

# Appendices

# Appendix A

## Letters to the Ministry



January 25, 2018

Reference No. 11103232

Ms. Mili New  
Director, West Central Region  
Ministry of the Environment and Climate Change  
119 King Street West  
12<sup>th</sup> Floor  
Hamilton, ON  
L8P 4Y7

Dear Ms. New:

**Project No: 11103232**

**Regarding: Completion of Phase 8A Base Liner and Leachate Collection System  
Terrapure Environmental Stoney Creek Regional Facility, Stoney Creek, Ontario  
(Certificate of Approval No. A181008)**

Herein we provide our opinion that the construction of the landfill base liner and leachate collection system for Phase 8A has been principally completed. The following is relevant:

- a. Liner and leachate collection system construction has been completed within the footprint of Phase 8A, from approximately E 1030 up to a location of approximately E 1300. The newly constructed works have been successfully connected to the previously constructed liner and leachate collection system.
- b. Quality assurance inspection has been carried out by GHD, including overall contract administration and inspection, geomembrane inspection, and soil compaction testing. Based on this inspection work, we are of the opinion that the base liner and leachate collection system have been constructed in general accordance with the approved Phase 8A design and specifications.
- c. In-situ and laboratory hydraulic conductivity testing has been carried out on the primary and secondary clay liners. The results of this testing indicate that the hydraulic conductivity is less than the maximum design value of  $5 \times 10^{-8}$  cm/s.
- d. We understand that Terrapure Environmental will commence placing waste in the portion of the landfill noted herein. In our opinion, waste that is placed within this area, as well as any resultant leachate, will be contained within the landfill.

A report detailing the construction and quality assurance work carried out for the Phase 8A base liner and leachate collection system will be submitted upon its full completion.



Should you have any questions, please do not hesitate to contact the undersigned, or Mr. Lorenzo Alfano of Terrapure Environmental at (905) 548-5876.

Sincerely,

GHD

A handwritten signature in black ink that reads "Brian Dermody". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Brian Dermody, P. Eng.

BMD/sw/1

cc: Mr. Lorenzo Alfano, Terrapure Environmental  
Mr. Paul Widmeyer, MOECC Hamilton District Manager



# Appendix B

## Construction Photographs



Photo 1 - Removal of the Existing Temporary Berm



Photo 2 - Construction of Groundwater Collection Trench



## Construction Photographs





Photo 3 - Construction of the Engineered Fill Sidewall



Photo 4 - Conducting In-Situ Compaction Testing of Clay Liner



## Construction Photographs





Photo 5 - Conducting In-Situ Hydraulic Conductivity Testing of Clay Liner



Photo 6 - Smooth Rolling the Final Lift of the Clay Liner



## Construction Photographs



Photo 7 - Seaming of Geotextile



Photo 8 - Placement of Clear Stone for the Hydraulic Control Layer



## Construction Photographs





Photo 9 - Deploying Geomembrane on the Sidewall



Photo 10 - Air Testing Welded Geomembrane Seam



## Construction Photographs



Photo 11 - Staged Construction of Base Liner Components



## Construction Photographs

# Appendix C

## Daily Activity Logs





## Daily Inspection Record

**Job Number:** 11103232 **Date:** June 19, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 26°C, Mostly Cloudy

### Phase 8A Progress:

- Mobilized, placed signs and barrels
- Exposed liner flap on the inner side of the temporary berm between E1025 and E1075

### Personnel:

1 Foreman  
1 Laborer(s)  
1 Excavator operator(s)  
1 GHD engineer  
1 GHD inspector

### Equipment Used:

1 Excavator(s)

### Equipment Notes:

John Deere 245G LC

### Other Progress Notes:

-



## Daily Inspection Record

**Job Number:** 11103232 **Date:** June 20, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 20°C, Mostly Cloudy

### Phase 8A Progress:

- Exposed liner flap on the inner side temporary berm between N1260 and N1300
- Terrapure turned on six inch diameter pump to dewater area on the outside of the temporary berm between E1100 and E1300

### Personnel:

1 Foreman  
1 Laborer(s)  
1 Excavator operator(s)  
1 GHD engineer  
1 GHD inspector

### Equipment Used:

1 Excavator(s)  
1 Water Pump (6 inch)

### Equipment Notes:

John Deere 245G LC

### Other Progress Notes:

- Water was found at the temporary berm membrane liner at the corner of the temporary berm at N1260, E1060



## Daily Inspection Record

**Job Number:** 11103232 **Date:** June 21, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 19°C, Some Clouds

### Phase 8A Progress:

- Exposed liner flap on the outer side of the temporary berm between E1025 and E1075 and between N1260 and N1300
- Removed and stockpiled 50 mm clear stone from the temporary berm between E1025 and E1075
- Stockpiled at approximately N1460, E1130
- Sand bags were placed to hold liner in place between E1025 and E1075

### Personnel:

1 Foreman  
2 Laborer(s)  
1 Excavator operator(s)  
1 GHD engineer  
1 GHD inspector

### Equipment Used:

1 Excavator(s)  
1 Water Pump (3/4 inch)

### Equipment Notes:

John Deere 245G LC

### Other Progress Notes:

- Investigation: After closer examination (after the temporary berm liner was cut back) it was determined that the water was not underneath the ground membrane liner, but only between the temporary berm membrane liner and the ground membrane liner at N1260, E1060



# Daily Inspection Record

**Job Number:** 11103232 **Date:** June 22, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 20°C, Intermittent Clouds; Period of showers from 11:00 A.M. to 12:30 P.M.

## Phase 8A Progress:

- Continued removing and stockpiling 50 mm clear stone from the temporary berm between N1260 and N1300
- Stockpiled at approximately N1460, E1130
- Sand bags were placed to hold liner in place between N1260 and N1300

## Personnel:

1 Foreman  
2 Laborer(s)  
1 Excavator operator(s)  
1 Rock truck operator(s)  
1 GHD engineer  
1 GHD inspector

## Equipment Used:

1 Excavator(s)  
1 Rock Truck(s)  
1 Water Pump (3/4 inch)

## Equipment Notes:

John Deere 245G LC  
Case 330B

## Other Progress Notes:

-



## Daily Inspection Record

**Job Number:** 11103232 **Date:** June 23, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 20°C, Rain; Started approximately 9 am

### Phase 8A Progress:

- Pulled waste away from the temporary berm from E1050 to E1125
- Sand bags were used to hold in place the membrane liner E1050 and E1125

### Personnel:

1 Foreman  
2 Laborer(s)  
1 Excavator operator(s)  
1 GHD inspector

### Equipment Used:

1 Excavator(s)

### Equipment Notes:

John Deere 245G LC

### Other Progress Notes:

-



## Daily Inspection Record

**Job Number:** 11103232 **Date:** June 26, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 20°C, Intermittent Clouds, started to rain approximately 2:30pm

### Phase 8A Progress:

- Pulled back waste to expose the inside liner of the temporary berm between E1125 and E1175
- Cleared soil off the outside of the temporary berm between E1125 and E1175
- Stockpiled 50 mm clear stone from within the berm to beside the temporary berm for removal between E1125 and E1175
- Stockpiled at approximately N1460, E1130

### Personnel:

1 Foreman  
2 Laborer(s)  
1 Excavator operator(s)  
1 GHD inspector  
1 GHD engineer

### Equipment Used:

1 Excavator(s)

### Equipment Notes:

John Deere 245G LC

### Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** June 27, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 20°C, cloudy; Rained in small intervals throughout the afternoon

### Phase 8A Progress:

- Stockpiled the 50 mm clear stone from within to beside the temporary berm between E1125 and E1175
- Began exposing and clearing impurities from the top of the clay from within the temporary berm between E1025 and E1075, and N1260 and N1300
- The impurities were stockpiled nearby and used later as engineered fill

### Personnel:

1 Foreman  
2 Laborer(s)  
1 Excavator operator(s)  
1 GHD inspector  
1 GHD engineer

### Equipment Used:

1 Excavator(s)  
1 Water Pump (3/4 inch)

### Equipment Notes:

John Deere 245G LC

### Other Progress Notes:

-



## Daily Inspection Record

**Job Number:** 11103232 **Date:** June 28, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 23°C, Sunny

### Phase 8A Progress:

- Moved the 50 mm clear stone beside the temporary berm (E1075 to E1125) and stockpiled it at N1340, E1475
- Removed and replaced the top layer of the 19 mm clear stone to clear away soil off of the ground water collection trench between E1075 and E1125
- Placed geotextile A on top of the ground water trench between E1075 and E1125
- Placed and compacted granular A between E1075 and E1125 at a minimum of 8 inches

### Personnel:

1 Foreman  
2 Laborer(s)  
1 Excavator operator(s)  
1 Rock truck operator(s)  
1 GHD inspector  
1 GHD engineer  
1 GHD surveyor

### Equipment Used:

1 Excavator(s)  
1 Rock Truck(s)  
1 Soil Tamper

### Equipment Notes:

John Deere 245G LC  
Case 330B  
PU6555

### Other Progress Notes:

- GHD surveyor established 1 cut cross by the trailers and 2 control points, 1 by the truck wheel wash station and 1 on the top of the berm by the Phase 8A construction by First rd. W, on the other side of the vegetated swale





## Daily Inspection Record

**Job Number:** 11103232 **Date:** June 29, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 21°C, cloudy; small periods of showers in the morning

### Phase 8A Progress:

- Exposed clay inside the temporary berm between E1075 and E1125
- Placed engineered fill between E1075 and E1125
- Dufferin compared own surveyed coordinates to GHD coordinates for the cut cross and 2 control points

### Personnel:

1 Foreman  
3 Laborer(s)  
1 Excavator operator(s)  
1 GHD inspector  
1 GHD engineer  
1 GHD soil inspector

### Equipment Used:

1 Excavator(s)

### Equipment Notes:

John Deere 245G LC

### Other Progress Notes:

- It was determined that the existing base liner extends beyond the proposed toe of slope for the new cell. Alignment to be confirmed and adjusted to ensure that adequate benching of compacted clay layers is achieved when connecting new liner to existing.



## Daily Inspection Record

**Job Number:** 11103232 **Date:** June 30, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 21°C, Cloudy

### Phase 8A Progress:

- Pulled waste back from temporary berm to uncover membrane between E1150 and E1175
- Terrapure turned on 6 inch water pump to dewater work area outside of the berm approximately between E1075 and E1260

### Personnel:

1 Foreman  
2 Laborer(s)  
1 Excavator operator(s)  
1 GHD inspector

### Equipment Used:

1 Excavator(s)  
1 Water Pump (6 inch)

### Equipment Notes:

John Deere 245G LC

### Other Progress Notes:

- Wrinkles in the membrane were discovered in Phase 1B between E1150 and E1200; further investigation will commence



## Daily Inspection Record

**Job Number:** 11103232 **Date:** July 4, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 24°C, Sunny

### Phase 8A Progress:

- Pulled waste back from temporary berm to uncover membrane between E1175 and E1200
- Uncovered leachate collection pipe at approximately N1290, E1200
- Exposed clay inside the temporary berm between E1125 and E1200
- Prepared area for rock truck access between E1100 and E1200

### Personnel:

1 Foreman  
3 Laborer(s)  
1 Excavator operator(s)  
1 GHD inspector

### Equipment Used:

2 Excavator(s)  
1 Water Pump (6 inch)

### Equipment Notes:

John Deere 245G LC  
John Deere 470G LC

### Other Progress Notes:

- Terrapure turned on 6 inch water pump to dewater work area outside of the berm approximately between E1075 and E1260
- Brought in bulldozer (John Deere 750K XCT) and excavator (John Deere 470G LC)



## Daily Inspection Record

**Job Number:** 11103232 **Date:** July 5, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 20°C, Sunny

### Phase 8A Progress:

- Cleared and leveled the side slope approximately between N1260 and N1320
- Placed a base grade layer onto the side slope approximately between N1260 and N1320
- Cut membrane flap off of the temporary berm from E1120 to E1200, while leaving some geomembrane for containment

### Personnel:

1 Foreman  
3 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
1 GHD inspector  
1 GHD engineer

### Equipment Used:

2 Excavator(s)  
  
1 Bulldozer(s)

### Equipment Notes:

John Deere 245G LC  
John Deere 470G LC  
John Deere 750K XCT

### Other Progress Notes:

- Investigating membrane wrinkle in Phase 1B by digging back into the waste. Area under investigation was approximately E1150 to E1175. (1 labourer and 1 excavator operator)
- Dufferin brought in a padfoot compactor (CAT CS 563E)
- Construction meeting #1 was held



## Daily Inspection Record

**Job Number:** 11103232 **Date:** July 6, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 28°C, Partly Sunny

### Phase 8A Progress:

- Removed 50 mm clear stone from the temporary berm from approximately between E1160 to E1200
- Stockpiled at approximately N1340, E1475
- Graded engineered fill on the side slope between N1260 and N1320
- Stockpiled granular A material for base layer at the base of the slope in the area between N1260 and N1320, and E1050 and E1060.
- The granular A came from approximately N1340, E1475

### Personnel:

1 Foreman  
3 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Rock truck operator(s)  
1 GHD inspector  
1 GHD engineer  
1 GHD soil inspector

### Equipment Used:

2 Excavator(s)  
  
1 Bulldozer(s)  
1 Rock Truck(s)

### Equipment Notes:

John Deere 245G LC  
John Deere 470G LC  
John Deere 750K XCT  
Case 330B

### Other Progress Notes:

- The membrane wrinkle in Phase 1B investigation concluded (separate report)
- Had 2 labourers and 1 Excavator operator(s) rebuilding the leachate collection layer in Phase 1B at 2 of the 3 wrinkle investigation trenches.



## Daily Inspection Record

**Job Number:** 11103232 **Date:** July 7, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 26°C, Cloudy

### Phase 8A Progress:

- Began placing base grade layer with engineered fill between E1050 and E1140
- Engineered fill came from the stockpile at N1340, E1100
- Spread Granular A over the end of the ground water collection trench at N1300, E1050
- The granular A came from approximately N1340, E1475.
- Began excavating soil off of the outside of the temporary berm between E1250 and E1270

### Personnel:

1 Foreman  
3 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
1 water truck operator(s)  
1 GHD inspector  
1 GHD soil inspector

### Equipment Used:

1 Excavator(s)  
1 Bulldozer(s)  
1 Water truck(s)  
1 Padfoot(s)

### Equipment Notes:

John Deere 470G LC  
John Deere 750K XCT  
  
CAT CS 563E

### Other Progress Notes:

- Had 2 labourers and 1 Excavator operator(s) finish rebuilding the leachate collection layer at the wrinkle investigation trenches.
- The John Deere 245G LC was down for maintenance



## Daily Inspection Record

**Job Number:** 11103232 **Date:** July 10, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Brian Dermody **Weather:** 27°C, Partly Sunny

### Phase 8A Progress:

- Continued placing engineered fill between E1050 and E1140.
- Engineered fill came from the stockpile at N1340, E1100
- Material required addition of water to adjust moisture content
- GHD and Dufferin survey crews on-site to reconfirm control points and construction grades

### Personnel:

1 Foreman  
3 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
1 water truck operator(s)  
1 GHD engineer  
1 GHD soil inspector

### Equipment Used:

1 Excavator(s)  
1 Bulldozer(s)  
1 Water truck(s)  
1 Padfoot(s)

### Equipment Notes:

John Deere 470G LC  
John Deere 750K XCT  
  
CAT CS 563E

### Other Progress Notes:

- GHD surveyed the alignment of the existing Secondary Clay Liner along the temporary berm



## Daily Inspection Record

**Job Number:** 11103232 **Date:** July 11, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Brian Dermody **Weather:** 29°C, Sunny

### Phase 8A Progress:

- Continued placing engineered fill between E1050 and E1140.
- Engineered fill came from the stockpile at N1340, E1100
- Material from west engineered fill stockpile nearly depleted
- Additional material will be sourced form the spoil stockpile at N1350, E1175

### Personnel:

1 Foreman  
3 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
1 GHD engineer  
1 GHD soil inspector

### Equipment Used:

1 Excavator(s)  
1 Bulldozer(s)  
1 Padfoot(s)

### Equipment Notes:

John Deere 470G LC  
John Deere 750K XCT  
CAT CS 563E

### Other Progress Notes:

- Inspected stormwater management pond and groundwater detention pond





## Daily Inspection Record

**Job Number:** 11103232 **Date:** July 12, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 21°C, Cloudy

### Phase 8A Progress:

- Continued placing engineered fill between E1050 and E1140.
- Engineered fill came from the stockpile at N1340, E1100
- Material from west engineered fill stockpile nearly depleted
- Additional material will be sourced form the spoil stockpile at N1350, E1175

### Personnel:

1 Foreman  
3 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
1 GHD inspector  
1 GHD soil inspector

### Equipment Used:

1 Excavator(s)  
1 Bulldozer(s)  
1 Padfoot(s)

### Equipment Notes:

John Deere 470G LC  
John Deere 750K XCT  
CAT CP 56B

### Other Progress Notes:

- Replaced Padfoot compactor Cat CS 563E with CAT CP 56B



# Daily Inspection Record

**Job Number:** 11103232 **Date:** July 13, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 23°C, Heavy Rain

## Phase 8A Progress:

- Placed geotextile A on the groundwater trench between E1150 and E1200

## Personnel:

1 Foreman  
/ Padfoot operator(s)/ smooth drum operator(s)  
3 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Rock truck operator(s)  
1 GHD inspector  
1 GHD soil inspector

## Equipment Used:

1 Excavator(s)  
1 Rock Truck(s)

## Equipment Notes:

John Deere 470G LC  
Case 330B

## Other Progress Notes:

- Brought in Bomag BW 213 PDH-40 (Padfoot) and Caterpillar CS44 (smooth drum roller)



## Daily Inspection Record

**Job Number:** 11103232 **Date:** July 14, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 22°C, Cloudy

### Phase 8A Progress:

- Spread granular A material for base layer at the bottom of the slope in the area between N1300 and N1330, and E1050 and E1060.
- The granular A came from approximately N1340, E1475.
- Removed 50 mm clear stone from temporary berm between E1160 and E1200
- Stockpiled approximately N1340, E1475 (near the granular A stockpile)
- Placed granular A from N1340, E1475 stockpile and geotextile across ground water trench between E1150 and E1250
- Began reforming engineered fill stockpile in the area between N1340 and N1360, and E1150 and E1200

### Personnel:

1 Foreman/ Padfoot operator(s)/ smooth drum operator(s)  
3 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Rock truck operator(s)  
1 GHD inspector  
1 GHD soil inspector (morning)

### Equipment Used:

1 Excavator(s)  
1 Rock Truck  
1 Padfoot(s)  
1 Smooth Drum Roller(s)  
1 Bulldozer(s)

### Equipment Notes:

John Deere 245G LC  
Case 330B  
Bomag BW 213 PDH-40  
Caterpillar CS44  
John Deere 750K XCT

### Other Progress Notes:

- Bomag BW 213 PDH-40 (Padfoot) broke down in the morning



## Daily Inspection Record

**Job Number:** 11103232 **Date:** July 17, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 20°C, Partly Cloudy

### Phase 8A Progress:

- Pulled back waste and excavated temporary berm from E1210 to E1260
- Began exposing onsite clay source
- Location area approximately in between N1560 to N1600 and E1400 to E1500

### Personnel:

1 Foreman  
3 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
1 GHD inspector  
1 GHD engineer

### Equipment Used:

1 Bulldozer(s)  
1 Excavator(s)

### Equipment Notes:

John Deere 750K XCT  
John Deere 245G LC

### Other Progress Notes:

- Pumped water from E1200 to E1250 from just outside the temporary berm
- Removed Smooth Drum Roller (Catepillar 750K XCT) offsite
- Discovered water between the geomembranes of the temporary berm and base. To location was approximately between E1210 and E1250 will pump the water into the landfill



# Daily Inspection Record

**Job Number:** 11103232 **Date:** July 18, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 25°C, Sunny

## Phase 8A Progress:

- Placed engineered fill from E1120 to E1250
- The fill came from the stockpile at N1360, E1175

## Personnel:

1 Foreman  
3 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)  
1 Rock truck operator(s)  
1 GHD inspector  
1 GHD engineer (morning)  
1 GHD soil inspector

## Equipment Used:

1 Bulldozer(s)  
1 Excavator(s)  
1 Padfoot(s)  
1 Rock Truck(s)

## Equipment Notes:

John Deere 750K XCT  
John Deere 470G LC  
Bomag BW 213 PDH-40  
Case 330B

## Other Progress Notes:

-



## Daily Inspection Record

**Job Number:** 11103232 **Date:** July 19, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 27°C, Cloudy

### Phase 8A Progress:

- Continued placing engineered fill from E1120 to E1250
- The fill came from the stockpile at N1360, E1175

### Personnel:

1 Foreman/ Padfoot operator(s)  
3 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
2 Rock truck operator(s)  
1 GHD inspector  
1 GHD soil inspector

