Sample L	Гуре: .ocation:		Existing Soil Bai East Bo	naterial rrier Layer prrow Pit, -6	6'			USCS Classifica (CL), Brown	ition: Sandy Le	ean Clay
								Grading: ASTM	1 D 422 - 07	
% Pa 100 90 80 70	assing	\sum						Date Tested: 5/ Sieve Size ½in (12.5mm) 3/8in (9.5mm) No.4 (4.75mm) No.10 (2.0mm) No.20 (850µm) No.40 (425µm)	4/2018 % Passing 100 96 85 81 79 75	Limits
50	******				\			No.60 (250μm) No.100 (150μm) No.200 (75μm)	71 66 61	
40 					7	$\overline{\ }$	······ ······	32.5 µm 20.7 µm 12.2 µm 8.7 µm 6.3 µm 3.1 µm	32.0 30.4 25.7 22.7 19.7 16.9	
10++		******	******					1.3 µm	10.0	
٥L		3/8in +	No.10 No.20	09.0N 09.0N Sieve	32.5 µm -	12.2 m 8.7 m 6.3 m 3.1 m	1.3 µm			
COBBLES	GRA	VEI		SAND		FI	NES	¬		
(0.0%)	Coarse (0.0%)	Fine (15.2%)	Coarse (3.3%)	Medium (6.7%)	Fine (13.6%)	Silt (42.6%)	Clay (18.6%)	D85: 4.8018 D D30: 0.0198 D Cu: 55.73	60: 0.0724 015: 0.0024 Cc: 4.16	D50: 0.0544 D10: 0.0013



Material Test Report

Client:	Larry Swann Riley Bros. Construction Inc.
Project:	Morris, MN, 56267 B1802562 Fergus Falls Phase 3A (Baseliner) & Phase 1&2 (Final Cover)
TR:	Fergus Falls, MN, Adam Nistler, anistler@braunintertec.com

Report No: MAT:W18-000856-S2

Issue No: 1

andrew Sage

Andrew Lage Laboratory Coordinator Date of Issue: 5/7/2018

Sample Details

P-02 Sean McManus In place 5/2/2018 5/2/2018 ASTM D 422 Existing Material Soil Barrier Layer
East Borrow Pit, -6'

Other Test Results

Description	Method	Result	Limits
Finer than 75µm (%)	ASTM C 117 - 04	69	
Test Method		A	
Date Tested		5/3/2018	
Dispersion device	ASTM D 422 - 07		
Dispersion time (min)			
Shape			
Hardness			
Liquid Limit	ASTM D 4318 - 05	41	
Method		Method B	
Plastic Limit		13	
Plasticity Index		28	
Sample history		Air-dried	
Material retained on 425µm (No. 40) (%)		25.2	
Date Tested		5/4/2018	

Comments

BRAUN	Braun Intertec Corporation 526 10th Street NE, Suite 300 West Fargo, ND 58078 Phone: 701.232.8701 Report No: PTR:W18-000854-S2
Proctor Report	Issue No: 1
Client: Larry Swann Riley Bros. Construction Inc. PO Box 535 Morris, MN, 56267 Project: B1802562 Fergus Falls Phase 3A (Baseliner) & Phase 1&2 (Final Cover) Fergus Falls, MN, TR: Adam Nistler, anistler@braunintertec.com	Andrew Lage Laboratory Coordinator Date of Issue: 5/7/2018
Sample DetailsSample ID:W18-000854-S2Date Sampled:5/2/2018Date Submittion	mple ID: P-02 ted: 5/2/2018
Sampled By:Sean McManusSampling MeSource:Existing MaterialMaterial:Soil Barrier LayerSpecification:General InformationLocation:East Borrow Pit, -6'Date Tested:5/4/2018	ethod: In place
Dry Density - Moisture Content Relationship	Test Results
Dry Density (lbf/ft ³) 109.0 109.0 108.0 107.0 107.0 106	ASTM D 698 - 07Maximum Dry108.7Density (lbf/ft³):Corrected MaximumDry Density (lbf/ft³):Optimum Moisture18.3Content (%):Corrected Optimum18.3Moisture ContentMoist(%):Method:Method:APreparation Method:MoistSpecific Gravity (Fines):2.65Specific Gravity Method:AssumedRetained Sieve No 44(4.75mm) (%):Yisual Description:Visual Description:USCS Classification: Sandy Lean Clay (CL), Brown

Comments



Material Test Report	Report No: MAT:W18-002243-S1 Issue No: 1	
Client: Larry Swann Riley Bros. Construction Inc. PO Box 535 Morris, MN, 56267 Project: B1802562 Fergus Falls Phase 3A (Baseliner) & Phase 1&2 (Final Cover)	Andrew Lage	
Fergus Falls, MN,	Laboratory Coordinator	
Sample Details	Atterberg Limit:	
Sample ID:W18-002243-S1Alternate Sample ID:P-05Sampled By:Sean McManusSampling Method:ASTM D75/AASHTO T2 StockpileDate Sampled:6/5/2018Date Submitted:6/5/2018Specification:ASTM D 422	Liquid Limit: 30 Plastic Limit: 11 Plasticity Index: 19 Linear Shrinkage (%): N/A Sample Description:	
Source: Existing Material Material Type: Soil Barrier Layer Sample Location: SE Stockpile - Clay Liner	USCS Classification: Sandy Lean Clay, Brown	
Particle Size Distribution	Grading: ASTM D 422 - 07	
% Passing 100 100 100 100 100 100 100 10	Date Tested: $6/11/2018$ Sieve Size % Passing Limits 1in (25.0mm) 100 ¾in (19.0mm) 91 ¼in (12.5mm) 91 3/8in (9.5mm) 91 No.4 (4.75mm) 87 No.10 (2.0mm) 83 No.20 (850µm) 80 No.40 (425µm) 76 No.60 (250µm) 70 No.100 (150µm) 61 No.200 (75µm) 51 31.7 µm 33.6 20.2 µm 31.2 11.9 µm 26.3 8.6 µm 22.9 6.2 µm 20.5 3.1 µm 14.1 1.3 µm 10.7	
COBBLESGRAVELSANDFINES(0.0%)Coarse (8.9%)Fine (4.0%)Coarse (4.1%)Medium (7.0%)Fine (24.7%)Silt (33.3%)Cla (18.0%)	D85: 3.0462 D60: 0.1376 D50: 0.0705 D30: 0.0177 D15: 0.0034 D10: 0.0011 Cu: 126.58 Cc: 2.11	



Report No: MAT:W18-002243-S1

Andrew Lage

Issue No: 1

Andrew Lage

Laboratory Coordinator Date of Issue: 6/15/2018

Material Test Report

Client:	Larry Swann Riley Bros, Construction Inc
	PO Box 535
Draiaatu	Morris, MN, 56267
Project.	Fergus Falls Phase 3A (Baseliner) & Phase 1&2 (Final Cover)
TR:	Fergus Falls, MN, Brett Gruber, bgruber@braunintertec.com

Sample Details

Sample ID:	W18-002243-S1
Alternate Sample ID:	P-05
Sampled By:	Sean McManus
Sampling Method:	ASTM D75/AASHTO T2 Stockpile
Date Sampled:	6/5/2018
Date Submitted:	6/5/2018
Specification:	ASTM D 422
Source:	Existing Material
Material Type:	Soil Barrier Layer
Sample Location:	SE Stockpile - Clay Liner

Other Test Results

Description	Method	Result	Limits
Finer than 75µm (%)	ASTM C 117 - 04	53	
Test Method		А	
Date Tested		6/7/2018	
Dispersion device	ASTM D 422 - 07		
Dispersion time (min)			
Shape			
Hardness			
Liquid Limit	ASTM D 4318 - 05	30	
Method		Method B	
Plastic Limit		11	
Plasticity Index		19	
Sample history		Air-dried	
Date Tested		6/12/2018	

Comments

BRAUN	Braun Intertec Corporation 526 10th Street NE, Suite 300 West Fargo, ND 58078 Phone: 701.232.8701
Proctor Report	Report No: PTR:W18-002240-S1 Issue No: 1
Client: Larry Swann Riley Bros. Construction Inc. PO Box 535 Morris, MN, 56267 Project: B1802562 Fergus Falls Phase 3A (Baseliner) & Phase 1&2 (Final Cover) Fergus Falls, MN, TR: Brett Gruber, bgruber@braunintertec.com	Andrew Lage Andrew Lage Laboratory Coordinator Date of Issue: 6/15/2018
Sample DetailsSample ID:W18-002240-S1Alternate SaDate Sampled:6/5/2018Date SubmitSampled By:Sean McManusSampling MSource:Existing MaterialMaterial:Soil Barrier LayerSpecification:General InformationLocation:SE Stockpile - Clay LinerDate Tested:6/7/2018	ample ID: P-05 tted: 6/5/2018 ethod: ASTM D75/AASHTO T2 Stockpile
Dry Density - Moisture Content Relationship	Test Results
0% Air Voids	ASTM D 698 - 07 Maximum Dry 112.6 Density (lbf/ft ³): Corrected Maximum 112.6 Dry Density (lbf/ft ³): Optimum Moisture 15.0 Content (%): Corrected Optimum 15.0 Moisture Content (%): Method: A Preparation Method: Moist Specific Gravity (Fines): 2.65 Specific Gravity Method: Assumed Retained Sieve No 4 (4.75mm) (%): Passing Sieve No 4 (4.75mm) (%): Visual Description: USCS Classification: Sandy Lean Clay (CL), Brown
12 13 14 15 16 17 18 19 20 Moisture Content (%)	

Comments



Material Test R	leport	Report No: MAT:W18-002243-S2 Issue No: 1
Client: Larry Swann Riley Bros. Construct PO Box 535 Morris, MN, 56267 Project: B1802562 Fergus Falls Phase	ction Inc. 3A (Baseliner) & Phase 1&2 (Final	Cover) Andrew Lage
Fergus Falls, MN, TR: Brett Gruber, bgrube	er@braunintertec.com	Laboratory Coordinator Date of Issue: 6/15/2018
Sample Details		Atterberg Limit:
Sample ID: Alternate Sample ID: Sampled By: Sampling Method: Date Sampled: Date Submitted:	W18-002243-S2 P-06 Sean McManus ASTM D75/AASHTO T2 Stock 6/5/2018 6/5/2018	Dile Liquid Limit: 29 Plastic Limit: 12 Plasticity Index: 17 Linear Shrinkage (%): N/A
Specification:	ASTM D 422 Existing Material	Sample Description:
Material Type: Sample Location:	Soil Barrier Layer Stockpile West of Landfill - Fina	al Layer USCS Classification: Sandy Lean Clay (CL), Brown
Destiele Cine Distribution		Grading: ASTM D 422 - 07
% Passing	No.500 No.200 32.6 m 21.1 Lm 33.6 m 8.8 m 8.3 m 12.4 Lm 8.3 m 12.4 Lm 12.4 Lm	Diffing 0): Hataat Date Tested: 6/11/2018 Sieve Size % Passing Limits No.4 (4.75mm) 100 No.10 (2.0mm) 98 No.20 (850µm) 93 No.40 (425µm) 86 No.60 (250µm) 80 No.100 (150µm) 71 No.200 (75µm) 64 32.6 µm 40.1 21.1 µm 34.8 12.4 µm 29.4 8.8 µm 26.8 6.3 µm 23.2 3.2 µm 16.1 1.3 µm 10.1
COBBLES GRAVEL	SAND	FINES D85: 0.3995 D60: 0.0655 D50: 0.0461
(0.0%) Coarse Fine (0.0%) (0.0%) (0.0%)	Coarse Medium Fine (2.0%) (12.4%) (21.8%) (Silt Clay (43.6%) (20.2%) Cu: 51.14 Cc: 2.06



Material Test Report

Client: Larry Swann Riley Bros. Construction Inc. PO Box 535 Morris, MN, 56267 Project: B1802562 Fergus Falls Phase 3A (Baseliner) & Phase 1&2 (Final Cover) Fergus Falls, MN, TR: Brett Gruber, bgruber@braunintertec.com

Sample Details

Sample ID:	W18-002243-S2
Alternate Sample ID:	P-06
Sampled By:	Sean McManus
Sampling Method:	ASTM D75/AASHTO T2 Stockpile
Date Sampled:	6/5/2018
Date Submitted:	6/5/2018
Specification:	ASTM D 422
Source:	Existing Material
Material Type:	Soil Barrier Layer
Sample Location:	Stockpile West of Landfill - Final Layer

Other Test Results

Description	Method	Result	Limits
Finer than 75µm (%)	ASTM C 117 - 04	56	
Test Method		A	
Date Tested		6/7/2018	
Dispersion device	ASTM D 422 - 07		
Dispersion time (min)			
Shape			
Hardness			
Liquid Limit	ASTM D 4318 - 05	29	
Method		Method B	
Plastic Limit		12	
Plasticity Index		17	
Sample history		Air-dried	
Date Tested		6/11/2018	

Comments

N/A

Report No: MAT:W18-002243-S2 Issue No: 1

Andrew Lage

Andrew Lage Laboratory Coordinator Date of Issue: 6/15/2018

Braun Intertec Corporation 526 10th Street NE, Suite 300 BRAUN West Fargo, ND 58078 INTERTEC Phone: 701.232.8701 Report No: PTR:W18-002240-S2 Proctor Report Issue No: 1 Client: Larry Swann Riley Bros. Construction Inc. Andrew Lage PO Box 535 Morris, MN, 56267 Project: B1802562 Fergus Falls Phase 3A (Baseliner) & Phase 1&2 (Final Cover) Andrew Lage Laboratory Coordinator Fergus Falls, MN, TR: Brett Gruber, bgruber@braunintertec.com Date of Issue: 6/15/2018 Sample Details Sample ID: W18-002240-S2 Alternate Sample ID: P-06 Date Sampled: 6/5/2018 Date Submitted: 6/5/2018 Sampled By: Sampling Method: Sean McManus ASTM D75/AASHTO T2 Stockpile Source: **Existing Material** Material: Soil Barrier Layer Specification: **General Information** Location: Stockpile West of Landfill - Final Layer Date Tested: 6/7/2018 Dry Density - Moisture Content Relationship Test Results 0% Air Voids ASTM D 698 - 07 Maximum Dry 120.1 Dry Density (lbf/ft3) Density (lbf/ft3): 121.0 T Corrected Maximum 120.1 Dry Density (lbf/ft³): 120.0 Optimum Moisture 11.9 119.0 Content (%): Corrected Optimum 11.9 118.0 Moisture Content 117.0 (%): Method: А 116.0 Preparation Method: Moist 115.0 Specific Gravity (Fines): 2.65 Specific Gravity Method: Assumed 114.0 Retained Sieve No 4 6 (4.75mm) (%): 113.0 Passing Sieve No 4 94 112.0 (4.75mm) (%): Visual Description: USCS Classification: Sandy 111.0 Lean Clay (CL), Brown 110.0 109.0 108.0 10 16 18 20 8 12 14 Moisture Content (%)