### Equipment Used:

1 Excavator(s)  
2 Rock Truck(s)  
  
1 Padfoot(s)  
1 Bulldozer(s)

### Equipment Notes:

John Deere 470G LC  
Case 330B  
Caterpillar 735  
Bomag BW 213 PDH-40  
John Deere 750K XCT

### Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** July 20, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 20°C, Cloudy with periods of storms

## Phase 8A Progress:

- Compacted the engineered fill from previous day between E1120 to E1250
- Continued excavating and removing 50 mm clear stone from temporary berm between E1150 to E1250
- Stockpiled at approximately N1340, E1475 (near the granular A stockpile)

## Personnel:

1 Foreman/ Padfoot operator(s)  
2 Laborer(s)  
1 Excavator operator(s)  
1 Rock truck operator(s)  
1 GHD inspector

## Equipment Used:

1 Excavator(s)  
1 Rock Truck(s)  
1 Padfoot(s)

## Equipment Notes:

John Deere 245G LC  
Caterpillar 735  
Bomag BW 213 PDH-40

## Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** July 21, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 29°C, Some clouds

## Phase 8A Progress:

- Continued excavating and removing 50 mm clear stone from temporary berm between E1150 to E1250
- Stockpiled at approximately N1340, E1475 (near the granular A stockpile)

## Personnel:

1 Foreman  
2 Laborer(s)  
1 Excavator operator(s)  
1 Rock truck operator(s)  
1 GHD inspector

## Equipment Used:

1 Excavator(s)  
1 Rock Truck(s)

## Equipment Notes:

John Deere 245G LC  
Caterpillar 735

## Other Progress Notes:

-





## Daily Inspection Record

**Job Number:** 11103232 **Date:** July 24, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 21°C, Cloudy

### Phase 8A Progress:

- Exposed hydraulic control layer from E1110 to E1210

### Personnel:

1 Foreman  
2 Laborer(s)  
1 Excavator operator(s)  
1 GHD inspector

### Equipment Used:

1 Excavator(s)

### Equipment Notes:

John Deere 245G LC

### Other Progress Notes:

- Construction meeting #2 was held



## Daily Inspection Record

**Job Number:** 11103232 **Date:** July 25, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 20°C, Cloudy

### Phase 8A Progress:

- Excavated clay from temporary berm between E1110 to E1250
- The clay was stockpiled at approximately N1600, E1450

### Personnel:

1 Foreman  
2 Laborer(s)  
1 Excavator operator(s)  
1 Rock truck operator(s)  
1 GHD inspector

### Equipment Used:

1 Excavator(s)  
1 Rock Truck(s)

### Equipment Notes:

John Deere 245G LC  
Caterpillar 735

### Other Progress Notes:

-



## Daily Inspection Record

**Job Number:** 11103232 **Date:** July 26, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 26°C, Partly Sunny

### Phase 8A Progress:

- Began placing engineered fill and constructing the Phase 8A sidewall from E1130 to E1250
- The fill came from the stockpile at N1360, E1175

### Personnel:

1 Foreman  
2 Laborer(s)  
1 Excavator operator(s)  
1 Padfoot operator(s)  
1 Bulldozer operator(s)  
2 Rock truck operator(s)  
1 GHD inspector  
1 GHD soil inspector

### Equipment Used:

1 Excavator(s)  
2 Rock Truck(s)  
  
1 Padfoot(s)  
1 Bulldozer(s)

### Equipment Notes:

John Deere 470G LC  
Case 330B  
Caterpillar 735  
Bomag BW 213 PDH-40  
John Deere 750K XCT

### Other Progress Notes:

-



## Daily Inspection Record

**Job Number:** 11103232 **Date:** July 27, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 28°C, Cloudy

### Phase 8A Progress:

- Continued placing engineered fill and constructing the Phase 8A sidewall berm from E1130 to E1250
- The fill came from the stockpile at N1360, E1175

### Personnel:

1 Foreman  
3 Laborer(s)  
1 Excavator operator(s)  
1 Padfoot operator(s)  
1 Bulldozer operator(s)  
2 Rock truck operator(s)  
1 GHD inspector  
1 GHD soil inspector

### Equipment Used:

1 Excavator(s)  
2 Rock Truck(s)  
  
1 Padfoot(s)  
1 Bulldozer(s)

### Equipment Notes:

John Deere 470G LC  
Case 330B  
Caterpillar 735  
Bomag BW 213 PDH-40  
John Deere 750K XCT

### Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** July 28, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 22°C, Sunny with some clouds

## Phase 8A Progress:

- Continued placing engineered fill and constructing the Phase 8A sidewall from E1130 to E1250
- The fill came from the stockpile at N1360, E1175
- Work stopped around 1 pm with some delays
- Moisture content of the engineered fill placed and in the stockpile was too high
- Left the placed fill to dry over weekend
- Began excavating trench (at approximately 3 pm to 4:45 pm) from E1050 to E1100 at the toe of the Phase 8A sidewall to expose tie in section of the Secondary Clay Liner

## Personnel:

- 1 Foreman
- 3 Laborer(s)
- 1 Excavator operator(s)
- 1 Padfoot operator(s)
- 1 Bulldozer operator(s)
- 2 Rock truck operator(s)
- 1 GHD inspector
- 1 GHD soil inspector

## Equipment Used:

- 1 Excavator(s)
- 2 Rock Truck(s)
- 1 Padfoot(s)
- 1 Bulldozer(s)

## Equipment Notes:

John Deere 470G LC  
Case 330B  
Caterpillar 735  
Bomag BW 213 PDH-40  
John Deere 750K XCT

## Other Progress Notes:

-



## Daily Inspection Record

**Job Number:** 11103232 **Date:** July 31, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 27°C, Sunny

### Phase 8A Progress:

- Continued placing engineered fill and constructing the Phase 8A sidewall from E1130 to E1250, during the morning
- The fill came from the stockpile at N1360, E1175
- Began removing large boulders set aside from the stockpile at N1360, E1175
- The boulders were moved to approximately N1450, E1350
- Began removing material from the stockpile at N1360, E1175 and moved it to build a screening berm along green mountain road starting at N1660, E1600

### Personnel:

1 Foreman  
3 Laborer(s)  
1 Excavator operator(s)  
1 Padfoot operator(s)  
1 Bulldozer operator(s)  
2 Rock truck operator(s)  
1 GHD inspector  
1 GHD soil inspector  
1 GHD engineer

### Equipment Used:

1 Excavator(s)  
2 Rock Truck(s)  
  
1 Padfoot(s)  
1 Bulldozer(s)

### Equipment Notes:

John Deere 470G LC  
Case 330B  
Caterpillar 735  
Bomag BW 213 PDH-40  
John Deere 750K XCT

### Other Progress Notes:

-



## Daily Inspection Record

**Job Number:** 11103232 **Date:** August 1, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 26°C, Sunny with some showers in the afternoon

### Phase 8A Progress:

- Continued removing material from the stockpile at N1360, E1175 and moving it to build a screening berm along green mountain road from N1660, E1570 to N1660, E1740
- Excavated the inside toe of the Phase 8A sidewall at the base grade layer from E1140 to E1210, to expose tie in section of the Secondary Clay Liner
- Added a lift of engineered fill to the outside of the Phase 8A sidewall from E1050 to E1120 from the stockpile at N1320, E1100

### Personnel:

1 Foreman  
3 Laborer(s)  
2 Excavator operator(s)  
1 Padfoot operator(s)  
1 Bulldozer operator(s)  
2 Rock truck operator(s)  
1 Water Truck Operator(s)  
1 GHD inspector  
1 GHD engineer

### Equipment Used:

2 Excavator(s)  
2 Rock Truck(s)  
1 Padfoot(s)  
1 Bulldozer(s)  
1 Water Truck

### Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Case 330B  
Caterpillar 735  
Bomag BW 213 PDH-40  
John Deere 750K XCT

### Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** August 2, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 27°C, Sunny with some showers in the afternoon

## Phase 8A Progress:

- Continued removing material from the stockpile at N1360, E1175 and moving it to build a screening berm along green mountain road from N1660, E1570 to N1660, E1740
- Extended clean out structures at N1315, E1112 and backfilled with compaction around the structure.
- Friatec Friamat, powered by gas-powered generator, was used for welding the HDPE pipes using HDPE couplings.
- The welding of the couplings were as per manufactures instructions (40 V, 900 sec)

## Personnel:

1 Foreman  
3 Laborer(s)  
2 Excavator operator(s)  
1 Padfoot operator(s)  
1 Bulldozer operator(s)  
2 Rock truck operator(s)  
1 Water Truck Operator(s)  
1 GHD inspector  
1 GHD engineer  
1 GHD soil inspector

## Equipment Used:

2 Excavator(s)  
  
2 Rock Truck(s)  
  
1 Padfoot(s)  
1 Bulldozer(s)  
1 Water Truck(s)

## Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Case 330B  
Caterpillar 735  
Bomag BW 213 PDH-40  
John Deere 750K XCT

## Other Progress Notes:

- Added 65° elbows to the groundwater cleanout pipes (N1315, E1112) to accommodate sidewall alignment





## Daily Inspection Record

**Job Number:** 11103232 **Date:** August 3, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 30°C, Partly Cloudy

### Phase 8A Progress:

- Continued removing material from the stockpile at N1360, E1175 and moved it to build a screening berm along green mountain road from N1660, E1570 to N1660, E1740
- Added 1 lift of engineered fill around the clean out structure at N1315, E1112

### Personnel:

1 Foreman  
2 Laborer(s)  
1 Excavator operator(s)  
1 Padfoot operator(s)/ Excavator operator(s)  
1 Bulldozer operator(s)  
2 Rock truck operator(s)  
1 Water Truck Operator(s)  
1 GHD inspector

### Equipment Used:

2 Excavator(s)  
  
2 Rock Truck(s)  
  
1 Padfoot(s)  
1 Bulldozer(s)  
1 Jumping Jack Tamper  
1 Water Truck(s)

### Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Case 330B  
Caterpillar 735  
Bomag BW 213 PDH-40  
John Deere 750K XCT  
Whacker Neuson WM100

### Other Progress Notes:

-



## Daily Inspection Record

**Job Number:** 11103232 **Date:** August 4, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 25°C, Cloudy with rain in the afternoon

### Phase 8A Progress:

- Continued removing material from the stockpile at N1360, E1175 and moving it to build a screening berm along green mountain road from N1660, E1570 to N1660, E1740

### Personnel:

1 Foreman  
3 Laborer(s)  
2 Excavator operator(s)  
1 Padfoot operator(s)  
1 Bulldozer operator(s)  
2 Rock truck operator(s)  
1 Water Truck Operator(s)  
1 GHD inspector

### Equipment Used:

1 Excavator(s)  
2 Rock Truck(s)  
  
1 Padfoot(s)  
1 Bulldozer(s)  
1 Water Truck(s)

### Equipment Notes:

John Deere 470G LC  
Case 330B  
Caterpillar 735  
Bomag BW 213 PDH-40  
John Deere 750K XCT

### Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** August 8, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 24°C, Sunny with some clouds

## Phase 8A Progress:

- Continued removing material from the stockpile at N1360, E1175 and moving it to build a screening berm along green mountain road from N1660, E1570 to N1660, E1740
- Leveled the outer side of the Phase 8A sidewall, between E1140 and E1200

## Personnel:

1 Foreman  
3 Laborer(s)  
2 Excavator operator(s)  
1 Padfoot operator(s)  
1 Bulldozer operator(s)  
2 Rock truck operator(s)  
1 Water Truck Operator(s)  
1 GHD inspector  
1 GHD engineer  
1 GHD soil inspector

## Equipment Used:

1 Excavator(s)  
2 Rock Truck(s)  
  
1 Padfoot(s)  
1 Bulldozer(s)  
1 Water Truck(s)

## Equipment Notes:

John Deere 470G LC  
Case 330B  
Caterpillar 735  
Bomag BW 213 PDH-40  
John Deere 750K XCT

## Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** August 9, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 27°C, Sunny with some clouds

## Phase 8A Progress:

- Graded Phase 8A sidewall from N1260 to N1300 and from E1120 to E1200
- Began excavating the ramp from N1340, E1300 to N1370, E1280
- The first 60 cm from the top were disposed of in the landfill in the vicinity of N1300, E1300
- The material below was sent for testing
- TP1 (0-1 m), TP2 (1-3 m), TP3 (3-5 m)
- GHD conducted compaction tests on clay plug between the engineered fill stockpile and Phase 8A sidewall from E1150 to E1200

## Personnel:

1 Foreman  
3 Laborer(s)  
1 Excavator operator(s)  
1 Padfoot operator(s)/ Excavator operator(s)  
1 Bulldozer operator(s)  
2 Rock truck operator(s)  
1 Water Truck Operator(s)  
1 GHD inspector  
1 GHD engineer  
1 GHD soil inspector

## Equipment Used:

2 Excavator(s)  
  
2 Rock Truck(s)  
  
1 Padfoot(s)  
1 Bulldozer(s)  
1 Water Truck(s)

## Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Case 330B  
Caterpillar 735  
Bomag BW 213 PDH-40  
John Deere 750K XCT

## Other Progress Notes:

-



## Daily Inspection Record

**Job Number:** 11103232 **Date:** August 10, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 26°C, Sunny with some clouds

### Phase 8A Progress:

- Continued grading Phase 8A sidewall from N1260 to N1300 and from E1120 to E1200
- Continued removing material from the stockpile at N1360, E1175 and moving it to build a berm along green mountain road from N1660, E1570 to N1660, E1740
- Continued excavating the surface of the ramp from N1340, E1300 to N1370, E1280
- The surface soil that was distinctively different (darker in colour) from the soil beneath was removed and disposed of in the landfill
- The soil within the ramp, that was visually lighter in colour, was stockpiled (N1450, E1375) for further testing
- Backfilled and compacted engineered fill around cleanout structure at N1315, E1112
- Pumped water from N1400, E1300 into the landfill

### Personnel:

1 Foreman  
2 Laborer(s)  
2 Excavator operator(s)  
1 Padfoot operator(s)  
1 Bulldozer operator(s)  
2 Rock truck operator(s)  
1 Water Truck Operator(s)  
1 GHD inspector  
1 GHD soil inspector

### Equipment Used:

2 Excavator(s)  
2 Rock Truck(s)  
1 Padfoot(s)  
1 Bulldozer(s)  
1 Jumping Jack Tamper  
1 Water Truck(s)  
1 (2 inch) pump

### Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Case 330B  
Caterpillar 735  
Bomag BW 213 PDH-40  
John Deere 750K XCT  
Whacker Neuson WM100

### Other Progress Notes:

- Construction meeting #3 was held



## Daily Inspection Record

**Job Number:** 11103232 **Date:** August 11, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 24°C, Cloudy with periods of rain throughout the afternoon

### Phase 8A Progress:

- Added 1 lift of engineered fill to the outer side of the Phase 8A sidewall from E1050 to E1125
- Continued excavating the surface of the ramp from N1340, E1300 to N1370, E1280
- Large rock were removed from the side of the ramp at N1375, E1275 to N1450, E1400
- The surface soil that was distinctively different (darker in colour) from the soil beneath was removed and disposed of in the landfill
- The soil within the ramp that was visually lighter in colour was stockpiled (N1450,E1375) for further testing

### Personnel:

1 Foreman  
2 Laborer(s)  
2 Excavator operator(s)  
1 Padfoot operator(s)  
1 Bulldozer operator(s)  
2 Rock truck operator(s)  
1 Water Truck Operator(s)  
1 GHD inspector  
1 GHD soil inspector  
1 GHD engineer  
1 GHD surveyor

### Equipment Used:

2 Excavator(s)  
  
2 Rock Truck(s)  
  
1 Padfoot(s)  
1 Bulldozer(s)  
1 Water Truck(s)

### Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Case 330B  
Caterpillar 735  
Bomag BW 213 PDH-40  
John Deere 750K XCT

### Other Progress Notes:

- Samples taken from the ramp include TP 1 which was from the top strata (0 to 1 m depth), TP 2 which was from the second strata (1 to 3 m), and TP 3 from the third strata (3 to 5 m). Results did not meet O.reg. 153/04 as amended, table 3. TP 1 was hauled into the landfill. TP 2 and 3 were stockpiled at N1450,E1375.



## Daily Inspection Record

**Job Number:** 11103232 **Date:** August 14, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 25°C, Sunny with some clouds

### Phase 8A Progress:

- Pumped water from outside the temporary berm around E1325, the water was pumped into the landfill
- Continued excavating the material from the ramp between N1340, E1300 to N1370, E1280
- The soil within the ramp was visually lighter in colour and was stockpiled (N1450,E1375) for further testing

### Personnel:

1 Foreman  
2 Laborer(s)  
1 Excavator operator(s)  
1 Excavator operator(s)/ Bulldozer operator(s)  
2 Rock truck operator(s)  
1 GHD inspector  
1 GHD engineer  
1 Water Truck Operator(s)

### Equipment Used:

2 Excavator(s)  
2 Rock Truck(s)  
1 Bulldozer(s)  
1 Water Truck(s)  
1 Water Pump (2 inch)

### Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Case 330B  
Caterpillar 735  
John Deere 750K XCT

### Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** August 15, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 25°C, Sunny with some clouds, rained briefly

## Phase 8A Progress:

- Continued excavating the material from the ramp between N1340, E1300 to N1370, E1280
- The soil within the ramp was visually lighter in colour and was stockpiled (N1450,E1375) for further testing
- Continued pumping water from outside the temporary berm around E1325, the water was pumped into the landfill

## Personnel:

1 Foreman  
2 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
2 Rock truck operator(s)  
1 GHD inspector  
1 GHD engineer  
1 Water Truck Operator(s)

## Equipment Used:

1 Excavator(s)  
2 Rock Truck(s)  
  
1 Bulldozer(s)  
1 Water Truck(s)  
1 Water Pump (6 inch)

## Equipment Notes:

John Deere 470G LC  
Case 330B  
Caterpillar 735  
John Deere 750K XCT

## Other Progress Notes:

-





## Daily Inspection Record

**Job Number:** 11103232 **Date:** August 16, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 21°C, Cloudy

### Phase 8A Progress:

- Cleared the vegetation from the outer side of the temporary berm from E1250 to E1325
- Continued excavating the material from the ramp between N1340, E1300 to N1370, E1280
- Material left over from TP 2 and TP 3 was stockpiled at N1450, E1375; and TP 1 was hauled into the landfill
- Material that was visually darker was automatically placed into the landfill
- Continued pumping water from the outer side of the temporary berm around E1325, the water was pumped into the landfill

### Personnel:

1 Foreman  
2 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
2 Rock truck operator(s)  
1 GHD inspector  
1 GHD engineer  
1 Water Truck Operator(s)

### Equipment Used:

2 Excavator(s)  
2 Rock Truck(s)  
1 Bulldozer(s)  
1 Water Truck(s)  
1 Water Pump (6 inch)  
1 Water Pump (2 inch)

### Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Case 330B  
Caterpillar 735  
John Deere 750K XCT

### Other Progress Notes:

- Received results from the TP 4 (5+ m depth) sampled ramp material. Results passed table 3 of O.Reg. 153/04 as amended.



# Daily Inspection Record

**Job Number:** 11103232 **Date:** August 17, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 22°C, Overcast, with heavy rain in the afternoon

## Phase 8A Progress:

- Continued excavating the material from the ramp between N1340, E1300 to N1370, E1280
- Material from TP 4 (soil from 5+ m depth) was used in constructing the new landfill berm from E1150 to E1250
- The material from the ramp was placed, starting at 196.7 masl on the berm
- Hauled waste material from the south section of the ramp into the landfill
- Continued pumping water from the outer side of the temporary berm around E1325, the water was pumped into the landfill

## Personnel:

- 1 Foreman
- 2 Laborer(s)
- 1 Excavator operator(s)
- 1 Bulldozer operator(s)/ Padfoot operator(s)
- 2 Rock truck operator(s)
- 1 GHD inspector
- 1 GHD soils inspector
- 1 Water Truck Operator(s)

## Equipment Used:

- 1 Excavator(s)
- 2 Rock Truck(s)
  
- 1 Bulldozer(s)
- 1 Padfoot(s)
- 1 Water Truck(s)
- 1 Water Pump (6 inch)
- 1 Water Pump (2 inch)

## Equipment Notes:

- John Deere 470G LC
- Case 330B
- Caterpillar 735
- John Deere 750K XCT
- Bomag BW 213 PDH-40

## Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** August 18, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 23°C, Cloudy

## Phase 8A Progress:

- Continued hauling waste material from the south section of the ramp into the landfill
- Continued pumping water from the outer side of the temporary berm around E1325, the water was pumped into the landfill
- Placed 1 lift of engineered fill on the outer side of the Phase 8A sidewall between E1125 and E1200 from stockpile at N1350, E1175
- Placed engineered fill for the Phase 8A sidewall between E1300 and E1325 from stockpile at N1350, E1175

## Personnel:

- 1 Foreman
- 2 Laborer(s)
- 1 Excavator operator(s)
- 1 Bulldozer operator(s)/ Padfoot operator(s)
- 2 Rock truck operator(s)
- 1 GHD inspector
- 1 GHD soils inspector
- 1 Water Truck Operator(s)

## Equipment Used:

- 1 Excavator(s)
- 2 Rock Truck(s)
  
- 1 Bulldozer(s)
- 1 Padfoot(s)
- 1 Water Truck(s)
- 1 Water Pump (6 inch)
- 1 Water Pump (2 inch)

## Equipment Notes:

- John Deere 470G LC
- Case 330B
- Caterpillar 735
- John Deere 750K XCT
- Bomag BW 213 PDH-40

## Other Progress Notes:

-



## Daily Inspection Record

**Job Number:** 11103232 **Date:** August 21, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 28°C, Clear skies

### Phase 8A Progress:

- Continued hauling waste material from the south section of the ramp into the landfill
- Continued pumping water from the outer side of the temporary berm around E1325, the water was pumped into the landfill
- Placed engineered fill on the outer side and inner side of the Phase 8A sidewall between E1125 and E1200 from ramp material at N1350, E1275

### Personnel:

2 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)  
2 Rock truck operator(s)  
1 GHD inspector  
1 GHD soils inspector  
1 Water Truck Operator(s)

### Equipment Used:

1 Excavator(s)  
2 Rock Truck(s)  
  
1 Bulldozer(s)  
1 Padfoot(s)  
1 Water Truck(s)  
1 Water Pump (2 inch)

### Equipment Notes:

John Deere 470G LC  
Case 330B  
Caterpillar 735  
John Deere 750K XCT  
Bomag BW 213 PDH-40

### Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** August 22, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 24°C, Cloudy

## Phase 8A Progress:

- Continued pumping water from the outer side of the temporary berm around E1325, the water was pumped into the landfill
- Placed engineered fill on the outer side and inner side of the Phase 8A sidewall between E1125 and E1200 from ramp material at N1350, E1275

## Personnel:

2 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)  
2 Rock truck operator(s)  
1 GHD inspector  
1 GHD soils inspector  
1 Water Truck Operator(s)

## Equipment Used:

1 Excavator(s)  
2 Rock Truck(s)  
  
1 Bulldozer(s)  
1 Padfoot(s)  
1 Water Truck(s)  
1 Water Pump (2 inch)  
1 Water Pump (6 inch)

## Equipment Notes:

John Deere 470G LC  
Case 330B  
Caterpillar 735  
John Deere 750K XCT  
Bomag BW 213 PDH-40

## Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** August 23, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 20°C, Clear skies

## Phase 8A Progress:

- Continued pumping water from the outer side of the temporary berm around E1325, the water was pumped into the landfill
- Hauled waste from the inside vicinity of the temporary berm, from E1250 to E1300, to expose leachate collection layer for tie in work.
- The waste was hauled into the landfill.

## Personnel:

2 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
2 Rock truck operator(s)  
1 GHD inspector  
1 Water Truck Operator(s)

## Equipment Used:

1 Excavator(s)  
2 Rock Truck(s)  
  
1 Bulldozer(s)  
1 Water Truck(s)  
1 Water Pump (2 inch)  
1 Water Pump (6 inch)

## Equipment Notes:

John Deere 470G LC  
Case 330B  
Caterpillar 735  
John Deere 750K XCT

## Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** August 24, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 19°C, Partly sunny

## Phase 8A Progress:

- Finalized screening berm along Green Mountain road (work done in the A.M.)
- Added top soil from top soil stockpile A located at N1200, E1200
- Graded the berm and added an access ramp
- Continued pumping water from the outer side of the temporary berm around E1325, the water was pumped into the landfill
- Added some engineered fill to the outer side of the Phase 8A sidewall, between E1125 and E1200, to create a continuous connection between the slope and the top of the berm. (work done in the P.M.)
- Continued hauling waste from the inside vicinity of the temporary berm, from E1250 to E1300, to expose leachate collection layer for tie in work.
- The waste was hauled into the landfill. (work done in the P.M.)
- Added one lift to Phase 8A sidewall at N1325, E1050; and one lift to the Phase 8A sidewall at N1380, E1325. (work done in the P.M.)

## Personnel:

2 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)  
2 Rock truck operator(s)  
1 GHD inspector  
1 Water Truck Operator(s)

## Equipment Used:

1 Excavator(s)  
2 Rock Truck(s)  
  
1 Bulldozer(s)  
1 Padfoot(s)  
1 Water Truck(s)  
1 Water Pump (2 inch)

## Equipment Notes:

John Deere 470G LC  
Case 330B  
Caterpillar 735  
John Deere 750K XCT  
Bomag BW 213 PDH-40

## Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** August 25, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 20°C, Sunny with some clouds

## Phase 8A Progress:

- Continued hauling waste material from the south section of the ramp into the landfill
- Continued pumping water from the outer side of the temporary berm around E1325, the water was pumped into the landfill
- Continued finalizing screening berm along Green Mountain road
- Smoothed slope surface and cleaned chunks of material at the toe of the slope

## Personnel:

2 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)  
2 Rock truck operator(s)  
1 GHD inspector  
1 Water Truck Operator(s)

## Equipment Used:

2 Excavator(s)  
2 Rock Truck(s)  
1 Bulldozer(s)  
1 Water Truck(s)  
1 Water Pump (2 inch)

## Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Case 330B  
Caterpillar 735  
John Deere 750K XCT

## Other Progress Notes:

-





## Daily Inspection Record

**Job Number:** 11103232 **Date:** August 28, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 20°C, Sunny with some clouds

### Phase 8A Progress:

- Removed ramp material and hauled it into the landfill
- Clean ramp material was placed to build up the outside of the Phase 8A sidewall from E1250 to E1325
- Continued pumping water from the outer side of the temporary berm around E1325, the water was pumped into the landfill

### Personnel:

1 Foreman  
2 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)  
2 Rock truck operator(s)  
1 GHD inspector  
1 Water Truck Operator(s)  
1 GHD soils inspector

### Equipment Used:

1 Excavator(s)  
2 Rock Truck(s)  
  
1 Bulldozer(s)  
1 Water Truck(s)  
1 Padfoot(s)  
1 Water Pump (2 inch)

### Equipment Notes:

John Deere 470G LC  
Case 330B  
Caterpillar 735  
John Deere 750K XCT  
  
Bomag BW 213 PDH-40

### Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** August 29, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 23°C, Sunny with some clouds

## Phase 8A Progress:

- Continued placing material from the ramp to build up the outside of the Phase 8A sidewall from E1250 to E1325
- Removed wet organic material not suitable as engineered fill from N1400, E1300
- Pulled back leachate filter blanket on the inside of the temporary berm from E1225 to E1300
- Continued pumping water from the outer side of the temporary berm around E1325, the water was pumped into the landfill

## Personnel:

1 Foreman  
3 Laborer(s)  
2 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)  
1 Rock truck operator(s)  
1 GHD inspector  
1 Water Truck Operator(s)  
1 GHD soils inspector  
1 GHD engineer

## Equipment Used:

2 Excavator(s)  
  
1 Rock Truck(s)  
1 Bulldozer(s)  
1 Water Truck(s)  
1 Padfoot(s)  
1 Water Pump (2 inch)

## Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Caterpillar 735  
John Deere 750K XCT  
  
Bomag BW 213 PDH-40

## Other Progress Notes:

- Construction meeting #4 was held



# Daily Inspection Record

**Job Number:** 11103232 **Date:** August 30, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 25°C, Sunny with some clouds

## Phase 8A Progress:

- Removed ramp material and hauled it into the landfill
- Clean ramp material was placed to build up the outside of the Phase 8A sidewall from E1250 to E1325
- Continued pumping water from the outer side of the temporary berm around E1325, the water was pumped into the landfill
- Pumping also occurred in the groundwater trench
- Began pumping water from the outer side of the temporary berm around E1250, the water was pumped into the landfill
- Began cutting the groundwater trench into the bed rock at N1325, E1225
- Began removing the top layer of clear stone of the temporary berm (E1220 to E1300)
- A tarp separated the top layer of clear stone from the bottom portion. The bottom portion was salvageable.

## Personnel:

1 Foreman  
3 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)  
2 Rock truck operator(s)  
1 GHD inspector  
1 Water Truck Operator(s)

## Equipment Used:

2 Excavator(s)  
2 Rock Truck(s)  
1 Bulldozer(s)  
1 Water Truck(s)  
1 Padfoot(s)  
2 Water Pump (2 inch)  
1 Water Pump (3 inch)

## Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Case 330B  
Caterpillar 735  
John Deere 750K XCT  
  
Bomag BW 213 PDH-40

## Other Progress Notes:

- The John Deere 470G LC was equipped with a hammer drill



## Daily Inspection Record

**Job Number:** 11103232 **Date:** August 31, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 18°C, Sunny with some clouds

### Phase 8A Progress:

- Continued cutting the groundwater trench into the bed rock from N1325, E1225 to N1380, E1310
- Continued pumping water from the outer side of the temporary berm around E1325, the water was pumped into the landfill
- Pumping also occurred in the groundwater trench
- Continued removing clear stone from the temporary berm from E1220 to E1300 and stockpiling the material at N1490, E1325

### Personnel:

1 Foreman  
3 Laborer(s)  
2 Excavator operator(s)  
1 Rock truck operator(s)  
1 GHD inspector

### Equipment Used:

2 Excavator(s)  
  
1 Rock Truck(s)  
2 Water Pump (2 inch)  
1 Water Pump (3 inch)

### Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Caterpillar 735

### Other Progress Notes:

- The hammer drill needed to be replaced, trench work stopped for 4.5 hours
- The John Deere 470G LC was equipped with a hammer drill



## Daily Inspection Record

**Job Number:** 11103232 **Date:** September 1, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 14°C, Sunny with some clouds

### Phase 8A Progress:

- Continued cutting the groundwater trench into the bed rock from N1325, E1225 to N1380, E1310
- Continued pumping water from the outer side of the temporary berm around E1325, the water was pumped into the landfill
- Pumping also occurred in the groundwater trench and within the temporary berm
- Continued removing 50 mm clear stone from the temporary berm from E1220 to E1300 and stockpiling the material at N1490, E1325

### Personnel:

1 Foreman  
3 Laborer(s)  
2 Excavator operator(s)  
1 Rock truck operator(s)  
1 GHD inspector

### Equipment Used:

2 Excavator(s)  
  
1 Rock Truck(s)  
2 Water Pump (2 inch)  
1 Water Pump (3 inch)  
1 Water Pump (1 inch)

### Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Caterpillar 735

### Other Progress Notes:

- The John Deere 470G LC was equipped with a hammer drill



## Daily Inspection Record

**Job Number:** 11103232 **Date:** September 5, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 18°C, Cloudy with periods of showers after 2 pm

### Phase 8A Progress:

- Continued cutting the groundwater trench into the bed rock from N1325, E1225 to N1380, E1310
- Continued removing 50 mm clear stone from the temporary berm from E1220 to E1300 and stockpiling the material at N1490, E1325
- Began removing the broken rock from the groundwater trench
- The rock was moved to N1425, E1375
- Began pulling back waste from the temporary berm from E1275 to E1300

### Personnel:

1 Foreman  
3 Laborer(s)  
2 Excavator operator(s)  
1 Rock truck operator(s)  
1 GHD inspector

### Equipment Used:

2 Excavator(s)  
  
1 Rock Truck(s)  
1 Water Pump (1 inch)  
1 Water Pump (2 inch)  
1 Water Pump (3 inch)

### Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Caterpillar 735

### Other Progress Notes:

- The John Deere 470G LC was equipped with a hammer drill



# Daily Inspection Record

**Job Number:** 11103232 **Date:** September 6, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 21°C, Sunny with some clouds

## Phase 8A Progress:

- Continued pulling back waste from the temporary berm from E1275 to E1300
- Connected the ground water collection pipe from N1325, E1225 to N1380, E1310
- Began placing 19 mm clear stone into the ground water trench
- Continued removing 50 mm clear stone from the temporary berm from E1220 to E1300 and stockpiling the material at N1490, E1325

## Personnel:

- 1 Foreman
- 2 Laborer(s)
- 2 Excavator operator(s)
- 1 Rock truck operator(s)
- 1 GHD inspector
- 1 Terrapure front end loader operator(s)

## Equipment Used:

- 2 Excavator(s)
- 1 Rock Truck(s)
- 1 Front End Loader (Terrapure)
- 1 Water Pump (1 inch)
- 1 Water Pump (2 inch)
- 1 Water Pump (3 inch)

## Equipment Notes:

- John Deere 470G LC
- John Deere 245G LC
- Caterpillar 735
- Caterpillar 972M

## Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** September 7, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 17°C, Sunny with some clouds; Rain began after 1 PM

## Phase 8A Progress:

- Continued removing 50 mm clear stone from the temporary berm from E1220 to E1300 and stockpiling the material at N1490, E1325
- Connected the existing ground water trench (at approximately N1350, E1310) to the newly constructed ground water trench by constructing an approximately 5m long ground water trench
- Continued connecting the ground water collection pipe from N1325, E1225 to N1380, E1310
- Continued placing 19 mm clear stone into the ground water trench
- Covered the 19 mm clear stone with Type A geotextile
- Began placing granular A over the Type A geotextile

## Personnel:

1 Foreman  
3 Laborer(s)  
2 Excavator operator(s)  
1 Rock truck operator(s)  
1 GHD inspector  
1 Terrapure front end loader operator(s)

## Equipment Used:

2 Excavator(s)  
  
1 Rock Truck(s)  
1 Front End Loader (Terrapure)  
1 Water Pump (1 inch)  
1 Water Pump (2 inch)  
1 Water Pump (3 inch)

## Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Caterpillar 735  
Caterpillar 972M

## Other Progress Notes:

-





# Daily Inspection Record

**Job Number:** 11103232 **Date:** September 8, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 16°C, Sunny with some clouds; Rain began after 12 PM

## Phase 8A Progress:

- Prepared clay source at N1650, E1350, for Secondary Clay Liner
- Continued removing 50 mm clear stone from the temporary berm from E1220 to E1300 and stockpiling the material at N1490, E1325
- Began adding lifts of engineered fill to the Phase 8A sidewall between E1200 and E1300 from the stockpile at N1350, E1175

## Personnel:

3 Laborer(s)  
2 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)  
1 Rock truck operator(s)  
1 GHD inspector  
1 Water Truck Operator(s)  
1 GHD soils inspector

## Equipment Used:

2 Excavator(s)  
  
1 Rock Truck(s)  
1 Bulldozer(s)  
1 Water Truck(s)  
1 Padfoot(s)

## Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Caterpillar 735  
John Deere 750K XCT  
  
Bomag BW 213 PDH-40

## Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** September 11, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 20°C, Sunny

## Phase 8A Progress:

- Continued adding lifts of engineered fill to the Phase 8A sidewall between E1200 and E1300 from stockpile at N1350, E1175
- Continued preparing clay source, at N1650,E1350 for Secondary Clay Liner

## Personnel:

3 Laborer(s)  
2 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)  
2 Rock truck operator(s)  
1 Water Truck Operator(s)  
1 GHD inspector  
1 GHD soils inspector

## Equipment Used:

2 Excavator(s)  
  
2 Rock Truck(s)  
  
1 Bulldozer(s)  
1 Padfoot(s)  
1 Water Truck(s)

## Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Caterpillar 735  
Case 330B  
John Deere 750K XCT  
Bomag BW 213 PDH-40

## Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** September 12, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 23°C, Sunny

## Phase 8A Progress:

- Began placing Secondary Clay Liner along N1260 to N1300, and E1075 to E1275
- Clay source came from N1650, E1350
- 2 lifts were placed

## Personnel:

1 Foreman  
4 Laborer(s)  
2 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)  
2 Rock truck operator(s)  
2 Water Truck Operator(s)  
1 GHD inspector  
1 GHD soils inspector

## Equipment Used:

2 Excavator(s)  
  
2 Rock Truck(s)  
  
1 Bulldozer(s)  
1 Padfoot(s)  
2 Water Truck(s)

## Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Caterpillar 735  
Case 330B  
John Deere 750K XCT  
Bomag BW 213 PDH-40

## Other Progress Notes:

-



## Daily Inspection Record

**Job Number:** 11103232 **Date:** September 13, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 27°C, Sunny

### Phase 8A Progress:

- Continued Secondary Clay Liner placement along N1260 to N1300, and E1075 to E1275
- Clay source came from N1650, E1350
- 3 lifts were placed

### Personnel:

1 Foreman  
4 Laborer(s)  
2 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)  
2 Rock truck operator(s)  
2 Water Truck Operator(s)  
1 GHD inspector  
1 GHD soils inspector

### Equipment Used:

2 Excavator(s)  
  
2 Rock Truck(s)  
  
1 Bulldozer(s)  
1 Padfoot(s)  
2 Water Truck(s)

### Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Caterpillar 735  
Case 330B  
John Deere 750K XCT  
Bomag BW 213 PDH-40

### Other Progress Notes:

-



## Daily Inspection Record

**Job Number:** 11103232 **Date:** September 14, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 27°C, Sunny

### Phase 8A Progress:

- Continued Secondary Clay Liner placement along N1260 to N1300, and E1075 to E1275
- Clay source came from N1650, E1350
- 1 lift was placed
- 5 lifts of secondary liner was completed
- Installed first set of permeameters at N1300, E1050 for the Secondary Clay Liner

### Personnel:

1 Foreman  
4 Laborer(s)  
2 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)  
2 Rock truck operator(s)  
2 Water Truck Operator(s)  
1 GHD inspector  
1 GHD soils inspector  
1 GHD Engineer

### Equipment Used:

2 Excavator(s)  
  
2 Rock Truck(s)  
  
1 Bulldozer(s)  
1 Padfoot(s)  
2 Water Truck(s)

### Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Caterpillar 735  
Case 330B  
John Deere 750K XCT  
Bomag BW 213 PDH-40

### Other Progress Notes:

- 50 mm clear stone was brought in from offsite (Dufferin Aggregates, Milton Quarry) and stockpiled at N1400, E1075



## Daily Inspection Record

**Job Number:** 11103232 **Date:** September 15, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 27°C, Sunny

### Phase 8A Progress:

- Prepared clay source (N1650,E1350)
- Conducted a test pit investigation, at N1300, E1050, to determine the integrity of the geotextile directly below the hydraulic control layer
- First set of Shelby tubes were completed (1A/B) at N1300, E1040 for the Secondary Clay Liner
- Conducted a test pit investigation, at N1300, E1025, to determine the quality of clay construction for the Secondary Clay Liner

### Personnel:

1 Foreman  
3 Laborer(s)  
2 Excavator operator(s)  
1 Bulldozer operator(s)  
2 Rock truck operator(s)  
2 Water Truck Operator(s)  
1 GHD inspector  
1 GHD Engineer

### Equipment Used:

2 Excavator(s)  
  
1 Rock Truck(s)  
1 Bulldozer(s)  
2 Water Truck(s)

### Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Case 330B  
John Deere 750K XCT

### Other Progress Notes:

- 50 mm clear stone was brought in from offsite (Dufferin Aggregates, Milton Quarry) and stockpiled at N1400, E1075



# Daily Inspection Record

**Job Number:** 11103232 **Date:** September 18, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 30°C, Sunny

## Phase 8A Progress:

- Prepared Secondary Clay Liner surface for geotextile A installation along N1260 to N1300, and E1075 to E1275
- Began removing clay from temporary berm from E1210 to E1290 and stockpiling at N1650, E1350
- Terrafix began placing geotextile A on top of the Secondary Clay Liner from E1150 to E1175
- Another first set of Shelby tubes (1A/B) were completed at N1300, E1050 for Secondary Clay Liner
- The second set were completed to complement the first set, since one of the Shelby tubes were not filled with enough sample material

## Personnel:

1 Foreman  
4 Laborer(s)  
1 Excavator operator(s)  
2 Bulldozer operator(s)  
2 Rock truck operator(s)  
1 Smooth drum operator(s)  
1 Terrafix foreman  
4 Terrafix labourer(s)  
1 Water Truck Operator(s)  
1 GHD inspector  
1 GHD Engineer

## Equipment Used:

1 Excavator(s)  
2 Rock Truck(s)  
  
2 Bulldozer(s)  
  
1 Smooth Drum(s)  
1 Zoom Boom  
1 Water Truck(s)

## Equipment Notes:

John Deere 245G LC  
Caterpillar 735  
Case 330B  
John Deere 750K XCT  
John Deere 750J LT  
Caterpillar CS5333E  
Merlo P38.13 plus

## Other Progress Notes:

- 50 mm clear stone was brought in from offsite (Dufferin Aggregates, Milton Quarry) and stockpiled at N1400, E1075
- Construction meeting #5 was held



# Daily Inspection Record

**Job Number:** 11103232 **Date:** September 19, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 23°C, Cloudy in A.M., Sunny in P.M.