Comments



Material Test Report							Report	No: MAT:W18	3-002582-S1 Issue No: 1	
Client:	Dennis Mc, Houston Er 6901 E. Fis Maple Grov B1802554 Fergus Fall	Alpine ngineering sh Lake R ve, MN, 59 ls C & D L	g, Inc. d 5369 .andfill					X	Andrew	Lage
TR:	Fergus Fall Brett Grube	ls, MN, er. barube	r@braunint	tertec.com					Laboratory Date of Issue	Coordinator 6/25/2018
Sample D	etails						JL	Atterberg Li	mit:	
Sample IE Alternate Sampled Sampling Date Sam Date Subr): Sample ID By: Method: pled: mitted:):	W18-00 P-04 Sean M In place 6/14/20 6/14/20	02582-S1 IcManus 9 18 18				Li Pl Plast Linear Shr	iquid Limit: 38 astic Limit: 13 icity Index: 25 inkage (%): N/A	A
Specificat	tion:		ASTM [0 422				Sample Des	cription:	
Source: Material T Sample L	ype: ocation:		In Place Soil Bai Gridline	e rrier Layer H11				USCS Classif Lean Clay (Cl	ication: Sandy _), Brown	
		1 (1						Grading: AS	TM D 422 - 07	
% Pa 100 90 80 60 50 30 10 0	ssing	3.8in	No.10 No.20	001.0N Sieve	30 im 19.4 im	11.4 m 8.3 m 5.9 m 2.9 m	tam i K	Drying by: Date Tested: Sieve Size ½in (12.5mm) 3/8in (9.5mm) No.4 (4.75mm No.10 (2.0mm No.20 (850µm No.40 (425µm No.40 (425µm No.40 (425µm No.60 (250µm No.100 (150µ No.200 (75µm 30.0 µm 19.4 µm 11.4 µm 8.3 µm 5.9 µm 2.9 µm 1.3 µm	Oven 6/21/2018 % Passing 100 98 1) 96 1) 94 1) 91 1) 87 55.5 50.6 46.3 40.5 38.0 32.6 26.6	Limits
COBBLES	GRA	VEL		SAND		FI	NES			
(0.0%)	Coarse (0.0%)	Fine (3.6%)	Coarse (1.9%)	Medium (7.8%)	Fine (21.0%)	Silt (29.3%)	Clay (36.4%)	D85: 0.3632 D30: 0.0020	D60: 0.0449 D15: 0.0003	D50: 0.0180 D10: 0.0001



Project: B1802554

Sample Details

Client:

TR:

Material Test Report

6901 E. Fish Lake Rd Maple Grove, MN, 55369

Houston Engineering, Inc.

Fergus Falls C & D Landfill

Brett Gruber, bgruber@braunintertec.com

Dennis McAlpine

Fergus Falls, MN,

Braun Intertec Corporation 526 10th Street NE, Suite 300 West Fargo, ND 58078 Phone: 701.232.8701

Report No: MAT:W18-002582-S1 Issue No: 1

Issue No: 1

Andrew Lage

Andrew Lage Laboratory Coordinator Date of Issue: 6/25/2018

Sample ID: Alternate Sample ID: Sampled By: Sampling Method: Date Sampled: Date Submitted: Specification: Source: Material Type: Sample Location:

P-04 Sean McManus In place 6/14/2018 6/14/2018 ASTM D 422 In Place Soil Barrier Layer Gridline H11

W18-002582-S1

Other Test Results

Description	Method	Result	Limits
Finer than 75µm (%)	ASTM C 117 - 04	66	
Test Method		А	
Date Tested		6/18/2018	
Dispersion device	ASTM D 422 - 07		
Dispersion time (min)			
Shape			
Hardness			
Liquid Limit	ASTM D 4318 - 05	38	
Method		Method B	
Plastic Limit		13	
Plasticity Index		25	
Sample history		Air-dried	
Date Tested		6/19/2018	

Comments

Issue No: 1

Andrew Lage



Comments

BRAUN

INTERTEC



Material Test Report							Report	No: MAT:W1	8-002641-S1 Issue No: 1	
Client:	Dennis McA Houston En 6901 E. Fisl Maple Grov B1802554 Fergus Falls	Jpine gineering n Lake Ro e, MN, 55 s C & D L	, Inc. 1 5369 andfill					X	Andrew	- Lage Andrew Lage
TR: E	Fergus Falls Brett Grube	s, MN, r, bgruber	r@braunint	ertec.com					Laborator Date of Issu	y Coordinator e: 6/26/2018
Sample D	etails							Atterberg Li	mit:	
Sample ID Alternate Sampled I Sampling Date Sam Date Subr): Sample ID: By: Method: pled: nitted:	:	W18-00 P-05 Jeff Fou In place 6/15/20 6/15/20	2641-S1 Icault 18 18				Li Pl Plast Linear Shr	iquid Limit: 43 astic Limit: 16 icity Index: 27 inkage (%): N/	A
Specificat	tion:) 422				Sample Des	cription:	
Material T Sample Lo	ype: ocation:		Soil Bar Gridline	rier Layer H13, Lift 4	ŀ			USCS Classif Lean Clay (Cl	ication: Sandy _), Brown	
Dertiele C	ine Dietrik							Grading: AS	TM D 422 - 07	
% Pa 100 90 	ssing	No.20+	No.40 No.60	Deve Sieve	28.8 µm 18.5 µm 11.1 µm 7 ot im	2.8 m	13 µm+	Date Tested: Sieve Size 3/8in (9.5mm) No.4 (4.75mm No.10 (2.0mm No.20 (850µm No.40 (425µm No.40 (425µm No.100 (150µ No.200 (75µm 28.8 µm 18.5 µm 11.1 µm 7.9 µm 5.7 µm 2.8 µm 1.3 µm	6/22/2018 % Passing 99 99 90 90 92 91 92 91 92 92 91 92 92 93 94 94 95 95 96 97 97 97 97 97 97 97 97 97 97	Limits
COBBLES	GRA	VEL		SAND		FIN	IES		B00	
(0.0%)	Coarse (0.0%)	Fine (2.2%)	Coarse (2.3%)	Medium (7.9%)	Fine (16.3%)	Silt (30.2%)	Clay (41.1%)	D85: 0.3019 D30: 0.0017	D60: 0.0290 D15: 0.0004	D50: 0.0113 D10: 0.0002



Project: B1802554

Sample Details

Client:

TR:

Material Test Report

6901 E. Fish Lake Rd Maple Grove, MN, 55369

Fergus Falls C & D Landfill

Brett Gruber, bgruber@braunintertec.com

Dennis McAlpine Houston Engineering, Inc.

Fergus Falls, MN,

Braun Intertec Corporation 526 10th Street NE, Suite 300 West Fargo, ND 58078 Phone: 701.232.8701

> Report No: MAT:W18-002641-S1 Issue No: 1

Andrew Lage

Andrew Lage Laboratory Coordinator Date of Issue: 6/26/2018

Sample ID:	W18-002641-S1
Alternate Sample ID:	leff Foucault
Sampled By:	In place
Sampling Method:	6/15/2018
Date Sampled.	6/15/2018
Specification:	ASTM D 422
Source:	In Place
Material Type:	Soil Barrier Layer
Sample Location:	Gridline H13, Lift 4

Other Test Results

Description	Method	Result	Limits
Finer than 75µm (%)	ASTM C 117 - 04	69	
Test Method		A	
Date Tested		6/18/2018	
Dispersion device	ASTM D 422 - 07		
Dispersion time (min)			
Shape			
Hardness			
Liquid Limit	ASTM D 4318 - 05	43	
Method		Method B	
Plastic Limit		16	
Plasticity Index		27	
Sample history		Air-dried	
Date Tested		6/22/2018	

Comments



Comments

BRAUN

INTERTEC

Form No: 110031, Report No: PTR:W18-002380-S1



Material Test Report							Report	No: MAT:W18-	002694-S1 Issue No: 1	
Client: Project:	Dennis Mc/ Houston Er 6901 E. Fis Maple Grov B1802554 Fergus Fall	Alpine Igineering h Lake Rc re, MN, 55 s C & D La	, Inc. I 369 andfill					K	Indrew,	Lage
TR:	Fergus Fall Brett Grube	s, MN, er, bgruber	@braunint	ertec.com					Laboratory Date of Issue:	Coordinator 6/27/2018
Sample D	etails							Atterberg Lin	nit:	
Sample IE Alternate Sampled Sampling Date Sam Date Subi Specifica	D: Sample ID By: Method: pled: mitted: tion:	:	W18-00 P-06 Sean M In place 6/21/20 6/21/20 ASTM [2694-S1 cManus 18 18 0 422				Lio Pla Plasti Linear Shrin	quid Limit: 36 astic Limit: 13 city Index: 23 nkage (%): N/A	
Source: Material T Sample L	ype: ocation:		In Place Soil Bai Gridline	rier Layer J13, Top I	_ift			USCS Classific Lean Clay (CL	cation: Sandy), Brown	
Particle S	Size Distri	oution						Grading: AST	M D 422 - 07 Oven	
% Pa 100 90 80 60 50 30 10 10	ussing	3/8/1 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	No.20	001 °N Sieve	31 Jm 200 1	8.5 im 8.5 im 3 im	tsm / /	Sieve Size ½in (12.5mm) 3/8in (9.5mm) No.4 (4.75mm) No.10 (2.0mm) No.20 (850µm) No.40 (425µm) No.40 (425µm) No.100 (150µm) No.100 (150µm) 31.0 µm 20.1 µm 11.9 µm 8.5 µm 6.1 µm 1.3 µm	% Passing 100 97 95 93 86 79 74 n) 68 0 79 1 74 n) 68 0 79 1 74 n) 68 0 79 1 74 n) 68 0 71 24 0 74 n) 68 0 79 24 0 74 n) 68 0 34.0 48.5 41.2 37.6 34.8 29.2 23.0	Limits
COBBLES	GRA	VEL		SAND		FIN	NES	D85: 0.7546		50· 0 0226
(0.0%)	Coarse (0.0%)	Fine (5.0%)	Coarse (2.2%)	Medium (14.0%)	Fine (17.7%)	Silt (28.3%)	Clay (32.8%)	D30: 0.0033	D15: 0.0004 E	0.0226 010: 0.0002



Project: B1802554

Sample Details

Client:

TR:

Material Test Report

6901 E. Fish Lake Rd Maple Grove, MN, 55369

Fergus Falls C & D Landfill

Brett Gruber, bgruber@braunintertec.com

Dennis McAlpine Houston Engineering, Inc.

Fergus Falls, MN,

Braun Intertec Corporation 526 10th Street NE, Suite 300 West Fargo, ND 58078 Phone: 701.232.8701

> Report No: MAT:W18-002694-S1 Issue No: 1

Andrew Lage

Andrew Lage Laboratory Coordinator Date of Issue: 6/27/2018

Other Test Results

Description	Method	Result	Limits
Finer than 75µm (%)	ASTM C 117 - 04	61	
Test Method		А	
Date Tested		6/22/2018	
Dispersion device	ASTM D 422 - 07		
Dispersion time (min)			
Shape			
Hardness			
Liquid Limit	ASTM D 4318 - 05	36	
Method		Method B	
Plastic Limit		13	
Plasticity Index		23	
Sample history		Oven-dried	
Date Tested		6/25/2018	

Comments



Comments

BRAUN

INTERTEC

Form No: 110031, Report No: PTR:W18-002617-S1





Braun Intertec Corporation 11001 Hampshire Avenue South Minneapolis, MN 55438 Phone: 952.995.2000

Mate	rial Tes	t Report	Report No: M	Report No: MAT:W18-002935-S4 Issue No: 1		
Client: Dennis McAlpine Houston Engineering, Inc. 6901 E. Fish Lake Rd Maple Grove, MN, 55369 Project: B1802554 Fergus Falls C & D Landfill Fergus Falls, MN,		Laboratory R	Laboratory Results Reviewed by:			
Sample	Details	g				
Sample ID: Alternate Sample ID: Sampled By: Sampling Method: Date Sampled: Date Submitted: Specification: Source: Material Type: Sample Location:		W18-002935-S4 CL-4 Sean McManus In place 6/14/2018 6/15/2018 ASTM D 422 Soil Barrier Layer Phase 3A, Lift #2				
Other Te	est Results					
Descript Dispersic Dispersic Shape Hardness Liquid Lir Method Plastic Li Plasticity Sample h Date Tes	ion on device on time (min) S mit mit Index history ted	Method ASTM D 422 - 07 ASTM D 4318 - 05	Result Mixer 1 31 Method B 14 17 Air-dried 7/3/2018	Limits		

Comments





Braun Intertec Corporation 11001 Hampshire Avenue South Minneapolis, MN 55438 Phone: 952.995.2000

Material Test Report			Report No:	Report No: MAT:W18-002935-S5 Issue No: 1		
Client: Dennis McAlpin Houston Engine 6901 E. Fish La Maple Grove, M Project: B1802554 Fergus Falls C		ne eering, Inc. ake Rd MN, 55369 & D Landfill	Laboratory	Results Reviewed by:		
TR:	Fergus Falls, N Brett Gruber, b	/N, gruber@braunintertec.com	D	Project Manager Date of Issue: 7/3/2018		
Sample	Details					
Sample Alternat Sample Samplin Date Sa Date Su Specific Source: Material Sample	ID: te Sample ID: d By: ng Method: mpled: bmitted: cation: I Type: Location:	W18-002935-S5 CL-5 Sean McManus In place 6/14/2018 6/15/2018 ASTM D 422 Soil Barrier Layer Phase 3A, Grid J13, Lift #2				
Other Te	est Results					
Descript Dispersio Dispersio Shape Hardnes	tion on device on time (min) ss	Method ASTM D 422 - 07	Result Mixer 1	Limits		
Liquid Li Method Plastic L Plasticity Sample Date Tes	mit .imit / Index history sted	ASTM D 4318 - 05	31 Method B 15 16 Air-dried 7/3/2018			