## Phase 8A Progress:

- Finished removing clay from temporary berm from E1210 to E1290 and stockpiling at N1650, E1350
- Terrafix began placing geotextile A on top of the Secondary Clay Liner from E1075 to E1150 and N1260 to N1300
- Began adding engineered fill to the Phase 8A sidewall between E1200 and E1300 from the stockpile at N1375, E1175
- Added and graded 50 mm clear stone on top of geotextile A from E1075 to E1175 and along the base of N1260 to N1300
- Removed permeameters at approximately N1300, E1050

## Personnel:

1 Foreman  
4 Laborer(s)  
1 Excavator operator(s)  
2 Bulldozer operator(s)  
2 Rock truck operator(s)  
1 Smooth drum operator(s)  
1 Terrafix foreman  
4 Terrafix labourer(s)  
1 Water Truck Operator(s)  
1 GHD inspector  
1 GHD Engineer

## Equipment Used:

2 Excavator(s)  
2 Rock Truck(s)  
2 Bulldozer(s)  
1 Smooth Drum(s)  
1 Zoom Boom  
1 Front End Loader (Terrapure)  
1 Water Truck(s)

## Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Caterpillar 735  
Case 330B  
John Deere 750K XCT  
John Deere 750J LT  
Caterpillar CS5333E  
Merlo P38.13 plus  
Caterpillar 972M

## Other Progress Notes:

-





# Daily Inspection Record

**Job Number:** 11103232 **Date:** September 20, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 27°C, Sunny

## Phase 8A Progress:

- Continued adding engineered fill to the Phase 8A sidewall between E1200 and E1300 from the stockpile at N1375, E1175
- Second set of Shelby tubes (2A/B) were completed at approximately N1316, E1189 for the Secondary Clay Liner
- Installed second set of permeameters at N1316, E1189 for the Secondary Clay Liner
- Graded and cleaned up the screening berm along Green Mountain
- Smoothed slope surface and cleaned chunks of material at the toe of the slope

## Personnel:

1 Foreman  
4 Laborer(s)  
1 Excavator operator(s)  
1 mini Excavator operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)  
2 Rock truck operator(s)  
1 Water Truck Operator(s)  
1 GHD inspector  
1 GHD Engineer  
1 GHD soils inspector

## Equipment Used:

1 Excavator(s)  
2 Rock Truck(s)  
  
1 Bulldozer(s)  
1 Padfoot(s)  
1 Water Truck(s)  
1 Mini Excavator(s)

## Equipment Notes:

John Deere 470G LC  
Caterpillar 735  
Case 330B  
John Deere 750K XCT  
Bomag BW 213 PDH-40

## Other Progress Notes:

- 50 mm clear stone was brought in from offsite (Dufferin Aggregates, Milton Quarry) and stockpiled at N 1400, E 1075



## Daily Inspection Record

**Job Number:** 11103232 **Date:** September 21, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 25°C, Sunny

### Phase 8A Progress:

- Continued adding engineered fill to the Phase 8A sidewall between E1200 and E1300 from the stockpile at N1375, E1175

### Personnel:

1 Foreman  
2 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)  
2 Rock truck operator(s)  
1 Water Truck Operator(s)  
1 GHD inspector  
1 GHD soils inspector

### Equipment Used:

2 Excavator(s)  
2 Rock Truck(s)  
1 Bulldozer(s)  
1 Padfoot(s)  
1 Water Truck(s)

### Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Caterpillar 735  
Case 330B  
John Deere 750K XCT  
Bomag BW 213 PDH-40

### Other Progress Notes:

- 50 mm clear stone was brought in from offsite (Dufferin Aggregates, Milton Quarry) and stockpiled at N 1400, E 1075



# Daily Inspection Record

**Job Number:** 11103232 **Date:** September 22, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 27°C, Sunny

## Phase 8A Progress:

- Placed 1 lift of engineered fill on the Phase 8A sidewall between E1200 and E1300 from the stockpile at N1375, E1175
- Terrafix began placing geotextile A on top of the Secondary Clay Liner from E1075 to E1150 and N1260 to N1300
- Added and graded 50 mm clear stone on top of geotextile A from N1260 to N1300
- Began preparing clay source (N1650, E1350) for the Primary Clay Liner

## Personnel:

- 1 Foreman
- 3 Laborer(s)
- 1 Excavator operator(s)
- 1 Bulldozer operator(s)/ Padfoot operator(s)
- 2 Rock truck operator(s)
- 1 Water Truck Operator(s)
- 1 GHD inspector
- 1 Terrafix foreman
- 5 Terrafix labourer(s)

## Equipment Used:

- 2 Excavator(s)
- 2 Rock Truck(s)
- 1 Bulldozer(s)
- 1 Padfoot(s)
- 1 Water Truck(s)

## Equipment Notes:

- John Deere 470G LC
- John Deere 245G LC
- Caterpillar 735
- Case 330B
- John Deere 750K XCT
- Bomag BW 213 PDH-40

## Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** September 25, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 27°C, Sunny

## Phase 8A Progress:

- Began placing Primary Clay Liner from N1250 to N1300 and from E1075 to E1175
- Clay source came from N1650, E1350
- 2 lifts were placed
- Continued preparing clay source (N1650, E1350) for the Primary Clay Liner
- Conducted a test pit investigation, at N1325, E1175, to determine the integrity of the geotextile directly below the Primary Clay Liner and to inspect the quality of clay

## Personnel:

1 Foreman  
3 Laborer(s)  
1 Excavator operator(s)  
1 Excavator operator(s)/ Padfoot operator(s)  
1 Bulldozer operator(s) 1 Padfoot operator(s)  
2 Rock truck operator(s)  
2 Water Truck Operator(s)  
1 GHD inspector  
1 GHD soils inspector

## Equipment Used:

2 Excavator(s)  
  
2 Rock Truck(s)  
  
1 Bulldozer(s)  
2 Padfoot(s)  
  
2 Water Truck(s)

## Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Caterpillar 735  
Case 330B  
John Deere 750K XCT  
Bomag BW 213 PDH-40  
Caterpillar CP56B

## Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** September 26, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 27°C, Sunny

## Phase 8A Progress:

- Continued placing Primary Clay Liner from N1250 to N1300 and from E1075 to E1175
- Clay source came from N1650, E1350
- 2 lifts were placed
- Continued preparing clay source (N1650, E1350) for the Primary Clay Liner
- Added engineered fill from E1100 to E1200 to the top of the Phase 8A sidewall
- The fill came from the stockpile at N1375, E1175

## Personnel:

1 Foreman  
3 Laborer(s)  
1 Excavator operator(s)  
1 Excavator operator(s)/ Padfoot operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)  
2 Rock truck operator(s)  
2 Water Truck Operator(s)  
1 GHD inspector  
1 GHD engineer  
1 GHD soils inspector

## Equipment Used:

2 Excavator(s)  
2 Rock Truck(s)  
1 Bulldozer(s)  
2 Padfoot(s)  
2 Water Truck(s)

## Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Caterpillar 735  
Case 330B  
John Deere 750K XCT  
Bomag BW 213 PDH-40  
Caterpillar CP56B

## Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** September 27, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 25°C, Sunny

## Phase 8A Progress:

- Finished placing Primary Clay Liner from N1250 to N1300 and from E1075 to E1175
- Clay source came from N1650, E1350
- 1 lifts were placed
- Continued preparing clay source (N1650,E1350) for the Primary Clay Liner
- Removed permeameter tubes at N1316, E1189
- Conducted a test pit investigation, at N1316, E1190, to determine the quality of clay construction for the Secondary Clay Liner
- Continued adding engineered fill from E1100 to !200 to the top of the Phase 8A sidewall
- The fill came from the stockpile at N1375, E1175

## Personnel:

1 Foreman  
4 Laborer(s)  
1 Excavator operator(s)  
1 Excavator operator(s)/ Padfoot operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)  
2 Rock truck operator(s)  
1 Water Truck Operator(s)  
1 GHD inspector  
1 GHD engineer  
1 GHD soils inspector

## Equipment Used:

3 Excavator(s)  
  
2 Rock Truck(s)  
  
1 Bulldozer(s)  
1 Padfoot(s)  
1 Water Truck(s)

## Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Caterpillar 307E  
Caterpillar 735  
Case 330B  
John Deere 750K XCT  
Bomag BW 213 PDH-40

## Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** September 28, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 17°C, Cloudy

## Phase 8A Progress:

- Regraded base grade layer to new coordinates from E1200 to E1325
- First set of Shelby tubes (3A/B) were completed at approximately N1298.38, E1108.27 for the Primary Clay Liner
- Installed first set of permeameters at N1298.38, E1108.27 for the Primary Clay Liner
- Fine graded Primary Clay Liner from N1260 to N1300 and from E1125 to E1175
- Continued preparing clay source (N1650,E1350) for the Secondary Clay Liner
- Dug an anchor trench on top of the side wall from N1260 to N1300

## Personnel:

- 1 Foreman
- 4 Laborer(s)
- 3 Excavator operator(s)
- 1 Bulldozer operator(s)
- 1 Padfoot operator(s)
- 2 Rock truck operator(s)
- 1 GHD inspector
- 1 GHD soils inspector

## Equipment Used:

- 3 Excavator(s)
- 2 Rock Truck(s)
- 1 Bulldozer(s)
- 1 Padfoot(s)

## Equipment Notes:

- John Deere 470G LC
- John Deere 245G LC
- John Deere 60 D
- Caterpillar 735
- Case 330B
- John Deere 750K XCT
- Bomag BW 213 PDH-40

## Other Progress Notes:

-



## Daily Inspection Record

**Job Number:** 11103232 **Date:** September 29, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 13°C, Cloudy and rain in the A.M.

### Phase 8A Progress:

- Terrafix placed geomembrane from N1260 to N1300
- Graded base layer from E1200 to E1300 and added 1 lift
- Rock picked and fine graded the Primary Clay Liner from E1150 to E1200
- Dug an anchor trench from E1200 to E1300

### Personnel:

1 Foreman  
4 Laborer(s)  
3 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)  
2 Rock truck operator(s)  
1 GHD inspector  
1 Terrafix Foreman  
4 Terrafix Labourers

### Equipment Used:

2 Excavator(s)  
  
2 Rock Truck(s)  
  
1 Bulldozer(s)  
1 Padfoot(s)  
1 Zoom Boom

### Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
John Deere 60 D  
Caterpillar 735  
Case 330B  
John Deere 750K XCT  
Bomag BW 213 PDH-40  
Merlo P38.13 plus

### Other Progress Notes:

-





# Daily Inspection Record

**Job Number:** 11103232 **Date:** October 2, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 20°C, Clear sky

## Phase 8A Progress:

- Terrafix placed geomembrane from E1125 to E1175
- Terrafix placed geotextile B on top of the geomembrane from E1125 to E1175
- Began Secondary Clay Liner placement along E1210 to E1300
- Clay source came from N1650, E1350

## Personnel:

1 Foreman  
3 Laborer(s)  
2 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)  
2 Rock truck operator(s)  
1 GHD inspector  
1 GHD soil inspector  
2 Water Truck Operator(s)  
1 Terrafix Foreman  
4 Terrafix Labourers

## Equipment Used:

2 Excavator(s)  
2 Rock Truck(s)  
1 Bulldozer(s)  
1 Padfoot(s)  
1 Zoom Boom  
2 Water Truck(s)

## Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Caterpillar 735  
Case 330B  
John Deere 750K XCT  
Bomag BW 213 PDH-40  
Merlo P38.13 plus

## Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** October 3, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 20°C, Clear sky

## Phase 8A Progress:

- Terrafix completed repairs and connection to existing membrane from N1260 to N1300
- Terrafix placed geotextile B of the geomembrane from N1260 to N1300
- Continued Secondary Clay Liner placement along E1210 to E1300
- Clay source came from N1650, E1350
- Backfilled and compacted anchor trench from E1125 to E1175
- Began placing 19 mm clear stone on top of geotextile B from E1125 to E1175
- Removed first set of permeameter tubes at N1298.38, E1108.27 for the Primary Clay Liner

## Personnel:

1 Foreman  
3 Laborer(s)  
3 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)  
2 Rock truck operator(s)  
1 GHD inspector  
1 GHD soil inspector  
2 Water Truck Operator(s)  
1 Terrafix Foreman  
4 Terrafix Labourers

## Equipment Used:

3 Excavator(s)  
  
2 Rock Truck(s)  
  
1 Bulldozer(s)  
1 Padfoot(s)  
1 Zoom Boom  
2 Water Truck(s)

## Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
John Deere 60 D  
Caterpillar 735  
Case 330B  
John Deere 750K XCT  
Bomag BW 213 PDH-40  
Merlo P38.13 plus

## Other Progress Notes:

- John Deere 470G LC, broke down and was being serviced



# Daily Inspection Record

**Job Number:** 11103232 **Date:** October 4, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 22°C, Cloudy, rain in the P.M.

## Phase 8A Progress:

- Placed 19 mm clear stone on top of geotextile B from N1260 to N1300
- Extended one of three ground water clean out structure at N1377, E1295
- Placed one 200 mm leachate collection pipes in the area of N1258, E1062

## Personnel:

1 Foreman  
4 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
2 Rock truck operator(s)  
1 GHD inspector  
1 Water Truck Operator(s)  
1 Terrapure front end loader operator(s)

## Equipment Used:

1 Excavator(s)  
2 Rock Truck(s)  
  
1 Bulldozer(s)  
1 Front End Loader (Terrapure)  
1 Water Truck(s)

## Equipment Notes:

John Deere 470G LC  
Caterpillar 735  
Case 330B  
John Deere 750K XCT  
Caterpillar 972M

## Other Progress Notes:

- Rain began in the P.M. Shut down work in the afternoon



## Daily Inspection Record

**Job Number:** 11103232 **Date:** October 5, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 20°C, Clear sky

### Phase 8A Progress:

- Placed Granular A on top of the 19 mm clear stone from N1260 to N1300
- Extended the last two groundwater clean out structure at N1377, E1295
- Installed third set of permeameters at N1354.53, E1265.82 for the Secondary Clay Liner
- Third set of Shelby tubes were completed (4A/B) at N1354.53, E1265.82 for the Secondary Clay Liner
- Backfilled immediately adjacent to ground water clean out pipes with granular A and then backfilled around the granular A with engineered fill
- Granular A came from stockpile at N1475, E1250
- The engineered fill came from the stockpile at N1360, E1175

### Personnel:

1 Foreman  
4 Laborer(s)  
2 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)  
1 Rock truck operator(s)  
1 GHD inspector  
1 GHD soil inspector  
1 Water Truck Operator(s)

### Equipment Used:

2 Excavator(s)  
  
1 Rock Truck(s)  
1 Bulldozer(s)  
1 Padfoot(s)  
1 Water Truck(s)

### Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Caterpillar 735  
John Deere 750K XCT  
Bomag BW 213 PDH-40

### Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** October 6, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 18°C, Cloudy

## Phase 8A Progress:

- Began adding engineered fill to the phase 8A sidewall from E1025 to E1075
- The engineered fill came from the stockpile at N1325, E1100
- Continued adding and finished engineered fill to the phase 8A sidewall from E1225 to E1325
- The engineered fill came from the stockpile at N1360, E1175

## Personnel:

1 Foreman  
3 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)  
1 Rock truck operator(s)  
1 GHD inspector  
1 GHD soil inspector  
1 Water Truck Operator(s)

## Equipment Used:

1 Excavator(s)  
1 Rock Truck(s)  
1 Bulldozer(s)  
1 Padfoot(s)  
  
1 Water Truck(s)

## Equipment Notes:

John Deere 470G LC  
Caterpillar 735  
John Deere 750K XCT  
Bomag BW 213 PDH-40  
Caterpillar CS44

## Other Progress Notes:

-



## Daily Inspection Record

**Job Number:** 11103232 **Date:** October 10, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 22°C, Clear sky

### Phase 8A Progress:

- Pumped standing water around the Phase 8A site
- Conducted a test pit investigation, at N1325, E1150, to determine the integrity of the geotextile directly below the leachate collection layer

### Personnel:

1 Foreman  
2 Laborer(s)  
1 GHD inspector

### Equipment Used:

1 Water Pump (2 inch)

### Equipment Notes:

### Other Progress Notes:

- Rained over the weekend which caused the work area to be wet with spots of standing water. Material placement was suspended



## Daily Inspection Record

**Job Number:** 11103232 **Date:** October 11, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 13°C, Cloudy and drizzling in the A.M.  
Rain in the P.M.

### Phase 8A Progress:

- No construction progress

### Personnel:

1 Foreman  
4 Laborer(s)  
1 Excavator operator(s)  
1 GHD inspector

### Equipment Used:

1 Excavator(s)

### Equipment Notes:

John Deere 245G LC

### Other Progress Notes:

- Repaired and improved existing berm from N1410, E1740 to N1410, E1760 (Phase 6C)



# Daily Inspection Record

**Job Number:** 11103232 **Date:** October 12, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 13°C, Cloudy

### Phase 8A Progress:

- Pumped standing water around the Phase 8A site

### Personnel:

- 1 Foreman
- 1 Laborer(s)
- 1 GHD inspector

### Equipment Used:

- 1 Water Pump (2 inch)

### Equipment Notes:

### Other Progress Notes:

-





# Daily Inspection Record

**Job Number:** 11103232 **Date:** October 13, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 18°C, Clear sky

## Phase 8A Progress:

- Finished placing engineered fill on the Phase 8A sidewall from E1025 to E1075
- The engineered fill came from the stockpile at N1325, E1100

## Personnel:

1 Foreman  
2 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)  
1 Rock truck operator(s)  
1 GHD inspector  
1 GHD soil inspector

## Equipment Used:

1 Excavator(s)  
1 Rock Truck(s)  
1 Bulldozer(s)  
1 Padfoot(s)

## Equipment Notes:

John Deere 470G LC  
Caterpillar 735  
John Deere 750K XCT  
Bomag BW 213 PDH-40

## Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** October 16, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 12°C, Clear sky

## Phase 8A Progress:

- Prepared clay source at approximately N1650, E1350
- Pumped standing water around the Phase 8A site
- Graded engineered fill material on the outer side of the Phase 8A sidewall around N1325, E1225
- Removed third set of permeameters at N1354, E1265 for the Secondary Clay Liner
- Conducted a test pit investigation, at N1354, E1265, to determine the quality of clay construction for the Secondary Clay Liner

## Personnel:

1 Foreman  
3 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Rock truck operator(s)  
1 GHD inspector  
1 Terrafix Foreman  
2 Terrafix Labourers

## Equipment Used:

1 Excavator(s)  
1 Rock Truck(s)  
1 Bulldozer(s)  
1 Water Pump (2 inch)  
1 Zoom Boom

## Equipment Notes:

John Deere 470G LC  
Caterpillar 735  
John Deere 750K XCT  
Merlo P38.13 plus

## Other Progress Notes:

- Prepared area around groundwater detention pond for access and sediment removal (N1650, E1105)
- Terrafix began repairing the geotextile and geomembrane of existing berm from N1410, E1740 to N1410, E1760 (Phase 6C)



## Daily Inspection Record

**Job Number:** 11103232 **Date:** October 17, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 15°C, Clear sky

### Phase 8A Progress:

- Began Secondary Clay Liner placement along E1025 to E1075
- Clay source came from N1650, E1350
- Began Secondary Clay Liner placement along E1250 to E1300
- Clay source came from N1650, E1350

### Personnel:

1 Foreman  
3 Laborer(s)  
2 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)  
2 Rock truck operator(s)  
1 GHD inspector  
1 GHD soil inspector  
1 Water Truck Operator(s)  
1 Terrafix Foreman  
3 Terrafix Labourers

### Equipment Used:

2 Excavator(s)  
2 Rock Truck(s)  
1 Bulldozer(s)  
1 Padfoot(s)  
1 Water Truck(s)  
1 Zoom Boom

### Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Caterpillar 735  
Case 330B  
John Deere 750K XCT  
Bomag BW 213 PDH-40  
Merlo P38.13 plus

### Other Progress Notes:

- Sediment removal commenced at groundwater detention pond (N1650, E1105)
- Terrafix finished repairing the geotextile and geomembrane of existing berm from N1410, E1740 to N1410, E1760 (Phase 6C)



# Daily Inspection Record

**Job Number:** 11103232 **Date:** October 18, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 20°C, Clear sky

## Phase 8A Progress:

- Finished Secondary Clay Liner placement along E1025 to E1075
- Clay source came from N1650, E1350
- Finished Secondary Clay Liner placement along E1250 to E1300
- Clay source came from N1650, E1350
- Moved large boulders stockpiled at N1350, E1225 to N1375, E1350

## Personnel:

- 1 Foreman
- 3 Laborer(s)
- 1 Excavator operator(s)
- 1 Bulldozer operator(s)
- 2 Padfoot operator(s)
- 2 Rock truck operator(s)
- 1 GHD inspector
- 1 GHD soil inspector
- 1 Water Truck Operator(s)

## Equipment Used:

- 1 Excavator(s)
- 2 Rock Truck(s)
- 1 Bulldozer(s)
- 2 Padfoot(s)
- 1 Water Truck(s)

## Equipment Notes:

- John Deere 470G LC
- Caterpillar 735
- Case 330B
- John Deere 750K XCT
- Bomag BW 213 PDH-40
- Homatsu 51EX

## Other Progress Notes:

-



## Daily Inspection Record

**Job Number:** 11103232 **Date:** October 19, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 20°C, Clear sky

### Phase 8A Progress:

- Fine graded Secondary Clay Liner along E1025 to E1075 and E1250 to E1300
- Terrafix placed geotextile A on top of the Secondary Clay Liner along E1250 to E1300
- Placed 50 mm clear stone for the hydraulic control layer from E1175 to E1200
- The clear stone came from the stockpile at N1400, E1075

### Personnel:

1 Foreman  
1 Laborer(s)  
1 Bulldozer operator(s)  
1 Excavator operator(s)  
2 Rock truck operator(s)  
1 Smooth Drum operator(s)  
1 GHD inspector  
1 Water Truck Operator(s)  
1 Terrafix Foreman  
4 Terrafix Labourers

### Equipment Used:

1 Excavator(s)  
2 Rock Truck(s)  
  
1 Bulldozer(s)  
1 Smooth Drum Roller(s)  
1 Water Truck(s)  
1 Zoom Boom

### Equipment Notes:

John Deere 245G LC  
Caterpillar 735  
Case 330B  
John Deere 750K XCT  
Caterpillar CP56B  
  
Merlo P38.13 plus

### Other Progress Notes:

- Construction meeting #6 was held



## Daily Inspection Record

**Job Number:** 11103232 **Date:** October 20, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 20°C, Clear sky

### Phase 8A Progress:

- Terrafix placed geotextile A on top of the Secondary Clay Liner along E1025 to E1075
- Placed 50 mm clear stone for the hydraulic control layer from E1200 to E1325
- The clear stone came from the stockpile at N1400, E1075
- Terrafix placed geotextile A on top of the hydraulic control layer along E1200 to E1325

### Personnel:

1 Foreman  
1 Laborer(s)  
2 Bulldozer operator(s)  
2 Excavator operator(s)  
2 Rock truck operator(s)  
1 Smooth Drum operator(s)  
1 GHD inspector  
1 Water Truck Operator(s)  
1 Terrafix Foreman  
2 Terrafix Labourers

### Equipment Used:

1 Excavator(s)  
2 Rock Truck(s)  
  
2 Bulldozer(s)  
  
1 Smooth Drum Roller(s)  
1 Water Truck(s)  
1 Zoom Boom

### Equipment Notes:

John Deere 245G LC  
Caterpillar 735  
Case 330B  
John Deere 750K XCT  
Komatsu 51EX  
Caterpillar CP56B  
  
Merlo P38.13 plus

### Other Progress Notes:

- 50 mm clear stone was brought in from offsite (Dufferin Aggregates, Milton Quarry) and stockpiled at N1400, E1075



# Daily Inspection Record

**Job Number:** 11103232 **Date:** October 23, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 20°C, Cloudy; Some rain in the P.M.

## Phase 8A Progress:

- Placed 50 mm clear stone for the hydraulic control layer from E1025 to E1075
- The clear stone came from the stockpile at N1400, E1075
- Terrafix continued placing geotextile A on top of the hydraulic control layer along E1200 to E1325
- Terrafix placed geotextile A on top of the hydraulic control layer along E1025 to E1075
- Prepared clay source at approximately N1650, E1350

## Personnel:

1 Foreman  
2 Laborer(s)  
2 Excavator operator(s)  
1 Bulldozer operator(s)  
2 Rock truck operator(s)  
1 GHD inspector  
1 Water Truck Operator(s)  
1 Terrafix Foreman  
5 Terrafix Labourers

## Equipment Used:

2 Excavator(s)  
  
2 Rock Truck(s)  
  
1 Bulldozer(s)  
1 Water Truck(s)  
1 ATV  
1 Zoom Boom

## Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Caterpillar 735  
Case 330B  
John Deere 750K XCT  
  
Polaris  
Merlo P38.13 plus

## Other Progress Notes:

- 50 mm clear stone was brought in from offsite (Dufferin Aggregates, Milton Quarry) and stockpiled at N1400, E1075



## Daily Inspection Record

**Job Number:** 11103232 **Date:** October 24, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 15°C, Sunny with some clouds

### Phase 8A Progress:

- Cut existing liner to prepare for benching of the Primary Clay Liner from E1200 to E1250
- Pumped water from various locations around the work site

### Personnel:

1 Foreman  
2 Laborer(s)

### Equipment Used:

1 Water Pump (2 inch)  
1 Water Pump (1 inch)

### Equipment Notes:

### Other Progress Notes:

- Rain from last night prevented large equipment from entering the work area





## Daily Inspection Record

**Job Number:** 11103232 **Date:** October 25, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 9°C, Sunny with some clouds

### Phase 8A Progress:

- Began placing Primary Clay Liner from E1175 to E1250
- Sourced from N1650, E1350
- Continued preparing clay source at approximately N1650, E1350

### Personnel:

1 Foreman  
2 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)  
2 Rock truck operator(s)  
1 GHD inspector  
1 GHD soil inspector  
1 Water Truck Operator(s)

### Equipment Used:

1 Excavator(s)  
2 Rock Truck(s)  
  
1 Bulldozer(s)  
1 Padfoot(s)  
1 Water Truck(s)

### Equipment Notes:

John Deere 470G LC  
Caterpillar 735  
Case 330B  
John Deere 750K XCT  
Bomag BW 213 PDH-40

### Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** October 26, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 13°C, Sunny with some clouds

## Phase 8A Progress:

- Continued placing Primary Clay Liner from E1175 to E1250
- Sourced from N1650, E1350
- Continued preparing clay source at approximately N1650, E1350

## Personnel:

1 Foreman  
3 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)  
2 Rock truck operator(s)  
1 GHD soil inspector  
1 Water Truck Operator(s)

## Equipment Used:

1 Excavator(s)  
2 Rock Truck(s)  
  
1 Bulldozer(s)  
1 Padfoot(s)  
1 Water Truck(s)

## Equipment Notes:

John Deere 470G LC  
Caterpillar 735  
Case 330B  
John Deere 750K XCT  
Bomag BW 213 PDH-40

## Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** October 27, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 16°C, Cloudy

## Phase 8A Progress:

- Finished placing Primary Clay Liner from E1175 to E1250
- Sourced from N1650, E1350
- Continued preparing clay source at approximately N1650, E1350
- Added engineered fill behind the Phase 8A sidewall to level it from E1175 to E1250
- The fill came from the stockpile at N1360, E1175

## Personnel:

1 Foreman  
3 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)  
2 Rock truck operator(s)  
1 GHD inspector  
1 GHD soil inspector  
1 Water Truck Operator(s)

## Equipment Used:

1 Excavator(s)  
2 Rock Truck(s)  
  
1 Bulldozer(s)  
1 Padfoot(s)  
1 Water Truck(s)

## Equipment Notes:

John Deere 470G LC  
Caterpillar 735  
Case 330B  
John Deere 750K XCT  
Bomag BW 213 PDH-40

## Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** October 30, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 9°C, Cloudy

## Phase 8A Progress:

- Second set of Shelby tubes (5A/B) were completed at approximately N1350, E1275 for the Primary Clay Liner
- Began placing Primary Clay Liner from E1025 to E1100 and E1275 to E1325
- Sourced from N1650, E1350
- Continued preparing clay source at approximately N1650, E1350

## Personnel:

1 Foreman  
2 Laborer(s)  
2 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)  
2 Rock truck operator(s)  
1 GHD inspector  
1 GHD soil inspector  
1 Water Truck Operator(s)

## Equipment Used:

2 Excavator(s)  
  
2 Rock Truck(s)  
  
1 Bulldozer(s)  
1 Padfoot(s)  
1 Water Truck(s)

## Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Caterpillar 735  
Case 330B  
John Deere 750K XCT  
Bomag BW 213 PDH-40

## Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** October 31, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 8°C, Sunny with some clouds

## Phase 8A Progress:

- Began placing Primary Clay Liner from E1025 to E1100 and E1275 to E1325
- Sourced from N1650, E1350
- Continued preparing clay source at approximately N1650, E1350
- Fine graded the Primary Clay Liner from E1175 to E1225
- Conducted a test pit investigation, at N1350, E1275, to determine the quality of clay construction for the Primary Clay Liner
- Added engineered fill behind the Phase 8A sidewall to level it from E1025 to E1100 and E1275 to E1325
- The fill came from the stockpile at N1325, E1100

## Personnel:

1 Foreman  
2 Laborer(s)  
2 Excavator operator(s)  
1 Bulldozer operator(s)  
2 Padfoot operator(s)  
2 Rock truck operator(s)  
1 GHD inspector  
1 GHD soil inspector  
1 Water Truck Operator(s)

## Equipment Used:

2 Excavator(s)  
2 Rock Truck(s)  
1 Bulldozer(s)  
2 Padfoot(s)  
1 Water Truck(s)

## Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Caterpillar 735  
Case 330B  
John Deere 750K XCT  
Bomag BW 213 PDH-40  
Caterpillar CP56B

## Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** November 1, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 9°C, Cloudy

## Phase 8A Progress:

- Finished placing Primary Clay Liner from E1025 to E1100 and E1275 to E1325
- Sourced from N1650, E1350, and N1475 and E1125 (this stockpile contained clay from previous clay liner in the area of N1275, E1050)
- Continued preparing clay source at approximately N1650, E1350
- Terrafix placed geomembrane from E1175 to E1200
- Dug an anchor trench on top of the sidewall berm from E1175 to E1250

## Personnel:

1 Foreman  
3 Laborer(s)  
3 Excavator operator(s)  
1 Bulldozer operator(s)  
2 Padfoot operator(s)  
2 Rock truck operator(s)  
1 GHD inspector  
1 GHD soil inspector  
1 Water Truck Operator(s)  
1 Terrafix Foreman  
4 Terrafix Labourers

## Equipment Used:

3 Excavator(s)  
  
2 Rock Truck(s)  
  
1 Bulldozer(s)  
2 Padfoot(s)  
  
1 Water Truck(s)  
1 Zoom Boom(s)

## Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
John Deere 60 D  
Caterpillar 735  
Case 330B  
John Deere 750K XCT  
Bomag BW 213 PDH-40  
Caterpillar CP56B  
  
Merlo P38.13 plus

## Other Progress Notes:

-



## Daily Inspection Record

**Job Number:** 11103232 **Date:** November 2, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 15°C, Raining

### Phase 8A Progress:

- No work was done today due to the rain

### Personnel:

1 Foreman  
1 GHD inspector

### Equipment Used:

### Equipment Notes:

### Other Progress Notes:

- Construction meeting #7 was held



# Daily Inspection Record

**Job Number:** 11103232 **Date:** November 3, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 10°C, Sunny with some clouds

## Phase 8A Progress:

- Pumped water around the site
- Prepared and fused the leachate collection pipes

## Personnel:

1 Foreman  
2 Laborer(s)  
1 Excavator operator(s)  
1 Sandale Welder  
1 GHD inspector

## Equipment Used:

1 Excavator(s)  
1 Pump (2 inch)

## Equipment Notes:

John Deere 245G LC

## Other Progress Notes:

-





# Daily Inspection Record

**Job Number:** 11103232 **Date:** November 6, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 8°C, Sunny with some clouds

### Phase 8A Progress:

- Pumped water around the site

### Personnel:

1 Foreman  
2 Laborer(s)  
1 GHD inspector

### Equipment Used:

2 Pump (2 inch)  
2 Pump (1 inch)

### Equipment Notes:

### Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** November 7, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 9°C, Sunny with some clouds

## Phase 8A Progress:

- Third set of Shelby tubes (6A/B) were completed at approximately N1314, E1087 for the Primary Clay Liner
- Forth set of Shelby tubes (7A/B) were completed at approximately N1346, E1276 for the Primary Clay Liner
- Fifth set of Shelby tubes (8A/B) were completed at approximately N1351, E1272 for the Primary Clay Liner
- Conducted a test pit investigation, at N1314, E1087, to determine the quality of clay construction for the Primary Clay Liner
- Conducted a test pit investigation, at N1373, E1289, to determine the quality of clay construction for the Primary Clay Liner

## Personnel:

1 Foreman  
3 Laborer(s)  
1 Excavator operator(s)  
1 GHD inspector

## Equipment Used:

1 Excavator(s)

## Equipment Notes:

John Deere 245G LC

## Other Progress Notes:

-



## Daily Inspection Record

**Job Number:** 11103232 **Date:** November 8, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 7°C, Sunny with some clouds

### Phase 8A Progress:

- Fine graded the top of the Primary Clay Liner from E1225 to E1300 and E1025 to E1100
- Constructed an anchor trench from E1225 to E1300

### Personnel:

1 Foreman  
3 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
1 GHD inspector

### Equipment Used:

1 Excavator(s)  
1 Bulldozer(s)

### Equipment Notes:

John Deere 60 D  
John Deere 750K XCT

### Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** November 9, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 9°C, Cloudy

## Phase 8A Progress:

- Continued digging out an anchor trench from E1225 to E1300
- Smoothed Primary Clay Liner and prepared for geomembrane
- Terrafix placed geomembrane from E1225 to E1300
- Sixth set of Shelby tubes (9A/B) were completed at approximately N1373, E1289 for the Primary Clay Liner

## Personnel:

1 Foreman  
3 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
2 Excavator operator(s)  
1 Smooth drum operator(s)  
1 Terrafix Foreman  
7 Terrafix Labourers  
1 GHD inspector

## Equipment Used:

2 Excavator(s)  
  
1 Bulldozer(s)  
1 Smooth Drum Roller(s)

## Equipment Notes:

John Deere 60 D  
John Deere 245G LC  
John Deere 750K XCT  
Caterpillar CS44

## Other Progress Notes:

-



## Daily Inspection Record

**Job Number:** 11103232 **Date:** November 10, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** -2°C, Sunny with some clouds

### Phase 8A Progress:

- Terrafix continued geomembrane work from E1225 to E1300
- Placed engineered fill on the back side of the Phase 8A sidewall from E1025 to E1100 and E1175 to E1300
- Engineered fill material came from N1330, E1100 and N1350, E1175

### Personnel:

1 Foreman  
3 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)  
1 Rock truck operator(s)  
1 GHD inspector  
1 Terrafix Foreman  
6 Terrafix Labourers

### Equipment Used:

1 Excavator(s)  
1 Rock Truck(s)  
1 Bulldozer(s)  
1 Padfoot(s)

### Equipment Notes:

John Deere 470G LC  
Caterpillar 735  
John Deere 750K XCT  
Bomag BW 213 PDH-40

### Other Progress Notes:

-



## Daily Inspection Record

**Job Number:** 11103232 **Date:** November 13, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 6°C, Cloudy

### Phase 8A Progress:

- Terrafix placed geotextile B from E1200 to E1300
- Terrafix continued geomembrane work from E1225 to E1300
- Installed second set of permeameters at approximately N1373, E1289 for the Primary Clay Liner
- Began placing 19 mm clear stone on top of geotextile B from E1175 to E1225
- 19 mm clear stone came from the stockpile at N1475, E1350
- Filled and compacted the anchor trench from E1175 to E1225

### Personnel:

1 Foreman  
3 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Rock truck operator(s)  
1 GHD inspector  
1 Terrafix Foreman  
5 Terrafix Labourers  
1 Terrapure front end loader operator(s)

### Equipment Used:

1 Excavator(s)  
1 Rock Truck(s)  
1 Bulldozer(s)  
1 Front End Loader (Terrapure)

### Equipment Notes:

John Deere 60 D  
Caterpillar 735  
John Deere 750K XCT

### Other Progress Notes:

- 19 mm clear stone was brought in from offsite (Dufferin Aggregates, Flamborough Quarry) and stockpiled at N1475, E1350



## Daily Inspection Record

**Job Number:** 11103232 **Date:** November 14, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 5°C, Cloudy

### Phase 8A Progress:

- Terrafix continued geomembrane work from E1225 to E1300
- Continued placing 19 mm clear stone on top of geotextile B from E1225 to E1300
- 19 mm clear stone came from the stockpile at N1475, E1350
- Filled and compacted the anchor trench from E1225 to E1300

### Personnel:

1 Foreman  
3 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Rock truck operator(s)  
1 Padfoot operator(s)  
1 GHD inspector  
1 Terrafix Foreman  
4 Terrafix Labourers  
1 Terrapure front end loader operator(s)

### Equipment Used:

1 Excavator(s)  
1 Rock Truck(s)  
1 Bulldozer(s)  
1 Padfoot(s)  
1 Front End Loader (Terrapure)

### Equipment Notes:

John Deere 60 D  
Caterpillar 735  
John Deere 750K XCT  
Bomag BW 213 PDH-40  
Caterpillar 972M

### Other Progress Notes:

- 19 mm clear stone was brought in from offsite (Dufferin Aggregates, Flamborough Quarry) and stockpiled at N1475, E1350



## Daily Inspection Record

**Job Number:** 11103232 **Date:** November 15, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 8°C, Cloudy

### Phase 8A Progress:

- Continued placing 19 mm clear stone on top of geotextile B from E1225 to E1300
- 19 mm clear stone came from the stockpile at N1475, E1350
- Dug an anchor trench from E1025 to E1125
- Removed permeameters at approximately N1373, E1289
- Began placing granular A on top of the 19 mm clear stone for the leachate collection layer from approximately E1150 to E1160

### Personnel:

1 Foreman  
3 Laborer(s)  
1 Excavator operator(s)/ Padfoot operator(s)  
1 Bulldozer operator(s)  
1 Rock truck operator(s)  
1 GHD inspector  
1 Terrapure front end loader operator(s)

### Equipment Used:

1 Excavator(s)  
1 Rock Truck(s)  
1 Bulldozer(s)  
1 Padfoot(s)  
1 Front End Loader (Terrapure)

### Equipment Notes:

John Deere 60 D  
Caterpillar 735  
John Deere 750K XCT  
Bomag BW 213 PDH-40  
Caterpillar 972M

### Other Progress Notes:

- 19 mm clear stone was brought in from offsite (Dufferin Aggregates, Flamborough Quarry) and stockpiled at N1475, E1350





# Daily Inspection Record

**Job Number:** 11103232 **Date:** November 16, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 7°C, Cloudy

### Phase 8A Progress:

- Placed two 200 mm leachate collection pipes in the area of N1319, E1183

### Personnel:

- 1 Foreman
- 3 Laborer(s)
- 1 Excavator operator(s)
- 1 GHD inspector

### Equipment Used:

- 2 Excavator(s)

### Equipment Notes:

- John Deere 470G LC
- John Deere 60 D

### Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** November 17, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 4°C, Sunny with some clouds

## Phase 8A Progress:

- Positioned and covered the two 200 mm diameter leachate collection pipes in the area of N1319.45, E1183
- Began placing granular A on top of the 19 mm clear stone for the leachate collection bed from approximately E1160 to E1300
- Granular A came from the stockpile at N1475, E1275

## Personnel:

1 Foreman  
1 Laborer(s)  
1 Excavator operator(s)  
1 Bulldozer operator(s)  
1 Rock truck operator(s)  
1 GHD inspector  
1 Terrapure front end loader operator(s)

## Equipment Used:

1 Excavator(s)  
1 Rock Truck(s)  
1 Bulldozer(s)  
1 Front End Loader (Terrapure)

## Equipment Notes:

John Deere 60 D  
Caterpillar 735  
John Deere 750K XCT  
Caterpillar 972M

## Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** November 20, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 3°C, Cloudy

## Phase 8A Progress:

- Pumped water and dried clay liner surface from E1050 to E1100

## Personnel:

- 1 Foreman
- 3 Laborer(s)
- 1 Excavator operator(s)
- 1 GHD inspector
- 1 GHD soil inspector

## Equipment Used:

- 1 Excavator(s)
- 2 Frost Fighters

## Equipment Notes:

John Deere 60 D

## Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** November 21, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 9°C, Sunny with some clouds

### Phase 8A Progress:

- Pumped water and dried clay liner surface from E1050 to E1100

### Personnel:

- 1 Foreman
- 3 Laborer(s)
- 1 GHD inspector

### Equipment Used:

- 2 Frost Fighters

### Equipment Notes:

### Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** November 22, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 0°C, Mostly cloudy

### Phase 8A Progress:

- Pumped water and dried clay liner surface from E1050 to E1100

### Personnel:

- 1 Foreman
- 2 Laborer(s)
- 1 GHD inspector

### Equipment Used:

- 2 Frost Fighters

### Equipment Notes:

### Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** November 23, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 3°C, Mostly cloudy

## Phase 8A Progress:

- Terrafix began placing geomembrane from E1025 to E1100 and N1300 to N1325

## Personnel:

- 1 Foreman
- 3 Laborer(s)
- 1 GHD inspector
- 1 Terrafix Foreman
- 4 Terrafix Labourers
- 1 Excavator operator(s)

## Equipment Used:

- 1 Excavator(s)

## Equipment Notes:

John Deere 470G LC

## Other Progress Notes:

-



## Daily Inspection Record

**Job Number:** 11103232 **Date:** November 24, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 10°C, Mostly cloudy

### Phase 8A Progress:

- Terrafix continued placing geomembrane from E1025 to E1100 and N1300 to N1325
- Dug an anchor trench from E1300 to E1325