Comments




Report No: MAT:W18-002935-S6 Material Test Report Issue No: 1 Client: **Dennis McAlpine** Laboratory Results Reviewed by: Houston Engineering, Inc. 6901 E. Fish Lake Rd Maple Grove, MN, 55369 Project: B1802554 ISOЛЕС Fergus Falls C & D Landfill **Brett Gruber** 17025 **Project Manager** Fergus Falls, MN, TR: Brett Gruber, bgruber@braunintertec.com Date of Issue: 7/3/2018 Sample Details W18-002935-S6 Sample ID: CL-6 Alternate Sample ID: Sean McManus Sampled By: In place Sampling Method: 6/14/2018 Date Sampled: 6/15/2018 Date Submitted: ASTM D 422 Specification: Source: Soil Barrier Layer Material Type: Phase 3A, 10' off Grid F15, Lift #1 Sample Location: Other Test Results Method Result Limits Description ASTM D 422 - 07 Dispersion device Mixer Dispersion time (min) 1 Shape Hardness Liquid Limit ASTM D 4318 - 05 32 Method Method B Plastic Limit 15 Plasticity Index 17 Sample history Air-dried Date Tested 7/3/2018

Comments

N/A



Material

Braun Intertec Corporation 526 10th Street NE, Suite 300 West Fargo, ND 58078

							Phone: 701.232.8701			
Mate	rial Test R	eport					Report No: MAT:W18-002947-S1 Issue No: 1			
Client: Dennis McAlpine Houston Engineering, Inc. 6901 E. Fish Lake Rd Maple Grove, MN, 55369 Project: B1802554 Fergus Falls C & D Landfill							Andrew Lage Andrew Lage			
TR:	Fergus Falls, MN, Brett Gruber, bgruber	@braunint		Laboratory Coordinator Date of Issue: 7/3/2018						
Sample	Details						Atterberg Limit:			
Sample Alternate Sample Samplin Date Sar Date Sub Specific Source: Material Sample	ID: e Sample ID: d By: g Method: mpled: omitted: ation: Type: Location:	W18-00 CL-7 Jeff Fou In place 6/15/20 6/15/20 ASTM D In Place Soil Bar Phase 3	2947-S1 Icault 18 0 422 rier Layer 8A, Gridline	ə J13, Lift #	<i>‡</i> 4		Liquid Limit: 32 Plastic Limit: 14 Plasticity Index: 18 Linear Shrinkage (%): N/ Sample Description: USCS Classification: Sandy L Clay (CL), brown	e A Lean		
Particle	Size Distribution						Grading: ASTM D 422 - 07			
% F 100 90 80 70 60 50 50 40 30 50 10 -	Passing Vor 50 No 20 No 20	No.40+ No.60	- 002-00 Nieve	28.9 µm 11.4 µm 8.2 µm	2.9 µm	1.3 µm	Sieve Size % Passing 3/8in (9.5mm) 100 No.4 (4.75mm) 99 No.10 (2.0mm) 88 No.20 (850µm) 88 No.40 (425µm) 80 No.60 (250µm) 75 No.100 (150µm) 67 No.200 (75µm) 67 28.9 µm 47.9 18.9 µm 41.9 11.4 µm 35.4 8.2 µm 32.5 5.8 µm 29.2 2.9 µm 22.2 1.3 µm 18.5	Limits 5 5 5 7 1 9 9 4 3 2 2 3		
COBBLE	S GRAVEL		SAND		FIN	IES				
(0.0%)	Coarse Fine (0.0%) (4.8%)	Coarse (7.6%)	Medium (8.2%)	Fine (19.0%)	Silt (33.3%)	Clay (27.3%)	D30: 0.0063 D15: 0.0007	D50: 0.0339 D10: 0.0002		



Project: B1802554

Sample Details

Client:

TR:

Material Test Report

6901 E. Fish Lake Rd Maple Grove, MN, 55369

Houston Engineering, Inc.

Fergus Falls C & D Landfill

Dennis McAlpine

Fergus Falls, MN,

Braun Intertec Corporation 526 10th Street NE, Suite 300 West Fargo, ND 58078 Phone: 701.232.8701

> Report No: MAT:W18-002947-S1 Issue No: 1

Andrew Lage

Andrew Lage Laboratory Coordinator Date of Issue: 7/3/2018

W18-002947-S1 Sample ID: CL-7 Alternate Sample ID: Jeff Foucault Sampled By: In place Sampling Method: 6/15/2018 Date Sampled: 6/15/2018 Date Submitted: ASTM D 422 Specification: In Place Source: Soil Barrier Layer Material Type: Phase 3A, Gridline J13, Lift #4 Sample Location:

Brett Gruber, bgruber@braunintertec.com

Other Test Results

Description	Method	Result	Limits
Dispersion device	ASTM D 422 - 07		
Dispersion time (min)			
Shape			
Hardness			
Liquid Limit	ASTM D 4318 - 05	32	
Method		Method B	
Plastic Limit		14	
Plasticity Index		18	
Sample history		Unknown	
Material retained on 425µm (No. 40) (%)		20.5	
Date Tested		6/26/2018	

Comments

N/A



Material

Braun Intertec Corporation 526 10th Street NE, Suite 300 West Fargo, ND 58078

							Pho	Phone: 701.232.8701			
Mater	ial Te	est R	eport					Report No: MAT:W18-002947-S2 Issue No: 1			
Client: Dennis McAlpine Houston Engineering, Inc. 6901 E. Fish Lake Rd Maple Grove, MN, 55369 Project: B1802554 Fergus Falls C & D Landfill								Andrew Lage Andrew Lage			
Fergus Falls, MN, TR: Brett Gruber, bgruber@braunintertec.com								Laboratory Coordinator Date of Issue: 7/3/2018			
Sample D	etails							Atterberg Limit:			
Sample ID:W18-002947-S2Alternate Sample ID:CL-8Sampled By:Jeff FoucaultSampling Method:In placeDate Sampled:6/15/2018Date Submitted:6/15/2018Specification:ASTM D 422								Liquid Limit: 33 Plastic Limit: 14 Plasticity Index: 19 Linear Shrinkage (%): N/A Sample Description:			
Source:In PlaceMaterial Type:Soil Barrier LayerSample Location:Phase 3A, Gridline H15, Lift #3								USCS Classification: Sandy Lean Clay (CL), brown			
Particle S	size Distril	oution						Grading: ASTM D 422 - 07			
% Pz 100 90 	Point of the second sec	No.20	No.40 No.100	Dieve	29 µm 19 µm 11.2 µm	8.1 tm 5.9 tm 2.9 tm		Date rested: 0/20/2018 Sieve Size % Passing Limits 3/8in (9.5mm) 100 No.4 (4.75mm) 94 No.10 (2.0mm) 86 No.20 (850µm) 82 No.40 (425µm) 76 No.60 (250µm) 71 No.100 (150µm) 64 No.200 (75µm) 58 29.0 µm 47.3 19.0 µm 42.0 11.2 µm 37.2 8.1 µm 33.9 5.9 µm 29.9 2.9 µm 24.5 1.3 µm 19.8			
	1										
COBBLES	GRA	VEL		SAND		FI	NES	D85: 1.5389 D60: 0.0940 D50: 0.0368			
(0.0%)	Coarse (0.0%)	Fine (6.4%)	Coarse (7.3%)	Medium (10.4%)	Fine (17.8%)	Silt (29.8%)	Clay (28.3%)	D30: 0.0059 D15: 0.0006 D10: 0.0002			



Project: B1802554

Sample Details

Client:

TR:

Material Test Report

6901 E. Fish Lake Rd Maple Grove, MN, 55369

Houston Engineering, Inc.

Fergus Falls C & D Landfill

Dennis McAlpine

Fergus Falls, MN,

Braun Intertec Corporation 526 10th Street NE, Suite 300 West Fargo, ND 58078 Phone: 701.232.8701

> Report No: MAT:W18-002947-S2 Issue No: 1

1550E NO. 1

Andrew Lage

Andrew Lage Laboratory Coordinator Date of Issue: 7/3/2018

W18-002947-S2 Sample ID: CL-8 Alternate Sample ID: Jeff Foucault Sampled By: In place Sampling Method: 6/15/2018 Date Sampled: 6/15/2018 Date Submitted: ASTM D 422 Specification: In Place Source: Soil Barrier Layer Material Type: Phase 3A, Gridline H15, Lift #3 Sample Location:

Brett Gruber, bgruber@braunintertec.com

Other Test Results

Description	Method	Result	Limits
Dispersion device	ASTM D 422 - 07		
Dispersion time (min)			
Shape			
Hardness			
Liquid Limit	ASTM D 4318 - 05	33	
Method		Method B	
Plastic Limit		14	
Plasticity Index		19	
Sample history		Air-dried	
Material retained on 425µm (No. 40) (%)		24.1	
Date Tested		6/25/2018	

Comments

N/A



Braun Intertec Corporation 526 10th Street NE, Suite 300 West Fargo, ND 58078 Phone: 701.232.8701

Mater	ial Te	est R	eport		Report No: MAT:W18-002947-S3 Issue No: 1					
Client: I H Project: H	Dennis McA Houston Er 6901 E. Fis Maple Grov B1802554 Fergus Fall	Alpine Igineering h Lake Ro re, MN, 55 s C & D L	i, Inc. d 5369 andfill		Andrew Lage Andrew Lage					
TR: E	Fergus Fall Brett Grube	s, MN, r, bgrube	r@braunint		Laboratory Coordinator Date of Issue: 7/3/2018					
Sample D	etails				Atterberg Limit:					
Sample ID:W18-002947-S3Alternate Sample ID:CL-9Sampled By:Jeff FoucaultSampling Method:In placeDate Sampled:6/15/2018Date Submitted:6/15/2018Specification:ASTM D 422Source:In PlaceMaterial Type:Soil Barrier LayerSample Location:Phase 3A, Gridline J11, Lift #3								Liquid Limit: 29 Plastic Limit: 12 Plasticity Index: 17 Linear Shrinkage (%): N/A Sample Description: USCS Classification: Sandy Lean Clay (CL), brown		
Particle S	ize Distril	oution						Grading: ASTM D 422 - 07		
% Pa 100 90 	No.10	No.20-	No.50 No.100	-00 Sieve	29.2 µm 19.2 µm 11.5 µm 8.9 µm	sum-	tam+ : : : : : : : : : : : : : : : : : : :	Date Tested: 6/26/2018 Sieve Size % Passing Limits 3/8in (9.5mm) 100 No.4 (4.75mm) 98 No.10 (2.0mm) 96 No.20 (850µm) 91 No.40 (425µm) 85 No.60 (250µm) 78 No.100 (150µm) 69 No.200 (75µm) 61 29.2 µm 49.3 19.2 µm 43.0 11.5 µm 37.4 8.2 µm 34.6 5.9 µm 29.7 3.0 µm 22.7 1.3 µm 19.3		
COBBLES	GRA	VEL		SAND		FIN	IES			
(0.0%)	Coarse (0.0%)	Fine (2.1%)	Coarse (1.8%)	Medium (11.0%)	Fine (24.2%)	Silt (33.3%)	Clay (27.5%)	D85: 0.4230 D60: 0.0701 D50: 0.0309 D30: 0.0060 D15: 0.0005 D10: 0.0001		



Project: B1802554

Sample Details

Client:

TR:

Material Test Report

6901 E. Fish Lake Rd Maple Grove, MN, 55369

Houston Engineering, Inc.

Fergus Falls C & D Landfill

Dennis McAlpine

Fergus Falls, MN,

Braun Intertec Corporation 526 10th Street NE, Suite 300 West Fargo, ND 58078 Phone: 701.232.8701

> Report No: MAT:W18-002947-S3 Issue No: 1

Andrew Lage

Andrew Lage Laboratory Coordinator Date of Issue: 7/3/2018

W18-002947-S3 Sample ID: CL-9 Alternate Sample ID: Jeff Foucault Sampled By: In place Sampling Method: 6/15/2018 Date Sampled: 6/15/2018 Date Submitted: ASTM D 422 Specification: In Place Source: Soil Barrier Layer Material Type: Phase 3A, Gridline J11, Lift #3 Sample Location:

Brett Gruber, bgruber@braunintertec.com

Other Test Results

Description	Method	Result	Limits
Dispersion device	ASTM D 422 - 07		
Dispersion time (min)			
Shape			
Hardness			
Liquid Limit	ASTM D 4318 - 05	29	
Method		Method B	
Plastic Limit		12	
Plasticity Index		17	
Sample history		Air-dried	
Material retained on 425µm (No. 40) (%)		14.9	
Date Tested		6/25/2018	

Comments

N/A



Material

Braun Intertec Corporation 526 10th Street NE, Suite 300 West Fargo, ND 58078

								Phone: 701.232.8701			
Mate	rial Te	est Ro	eport					Report No: MAT:W18-002947-S4 Issue No: 1			
Client: Dennis McAlpine Houston Engineering, Inc. 6901 E. Fish Lake Rd Maple Grove, MN, 55369 Project: B1802554 Fergus Falls C & D Landfill								Andrew Lage Andrew Lage			
Fergus Falls, MN, TR: Brett Gruber, bgruber@braunintertec.com								Laboratory Coordinator Date of Issue: 7/3/2018			
Sample [Details							Atterberg Limit:			
Sample I Alternate Sampled Sampling Date San Date Sub Specifica Source: Material	D: By: g Method: npled: omitted: ation: Type:	:	W18-00 CL-10 Jeff Fou In place 6/21/20 6/21/20 ASTM I In Place Soil Bar	2947-S4 ucault 18 18 0 422 e rier Layer				Liquid Limit: 32 Plastic Limit: 14 Plasticity Index: 18 Linear Shrinkage (%): N/A Sample Description: USCS Classification: Sandy Lean			
Sample I	_ocation:		Phase 3	3A, Gridline	е F13, Тор	Lift					
Particle	Size Distril	oution						Grading: ASTM D 422 - 07			
% F 100 - 90 - 80 - 60 - 40 - 10 - 10 - 10 - 10 - 10 -	assing	No.20	No.100	Dieve	24.9 µm 19.5 µm 11.6 µm 8.3 µm	29µm	taµ+ · · / · · · · · · · · · · · · · · · ·	Date Tested: 6/26/2018 Sieve Size % Passing Limits 3/8in (9.5mm) 100 No.4 (4.75mm) 97 No.10 (2.0mm) 95 No.20 (850µm) 91 No.40 (425µm) 86 No.60 (250µm) 80 No.100 (150µm) 71 No.200 (75µm) 63 29.9 µm 47.5 19.5 µm 42.2 11.6 µm 36.5 8.3 µm 32.9 5.9 µm 29.3 2.9 µm 22.9 1.3 µm 18.5			
COBBLES	S GRA	VEL		SAND		FIN	IES				
(0.0%)	Coarse (0.0%)	Fine (2.6%)	Coarse (2.2%)	Medium (9.3%)	Fine (23.4%)	Silt (35.2%)	Clay (27.4%)	D30: 0.0063 D15: 0.0007 D10: 0.0003			



Project: B1802554

Sample Details

Client:

TR:

Material Test Report

6901 E. Fish Lake Rd Maple Grove, MN, 55369

Houston Engineering, Inc.

Fergus Falls C & D Landfill

Dennis McAlpine

Fergus Falls, MN,

Braun Intertec Corporation 526 10th Street NE, Suite 300 West Fargo, ND 58078 Phone: 701.232.8701

Report No: MAT:W18-002947-S4 Issue No: 1

Andrew Lage

Andrew Lage Laboratory Coordinator Date of Issue: 7/3/2018

W18-002947-S4 Sample ID: CL-10 Alternate Sample ID: Jeff Foucault Sampled By: In place Sampling Method: 6/21/2018 Date Sampled: 6/21/2018 Date Submitted: ASTM D 422 Specification: In Place Source: Soil Barrier Layer Material Type: Phase 3A, Gridline F13, Top Lift Sample Location:

Brett Gruber, bgruber@braunintertec.com

Other Test Results

Description	Method	Result	Limits
Dispersion device	ASTM D 422 - 07		
Dispersion time (min)			
Shape			
Hardness			
Liquid Limit	ASTM D 4318 - 05	32	
Method		Method B	
Plastic Limit		14	
Plasticity Index		18	
Sample history		Oven-dried	
Material retained on 425µm (No. 40) (%)		14.1	
Date Tested		6/25/2018	

Comments

N/A

Houston Engineering, Inc.

Required Tests:

PROJECT: Fergus Falls Landfill PH3A

Project No.: 6018-006

Location: Fergus Falls, MN

Source Permeability - 1 test per 5000 CY

Conformance Permeability - 1 test per 2 acre placement per lift (lifts 2 thru 4 only)

Test No.	Source = S Conformance = C	Date Sample Extracted	Gridpoint Location	Date Sample Tested (Results Available)	Hydraulic Conductivity (cm/sec.)	Pass / Fail	Corrected Hydraulic Conductivity (cm/sec.)	Pass / Fail	Notes
		Specification Re	quirements		1x10 ⁻⁷ min				
W18-001815-S1	S	5/2/2018	Cell Floor, -5'	6/5/2018	5.34E-08	Pass	5.09E-08	Pass	
W18-001815-S2	S	5/2/2018	East Borrow Pit, -6'	6/5/2018	3.44E-08	Pass	3.28E-08	Pass	
W18-001815-S3	S	5/2/2018	Entrance Road	6/5/2018	2.70E-06	Fail	2.57E-06	Fail	Soil not used
W18-002706-S1	S	6/5/2018	SE Stockpile	6/15/2018	1.11E-07	Fail	1.06E-07	Fail	Soil not used
W18-002706-S2	S	6/5/2018	West Stockpile	6/15/2018	1.80E-07	Fail	1.72E-07	Fail	Soil not used
W18-002944-S2	С	6/15/2018	H13, lift #4	7/3/2018	5.29E-08	Pass	5.05E-08	Pass	
W18-002944-S3	С	6/15/2018	H13 Lift #3	7/3/2018	3.20E-08	Pass	3.05E-08	Pass	
W18-002944-S4	С	6/14/2018	J13 Lift #2	7/3/2018	8.61E-09	Pass	8.21E-09	Pass	
W18-002944-S5	С	6/14/2018	Lift #2	7/3/2018	4.31E-09	Pass	4.11E-09	Pass	
W-18-003133-S1	С	6/21/2018	J13, Final lift	7/9/2018	3.04E-07	Fail	2.89E-07	Fail	
W-18-003133-S4	С	6/15/2018	J11, lift #2	7/9/2018	1.43E-08	Pass	1.36E-08	Pass	
W-18-003133-S5	С	6/15/2018	H15, lift #3	7/9/2018	1.46E-08	Pass	1.40E-08	Pass	
W-18-003133-S6	С	6/15/2018	H15, lift #2	7/9/2018	1.70E-08	Pass	1.62E-08	Pass	
W-18-003133-S7	с	6/15/2018	J11, lift #3	7/9/2018	1.32E-08	Pass	1.26E-08	Pass	
W-18-003133-S9	с	6/15/2018	J13, lift #3	7/9/2018	1.70E-08	Pass	1.62E-08	Pass	
W-18-003133-S10	С	6/15/2018	J13, lift #4	7/9/2018	1.98E-07	Fail	1.88E-07	Fail	
W-18-003133-S11	С	6/21/2018	F13, final lift	7/9/2018	3.28E-08	Pass	3.13E-08	Pass	
PH3A _Perm 12	С	7/12/2018	25' N of J13, lift #4	7/20/2018	1.10E-08	Pass	-	-	tested 25' North of J13 Prior to rework
PH3A _Perm 13	С	7/12/2018	J13, lift #4	7/20/2018	9.10E-09	Pass	-	-	retest of PH3A Perm 10 following rework

Soil Barrier Layer Permeability Tests

Tests 2

6

BRAUN		11001 Hampshire Avenue South Minneapolis, MN 55438 Phone: 952.995.2000						
Material Test Re	port			Report No: MAT:W18-001815-S1 Issue No: 1				
Client: Larry Swann Riley Bros. Constructior	ות.			L	aboratory Result	s Reviewed by:		
PO Box 535 Morris, MN, 56267 Project: B1802562 Fergus Falls Phase 3A	(Baseliner) & Ph	ase 1&2 (Final	Cover)	ISO/BC James Strein				
Fergus Falls, MN, TR: Brett Gruber, bgruber@	braunintertec.coi	17025	Geotech Date of Is	nical Laboratory sue: 6/5/2018				
Sample Details				Particle Size	e Distributior	ו		
Sample ID: W18-00 Alternate Sample ID: P-01 Sampled By: Sean Mo Sampling Method: In place Date Sampled: 5/2/2018 Date Submitted: 5/2/2018	1815-S1 :Manus 3			Method: Drying by: Date Tested:				
Specification: Source: Existing Material Type: Sandy L Sample Location: Cell Floo	Material ean Clay or, -5'			Sieve Size	% Passing	Limits		
Other Test Results								
Description Temperature (°C) Cell Pressure (lb/in ²) Top Pressure (lb/in ²) Bottom Pressure (lb/in ²) Effective Pressure (lb/in ²) Pressure Differential (lb/in ²) Permeant Assumed Specific Gravity Initial Sample Height (in) Final Sample Height (in) Final Sample Diameter (in) Final Sample Diameter (in) Initial Sample Cross-Section Area (in ²)	Method ASTM D 5084 De-air	Result 4 - 03 22.0 99.0 91.0 94.0 5.0 3.0 ed tap water 2.700 2.786 2.786 1.420 1.420 1.584	Limits	Chart				
Final Sample Cross-Section Area (in ²)		1.584 4 412		onart				
Final Sample Volume (in*) Final Sample Volume (in*) Final Sample Mass (g) Final Sample Mass (g) Maximum Dry Density (lb/ft ³) Optimum Moisture Content (%) Relative Compaction (%) Moisure Content Dry Density (lb/ft ³) Initial Moisture Content (%) Final Moisture Content (%) Final Saturation (%) Final Saturation (%) Initial Hydraulic Gradient Ending Hydraulic Gradient Hydraulic Conductivity (cm/s)	2.9 % abo	4.412 4.412 126.9 126.9 114.3 15.1 96 ove optimum 109.6 18.0 19.9 90 100 31.6 31.2 5.34E-08						
N/A								

BRAUN	11001 Hampshire Avenue South Minneapolis, MN 55438 Phone: 952.995.2000			
Material Test Report	Report No: MAT:W18-001815-S1 Issue No: 1			
Client: Larry Swann Riley Bros. Construction Inc. PO Box 535 Morris, MN, 56267 Project: B1802562 Fergus Falls Phase 3A (Baseliner) & Phase 1&2 (Final Cover) Fergus Falls. MN.	Laboratory Results Reviewed by: James Structure JisonBC 17025 Jim Streier Geotechnical Laboratory			
TR: Brett Gruber, bgruber@braunintertec.com	Date of Issue: 6/5/2018			
Sample DetailsSample ID:W18-001815-S1Alternate Sample ID:P-01Sampled By:Sean McManusSampling Method:In placeDate Sampled:5/2/2018Date Submitted:5/2/2018Specification:Source:Source:Existing MaterialMaterial Type:Sandy Lean ClaySample Location:Cell Floor, -5'	Particle Size Distribution Method: Drying by: Date Tested: Sieve Size % Passing Limits			
Other Test Results Description Method Result Limits Corrected Hydraulic Conductivity (cm/s) 5.09E-08 0/5/2018 0/5/2018	Chart			
Comments N/A	<u>I</u>			

BRAUN		11001 Hampshire Avenue South Minneapolis, MN 55438 Phone: 952.995.2000					
Material Test Re	port			Report No: MAT:W18-001815-S2 Issue No: 1			
Client: Larry Swann Riley Bros. Constructio	n Inc.			L	aboratory Result	s Reviewed by:	
PO Box 535 Morris, MN, 56267 Project: B1802562 Fergus Falls Phase 3A	(Baseliner) & Ph	ase 1&2 (Final	Cover)	James Streine			
Fergus Falls, MN, TR: Brett Gruber, bgruber@	braunintertec.co	'n	,	11(025)	Geotech Date of Is	nical Laboratory sue: 6/5/2018	
Sample Details				Particle Size	e Distributior	1	
Sample ID: W18-00 Alternate Sample ID: P-02 Sampled By: Sean M Sampling Method: In place Date Sampled: 5/2/201 Date Submitted: 5/2/201	1815-S2 cManus e 8 8			Method: Drying by: Date Tested:			
Specification: Source: Existing Material Type: Sandy I Sample Location: East Bo	∣ Material _ean Clay prrow Pit, -6'			Sieve Size	% Passing	Limits	
Other Test Results							
Description Temperature (°C) Cell Pressure (lb/in ²) Top Pressure (lb/in ²) Bottom Pressure (lb/in ²) Effective Pressure (lb/in ²) Pressure Differential (lb/in ²) Permeant Assumed Specific Gravity Initial Sample Height (in) Final Sample Height (in) Final Sample Diameter (in) Final Sample Diameter (in) Final Sample Cross-Section Area (in ²)	Method ASTM D 5084 De-air	Result 4 - 03 22.0 99.0 91.0 94.0 5.0 3.0 ed tap water 2.700 2.782 2.782 1.420 1.420 1.584 4 524	Limits	Chart			
Final Sample Cross-Section Area (in ²) Initial Sample Volume (in ³) Final Sample Volume (in ³) Initial Sample Mass (g) Final Sample Mass (g) Maximum Dry Density (lb/ft ³) Optimum Moisture Content (%) Relative Compaction (%) Moisure Content Dry Density (lb/ft ³) Initial Moisture Content (%) Final Moisture Content (%) Final Moisture Content (%) Final Saturation (%) Final Saturation (%) Initial Hydraulic Gradient Ending Hydraulic Gradient Hydraulic Conductivity (cm/s)	2.5 % abo	1.584 4.406 4.406 120.6 120.6 108.7 18.3 96 ove optimum 104.3 20.8 22.7 91 100 31.5 32.2 3.44E-08		Chart			
N/A							

BRAUN		11001 Hampshire Avenue South Minneapolis, MN 55438 Phone: 952.995.2000			
Material Test Report			Re	port No: MAT:V	/18-001815-S2 Issue No: 1
Client: Larry Swann Riley Bros. Construction Inc. PO Box 535 Morris, MN, 56267 Project: B1802562 Fergus Falls Phase 3A (Baseline	er) & Phase 1&2 (Final (Cover)	150/EC	aboratory Result	s Reviewed by:
Fergus Falls, MN, TR: Brett Gruber, bgruber@brauninte	ertec.com			Geotech Date of Is	nical Laboratory sue: 6/5/2018
Sample Details			Particle Siz	e Distributior	
Sample ID:W18-001815-S2Alternate Sample ID:P-02Sampled By:Sean McManusSampling Method:In placeDate Sampled:5/2/2018Date Submitted:5/2/2018			Method: Drying by: Date Tested:		
Specification: Source: Existing Material Material Type: Sandy Lean Clay Sample Location: East Borrow Pit, -	6'		Sieve Size	% Passing	Limits
Other Test Results Description Method Corrected Hydraulic Conductivity (cm/s) Date Tested Date Tested Date Tested	od Result 3.28E-08 6/5/2018	Limits	Chart		
Comments N/A					