### Personnel:

1 Foreman  
2 Laborer(s)  
1 GHD inspector  
1 Terrafix Foreman  
7 Terrafix Labourers  
2 Excavator operator(s)

### Equipment Used:

2 Excavator(s)  
  
1 Zoom Boom

### Equipment Notes:

John Deere 60 D  
John Deere 470G LC  
Merlo P38.13 plus

### Other Progress Notes:

-



# Daily Inspection Record

**Job Number:** 11103232 **Date:** November 25, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 10°C, Mostly cloudy with some periods of rain

## Phase 8A Progress:

- Terrafix worked on the geomembrane doing various tasks such as repairs and connections, from E1025 to E1100 and N1300 to N1325
- Pumped water from N1375, E1300 area

## Personnel:

1 Foreman  
1 Laborer(s)  
1 GHD inspector  
1 Terrafix Foreman  
6 Terrafix Labourers  
1 Excavator operator(s)

## Equipment Used:

1 Pump (2 inch)

## Equipment Notes:

## Other Progress Notes:

-





## Daily Inspection Record

**Job Number:** 11103232 **Date:** November 27, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 3°C, Sunny with some clouds

### Phase 8A Progress:

- Began exposing sections of Phase 1B for the connection work from N1260 to N1300 and E1050 to E1125
- Backfilled and compacted the anchor trench from E1025 to E1100
- Continued pumping water from N1375, E1300 area
- Terrafix continued working on the geomembrane doing various tasks such as repairs and connections, from E1025 to E1100 and N1300 to N1325
- Terrafix placed geotextile B on top of the geomembrane from E1025 to E1100 and N1300 to N1325

### Personnel:

1 Foreman  
3 Laborer(s)  
1 GHD inspector  
1 Terrafix Foreman  
7 Terrafix Labourers  
2 Excavator operator(s)  
1 Padfoot operator(s)

### Equipment Used:

2 Excavator(s)  
  
1 Zoom Boom  
1 Pump (2 inch)  
1 Padfoot(s)

### Equipment Notes:

John Deere 60 D  
John Deere 470G LC  
Merlo P38.13 plus  
  
Bomag BW 213 PDH-40

### Other Progress Notes:

-



## Daily Inspection Record

**Job Number:** 11103232 **Date:** November 28, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 14°C, Sunny with some clouds

### Phase 8A Progress:

- Backfilled and compacted anchor trench from N1300 to N1325
- Continued pumping water from N1375, E1300 area
- Began placing 19 mm clear stone on top of geotextile B from E1025 to E1100 and N1300 to N1325 (work done in the PM)
- 19 mm clear stone came from the stockpile at N1475, E1350

### Personnel:

1 Foreman  
2 Laborer(s)  
1 GHD inspector  
2 Excavator operator(s)  
2 Rock truck operator(s)  
1 Bulldozer operator(s)  
1 Padfoot operator(s)

### Equipment Used:

2 Excavator(s)  
2 Rock Truck(s)  
1 Bulldozer(s)  
1 Padfoot(s)  
1 Pump (2 inch)

### Equipment Notes:

John Deere 60 D  
John Deere 470G LC  
Caterpillar 735  
Case 330B  
John Deere 750K XCT  
Bomag BW 213 PDH-40

### Other Progress Notes:

- 19 mm clear stone was brought in from offsite (Dufferin Aggregates, Flamborough Quarry) and stockpiled at N1475, E1350



## Daily Inspection Record

**Job Number:** 11103232 **Date:** November 29, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 6°C, Mostly cloudy

### Phase 8A Progress:

- Continued placing 19 mm clear stone on top of geotextile B from E1025 to E1100 and N1300 to N1325 (work done in the PM)
- 19 mm clear stone came from the stockpile at N1475, E1350
- Continued pumping water from N1375, E1300 area
- Continued exposing sections of Phase 1B/ Phase 2 for the connection work from E1100 to E11300

### Personnel:

1 Foreman  
2 Laborer(s)  
1 GHD inspector  
2 Excavator operator(s)  
2 Rock truck operator(s)  
1 Bulldozer operator(s)

### Equipment Used:

3 Excavator(s)  
  
2 Rock Truck(s)  
  
1 Bulldozer(s)  
1 Pump (2 inch)  
1 Pump (1 inch)

### Equipment Notes:

John Deere 245G LC  
John Deere 470G LC  
John Deere 60 D  
Caterpillar 735  
Case 330B  
John Deere 750K XCT

### Other Progress Notes:

- 19 mm clear stone was brought in from offsite (Dufferin Aggregates, Flamborough Quarry) and stockpiled at N1475, E1350



# Daily Inspection Record

**Job Number:** 11103232 **Date:** November 30, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 7°C, Cloudy, Rain in the PM

## Phase 8A Progress:

- Continued and finished placing 19 mm clear stone on top of geotextile B from E1025 to E1100 and N1300 to N1325
- 19 mm clear stone came from the stockpile at N1475, E1350
- Continued placing granular A on top of the 19 mm clear stone from E1025 to E1100 and N1300 to N1325
- Granular A came from the stockpile at N1475, E1275
- Terrafix began and finished placing geomembrane from E1300 to E1325
- Terrafix placed geotextile B on top of the geomembrane from E1300 to E1325
- Began 19 mm clear stone on top of geotextile B from E1300 to E1325
- 19 mm clear stone came from the stockpile at N1475, E1350
- Placed one 200 mm diameter leachate collection pipe in the area of N1307, E1062

## Personnel:

1 Foreman  
2 Laborer(s)  
1 GHD inspector  
1 Terrafix Foreman  
5 Terrafix Labourers  
2 Excavator operator(s)  
1 Bulldozer operator(s)  
2 Rock truck operator(s)

## Equipment Used:

2 Excavator(s)  
2 Rock Truck(s)  
1 Bulldozer(s)  
1 Zoom Boom

## Equipment Notes:

John Deere 470G LC  
John Deere 60 D  
Caterpillar 735  
Case 330B  
John Deere 750K XCT  
Merlo P38.13 plus

## Other Progress Notes:

-



## Daily Inspection Record

**Job Number:** 11103232 **Date:** December 1, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 7°C, Clear sky

### Phase 8A Progress:

- Placed one 200 mm diameter leachate collection pipe in the area of N1352, E1278
- Continued placing 19 mm clear stone on top of geotextile B from E1300 to E1325
- 19 mm clear stone came from the stockpile at N1475, E1350
- Began placing granular A on top of the 19 mm clear stone from E1300 to E1325
- Granular A came from the stockpile at N1475, E1275
- Pumped water in the area east of E1325
- Placed engineered fill east of E1325 to build an access road
- Engineered fill came from stockpile at N1350, E1175
- Began placing 19 mm clear stone at the east end of Phase 8A for the temporary berm construction
- Began smooth drum rolling the granular A in the leachate blanket at the west end of Phase 8A around E1050

### Personnel:

- 1 Foreman/ Padfoot operator(s)
- 1 Laborer(s)
- 1 GHD inspector
- 2 Excavator operator(s)
- 1 Bulldozer operator(s)/ 1 Smooth drum operator(s)
- 2 Rock truck operator(s)

### Equipment Used:

- 2 Excavator(s)
- 2 Rock Truck(s)
- 1 Bulldozer(s)
- 1 Padfoot(s)
- 1 Pump (2 inch)
- 1 Smooth Drum Roller

### Equipment Notes:

- John Deere 470G LC
- John Deere 60 D
- Caterpillar 735
- Case 330B
- John Deere 750K XCT
- Bomag BW 213 PDH-40
  
- Caterpillar CS44

### Other Progress Notes:

-



## Daily Inspection Record

**Job Number:** 11103232 **Date:** December 4, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 10°C, Sunny with some clouds

### Phase 8A Progress:

- Graded and worked on the temporary berm on the east end of Phase 8A
- Placed additional 19 mm clear stone at the east end of Phase 8A for the temporary berm construction
- 19 mm clear stone came from the stockpile at N1475, E1350
- Terrafix placed geotextile B on top of the clear stone on the temporary berm
- Terrafix placed geomembrane on top of the Geotextile B on the temporary berm

### Personnel:

1 Foreman  
1 Laborer(s)  
1 GHD inspector  
1 Excavator operator(s)  
1 Rock truck operator(s)  
1 Terrafix Foreman  
5 Terrafix Labourers

### Equipment Used:

2 Excavator(s)  
  
1 Rock Truck(s)  
1 Zoom Boom

### Equipment Notes:

John Deere 470G LC  
John Deere 60 D  
Caterpillar 735  
Merlo P38.13 plus

### Other Progress Notes:

- With completion of new temporary berm, containment achieved for Phase 8A



## Daily Inspection Record

**Job Number:** 11103232 **Date:** December 5, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 12°C, Cloudy, periods of rain

### Phase 8A Progress:

- Began connection work between Phase 1B and Phase 8A, removing temporary containment flap in the area of N1275, E1050
- Connected the remaining leachate collection pipes to the existing

### Personnel:

1 Foreman  
1 Laborer(s)  
1 Excavator operator(s)

### Equipment Used:

1 Excavator(s)

### Equipment Notes:

John Deere 245G LC

### Other Progress Notes:

-



## Daily Inspection Record

**Job Number:** 11103232 **Date:** December 6, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 4°C, Clear sky

### Phase 8A Progress:

- Terrafix continued placing geotextile B on top of the clear stone on the temporary berm
- Terrafix continued placing geomembrane on top of the Geotextile B on the temporary berm
- Terrafix placed geotextile B on top of the geomembrane on the temporary berm
- Began exposing sections of Phase 2 for the connection work from E1225 to E1325
- Connected the leachate collection blanket between Phase 1B and Phase 8A, by adding 19 mm clear stone and granular A in the area of N1275, E1050
- Granular A came from the stockpile at N1475, E1275
- 19 mm clear stone came from the stockpile at N1475, E1350

### Personnel:

1 Foreman  
2 Laborer(s)  
1 GHD inspector  
2 Excavator operator(s)  
1 Rock truck operator(s)  
1 Bulldozer operator(s)  
1 Terrafix Foreman  
5 Terrafix Labourers

### Equipment Used:

2 Excavator(s)  
  
1 Rock Truck(s)  
1 Zoom Boom  
1 Bulldozer(s)

### Equipment Notes:

John Deere 470G LC  
John Deere 60 D  
Case 330B  
Merlo P38.13 plus  
John Deere 750K XCT

### Other Progress Notes:

- 19 mm clear stone was brought in from offsite (Dufferin Aggregates, Flamborough Quarry) and stockpiled at N1475, E1350





## Daily Inspection Record

**Job Number:** 11103232 **Date:** December 7, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 0°C, Cloudy

### Phase 8A Progress:

- Connected the leachate collection blanket between Phase 1B and Phase 8A, by adding 19 mm clear stone and granular A from E1225 to E1325
- Granular A came from the stockpile at N1475, E1275
- 19 mm clear stone came from the stockpile at N1475, E1350

### Personnel:

1 Foreman  
2 Laborer(s)  
1 GHD inspector  
2 Excavator operator(s)  
1 Rock truck operator(s)  
1 Bulldozer operator(s)

### Equipment Used:

2 Excavator(s)  
  
1 Rock Truck(s)  
1 Bulldozer(s)

### Equipment Notes:

John Deere 470G LC  
John Deere 245G LC  
Case 330B  
John Deere 750K XCT

### Other Progress Notes:

- 19 mm clear stone was brought in from offsite (Dufferin Aggregates, Flamborough Quarry) and stockpiled at N1475, E1350



## Daily Inspection Record

**Job Number:** 11103232 **Date:** December 7, 2017  
**Client:** Terrapure Environmental  
**Job Name:** 11103232  
**Contractor:** Dufferin Construction  
**Inspected By:** Peter Lesieczko **Weather:** 0°C, Sunny with some clouds

### Phase 8A Progress:

- Compacted the Granular A leachate blanket for the entire cell

### Personnel:

1 Foreman  
1 Laborer(s)  
1 Smooth drum operator(s)

### Equipment Used:

1 Smooth Drum Roller(s)

### Equipment Notes:

Caterpillar CS44

### Other Progress Notes:

- Construction of Phase 8A completed

# Appendix D

## Field and Laboratory Soil Testing Reports

# Appendix D1

## Results Dated January 19, 2017



January 19, 2017

Reference No. 11103232

Mr. Brian Dermody  
GHD Limited  
184 Front Street East Suite 302  
Toronto Ontario  
M5A 4N3

Dear Mr. Dermody:

**Re: Laboratory Testing of Clay Liner Samples  
Terrapure-Stoney Creek Landfill  
65 Green Mountain Road W, Hamilton, Ontario**

This report presents the results of laboratory testing carried out on samples of native clay materials extracted at the above noted project site. The purpose of the laboratory testing was to determine the engineering properties of the extracted soil samples for use as a compacted clay liner at the above project site.

## 1. Field and Laboratory Test Results

A site visit was carried out on December 7, 2016, by our technician. At the time of our site visit two samples of native clay soils were collected from a borrow area identified as the north clay stockpile for laboratory testing. The samples were identified as Sample # 1 and Sample # 2 and were transported to our laboratory in Mississauga for testing.

Laboratory testing was carried out on the native clay samples for the following tests:

1. Standard Proctor Maximum Dry Density (SPMDD)
2. Hydraulic Conductivity (Remoulded Permeability) in accordance with ASTM D5084
3. Particle Size Analysis in accordance with ASTM D422
4. Atterberg Limits in accordance with ASTM D4318

The test results are summarized as follows:

Laboratory Test	Sample #1	Sample #2
Standard Proctor Maximum Dry Density (SPMDD)	1,801 kg/m <sup>3</sup> @ 17.7%	1,741 kg/m <sup>3</sup> @ 16.8%
Hydraulic Conductivity (Remoulded Permeability) in accordance with ASTM D5084 – Sample compacted to 98% SPMDD	8.55 x 10 <sup>-8</sup> cm/sec	4.0 x 10 <sup>-8</sup> cm/sec
Percent of particles passing the No. 4 sieve (4.75 mm)	95	100
Percent of particles passing the No. 200 sieve (0.075 mm)	78	88



Laboratory Test	Sample #1	Sample #2
Liquid Limit %	30%	30%
Plastic Limit %	18%	18%
Plasticity Index	12%	12%

The results of laboratory testing are attached for reference.

## 2. Discussion

It is understood that the project specifications for the native clay liner indicates the material is to meet the following requirements:

1. A remoulded permeability of  $5 \times 10^{-8}$  cm/s or less, as determined in accordance with ASTM D5084
2. Gradation:
  - a. Minimum 95 percent of particles passing the No. 4 sieve (4.75 mm)
  - b. Minimum 80 percent fines passing the No. 200 sieve (0.075 mm)
3. Plasticity Index:  $30 > PI > 12$

Based on the laboratory test results, Sample # 2 meets the project specifications and is considered suitable for the use as a clay liner at the Site. Sample #1 marginally does not meet the project specifications for acceptance criteria 1 (permeability) and 2 b. The sample has a permeability that is marginally greater than specified (i.e.  $8.55 \times 10^{-8}$  cm/sec vs  $5.0 \times 10^{-8}$  cm/sec specified) and the percent passing No. 200 sieve (0.075 mm) marginally exceeds the gradation specification (i.e. 78% passing vs 80% specified).

We trust that this information meets with your approval. Please do not hesitate to contact us, should any questions arise.

Sincerely,

GHD

Rajendra Kadia, B.Eng., C.E.T.

RK/ss/2

Encl.

Karl Roechner, M.A.Sc., P. Eng.

# Attachments

# **Attachment A Laboratory Test Results**





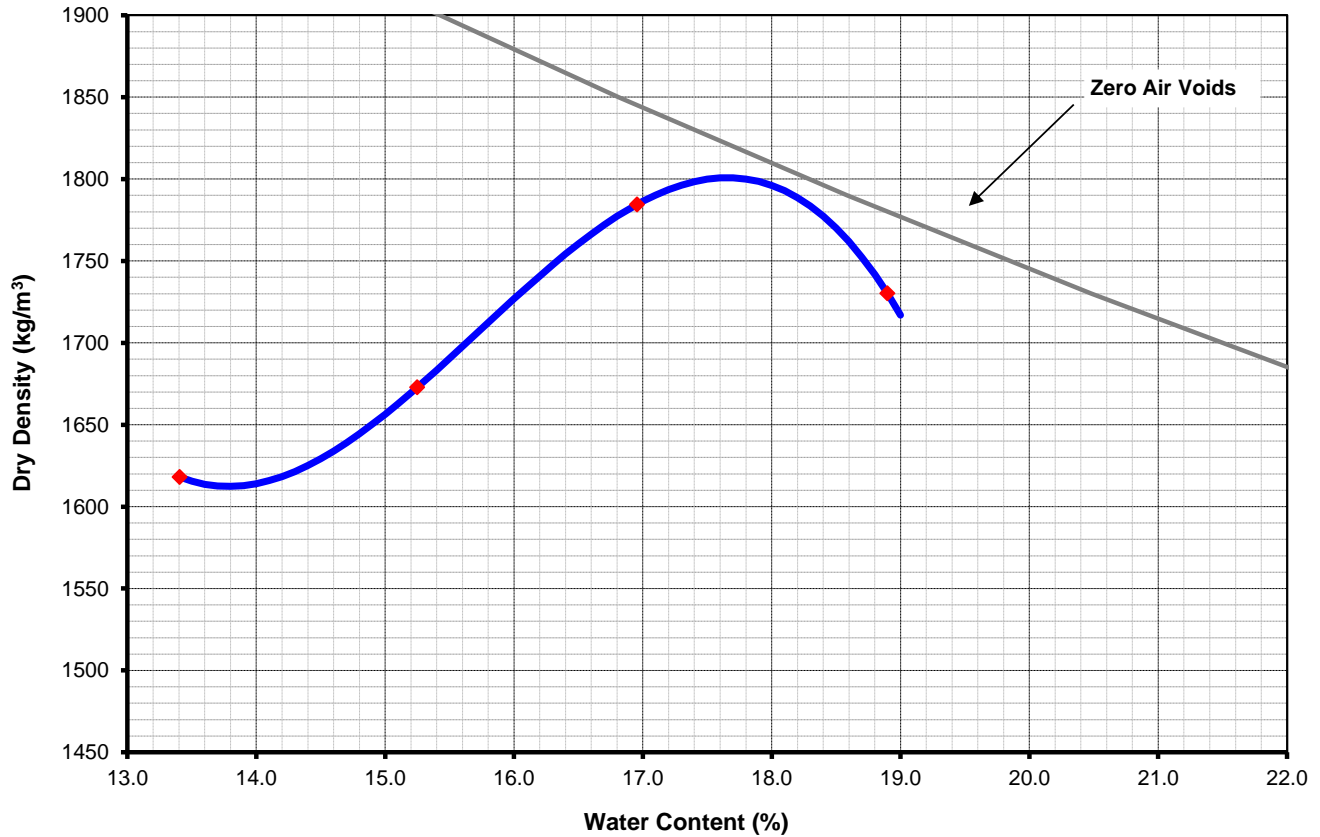
# Standard Proctor Test (MTO LS-706)

Client : Terrapure Environmental

Lab No : WLB-1150

Project/Site : Terrapure - Stoney Creek Landfill

Project No : 11103232



Prepared Sample: Dry  Moist  Assumed  $G_s$ : 2.77

LS-706 Test Procedure: A  B  C  Type of Hammer: Manual

4.75 mm      9.5 mm      19.0 mm

Soil Type: -

Material: Silty Clay, Some Sand, Trace Gravel

Proposed Use: -

Sample Identification: Sample # 1

Sample Location: In-situ test pits

Aggregate Supplier / Pit Name: -

Sample Date: -

Sampled By: Sharif

Max. Dry Density:	<u>1801</u> kg/m <sup>3</sup>
Optimum Moisture:	<u>17.7</u> %
% Retained on 4.75 mm:	<u>5.0</u> %
Corrected Dry Density:	<u>1801</u> kg/m <sup>3</sup>
Corrected Opt. Moist.:	<u>17.7</u> %