BRAUN			11001 Hampshire Avenue South Minneapolis, MN 55438 Phone: 952.995.2000			
Material Test Re	port		Re	port No: MAT:W	/18-001815-S3 Issue No: 1	
Client: Larry Swann Riley Bros. Constructior	n Inc.		L	aboratory Result	s Reviewed by:	
PO Box 535 Morris, MN, 56267 Project: B1802562 Fergus Falls Phase 3A	(Baseliner) & Phase 1&2 (Final (Cover)	ІБОЛЕС	James	Strin	
Fergus Falls, MN, TR: Brett Gruber, bgruber@	braunintertec.com		17025	Geotech Date of Is	nical Laboratory sue: 6/5/2018	
Sample Details			Particle Size	e Distributior)	
Sample ID: W18-00 Alternate Sample ID: P-04 Sampled By: Sean Mo Sampling Method: In place Date Sampled: 5/2/2018 Date Submitted: 5/2/2018	1815-S3 :Manus 3		Method: Drying by: Date Tested:			
Specification: Source: Existing Material Type: Sandy L Sample Location: Entrance	Material ean Clay ∋ Road		Sieve Size	% Passing	Limits	
Other Test Results						
Description Temperature (°C) Cell Pressure (lb/in ²) Top Pressure (lb/in ²) Bottom Pressure (lb/in ²) Effective Pressure (lb/in ²) Pressure Differential (lb/in ²) Permeant Assumed Specific Gravity Initial Sample Height (in) Final Sample Height (in) Final Sample Diameter (in) Final Sample Diameter (in) Initial Sample Cross-Section Area (in ²) Einal Sample Cross-Section Area (in ²)	Method Result ASTM D 5084 - 03 22.0 99.0 91.0 94.0 5.0 3.0 3.0 De-aired tap water 2.700 2.782 2.782 1.375 1.375 1.485 1.485	Limits	Chart			
Final Sample Cross-Section Area (in ²) Initial Sample Volume (in ³) Final Sample Volume (in ³) Initial Sample Mass (g) Final Sample Mass (g) Maximum Dry Density (lb/ft ³) Optimum Moisture Content (%) Relative Compaction (%) Moisure Content Dry Density (lb/ft ³) Initial Moisture Content (%) Final Moisture Content (%) Final Moisture Content (%) Initial Saturation (%) Final Saturation (%) Initial Hydraulic Gradient Ending Hydraulic Gradient Hydraulic Conductivity (cm/s) Comments	1.485 4.131 4.131 114.3 114.3 110.6 15.7 95 2.0 % above optimum 105.4 17.7 22.0 91 100 30.2 30.5 2.70E-06					
N/A						

BRAUN	11001 Hampshire Avenue South Minneapolis, MN 55438 Phone: 952.995.2000			
Material Test Report	Report No: MAT:W18-001815-S3 Issue No: 1			
Client: Larry Swann Riley Bros. Construction Inc. PO Box 535 Morris, MN, 56267 Project: B1802562 Fergus Falls Phase 3A (Baseliner) & Phase 1&2 (Final Cover)	Laboratory Results Reviewed by: James Street			
Fergus Falls, MN, TR: Brett Gruber, bgruber@braunintertec.com	Geotechnical Laboratory Date of Issue: 6/5/2018			
Sample Details	Particle Size Distribution			
Sample ID:W18-001815-S3Alternate Sample ID:P-04Sampled By:Sean McManusSampling Method:In placeDate Sampled:5/2/2018Date Submitted:5/2/2018	Method: Drying by: Date Tested:			
Specification: Source: Existing Material Material Type: Sandy Lean Clay Sample Location: Entrance Road	Sieve Size % Passing Limits			
Other Test Results				
Corrected Hydraulic Conductivity (cm/s) 2.57E-06 Date Tested 6/5/2018	Chart			
Comments N/A				

Braun Intertec Corporation 11001 Hampshire Avenue South Minneapolis, MN 55438 - ---יח ~~~ ~

BR	BRAUN		11001 Hampshire Avenue South Minneapolis, MN 55438 Phone: 952.995.2000				
Mate	erial Test R	eport			Rej	port No: MAT:W	18-002706-S1/ Issue No: 1
Client:	Larry Swann Riley Bros. Construct	ion Inc.			L	aboratory Results	s Reviewed by:
Project:	PO Box 535 Morris, MN, 56267 B1802562 Fergus Falls Phase 3	A (Baseliner) & Phase 1{	&2 (Final)	Cover)	150/JEC	James	Strive
TR:	Fergus Falls, MN, Brett Gruber, bgruber	@braunintertec.com			11000	Geotech Date of Is:	nical Laboratory sue: 6/27/2018
Sample	e Details				Particle Size	e Distributior	Ì
Sample Alternate Sampled Samplin Date Sar Date Sul	ID: W18-0 e Sample ID: P-05 d By: Sean g Method: Stockj mpled: 6/5/20 bmitted: 6/15/2)02706-S1 McManus pile 118 2018			Method: Drying by: Date Tested:		
Specific Source: Material Sample	ation: Type: Sandy Location: SE St	[,] Lean Clay ockpile - Clay Liner			Sieve Size	% Passing	Limits
Other ⁻	Test Results						
Descript	tion	Method	Result	Limits	_		
l empera Cell Pres Top Pres Bottom F Effective Pressure Permear Assumed Initial Sa Final Sar Initial San Final Sar	ature (⁹ C) ssure (lb/in ²) ssure (lb/in ²) Pressure (lb/in ²) Pressure (lb/in ²) Differential (lb/in ²) Differential (lb/in ²) Muthan d Specific Gravity Imple Height (in) Imple Height (in) Imple Diameter (in) Imple Diameter (in) Imple Cross-Section Area (in ²)	ASTM D 5084 - 03 De-aired tap	22.0 99.0 91.0 94.0 5.0 3.0 9 water 2.700 2.789 1.413 1.413 1.568		Chart		
Final Samp	ple Cross-Section Area (in ²)		1.568 4.373				
Final Sar Initial Sa Final Sar Maximum Optimum Relative Moisure Dry Dens	mple Volume (in ³) imple Mass (g) m Dry Density (lb/ft ³) n Moisture Content (%) Compaction (%) Content sity (lb/ft ³)	2.0 % above or	4.373 124.4 124.4 112.6 15.0 96 Dtimum 108.4				
Initial Mo Final Mo Initial Sa Final Sat Initial Hy Ending H	bisture Content (%) disture Content (%) (turation (%) rdraulic Gradient Hydraulic Gradient		17.0 20.5 83 100 29.4 29.6				
Hydraulio Commo N/A	c Conductivity (cm/s) ents	1.1	11E-07				

BRAUN	11001 Hampshire Avenue South Minneapolis, MN 55438 Phone: 952.995.2000			
Material Test Report	Report No: MAT:W18-002706-S1 Issue No: 1			
Client: Larry Swann Riley Bros. Construction Inc. PO Box 535	Laboratory Results Reviewed by:			
Morris, MN, 56267 Project: B1802562 Fergus Falls Phase 3A (Baseliner) & Phase 1&2 (Final Cover)	150/IEC 17025 Jim Streier			
Fergus Falls, MN, TR: Brett Gruber, bgruber@braunintertec.com	Geotechnical Laboratory Date of Issue: 6/27/2018			
Sample Details	Particle Size Distribution			
Sample ID:W18-002706-S1Alternate Sample ID:P-05Sampled By:Sean McManusSampling Method:StockpileDate Sampled:6/5/2018Date Submitted:6/15/2018	Method: Drying by: Date Tested:			
Specification:Source:Material Type:Sandy Lean ClaySample Location:SE Stockpile - Clay Liner	Sieve Size % Passing Limits			
Other Test Results Description Method Result Limits Corrected Hydraulic Conductivity (cm/s) 1.06E-07 Date Tested 6/27/2018				
Comments				
N/A				

BRAUN			11001 Hampshire Avenue South Minneapolis, MN 55438 Phone: 952.995.2000		
Material Test Re	port		Re	port No: MAT:W	18-002706-S2 Issue No: 1
Client: Larry Swann Riley Bros. Constructio	n Inc.		L	aboratory Result	s Reviewed by:
PO Box 535 Morris, MN, 56267 Project: B1802562 Fergus Falls Phase 3A	(Baseliner) & Phase 1&2 (Final (Cover)	Ізолес	James	Strin
Fergus Falls, MN, TR: Brett Gruber, bgruber@	braunintertec.com	,	17025	Geotech Date of Is	nical Laboratory sue: 6/27/2018
Sample Details			Particle Size	e Distributior	
Sample ID: W18-00 Alternate Sample ID: P-06 Sampled By: Sean M Sampling Method: Stockpil Date Sampled: 6/5/201 Date Submitted: 6/15/201	2706-S2 cManus e 8 18		Method: Drying by: Date Tested:		
Specification: Source: Material Type: Sandy L Sample Location: Stockpil	.ean Clay e W of Landfill - Final Layer		Sieve Size	% Passing	Limits
Other Test Results					
Description Temperature (°C) Cell Pressure (lb/in ²) Top Pressure (lb/in ²) Bottom Pressure (lb/in ²) Effective Pressure (lb/in ²) Pressure Differential (lb/in ²) Permeant Assumed Specific Gravity Initial Sample Height (in) Final Sample Height (in) Final Sample Diameter (in) Final Sample Diameter (in) Final Sample Cross-Section Area (in ²) Final Sample Volume (in ³)	Method Result ASTM D 5084 - 03 22.0 99.0 91.0 94.0 5.0 3.0 3.0 De-aired tap water 2.700 2.789 2.789 1.415 1.415 1.573 1.573 4.386 4.386	Limits	Chart		
Final Sample Volume (in ³) Initial Sample Mass (g) Final Sample Mass (g) Maximum Dry Density (lb/ft ³) Optimum Moisture Content (%) Relative Compaction (%) Moisure Content Dry Density (lb/ft ³) Initial Moisture Content (%) Final Moisture Content (%) Final Moisture Content (%) Initial Saturation (%) Final Saturation (%) Initial Hydraulic Gradient Ending Hydraulic Gradient Hydraulic Conductivity (cm/s)	4.386 132.3 132.3 120.1 11.9 96 1.9 % above optimum 114.9 13.8 17.2 80 100 30.6 31.3 1.80E-07				
N/A					

BRAUN	11001 Hampshire Avenue South Minneapolis, MN 55438 Phone: 952.995.2000			
Material Test Report	Re	port No: MAT:W18-002706-S Issue No:		
Client: Larry Swann Riley Bros. Construction Inc. PO Box 535	L	aboratory Results Reviewed by		
Morris, MN, 56267 Project: B1802562 Fergus Falls Phase 3A (Baseliner) & Phase 1&2 (Final Cover)	І БОЛЕС 17025	James Theirs Jim Streie		
Fergus Falls, MN, TR: Brett Gruber, bgruber@braunintertec.com		Geotechnical Laboratory Date of Issue: 6/27/2018		
Sample Details	Particle Size	e Distribution		
Sample ID:W18-002706-S2Alternate Sample ID:P-06Sampled By:Sean McManusSampling Method:StockpileDate Sampled:6/5/2018Date Submitted:6/15/2018	Method: Drying by: Date Tested:			
Specification: 0/13/2010 Source: Material Type: Sample Location: Stockpile W of Landfill - Final Layer	Sieve Size	% Passing Limits		
Other Test Results Description Method Result Limits Corrected Hydraulic Conductivity (cm/s) 1.72E-07	-			
	Chart			
Comments N/A				



Material Test Re	Material Test Report		Report No: MAT:W18-002944-S2 Issue No: 1		
Client: Dennis McAlpine Houston Engineering, li 6901 E. Fish Lake Rd Maple Grove, MN, 5536 Project: B1802554 Fergus Falls C & D Lan	nc. 59 dfill		150/JEC 17025	aboratory Result	s Reviewed by: Brett Gruber
Fergus Falls, MN, TR: Brett Gruber, bgruber@	braunintertec.com			Date of Is	Project Manager sue: 7/3/2018
Sample Details			Particle Siz	e Distributior	า
Sample ID: W18-00 Alternate Sample ID: Sampled By: Jeff Fou Sampling Method: Soil Bor Date Sampled: 6/15/207 Date Submitted:	2944-S2 cault ing Shelby Tube 18		Method: Drying by: Date Tested:		
Date Submitted: Specification: Source: Fill Plac Material Type: Soil Bar Sample Location: Phase 3 Other Test Results Description Temperature (°C) Cell Pressure (lb/in ²) Top Pressure (lb/in ²) Bottom Pressure (lb/in ²) Effective Pressure (lb/in ²) Pressure Differential (lb/in ²) Permeant Assumed Specific Gravity Initial Sample Height (in) Final Sample Height (in) Final Sample Diameter (in) Final Sample Diameter (in) Final Sample Cross-Section Area (in ²) Final Sample Volume (in ³) Final Sample Mass (g) Final Sample Mass (g) Final Sample Mass (g) Final Sample Mass (g) Final Saturation (%) Final Moisture Content (%) Final Moisture Content (%) Final Saturation (%) Final Hydraulic Gradient Ending Hydraulic Gradient Hydraulic Conductivity (cm/s) Corrected Hydraulic Conductivity (cm/s) Date Tested	ed rier Layer A, Grid H13, Lift #4 <u>Method Result</u> ASTM D 5084 - 03 22.0 99.0 91.0 94.0 5.0 3.0 De-aired tap water 2.700 2.790 1.411 1.564 1.564 4.363 4.363 120.6 120.6 105.3 105.3 105.3 18.7 22.1 84 100 29.9 2.99 2.99 5.29E-08 5.05E-08 7/3/2018	Limits	Sieve Size	% Passing	Limits
Comments _{N/A}					



Material Test Report		[Report No: MAT:W18-002944-S3 Issue No: 1		
Client: Dennis McAlpine Houston Engineering, Inc. 6901 E. Fish Lake Rd Maple Grove, MN, 55369 Project: B1802554 Fergus Falls C & D Landfill			La 150/JEC 17025	aboratory Result	s Reviewed by:
Fergus Falls, MN, TR: Brett Gruber, bgruber@braunintertec.c	om			I Date of Is	Project Manager sue: 7/3/2018
Sample Details			Particle Size	Distribution	
Sample ID:W18-002944-S3Alternate Sample ID:Jeff FoucaultSampled By:Jeff FoucaultSampling Method:Soil Boring Shelby TubDate Sampled:6/15/2018Date Submitted:Soil Boring Shelby Tub	e		Method: Drying by: Date Tested:		
Specification: Source: Fill Placed Material Type: Soil Barrier Layer Sample Location: Phase 3A, Grid H13, Li Other Test Results Description Method Method Temperature (°C) ASTM D 50 Cell Pressure (lb/in²) ASTM D 50 Top Pressure (lb/in²) Bottom Pressure (lb/in²) Effective Pressure (lb/in²) Persure Differential (lb/in²) Permeant De-a Assumed Specific Gravity Initial Sample Height (in) Final Sample Height (in) Hit b	ft #3 Result L 84 - 03 22.0 99.0 91.0 94.0 5.0 3.0 aired tap water 2.700 2.793 2.793	_imits	Sieve Size	% Passing	Limits
Initial Sample Diameter (in) Final Sample Diameter (in) Initial Sample Cross-Section Area (in ²) Final Sample Cross-Section Area (in ²) Initial Sample Volume (in ³) Final Sample Volume (in ³) Initial Sample Mass (g) Final Sample Mass (g) Initial Dry Density (lb/ft ³) Final Dry Density (lb/ft ³) Initial Moisture Content (%) Final Moisture Content (%) Final Saturation (%) Final Saturation (%) Initial Hydraulic Gradient Ending Hydraulic Gradient Hydraulic Conductivity (cm/s) Corrected Hydraulic Conductivity (cm/s) Date Tested	1.400 1.400 1.539 1.539 4.299 4.299 129.4 129.4 114.7 114.7 17.3 17.3 17.3 100 100 28.7 28.8 3.20E-08 3.05E-08 7/3/2018		Chart		
Comments N/A					