Remarks : Natural moisture content = 17.3%

Performed by : Blayne Stantic Date : January 10, 2017

Verified by : Michael Braverman Date : January 13, 2017



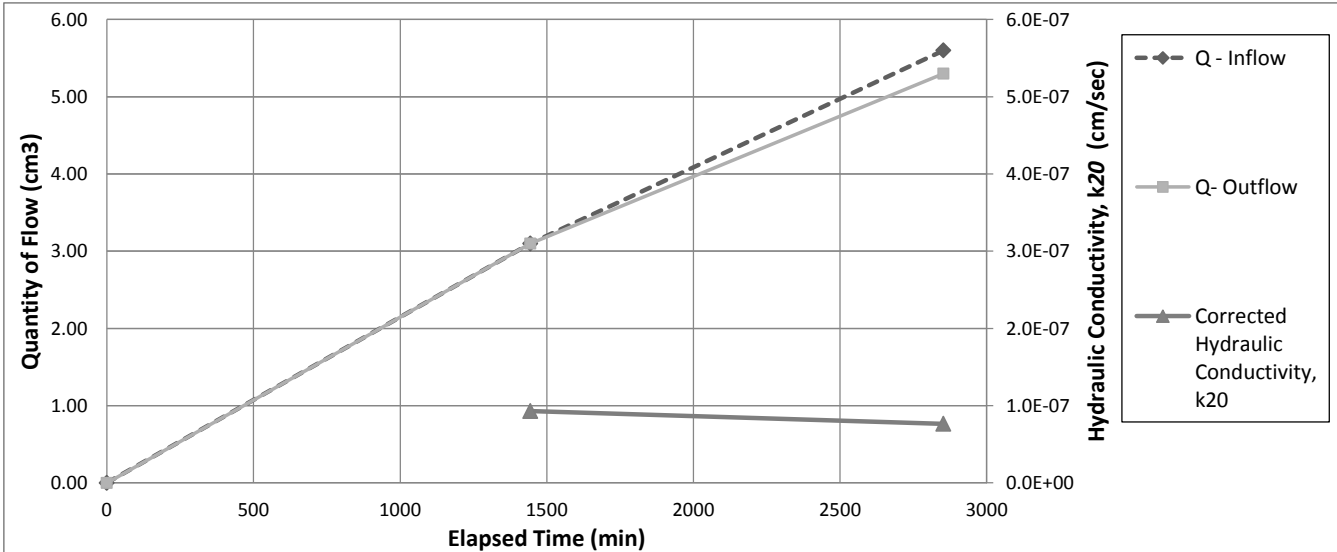
**HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS (ASTM D5084)**

<b>CLIENT:</b>	Terrapure Environmental	<b>LAB No.:</b>	WLB-1150
<b>PROJECT/ SITE:</b>	Terrapure - Stoney Creek Landfill, 65 Green Mountain Road W, Hamilton	<b>PROJECT No.:</b>	11103232
<b>Sample Location:</b>	-	<b>Sampled By:</b>	Client
<b>Sample Height/Depth:</b>	-	<b>Date Sampled:</b>	December 7, 2016
<b>Sample Identification:</b>	Sample #1	<b>Date Tested:</b>	Jan 13 - Jan 17, 2017

**Method C- Falling Head, Rising Tailwater Elevation**

<b>Sample Description:</b>	Silty Clay, some sand, trace gravel
----------------------------	-------------------------------------

Specimen Parameters	Initial	Final	Permeation Condition	
Diameter, cm	5.03		Cell Pressure, kPa	400.0
Length, cm	5.49		Head Pressure, kPa	387.5
Volume, cm <sup>3</sup>	108.9		Back Pressure, kPa	377.5
Wet Mass, g	233.7		B - Value	0.99
Dry Density, kg/m <sup>3</sup>	1763	1770	Effective Consolidation Pressure, kPa	20.00
Moisture, %	21.7	20.7	Volume under Steady Flow, cm <sup>3</sup>	5.3
Specific Gravity	2.79		Hydraulic Gradient, <i>i</i>	18.6
Degree of Saturation, %	100	100	<b>Hydraulic Conductivity, <i>k</i><sub>20</sub>, cm/sec</b>	<b>8.5E-08</b>
Largest Particle Size, mm	4.75			



**REMARKS:** Sample remolded to approx. 98% of SPMD  
 Max. 5\*10<sup>-8</sup> cm/ sec. Doesn't meet the specification

<b>PERFORMED BY:</b>	Michael Braverman	<b>DATE:</b>	January 13, 2017
<b>VERIFIED BY:</b>	Michael Braverman	<b>DATE:</b>	January 18, 2018



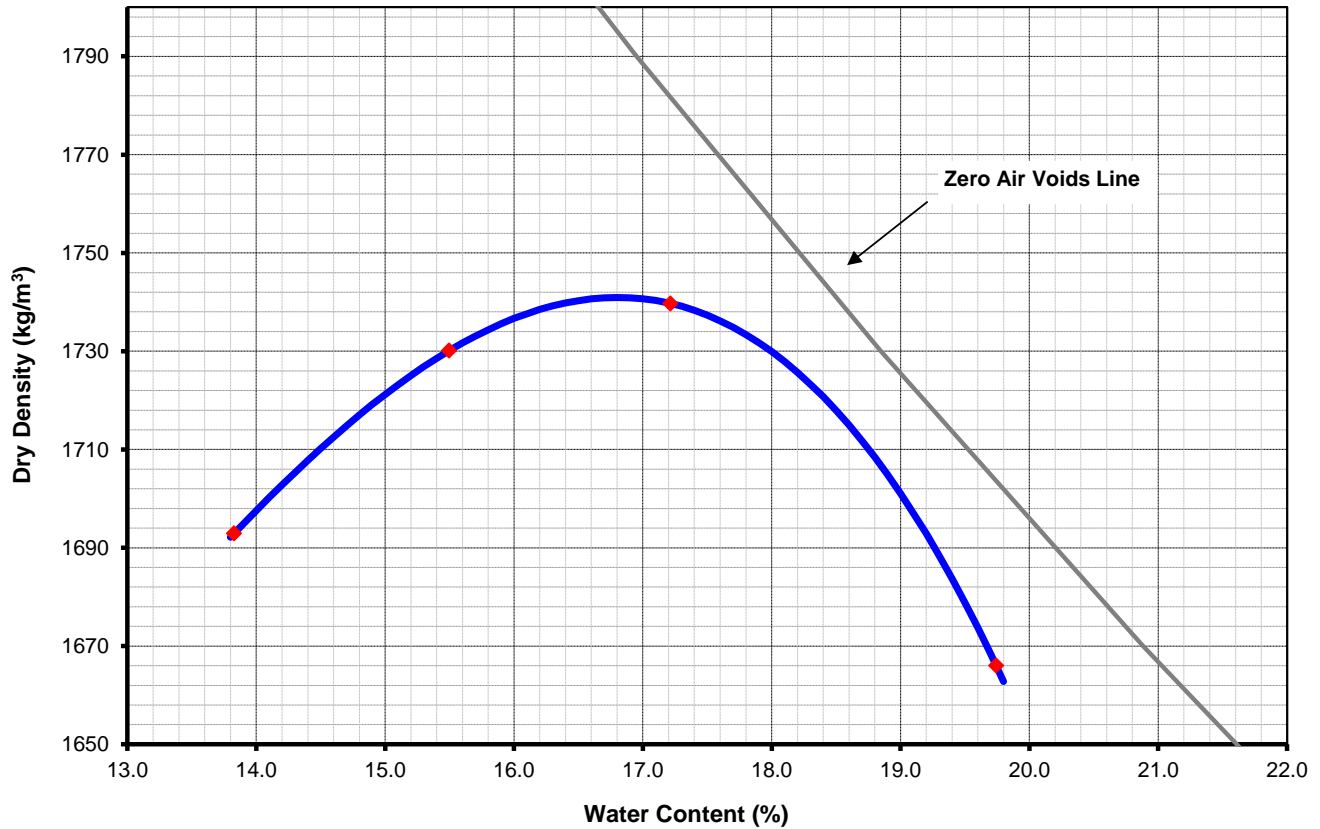
# Standard Proctor Test (MTO LS-706)

Client : Terrapure Enviromental

Lab No : WLB-1151

Project/Site : Terrapure - Stoney Creek Landfill

Project No : 11103232



Prepared Sample: Dry  Moist  Assumed  $G_s$ : 2.65

LS-706 Test Procedure: A  B  C  Type of Hammer: Manual

4.75 mm      9.5 mm      19.0 mm

Soil Type: -

Material: Clayey Silt, Some Sand

Proposed Use: -

Sample Identification: Sample # 2

Sample Location: In-situ test pits

Aggregate Supplier / Pit Name: -

Sample Date: December 7, 2016

Sampled By: -

Max. Dry Density:	<u>1741</u> kg/m <sup>3</sup>
Optimum Moisture:	<u>16.8</u> %
% Retained on 4.75 mm:	<u>0.0</u> %
Corrected Dry Density:	<u>1741</u> kg/m <sup>3</sup>
Corrected Opt. Moist.:	<u>16.8</u> %

Remarks : \_\_\_\_\_

\_\_\_\_\_

Performed by : Blayne Stantic

Date : January 13, 2017

Verified by : Michael Braverman

Date : January 16, 2017



**HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS (ASTM D5084)**

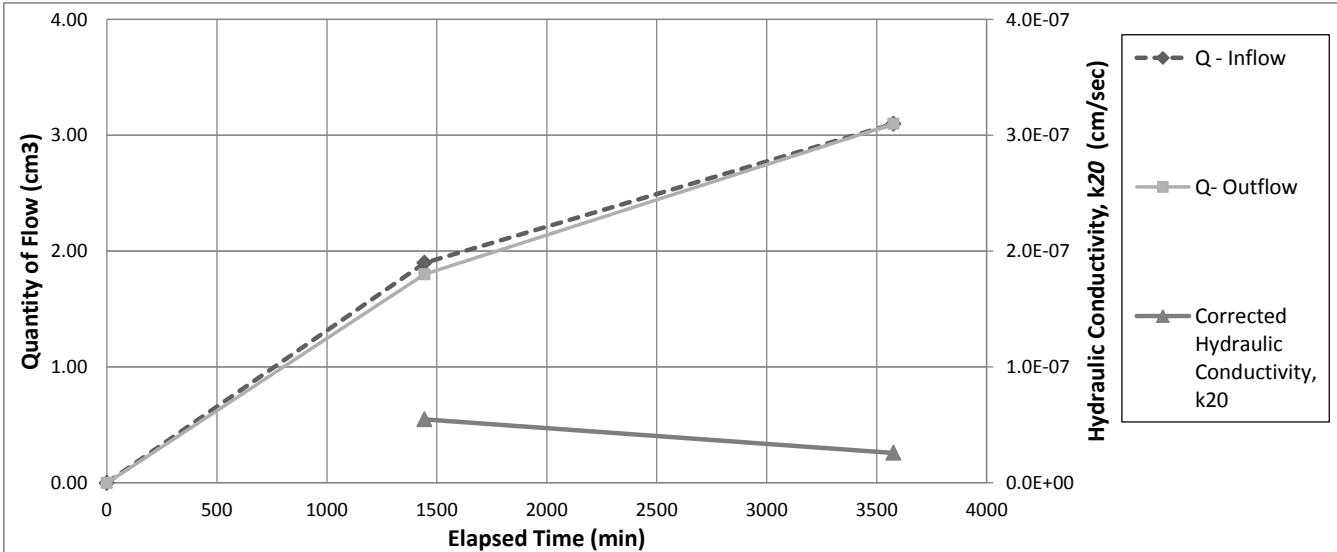
<b>CLIENT:</b>	Terrapure Environmental	<b>LAB No.:</b>	WLB-1151
<b>PROJECT/ SITE:</b>	Terrapure - Stoney Creek Landfill, 65 Green Mountain Road W, Hamilton	<b>PROJECT No.:</b>	11103232
<b>Sample Location:</b>	-	<b>Sampled By:</b>	Client
<b>Sample Height/Depth:</b>	-	<b>Date Sampled:</b>	December 7, 2016
<b>Sample Identification:</b>	Sample #2	<b>Date Tested:</b>	Jan 13 - Jan 17, 2017

**Method C- Falling Head, Rising Tailwater Elevation**

<b>Sample Description:</b>	Clayey silt, some sand
----------------------------	------------------------

Specimen Parameters	Initial	Final
Diameter, cm	4.97	
Length, cm	5.37	
Volume, cm <sup>3</sup>	104.2	
Wet Mass, g	211.1	
Dry Density, kg/m <sup>3</sup>	1707	1717
Moisture, %	18.7	20.2
Specific Gravity	2.63	
Degree of Saturation, %	91	100
Largest Particle Size, mm	4.75	

Permeation Condition	
Cell Pressure, kPa	400.0
Head Pressure, kPa	387.5
Back Pressure, kPa	377.5
B - Value	0.98
Effective Consolidation Pressure, kPa	20.00
Volume under Steady Flow, cm <sup>3</sup>	3.1
Hydraulic Gradient, <i>i</i>	19.0
<b>Hydraulic Conductivity, <i>k</i><sub>20</sub>, cm/sec</b>	<b>4.0E-08</b>



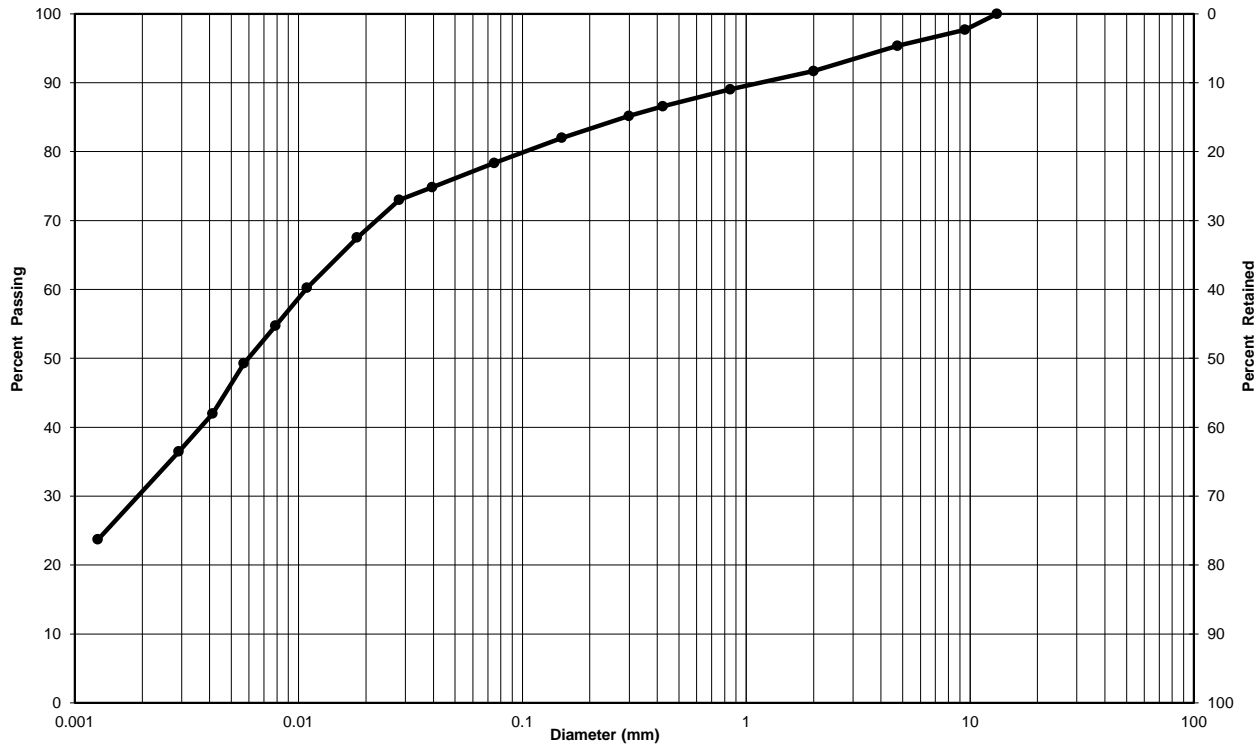
**REMARKS:** Sample remolded to approx. 98% of SPMD  
 Max. 5\*10-8 cm/ sec. Meets the specification

**PERFORMED BY:** Michael Braverman      **DATE:** January 13, 2017  
**VERIFIED BY:** Michael Braverman      **DATE:** January 18, 2017



**Particle-Size Analysis of Soils  
ASTM D422 (Geotechnical)**

<b>Client:</b>	Terrapure Environmental	<b>Lab No.:</b>	S1316
<b>Project, Site:</b>	Terrapure-Stoney Creek Landfill, 65 Green Mountain Road W, Hamilton	<b>Project No.:</b>	11103232
<b>Borehole No.:</b>	-	<b>Sample No.:</b>	Sample #1
<b>Depth:</b>	-	<b>Enclosure:</b>	



<b>Silty Clay</b>	<b>Sand</b>			<b>Gravel</b>	
	Fine	Medium	Coarse	Fine	Coarse
<b>Particle-Size Limits as per USCS (ASTM D-2487)</b>					

Soil Description	Gravel (%)	Sand (%)	Clay & Silt (%)
Silty Clay, Some Sand, Trace Gravel	5	17	78

**Remarks:** Silt-size particles (0.074 to 0.002 mm): 47%, Clay-size particles (<0.002 mm): 31%

<u>Min. 95 percent of particles passing the No. 4 sieve (4.75 mm)</u>	<u>Meets the specification</u>
<u>Min. 80 percent fines passing the No. 200 sieve (0.075 mm)</u>	<u>Doesn't meet the specification</u>

<b>Performed by:</b>	Anwar Rehani	<b>Date:</b>	January 9, 2017
<b>Verified by:</b>	Raj Kadia C.E.T	<b>Date:</b>	January 11, 2016



## Liquid Limit, Plastic Limit and Plasticity Index of Soils (ASTM D4318)

<b>Client:</b>	Terrapure Environmental	<b>Lab no.:</b>	S1316
<b>Project/Site:</b>	Terrapure-Stoney Creek Landfill, 65 Green Mountain Road W, Hamilton	<b>Project no.:</b>	11103232
Borehole no.:	Sample no.:	<b>Sample #1</b>	Depth:
Soil description:	Low Plasticity Inorganic Clay (CL)	Date sampled:	07-Dec-16
Apparatus:	Hand Crank	Balance no.:	1
Liquid limit device no.:	2	Porcelain bowl no.:	1
Sieve no.:	40	Oven no.:	1
		Spatula no.:	1
		Glass plate no.:	2

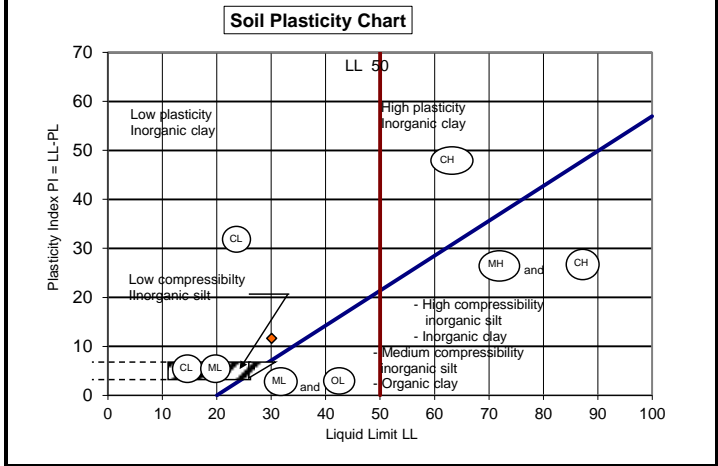
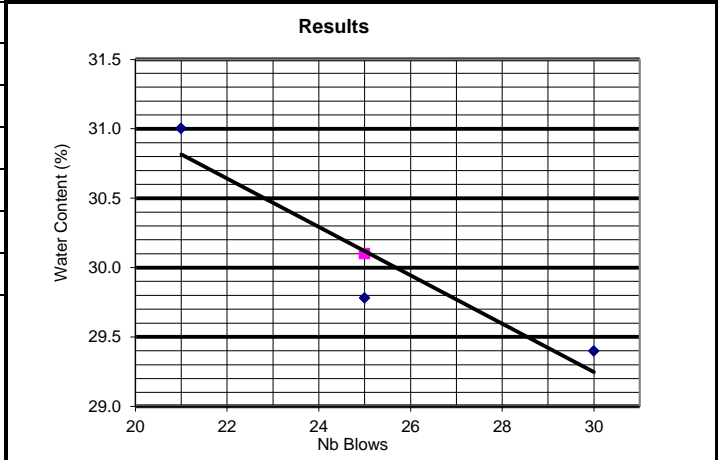
Liquid Limit (LL):			
	Test No. 1	Test No. 2	Test No. 3
Number of blows	30	25	21
Water Content:			
Tare no.	AT33	AT9	AT38
Wet soil+tare, g	20.35	19.72	20.49
Dry soil+tare, g	19.08	18.63	19.16
Mass of water, g	1.27	1.09	1.33
Tare, g	14.76	14.97	14.87
Mass of soil, g	4.32	3.66	4.29
Water content %	29.4%	29.8%	31.0%
Plastic Limit (PL) - Water Content:			
Tare no.	AT20	AT45	
Wet soil+tare, g	17.39	17.57	
Dry soil+tare, g	16.96	17.15	
Mass of water, g	0.43	0.42	
Tare, g	14.65	14.86	
Mass of soil, g	2.31	2.29	
Water content %	18.6%	18.3%	
Average water content %	18.5%		
Natural Water Content (W <sup>n</sup> ):			
Tare no.	E37		
Wet soil+tare, g	52.6		
Dry soil+tare, g	44.0		
Mass of water, g	8.60		
Tare, g	1.30		
Mass of soil, g	42.70		
Water content %	20.1%		