Material Test Report		Report No: MAT:W18-002944-S4 Issue No: 1			
Client: Dennis McAlpine Houston Engineering, Inc. 6901 E. Fish Lake Rd Maple Grove, MN, 55369 Project: B1802554 Fergus Falls C & D Landfi	11		ISOЛЕС 17025	aboratory Result	s Reviewed by:
Fergus Falls, MN, TR: Brett Gruber, bgruber@br	aunintertec.com			Date of Is	Project Manager sue: 7/3/2018
Sample Details			Particle Siz	e Distribution	1
Sample ID:W18-0029Alternate Sample ID:Sean McMSampled By:Sean McMSampling Method:Soil BoringDate Sampled:6/14/2018Date Submitted:Sean McM	44-S4 anus I Shelby Tube		Method: Drying by: Date Tested:		
Specification: Source: Fill Placed Material Type: Soil Barrie Sample Location: Phase 3A, Other Test Results Description Temperature (°C) Cell Pressure (lb/in²) Top Pressure (lb/in²) Bottom Pressure (lb/in²)	r Layer Grid J13, Lift #2 <u>Method Result</u> ASTM D 5084 - 03 22.0 99.0 91.0 94.0	Limits	Sieve Size	% Passing	Limits
Effective Pressure (lb/in ²) Pressure Differential (lb/in ²) Permeant Assumed Specific Gravity Initial Sample Height (in) Final Sample Height (in) Initial Sample Diameter (in) Final Sample Diameter (in) Initial Sample Cross-Section Area (in ²) Final Sample Cross-Section Area (in ²) Initial Sample Volume (in ³) Final Sample Volume (in ³) Final Sample Mass (g) Final Sample Mass (g) Initial Dry Density (lb/ft ³) Final Dry Density (lb/ft ³) Initial Moisture Content (%) Final Moisture Content (%) Final Saturation (%) Final Saturation (%) Initial Hydraulic Gradient	5.0 3.0 De-aired tap water 2.700 2.787 2.787 1.407 1.555 1.555 4.333 4.333 129.5 129.5 113.8 113.8 113.8 17.2 17.8 97 100 32.1		Chart		
Ending Hydraulic Gradient Hydraulic Conductivity (cm/s) Corrected Hydraulic Conductivity (cm/s) Date Tested	32.0 8.61E-09 8.21E-09 7/3/2018				
N/A					



Material Test Re	Material Test Report		Report No: MAT:W18-002944-S5 Issue No: 1		
Client: Dennis McAlpine Houston Engineering, Ir 6901 E. Fish Lake Rd Maple Grove, MN, 5536 Project: B1802554 Fergus Falls C & D Land	c. 9 Jfill		150/JEC 17025	aboratory Result	s Reviewed by:
Fergus Falls, MN, TR: Brett Gruber, bgruber@	braunintertec.com			Date of Is	Project Manager sue: 7/3/2018
Sample Details			Particle Siz	e Distribution	า
Sample ID: W18-002 Alternate Sample ID: Sampled By: Sean Mo Sampling Method: Soil Bori Date Sampled: 6/14/201 Date Submitted:	2944-S5 Manus ng Shelby Tube 8		Method: Drying by: Date Tested:		
Specification: Source: Fill Place Material Type: Soil Barr Sample Location: Phase 3	ed ier Layer A, Lift #2		Sieve Size	% Passing	Limits
Other Test Results	Mathad Daault	Lingthe			
Temperature (°C) Cell Pressure (lb/in ²) Top Pressure (lb/in ²) Bottom Pressure (lb/in ²) Effective Pressure (lb/in ²) Pressure Differential (lb/in ²) Permeant Assumed Specific Gravity Initial Sample Height (in) Final Sample Height (in) Initial Sample Diameter (in) Final Sample Diameter (in) Final Sample Cross-Section Area (in ²)	Method Result ASTM D 5084 - 03 22.0 99.0 91.0 94.0 5.0 3.0 De-aired tap water 2.700 2.556 2.556 1.397 1.533 1.533	Limits	Chart		
Final Sample Cross-Section Area (in ²) Initial Sample Volume (in ³)	1.533 3.918				
Final Sample Volume (in ³) Initial Sample Mass (g) Final Sample Mass (g) Initial Dry Density (lb/ft ³) Final Dry Density (lb/ft ³) Initial Moisture Content (%) Final Moisture Content (%) Initial Saturation (%) Final Saturation (%) Initial Hydraulic Gradient Ending Hydraulic Gradient Hydraulic Conductivity (cm/s) Corrected Hydraulic Conductivity (cm/s) Date Tested	3.918 104.7 104.7 101.8 101.8 24.0 24.2 99 100 30.2 29.6 4.31E-09 4.11E-09 7/3/2018		_		
Comments					
N/A					



Material Test Re	port		Re	port No: MAT:V	V18-003133-S1 Issue No: 1
Client: Dennis McAlpine Houston Engineering, lu 6901 E. Fish Lake Rd Maple Grove, MN, 5536 Project: B1802554 Fergus Falls C & D Lan	nc. 59 dfill		L 150/JEC 17025	aboratory Result	s Reviewed by: Brett Gruber
Fergus Falls, MN, TR: Brett Gruber, bgruber@	braunintertec.com			Date of Is	Project Manager sue: 7/10/2018
Sample Details			Particle Size	e Distributior	า
Sample ID: W18-00 Alternate Sample ID: Sampled By: Jeff Fou Sampling Method: Shelby Date Sampled: 6/21/207 Date Submitted:	3133-S1 cault Tube 18		Method: Drying by: Date Tested:		
Specification: Source: Fill Plac Material Type: Soil Bar Sample Location: Phase 3	ed rier Layer A, Grid J13, Final Lift		Sieve Size	% Passing	Limits
DescriptionTemperature (°C)Cell Pressure (lb/in²)Top Pressure (lb/in²)Bottom Pressure (lb/in²)Bottom Pressure (lb/in²)Effective Pressure (lb/in²)Pressure Differential (lb/in²)PermeantInitial Sample Height (in)Final Sample Height (in)Initial Sample Diameter (in)Final Sample Cross-Section Area (in²)Final Sample Cross-Section Area (in²)Initial Sample Volume (in³)Final Sample Volume (in³)Initial Sample Mass (g)Final Dry Density (lb/ft³)Final Dry Density (lb/ft³)Initial Moisture Content (%)	Method Result ASTM D 5084 - 03 22.0 99.0 94.0 91.0 8.0 De-aired tap water 2.785 2.785 2.785 1.425 1.425 1.595 1.595 4.442 4.442 132.2 131.9 113.4 113.1 15.8 18.5	Limits	Chart		
Initial Saturation (%) Final Saturation (%) Initial Hydraulic Gradient Ending Hydraulic Gradient Hydraulic Conductivity (cm/s) Corrected Hydraulic Conductivity (cm/s) Date Tested	88 100 30.2 31.4 3.04E-07 2.89E-07 7/9/2018				
N/A					



Material Test Re	port		Re	port No: MAT:V	V18-003133-S4 Issue No: 1
Client: Dennis McAlpine Houston Engineering, Inc. 6901 E. Fish Lake Rd Maple Grove, MN, 55369 Project: B1802554 Fergus Falls C & D Landfill			150/JEC 17025	aboratory Result	s Reviewed by:
Fergus Falls, MN, TR: Brett Gruber, bgruber@	braunintertec.com			Date of Is	Project Manager sue: 7/10/2018
Sample Details			Particle Siz	e Distributior	า
Sample ID: W18-003 Alternate Sample ID: Sampled By: Jeff Four Sampling Method: Shelby T Date Sampled: 6/15/201 Date Submitted:	3133-S4 cault ⁻ ube 8		Method: Drying by: Date Tested:		
Specification: Source: Fill Place Material Type: Soil Barr Sample Location: Phase 3	ed ier Layer A, Grid J11, Lift #2		Sieve Size	% Passing	Limits
Other Test Results					
Description	Method Result	Limits	_		
Lemperature (°C)	ASIM D 5084 - 03 22.0				
Top Pressure (lb/in ²)	99.0				
Bottom Pressure (lb/in ²)	94.0				
Effective Pressure (lb/in ²)	80				
Pressure Differential (Ib/in ²)	0.0				
Permeant	De-aired tap water				
Assumed Specific Gravity	2.700				
Initial Sample Height (in)	2.784				
Final Sample Height (in)	2.784				
Initial Sample Diameter (in)	1.408				
Final Sample Diameter (in)	1.408				
Initial Sample Cross-Section Area (in ²)	1.557		Chart		
Final Sample Cross-Section Area (in ²)	1.557		Chart		
Initial Sample Volume (in ³)	4.335				
Final Sample Volume (in ³)	4.335				
Initial Sample Mass (g)	117.5				
Initial Dry Donaity (Ib/ft3)	10.1				
Final Dry Density (Ib/ft ³)	103.3				
Initial Moisture Content (%)	23.6				
Final Moisture Content (%)	23.8				
Initial Saturation (%)	100				
Final Saturation (%)	100				
Initial Hydraulic Gradient	30.2				
Ending Hydraulic Gradient	29.5				
Hydraulic Conductivity (cm/s)	1.43E-08				
Corrected Hydraulic Conductivity (cm/s)	1.36E-08				
Date Tested	7/9/2018		-		
N/A					



Material Test Report	Report No: MAT:W18-003133-S5 Issue No: 1
Client: Dennis McAlpine Houston Engineering, Inc. 6901 E. Fish Lake Rd Maple Grove, MN, 55369 Project: B1802554 Fergus Falls C & D Landfill	Laboratory Results Reviewed by:
Fergus Falls, MN, TR: Brett Gruber, bgruber@braunintertec.com	Project Manager Date of Issue: 7/10/2018
Sample Details	Particle Size Distribution
Sample ID:W18-003133-S5Alternate Sample ID:Jeff FoucaultSampled By:Jeff FoucaultSampling Method:Shelby TubeDate Sampled:6/15/2018Date Submitted:Sampled:	Method: Drying by: Date Tested:
Specification: Source: Fill Placed Material Type: Soil Barrier Layer Sample Location: Phase 3A, Grid H15, Lift #3 Other Test Results Description Method Temperature (°C) ASTM D 5084 - 03 22.0 Cell Pressure (lb/in²) 99.0 Top Pressure (lb/in²) 94.0 Bottom Pressure (lb/in²) 91.0 Effective Pressure (lb/in²) 8.0 Pressure Differential (lb/in²) Pe-aired tap water	Sieve Size % Passing Limits
PermeantDe-aired tap waterAssumed Specific Gravity2.700Initial Sample Height (in)2.783Final Sample Height (in)2.783Initial Sample Diameter (in)1.409Final Sample Diameter (in)1.409Initial Sample Cross-Section Area (in²)1.559Final Sample Cross-Section Area (in²)1.559Initial Sample Volume (in³)4.339Final Sample Volume (in³)4.339Initial Sample Mass (g)126.1Final Sample Mass (g)126.6Initial Dry Density (lb/ft³)110.7Final Dry Density (lb/ft³)111.1Initial Moisture Content (%)19.0Final Saturation (%)98Final Saturation (%)100Initial Hydraulic Gradient29.1Hydraulic Conductivity (cm/s)1.40E-08Corments7/9/2018	Chart



		Issue No: 1
Client: Dennis McAlpine Houston Engineering, Inc. 6901 E. Fish Lake Rd Maple Grove, MN, 55369 Project: B1802554 Fergus Falls C & D Landfill	Laboratory Results	Reviewed by:
Fergus Falls, MN, TR: Brett Gruber, bgruber@braunintertec.com	P Date of Iss	Project Manager sue: 7/10/2018
Sample Details	Particle Size Distribution	
Sample ID:W18-003133-S6Alternate Sample ID:Jeff FoucaultSampled By:Jeff FoucaultSampling Method:Shelby TubeDate Sampled:6/15/2018Date Submitted:	Method: Drying by: Date Tested:	
Specification: Source: Fill Placed Material Type: Soil Barrier Layer Sample Location: Phase 3A, Grid H15, Lift #2 Other Test Results Description Method Result Limits Temperature (°C) ASTM D 5084 - 03 22.0 Cell Pressure (lb/in²) 99.0 Top Pressure (lb/in²) 94.0 Bottom Pressure (lb/in²) 91.0 Effective Pressure (lb/in²) 8.0	Sieve Size % Passing	Limits
Pressure Differential (lb/in²) De-aired tap water Assumed Specific Gravity 2.700 Initial Sample Height (in) 2.788 Final Sample Height (in) 2.788 Initial Sample Diameter (in) 1.419 Final Sample Diameter (in) 1.419 Initial Sample Cross-Section Area (in²) 1.581 Final Sample Cross-Section Area (in²) 1.581 Initial Sample Volume (in³) 4.409 Final Sample Volume (in³) 4.409 Initial Sample Mass (g) 125.5 Final Sample Mass (g) 125.3 Initial Dry Density (lb/ft³) 108.2 Initial Moisture Content (%) 19.9 Final Moisture Content (%) 97 Final Saturation (%) 97 Final Saturation (%) 100 Initial Hydraulic Gradient 29.5 Hydraulic Conductivity (cm/s) 1.70E-08 Corrected Hydraulic Conductivity (cm/s) 1.62E-08 Date Tested 7/9/2018	Chart	



Material Test Report	Report No: MAT:W18-003133-S7 Issue No: 1
Client: Dennis McAlpine Houston Engineering, Inc. 6901 E. Fish Lake Rd Maple Grove, MN, 55369 Project: B1802554 Fergus Falls C & D Landfill	Laboratory Results Reviewed by:
Fergus Falls, MN, TR: Brett Gruber, bgruber@braunintertec.com	Project Manager Date of Issue: 7/10/2018
Sample Details	Particle Size Distribution
Sample ID:W18-003133-S7Alternate Sample ID:Jeff FoucaultSampled By:Jeff FoucaultSampling Method:Shelby TubeDate Sampled:6/15/2018Date Submitted:	Method: Drying by: Date Tested:
Specification: Source: Fill Placed Material Type: Soil Barrier Layer Sample Location: Phase 3A, Grid J11, Lift #3 Other Test Results Description Method Result	Sieve Size % Passing Limits
DescriptionMethodResultTemperature (°C)ASTM D 5084 - 03 22.0Cell Pressure (lb/in²)99.0Top Pressure (lb/in²)91.0Effective Pressure (lb/in²)91.0Effective Pressure (lb/in²)91.0PermeantDe-aired tap waterAssumed Specific Gravity2.700Initial Sample Height (in)2.782Initial Sample Diameter (in)1.406Final Sample Diameter (in)1.406Initial Sample Cross-Section Area (in²)1.553Final Sample Volume (in³)4.319Final Sample Volume (in³)4.319Initial Sample Mass (g)117.5Initial Sample Mass (g)117.5Initial Moisture Content (%)21.4Final Saturation (%)96Final Saturation (%)96Final Saturation (%)1.32E-08Commonts7/9/2018	Chart
N/A	



Material Test Report		Re	port No: MAT:V	V18-003133-S9 Issue No: 1
Client: Dennis McAlpine Houston Engineering, Inc. 6901 E. Fish Lake Rd Maple Grove, MN, 55369 Project: B1802554 Fergus Falls C & D Landfill		150/JEC 17025	aboratory Result	s Reviewed by:
Fergus Falls, MN, TR: Brett Gruber, bgruber@braunintertec.com			Date of Is	Project Manager sue: 7/10/2018
Sample Details		Particle Size	Distribution	า
Sample ID:W18-003133-S9Alternate Sample ID:Jeff FoucaultSampled By:Jeff FoucaultSampling Method:Shelby TubeDate Sampled:6/15/2018Date Submitted:Sampled:		Method: Drying by: Date Tested:		
Specification: Source: Fill Placed Material Type: Soil Barrier Layer Sample Location: Phase 3A, Grid J13, Lift #3 Other Test Results Description Method Temperature (°C) ASTM D 5084 - 03 Cell Pressure (lb/in²) Top Pressure (lb/in²) Bottom Pressure (lb/in²) Bottom Pressure (lb/in²)	Result Limits 22.0 99.0 94.0 91.0	Sieve Size	% Passing	Limits
Bottom Pressure (Ib/in²) Effective Pressure Differential (Ib/in²) Permeant De-aired tap Assumed Specific Gravity Initial Sample Height (in) Final Sample Height (in) Initial Sample Diameter (in) Final Sample Diameter (in) Initial Sample Diameter (in) Initial Sample Diameter (in) Initial Sample Cross-Section Area (in²) Final Sample Cross-Section Area (in²) Initial Sample Volume (in³) Final Sample Volume (in³) Initial Sample Mass (g) Final Sample Mass (g) Initial Dry Density (Ib/ft³) Final Moisture Content (%) Final Saturation (%) Final Saturation (%) Initial Hydraulic Gradient Ending Hydraulic Conductivity (cm/s) 1.7 Corrected Hydraulic Conductivity (cm/s) 1.6 Date Tested 7/5	91.0 8.0 9 water 2.700 2.790 2.790 1.405 1.405 1.550 4.326 4.326 4.326 133.1 132.8 117.2 117.0 15.4 16.8 95 100 30.5 29.2 70E-08 52E-08 59/2018	Chart		
Comments N/A				



Material Test Re	port		Rep	oort No: MAT:W	18-003133-S10 Issue No: 1
Client: Dennis McAlpine Houston Engineering, In 6901 E. Fish Lake Rd Maple Grove, MN, 5536 Project: B1802554 Fergus Falls C & D Land	c. 9 Jfill		150/JEC 17025	aboratory Result	s Reviewed by:
Fergus Falls, MN, TR: Brett Gruber, bgruber@braunintertec.com				Date of Is	Project Manager sue: 7/10/2018
Sample Details			Particle Siz	e Distributior	า
Sample ID: W18-003 Alternate Sample ID: Sampled By: Jeff Four Sampling Method: Shelby T Date Sampled: 6/15/201 Date Submitted:	3133-S10 cault iube 8		Method: Drying by: Date Tested:		
Specification: Source: Fill Place Material Type: Soil Barr Sample Location: Phase 3/ Other Test Results Description Temperature (°C) Cell Pressure (lb/in ²) Top Pressure (lb/in ²) Bottom Pressure (lb/in ²) Effective Pressure (lb/in ²) Pressure Differential (lb/in ²) Permeant Assumed Specific Gravity Initial Sample Height (in) Final Sample Diameter (in) Final Sample Diameter (in) Final Sample Cross-Section Area (in ²) Final Sample Cross-Section Area (in ²) Initial Sample Volume (in ³) Final Sample Mass (g) Final Sample Mass (g) Initial Dry Density (lb/ft ³) Final Dry Density (lb/ft ³) Final Moisture Content (%) Final Moisture Content (%) Final Saturation (%) Initial Hydraulic Gradient Ending Hydraulic Gradient Hydraulic Conductivity (cm/s) Comments	ed ier Layer A, Grid J13, Lift #4 <u>Method Result</u> ASTM D 5084 - 03 22.0 99.0 94.0 91.0 8.0 De-aired tap water 2.700 2.782 2.782 1.419 1.581 1.581 4.400 4.400 129.2 128.7 111.9 111.5 15.6 18.6 83 99 31.1 28.3 1.98E-07 1.88E-07 7/9/2018	Limits	Sieve Size	% Passing	Limits
Comments _{N/A}					



Material Test Re	port		Rep	ort No: MAT:W	18-003133-S11 Issue No: 1
Client: Dennis McAlpine Houston Engineering, Ir 6901 E. Fish Lake Rd Maple Grove, MN, 5536 Project: B1802554 Fergus Falls C & D Land	nc. 9 dfill		180ЛЕС 17025	aboratory Result	s Reviewed by:
Fergus Falls, MN, TR: Brett Gruber, bgruber@	braunintertec.com			Date of Is	Project Manager sue: 7/10/2018
Sample Details			Particle Siz	e Distributior	ו
Sample ID: W18-003 Alternate Sample ID: Sampled By: Jeff Four Sampling Method: Shelby T Date Sampled: 6/21/201 Date Submitted:	3133-S11 cault ūbe 8		Method: Drying by: Date Tested:		
Specification: Source: Fill Place Material Type: Soil Barr Sample Location: Phase 3.	ed ier Layer A, Grid F13, Final Lift		Sieve Size	% Passing	Limits
Other Test Results					
Description	Method Result	Limits			
Temperature (°C) Cell Pressure (lb/in ²) Top Pressure (lb/in ²) Bottom Pressure (lb/in ²) Effective Pressure (lb/in ²)	ASTM D 5084 - 03 22.0 99.0 94.0 91.0 8.0				
Permeant	De-aired tap water				
Assumed Specific Gravity	2.700				
Initial Sample Height (in)	2.788				
Final Sample Height (in)	2.788				
Final Sample Diameter (in)	1.410				
Initial Sample Cross-Section Area (in ²)	1.579				
Final Sample Cross-Section Area (in ²)	1.579		Chart		
Initial Sample Volume (in ³)	4.403				
Final Sample Volume (in ³)	4.403				
Final Sample Mass (g)	118.6				
Initial Dry Density (lb/ft ³)	103.7				
Final Dry Density (lb/ft ³)	102.6				
Initial Moisture Content (%)	20.1				
Final Moisture Content (%)	23.9				
Final Saturation (%)	87				
Initial Hydraulic Gradient	29.8				
Ending Hydraulic Gradient	29.7				
Hydraulic Conductivity (cm/s)	3.28E-08				
Corrected Hydraulic Conductivity (cm/s)	3.13E-08				
Date lested	7/9/2018		-		
Comments					
N/A					

	Hyd	raulic Con	ductivity 7	Test Data A	ASTM D508	34	
Project:	Fergus Falls Landfill Phase 3A Expansion - #6018-006				Date:	7/20/2018	
Client:	Houston Engineering, Inc.			Job No.:	11517		
Boring No.:							
Sample No.:	PH3A_Perm 12	PH3A_Perm 13					
Depth (ft):	Lift #4	Lift #4					
Location:	25' N of J13	J13					
Sample Type:	тwт	тwт					
	Sandy Lean Clay w/a little gravel (CL)	Sandy Lean Clay w/a little gravel (CL)					
Soil Type:							
Atterberg Limits							
LL							
PL							
PI							
	Intact	Intact					
$r_{\rm construct}$	2 73	2 7/					
Unit: (iii): to Dia (in):	2.75	2.74					
e o Dry Density (pcf):	111.2	107.6					
Water Content:	16.9%	19.8%					
Test Type:	Falling	Falling					
Max Head (ft):	5.0	5.0					
Confining press. (Effective-psi):	2.0	2.0					
Trial No.:	6-10	6-10					
Water Temp °C:	22.0	22.0					
% Compaction							
% Saturation	95.0%	98.7%					
		(Coefficient of	Permeability			
K @ 20 °C (cm/sec)	1.1 x 10 ⁻⁸	9.1 x 10 ⁻⁹					
K @ 20 °C (ft/min)	2.2 x 10 ⁻⁸	1.8 x 10 ⁻⁸					
Notes:							
9	530 James Ave South			ERING , INC.	Bloomin	gton, MN 55431	

Attachment B – Phase 1 & 2 Material Gradations



INDEPENDENT TESTING TECHNOLOGIES, INC. 337 31ST AVENUE SOUTH, WAITE PARK, MN 56387 PH: (320) 253-4338 FAX: (320) 253-4547 www.independenttestingtech.com

GRAIN SIZE ANALYSIS Report Date: December 17, 2015 Permit Renewal Landfill Project: **15-429 City of Fergus Falls** Client: Fergus Falls, Minnesota Mr. Dan Edwards **PO Box 868** Fergus Falls, MN 56537 Mr. Dennis McApline, Houston Engineering 6901 E Fish Lake Rd Suite 140 Maple Grove MN 55369 CC: G-4 Sample #: **Sample Information BF-ITT** Sampled By: Lab Technician: CW Date Sampled: 12/14/2015 12/15/2015 Date Received: 12/15/2015 Date Tested: CL Lean Clay Classification: Stockpile Location: Pit: Not Given Specifications % Passing Sieve Size Laboratory Data *** 100 1" *** 3/4" 99 *** 99 5/8" *** 98 1/2" *** 98 3/8" *** #4 96 *** 93 #10 *** 89 #20 *** 83 #40 *** 72 #80 *** 60.8 #200

Houston Engineering Ing Minneapolis Mat

DEC 2 1 2015

Respectfully Submitted:

Chad T. Wolney, Soils Lab Manager



INDEPENDENT TESTING TECHNOLOGIES, INC. 337 31ST AVENUE SOUTH, WAITE PARK, MN 56387 PH: (320) 253-4338 FAX: (320) 253-4547

www.independenttestingtech.com

Report Date: December 18, 2015 **GRAIN SIZE ANALYSIS** Client: **City of Fergus Falls** Project: 15-429 Permit Renewal Landfill Mr. Dan Edwards Fergus Falls, Minnesota PO Box 868 Fergus Falls, MN 56537 CC: Mr. Dennis McApline, Houston Engineering 6901 E Fish Lake Rd Suite 140 Maple Grove MN 55369 Sample Information Sample #: G-5 Sampled By: **BF-ITT** Lab Technician: CW Date Sampled: 12/14/2015 Date Received: 12/14/2015 Date Tested: 12/17/2015 Classification: CL Lean Clay Location: Stockpile Pit: Not Given Laboratory Data Sieve Size % Passing Specifications 1" 100 *** 3/4" 99 *** 5/8" 99 *** 1/2" 99 *** 3/8" 97 *** #4 93 *** #10 90 *** #20 87 *** #40 83 *** #80 72 *** #200 62.6 ***



DEC 2 8 2015

Houston Engineering Inc Minneapolis MiN

Respectfully Submitted:

Chad T. Wolney, Soils L Manager


INDEPENDENT TESTING TECHNOLOGIES, INC. 337 31ST AVENUE SOUTH, WAITE PARK, MN 56387 PH: (320) 253-4338 FAX: (320) 253-4547 www.independenttestingtech.com

Report Date: December 18, 2015 **GRAIN SIZE ANALYSIS** Client: **City of Fergus Falls** Permit Renewal Landfill Project: 15-429 Mr. Dan Edwards Fergus Falls, Minnesota **PO Box 868** Fergus Falls, MN 56537 CC: Mr. Dennis McApline, Houston Engineering 6901 E Fish Lake Rd Suite 140 Maple Grove MN 55369 **Sample Information** Sample #: G-6 Sampled By: **BF-ITT** Lab Technician: CW Date Sampled: 12/14/2015 Date Received: 12/14/2015 Date Tested: 12/17/2015 Classification: CL Lean Clay Location: Stockpile Pit: Not Given Laboratory Data Sieve Size % Passing Specifications 1" *** 100 3/4" 99 *** 5/8" 99 *** 1/2" 99 *** 3/8" 98 *** #4 96 *** #10 92 *** #20 89 *** #40 84 *** #80 73 *** #200 63.2 ***



Housto no

Respectfully Submitted:

Chad T. Wolney, Soils Lab Manager

Attachment C – Disclaimer Form

DISCLAIMER FOR THE USE OF ELECTRONIC MEDIA

At your request, Houston Engineering Inc. ("Houston") is transferring information to you in electronic format (the "Electronic Information") concerning the project referenced below. This transfer constitutes a non-exclusive, limited license to you to use the information in the electronic file(s). Nothing in this transfer should be construed to create any right of the user to rely on the information provided or that the use of this Electronic Information implies that it has been reviewed or approved by Houston. Any use of this information is at the sole risk and liability of the user. Because information presented in electronic format can be modified, unintentionally or otherwise, Houston reserves the right to remove all indicia of ownership and/or involvement from the Electronic Information. The following shall apply to all Electronic Information provided by Houston in connection with this project:

- 1. Houston makes no performance guarantees, express or implied warranties, and assumes no obligation or liability for the reliability or accuracy of the information contained therein; or for the accuracy of the information translated by Houston's software for use with the end user's software. Moreover, any reuse of electronically stored documents imports a risk of error and misinterpretation through corruption of data, incompatibilities of computer programs, intentional manipulation and the like. As files distributed electronically may be subject to data erosion, erasure and/or alteration, and computer systems and software become obsolete over time, Houston makes no representations as to long term compatibility, usability, or readability of documents resulting from use of software application packages, operating systems, or computer hardware.
- 2. Houston assumes no liability for hardware or software damage that may result from the use of Electronic Information provided, or by electronic transfer due to viruses that may reside on the electronic media when transferred to the user.
- 3. Any use of this Electronic Information is at the sole risk and liability of the user. User is solely responsible for updating the information to reflect any changes following the preparation date of the Electronic Information conveyed by Houston. User agrees to make no claim and hereby waives, to the fullest extent permitted by law, any claim or cause of action of any nature against Houston, its officers, directors, employees, agents or subconsultants that may arise out of or in connection with the use of the Electronic Information.
- 4. User agrees not to forward, re-transmit or otherwise provide the Electronic Information to any third party including, without limitation, any subcontractor, agent or consultant without the prior written consent of Houston. If such consent is given, you agree to the fullest extent permitted by law, to hold harmless, indemnify, and defend Houston and each of its officers, directors, employees, agents, or subconsultants from and against any and all costs, losses and damages (including, but not limited to, all reasonable fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) that may arise out of or in connection with such third party use of the Electronic Information.
- 5. If for any reason a conflict exists between the Electronic Information provided and the stamped/sealed, signed plans and specifications, the stamped/sealed and signed plans and specifications shall take precedence in resolving any conflict, error, ambiguity or discrepancy.
- 6. Houston makes no performance guarantees, and assumes no obligation or liability for the accuracy of the information translated for use with the end users' software.

By downloading and/or accepting the Electronic Information, the user acknowledges and agrees to the foregoing conditions.

Project:_City of Fergus Falls Cla	ect:_City of Fergus Falls Class I C&D Landfill Phase 3B Expansion - City Project #9774				
Date:	Company:				
	Signature:				
	Its:				

Attachment D – Bid Form (REV1)

SECTION 00400 BID FORM (REV1)

Fergus Falls Class I C&D Landfill

Phase 3B Expansion Project

Owner: City of Fergus Falls, MN

To: City of Fergus Falls 112 West Washington Avenue / P.O. Box 868 Fergus Falls, MN 56537 Attn: Phase 3B Expansion Project Date _____, 20___

Proposal of

Bidder

Address

Pursuant to the bid for the Fergus Falls Class I C&D Landfill, Phase 3B Expansion Project to furnish all necessary machinery, equipment, tools, labor, materials and other means of construction and deliver materials and to do and perform all work set forth below (the "Work") at rates and at a total price or prices as hereinafter set forth, in accordance with the Contract Documents including the Drawings and Specifications, and addenda thereto on file in the office of the OWNER and OWNER'S ENGINEER, Houston Engineering, Inc. 7550 Meridian Circle North, Suite 120, Maple Grove, MN 55369-5455.

- First: In submitting this Bid Proposal, the undersigned bidder understands and agrees that the Instructions to Bidders and other Contract Documents referred to therein control and, without limiting the foregoing, that this Bid Proposal is based upon the following undertakings:
 - 1. That Bidder to the extent it deems necessary, has inspected the site of the work, existing construction in the areas of the proposed work, and is informed as to the condition thereof as the same bears on the work to be performed.
 - 2. That Bidder has received and examined the Drawings and Specifications, and is informed of all addenda thereto, and of the forms of the Contract Documents, including but not limited to the Agreement, performance and payment bonds and insurance certificates and endorsements to be furnished in the event an Agreement is awarded.
 - 3. Certain types of equipment and kinds of material are described in the specifications by

means of trade names and catalog numbers and/or manufacturer's names. The Agreement, if awarded, will be on the basis of materials and equipment described in the Drawings or stated in the Specifications without consideration of possible substitute or "orequal" items. In some cases, it is indicated in the Drawings or stated in the Specifications that a substitute or "or-equal" item of material or equipment may be furnished or used by CONTRACTOR. If approved, application for such approval will not be considered by ENGINEER until after the Effective Date of the Agreement. The procedure for submission of any such application and consideration of application is set forth in the Contract Documents. Bidder acknowledges that this proposal is submitted in strict accord with specified requirements, and other requirements of these documents.

- Second: The undersigned Bidder agrees, if it is the successful Bidder, to execute the Agreement as set forth at Section 00500 of the Contract Documents, and to furnish the required performance and payment bonds as set forth at Sections 00610 and 00620 of the Contract Documents and furnish insurance certificates and endorsements, all within fourteen (14) days of receiving the Notice of Award of contract from the OWNER.
- Third: The undersigned Bidder further agrees to begin work upon receipt of the Notice to Proceed and to prosecute said work to complete the same as specified in the Information Available to Bidders, subject to Liquidated Damages and other remedies.
- Fourth: The undersigned Bidder further agrees to guarantee performance of all work in accordance with Drawings and Specifications and in a good and workmanlike manner, and to renew or repair any work that may be rejected due to defective materials or workmanship prior to completion and acceptance of the material and installation by the OWNER.
- Fifth: The undersigned Bidder further agrees prior to or with the signing of the Agreement, to provide the following upon OWNER'S request:
 - 1. Such Catalogs, photographs, drawings, specifications, descriptive information and other details as to special equipment or materials bidder proposes to furnish for the work, to permit a valuation of the merits thereof and determination whether such special equipment or materials comply with the specifications.
 - 2. A properly executed affidavit of non-collusion.
 - 3. A statement of Bidder's qualifications.
 - 4. A statement setting forth all items of work that the Bidder proposes to sublet, and names of the subcontractors to whom such items shall be sublet.
- Sixth: Following is a tabulation of the undersigned Bidder's bid for all work performed to carry out the aforementioned construction being understood that this bid contemplates all machinery, equipment, tools, labor, materials and other means of construction and all materials and times specified in accordance with the Contract Documents, drawings and specifications and all Addenda thereto. At the opening of Bid Proposals, the total contract price will be read out loud for the primary bid. The undersigned Bidder proposes to do all unclassified work required to complete the contemplated Work, at a unit price contract as provide by the specifications and other Contract Documents.

Seventh: This bid is genuine and not made in the interest or on behalf of any undisclosed person, firm, or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization, or corporation; Bidder has not directly or indirectly induced or solicited any other bidder to submit a false or sham Bid; Bidder has not solicited or induced any person, firm or a corporation to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other bidder or over OWNER. Bidder agrees to complete the Work for the Primary Bid at the unit prices and/or lump sums as listed and set forth on the Bid Tabulation Schedules that follow.

City of Fergus Falls Class I C&D Landfill Phase 3B Expansion Project

No.	Item Description	Unit	Estimated Quantity	Unit Price	Amount	
	PHASE 3B EXPANSION PROJECT #9774					
1	Mobilization	LS	1			
2	Water for Construction	1000 GAL	1,500			
3	Control of Water	LS	1			
4	Traffic Control	LS	1			
5	Demolition and Removals - Salvage Existing 36" HDPE Storm Pipe/Culvert	LF	120			
6	Demolition and Removals - Salvage Existing 36" Storm Pipe/Culvert Flared End Sections	EA	2			
7	Demolition and Removals - Salvage Existing Gravel Mat'ls	CY	568			
8	Demolition and Removals - Salvage Rip-Rap	CY	29			
9	Demolition and Removals - PF-7 Well Abandonment	LS	1			
10	Test-pit Excavation	HR	40			
11	Common Excavation - Cell & Access Road (CV) (P)	CY	11,793			
12	Topsoil Management	CY	3,962			
13	Subgrade Correction (CV)	CY	6,167			
14	Re-Compacted Soil Barrier Layer (CV) (P)	CY	2,135			

No.	Item Description	Unit	Estimated Quantity	Unit Price	Amount
15	Sand Drainage Layer (In-Place) (P) - 1ft over waste limits	CY	2,988		
16	Phase Separation Berm, Turnaround Pads and Temporary Drainage Berms (CV) (P)	CY	3,731		
17	Leachate Collection Trench (includes fabric, perf pipe & rock)	LF	299		
18	Leachate Collection Cleanout Riser Pipe (Solid Pipe)	LF	16		
19	Groundwater Underdrain System - Piping Extension (includes fabric, perf pipe & rock)	LF	825		
20	Gravel Surfacing - Landfill Perimeter/Access Road(s)	TON	1,899		
21	North Turnaround Pad Ditch Grading	LS	1		
22	Silt Fence	LF	2,000		
23	Erosion Control Blanket - Straw	SY	500		
24	Erosion Control Fiber Roll - 12"	LF	500		
25	12" RCP Storm Pipe/Culvert	LF	88		
26	12" RCP Apron	EA	2		
27	36" RCP Storm Pipe/Culvert	LF	150		
28	36" RCP Apron	EA	2		
29	Rip-Rap	CY	24		
30	Seeding, Mulch, Fertilizer & Disk Anchoring	AC	2.84		
31	Leachate Collection Repair Coupling	EA	1		
32	Waste Excavation (LV)	CY	500		
	TOTAL (PHASE 3B EXPANSION PROJECT) =				

Eight: **Responsible Contractor Verification**. Per Minnesota Statute 16C.285, bidders must complete "Attachments A & A-1 of Section 410 – Responsible Contractor Verification and Certification of Compliance."

BIDDER'S QUALIFICATION STATEMENT

1. '	The name,	address and	phone/fax	number	of the bidder.
------	-----------	-------------	-----------	--------	----------------

Name
Address
Phone/fax
2. Years in business
3. List of contractor owned equipment available for this project.
Attach as separate submittal, if necessary.

4. List at least three (3) similar projects performed within the last five (5) years. The list of references shall include earthwork projects consisting of at least 50,000 CY of excavation. Attach as submittal, if necessary.

1. Name of Client	Date
Name of Contact	Phone
Description of Project	
2. Name of Client	Date
Name of Contact	Phone
Description of Project	

3. Name of Client	Date
Name of Contact	Phone
Description of Project	
4. Name of Client	Date
Name of Contact	Phone
Description of Project	
5. Name of Client	Date
Name of Contact	Phone
Description of Project	

5. List of person(s) who are employed by you and will supervise and be available to perform the work on this project and the number of years of experience.

	Names:	Years of experience	
Project Manager:			
Superintendent:			
Foreman:			
Personnel:			

6. Such additional information as will assist the Owner and Engineer in determining whether the bidder is adequately prepared to fulfill the contract. Attach as submittal, if necessary.

7. Contractors Anticipated Work Schedule

To demonstrate qualification to perform the Work, each Bidder shall complete and submit to the OWNER a detailed project schedule identifying the initiation, duration (time) and anticipated completion of each work task identified below.

Work Task	Initiation Date	Duration (days or weeks)	Completion Date
Mobilization			NA
Topsoil stripping & stockpiling			
Common Excavation			
Groundwater Underdrain System			
Extension			
Recompacted Clay Barrier Layer &			
Subgrade Correction			
Leachate Collection Trench			
Phase Delineation Berm, Turnaround Pad,			
and Temporary Drainage Berm			
Sand Drainage Layer			
Gravel Surfacing			
Site Restoration – Erosion Control,			
Seeding, Mulch, Disk Anchoring, Fertilizer			

Substantial Completion	NA	NA	September 1, 2025
Final Project Completion/Closeout	NA	NA	October 31, 2025

8. The undersigned hereby authorizes and requests any person, firm or corporation to furnish any information requested by the Owner in verification of the recitals constituting this statement of contractor's qualifications.

State the true, exact correct and complete name of the partnership, corporation or trade name under which you do business, and the address of the place of business. If a corporation, state the name of the President and secretary. If a partnership, state the names of the partners. If a trade name, state the names of the firms and/or individuals who do business under the trade name. It is absolutely necessary that this information be provided.

8.1 Correct and complete name of bidder: ______

8.2 The Business is a: ______

8.3 The address of the principal place of business is:

8.4 Telephone Number: ______

Dated at: ______ this ______ day

of _____, 20___.

Ву:_____

Attest: _____

AFFIDAVIT OF RESPONSIBLE CONTRACTOR COMPLIANCE TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

CERTIFICATE OF EXECUTION

Receipt is acknowledged of the following addenda:

Addenda	;;;;		
Witness this	day of	, 20	
Name:			
Title:			
Company:			
Signature:			

STATEMENT OF NONCOLLUSION

______, of _______, of _______, the party making the foregoing bid, states that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and further, that the bidder has not, directly or indirectly, submitted his or her bid price or breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

Signed: _____

LIST OF SUBCONTRACTORS

The Bidder shall list below the name and the location of the place of business of each Subcontractor who will perform work or labor or render service to the prime contractor in or about the construction of the work or improvement, or a Subcontractor who, under subcontract to the prime contractor, specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in the plans and specifications, in an amount in excess of one-half of 1 percent of the prime contractor's total bid or, in the case of bids or offers for the construction of streets or highways, including bridges, in excess of one-half of 1 percent of the prime contractor's total bid or ten thousand dollars (\$10,000), whichever is greater. The Bidder shall also list below the portion of the WORK which will be performed by each Subcontractor under its contract. The prime contractor shall list only one Subcontractor for each portion as is defined by the prime contractor in its bid. The Bidder's attention is directed to the General Conditions. Failure to comply with this requirement will render the Bid non-responsive and may cause its rejection.

Work to be Performed	Subcontractor License No.	Percent of Total Bid	Subcontractor Name & Address

Note: Attach additional sheets if required.

END OF SECTION 00400

Attachment E – Revised Plan Sheets



ł	ł				
	EXISTING SITE CONTROL				
	Point #	Elevation	Northing	Easting	Description
1	15	1238.76	157961.53	405512.87	CP15 0.5" IP
1	16	1229.33	157980.63	405022.55	CP16 0.5" IP
	17	1233.34	157748.96	405035.84	CP17 0.5" IP
	18	1240.45	157677.06	405489.88	CP18 0.5" IP
Į	19	1243.20	156644.78	405979.87	CP19 0.5" IP
1	20	1252.15	156197.84	406450.51	CP20 0.5" IP
J	21	1249.75	155635.87	406931.78	CP21 0.5" IP
]	22	1265.40	155960.25	407375.67	CP22 0.5" IP
J	23	1276.98	156831.91	407360.63	CP23 0.5" IP
┫	24	1271.11	157338.38	407325.85	CP24 0.5" IP
	25	1263.01	157404.55	406677.26	CP25 0.5" IP
1	26	1261.95	157523.40	406194.96	CP26 0.5" IP