**Soil Preparation:**

Cohesive <425 µm       Dry preparation

Cohesive >425 µm       Wet preparation

Non-cohesive



Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)	Natural Water Content W <sup>n</sup>
30	18	12	20

**Remarks:**

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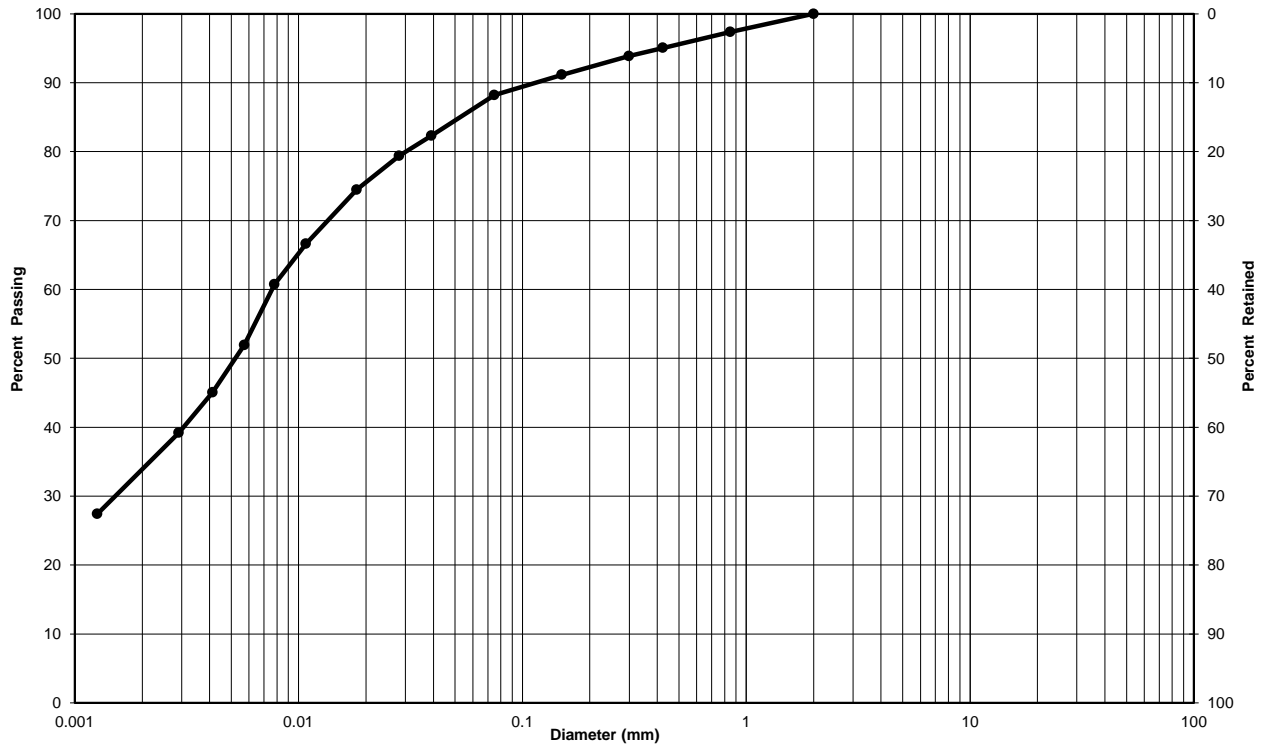
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<b>Performed by:</b>	Anwar Rehani	<b>Date:</b>	January 10, 2017
<b>Verified by:</b>	Raj Kadia, C.E.T.	<b>Date:</b>	January 11, 2017



**Particle-Size Analysis of Soils  
ASTM D422 (Geotechnical)**

<b>Client:</b>	Terrapure Environmental	<b>Lab No.:</b>	S1316
<b>Project, Site:</b>	Terrapure-Stoney Creek Landfill, 65 Green Mountain Road W, Hamilton	<b>Project No.:</b>	11103232
Borehole No.:	-	Sample No.:	Sample #2
Depth:	-	Enclosure:	



<b>Silty Clay</b>	<b>Sand</b>			<b>Gravel</b>	
	Fine	Medium	Coarse	Fine	Coarse
<b>Particle-Size Limits as per USCS (ASTM D-2487)</b>					

Soil Description	Gravel (%)	Sand (%)	Clay & Silt (%)
Clayey Silt, Some Sand	0	12	88

**Remarks:** Silt-size particles (0.074 to 0.002 mm): 54%, Clay-size particles (<0.002 mm): 34%

Min. 95 percent of particles passing the No. 4 sieve (4.75 mm) Meets the specification

Min. 80 percent fines passing the No. 200 sieve (0.075 mm) Meets the specification

<b>Performed by:</b>	Anwar Rehani	<b>Date:</b>	January 9, 2017
<b>Verified by:</b>	Raj Kadia C.E.T	<b>Date:</b>	January 11, 2017



## Liquid Limit, Plastic Limit and Plasticity Index of Soils (ASTM D4318)

<b>Client:</b>	Terrapure Environmental	<b>Lab no.:</b>	S1316
<b>Project/Site:</b>	Terrapure-Stoney Creek Landfill, 65 Green Mountain Road W, Hamilton	<b>Project no.:</b>	11103232
Borehole no.:	Sample no.:	Sample #2	
Soil description:	Low Plasticity Inorganic Clay (CL)	Depth:	
Apparatus:	Hand Crank	Balance no.:	2
Liquid limit device no.:	2	Porcelain bowl no.:	6
Sieve no.:	40	Oven no.:	1
		Spatula no.:	2
		Glass plate no.:	2

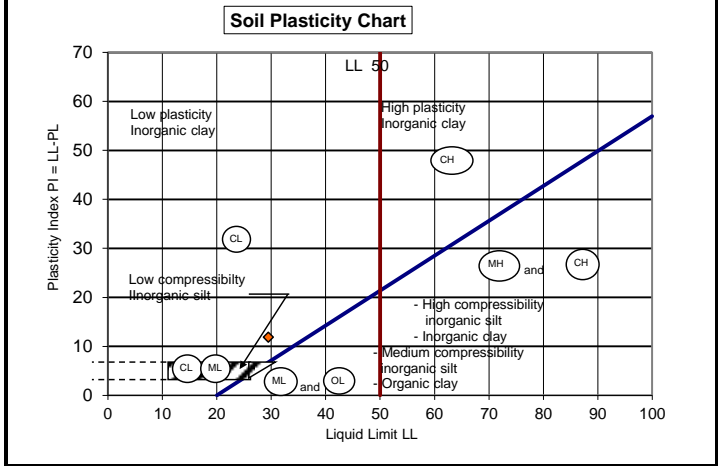
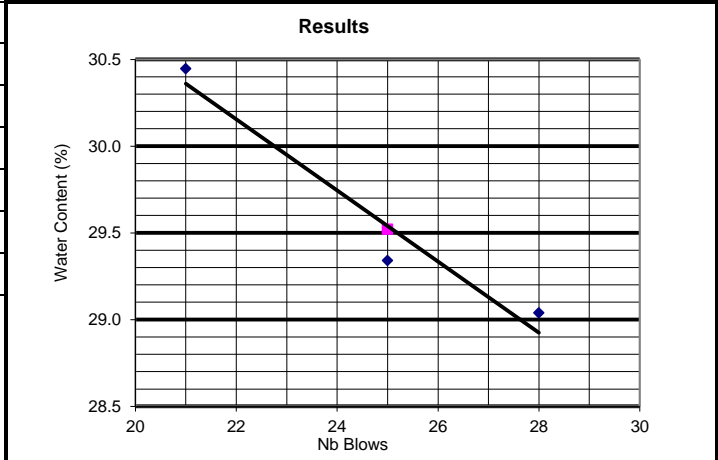
Liquid Limit (LL):			
	Test No. 1	Test No. 2	Test No. 3
Number of blows	28	25	21
Water Content:			
Tare no.	AT8	AT17	AT15
Wet soil+tare, g	21.33	20.26	19.87
Dry soil+tare, g	19.91	19.06	18.71
Mass of water, g	1.42	1.20	1.16
Tare, g	15.02	14.97	14.90
Mass of soil, g	4.89	4.09	3.81
Water content %	29.0%	29.3%	30.4%
Plastic Limit (PL) - Water Content:			
Tare no.	AT41	AT42	
Wet soil+tare, g	17.60	18.06	
Dry soil+tare, g	17.19	17.58	
Mass of water, g	0.41	0.48	
Tare, g	14.85	14.89	
Mass of soil, g	2.34	2.69	
Water content %	17.5%	17.8%	
Average water content %	17.7%		
Natural Water Content (W <sup>n</sup> ):			
Tare no.	1		
Wet soil+tare, g	44.5		
Dry soil+tare, g	37.5		
Mass of water, g	7.00		
Tare, g	1.30		
Mass of soil, g	36.20		
Water content %	19.3%		

**Soil Preparation:**

Cohesive <425 µm       Dry preparation

Cohesive >425 µm       Wet preparation

Non-cohesive



Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)	Natural Water Content W <sup>n</sup>
30	18	12	19

**Remarks:**

---



---

<b>Performed by:</b>	Anwar Rehani	<b>Date:</b>	January 10, 2017
<b>Verified by:</b>	Raj Kadia, C.E.T.	<b>Date:</b>	January 11, 2017





January 19, 2017

Reference No. 11103232

Mr. Brian Dermody  
GHD Limited  
184 Front Street East Suite 302  
Toronto Ontario  
M5A 4N3

Dear Mr. Dermody:

**Re: Field Compaction Report  
Terrapure-Stoney Creek Landfill  
65 Green Mountain Road W, Hamilton, Ontario**

This report presents the results of field (compaction) and laboratory testing carried out by GHD Limited at the above noted project site. The purpose of the field and laboratory testing was to collect samples of native and granular materials to assess compliance to project specifications and to determine the degree of compaction achieved on the granular materials being used as bedding for the proposed leachate removal pipes.

## 1. Summary of Site Inspections

Site inspections were carried out on November 30 and December 7, 2016, by one of our technicians. At the time of our site visit on November 30, 2016 granular and native samples were collected for laboratory testing. The samples collected are summarized as follows:

Type of Materials	Sampling Location	Proposed Use
Sample 1- Granular A (comprising of crushed limestone, gravel, bricks, shale)	Crusher plant on the south-east of site office	Base grading layer, leachate collection system drainage blanket, and miscellaneous applications
Sample 2- Granular A (comprising of crushed limestone, gravel, bricks, shale)	Onsite Stockpile	Base grading layer, leachate collection system drainage blanket, and miscellaneous applications
Sample 3-Excavated native materials	Existing Stockpile	Engineered fill
Sample 4- Excavated native materials	Stockpile on the west of existing Stockpile	Engineered fill
Sample 5- 19mm Clear Stone	Imported from Dufferin Construction	Leachate collection system drainage blanket, groundwater collection system

The collected samples were transported to our Mississauga laboratory for testing. The laboratory test results are attached for reference.



During our visit on December 7, 2016, a total of fourteen (14) in-situ density (compaction) tests were conducted using a nuclear density gauge. The compaction tests were carried out on the granular materials being used as bedding for the proposed leachate removal pipes.

The averaged measured degree of compaction of the granular materials was about 99 percent estimated Standard Proctor Maximum Dry Density (SPMDD).

Details of our inspections and individual test locations are enclosed.

## 2. Laboratory Test Results

Laboratory testing was carried out on representative samples of the granular materials for standard proctor test and grain size analysis. Samples of the native soil were collected for Standard Proctor determination. The results are summarized as follows:

Material	Lab Sample Number	Standard Proctor Maximum Dry Density (SPMDD) (kg/m <sup>3</sup> )	Optimum Water Content (%)
Sample 1- Granular A (comprising of crushed limestone, gravel, bricks, shale)	S1308	1885	6.0
Sample 2- Granular A (comprising of crushed limestone, gravel, bricks, shale)	S1309	2027	8.4
Sample 3- Excavated materials (Silty Clay with crushed stone and gravel)	S1310	2006	7.7
Sample 4- Excavated materials (Silty Clay with crushed stone and gravel)	S1311	2031	9.3

The grain size analysis of the samples of the Granular A material met the OPSS 1010 specifications for Granular A material. The grain size analysis carried on the 19 mm Clear Stone indicated the sample generally meets for OPSS.MUNI 1004 specifications for 19 mm Clear Stone Type I requirements. The Clear Stone sample was slightly coarse grained on the 19.0 mm sieve size.

The results of laboratory testing are attached for reference.

## 3. Discussion

It is understood that the project specifications require the granular materials being used as bedding for the proposed leachate removal pipes to be compacted to a minimum of at least 98 percent SPMDD. Based on the field and laboratory test results, compaction of the materials in the areas tested meets the specifications.

The grain size results obtained on the samples of the Granular A and clear stone indicate the materials generally meet project specifications and are considered suitable for use on the Site.



We trust that this information meets with your approval. Please do not hesitate to contact us, should any questions arise.

Sincerely,

GHD

A handwritten signature in blue ink that reads 'RJKadia'. The signature is written in a cursive style and is underlined with a single horizontal line.

Rajendra Kadia, B.Eng., C.E.T.

RK/ss/1

Encl.

A handwritten signature in blue ink that reads 'Karl Roechner'. The signature is written in a cursive style.

Karl Roechner, M.A.Sc., P. Eng.

# Attachments

# **Attachment A**






## **Field and Laboratory Test Results**



# Field Report

Project no.: <i>11103232 (02)</i>	Date: <i>Nov 30/2016</i>
Client: <i>G.H.D</i>	Contractor: <i>Dufferin Construction</i>
Project: <i>Stoney Creek Landfill Phase 8A Base Liner and Leachate Collection System</i>	<input type="checkbox"/> Compaction <input type="checkbox"/> Roofing <input type="checkbox"/> Footing base evaluation <input type="checkbox"/> Structural steel <input type="checkbox"/> Subgrade evaluation <input type="checkbox"/> Reinforcing steel <input type="checkbox"/> Concrete <input checked="" type="checkbox"/> Sampling <input type="checkbox"/> Other (specify): <input type="checkbox"/> Asphalt paving
Location: <i>65 Green Mountain Road W Hamilton ON</i>	

Field results      Temperature: \_\_\_\_\_ °C








*The above noted site has been visited by G.H.D site representative on Nov 30/2016, as requested by client. The purpose of the visit was site geotechnical investigation and sampling of engineering material for the laboratory analysis. After the site Health and Safety Orientation and site introduction in site office G.H.D site representative visited the site with Mr Brian Dermody (G.H.D Project Manager). Excavation of ground water collection trench and bench cut of existing liner for the connection of newly constructed liner was in progress. Crushing of granular A material (From on site material (limestone) <sup>+ gravel + bricks + shale</sup>) was in progress on crushing plant located on the SE side of site office. G.H.D site representative found 3 stockpiles for engineered fill material*

Corrective action to be taken:

- ① Existing spoil stockpile ② Stockpile on the W side of existing spoil stockpile ③ stockpile located on the N side of crushing plant, G.H.D site representative secured 2 samples from the first two stockpiles for the laboratory analysis (Silty clay with some gravel)*

Follow up visit required:       Yes       No


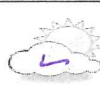



Site rep.:	Prepared by: <i>ZY</i>
Of:	Reviewed by: 





Project no.: 11103232-2	Date: Nov 30/2016
Client: G.H.D	Contractor: Dufferin Construction
Project: Stone Creek Landfill Phase 8A Base liner and Leachate collection system	<input type="checkbox"/> Compaction <input type="checkbox"/> Roofing <input type="checkbox"/> Footing base evaluation <input type="checkbox"/> Structural steel <input type="checkbox"/> Subgrade evaluation <input type="checkbox"/> Reinforcing steel <input type="checkbox"/> Concrete <input checked="" type="checkbox"/> Sampling <input type="checkbox"/> Other (specify): <input type="checkbox"/> Asphalt paving
Location: 65 Green Mountain Road west Hamilton ON	

Field results      Temperature: \_\_\_\_\_ °C

② One 19mm clear stone sample secured for the gradation only (material imported from Dufferin mill creek pit)

③ 2 samples of granular A has been secured for laboratory analysis, one from the stockpile and one from the crushing plant. (Lime stone, gravel, Bricks, Shale)

Required analysis

① Engineered fill material = Proctor (M.D.D, OMC)

② 19mm clear stone = Gradation only.


③ Granular A = Proctor (M.D.D, OMC), Gradation.

G.H.D site representative also found a source of clay located on the E side of site office, S side of green Mountain Rd Int, But due to unavailability corrective action to be taken:

on Excavator in that location, G.H.D site representative was not able to take a samples from the source for Laboratory analysis

Note: Sampling of clay and 50mm clear stone (imported material) scheduled in December

Follow up visit required:       Yes       No

Site rep.:	Prepared by: ZY
Of:	Reviewed by: 



# Field Report

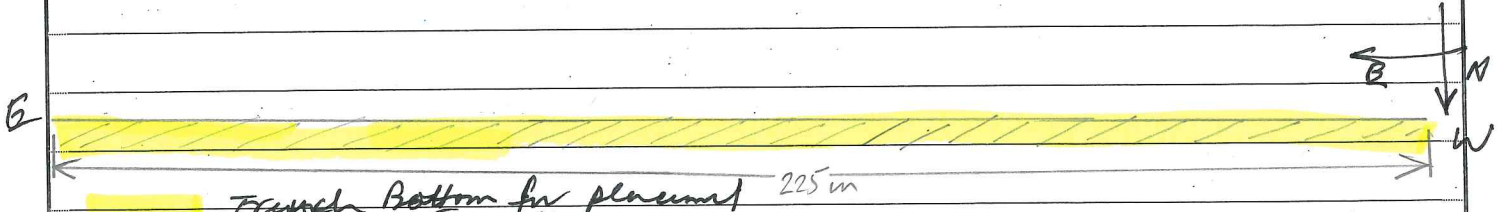
Project no.: 11103232	Date: December 07/2016
Client: C&D Ltd	Contractor:
Project: Temporary - Stoney creek landfill	<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing base evaluation <input type="checkbox"/> Subgrade evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Other (specify):
Location: 65 - Queen Mountain Rd. Hamilton	<input type="checkbox"/> Roofing <input type="checkbox"/> Structural steel <input type="checkbox"/> Reinforcing steel <input type="checkbox"/> Sampling <input type="checkbox"/> Asphalt paving

Field results      Temperature: +6 °C



The above noted site visited by C&D representative as requested. The purpose of the visit was to conduct the compaction test on base of pipe (leachate removal). The observation areas follows:

- 1) Areas inspected: About 225m long in East west direction.
- 2) The depth of Bed of Trench: About 1.2m to 1.4m bgs.
- 3) The contractor placed gr A.
- 4) Compaction was performed by 24" Dredal Tempson plate.
- 5) Nuclear Density gauge had been carried out to check the compaction.
- 6) Test results showed 99% to 100% SPDD, which met the project specifications.



Follow up visit required:  Yes  No

Site rep.: Bryton, Site - in - charge  
 Prepared by: Md. Sharif Hossain  
 Of: C&D Ltd  
 Reviewed by:





# Soil Compaction Verification Report

Project no.: <u>11103232</u> Client: <u>GHD Ltd</u> Project: <u>Temrapune - Stony Creek Landfill</u> Location: <u>65 - Caneen Mountains Rd, Hamersley</u>	Date: <u>December 07/2016</u> Contractor: Site visit type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time		
Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
I	gr A	2150	

Maximum dry density obtained from:  STD. test  MOD. Test  Estimated  Control strip

Sample(s) secured:  Yes  No

If yes, specify testing to be done:  
 Proctor  STD.  MOD.  Gradation

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
①	About 5m B of West end	Top of Base	I	2142	6.3	99	98	C
②	" 20m B " "	base "	I	2162	6.9	100	"	C
③	" 35m B " "	"	I	2155	7.2	100	"	C
④	" 50m B " "	"	I	2159	7.8	100	"	C
⑤	" 65m B " "	"	I	2158	8.0	100	"	C
⑥	" 80m B " "	"	I	2163	7.6	100	"	C
⑦	" 95m B " "	"	I	2140	7.8	99	"	C
⑧	" 110m B " "	"	I	2142	6.8	99	"	C
⑨	" 125m B " "	"	I	2152	7.0	100	"	C
⑩	" 140m B " "	"	I	2135	7.4	99	"	C
⑪	" 155m B " "	"	I	2140	8.0	99	"	C
⑫	" 170m B " "	"	I	2132	7.9	99	"	C
⑬	" 195m B " "	"	I	2140	7.6	99	"	C
⑭	" 220m B " "	"	I	2160	8.1	7.0	"	C

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Gauge No. <u>7825</u>	Calibration	Field Reading	Variation %
	Density	<u>3419.5</u>	<u>3394</u>	<u>1%</u>
	Moisture	<u>405.3</u>	<u>394</u>	<u>2%</u>

Gauge standard counts (acceptable variation: density 2%, moisture 4%)

Site rep.: Burrows, Site Superintendent Prepared by: Red Shamir Hamer  
 Of: GHD Ltd Reviewed by: [Signature]

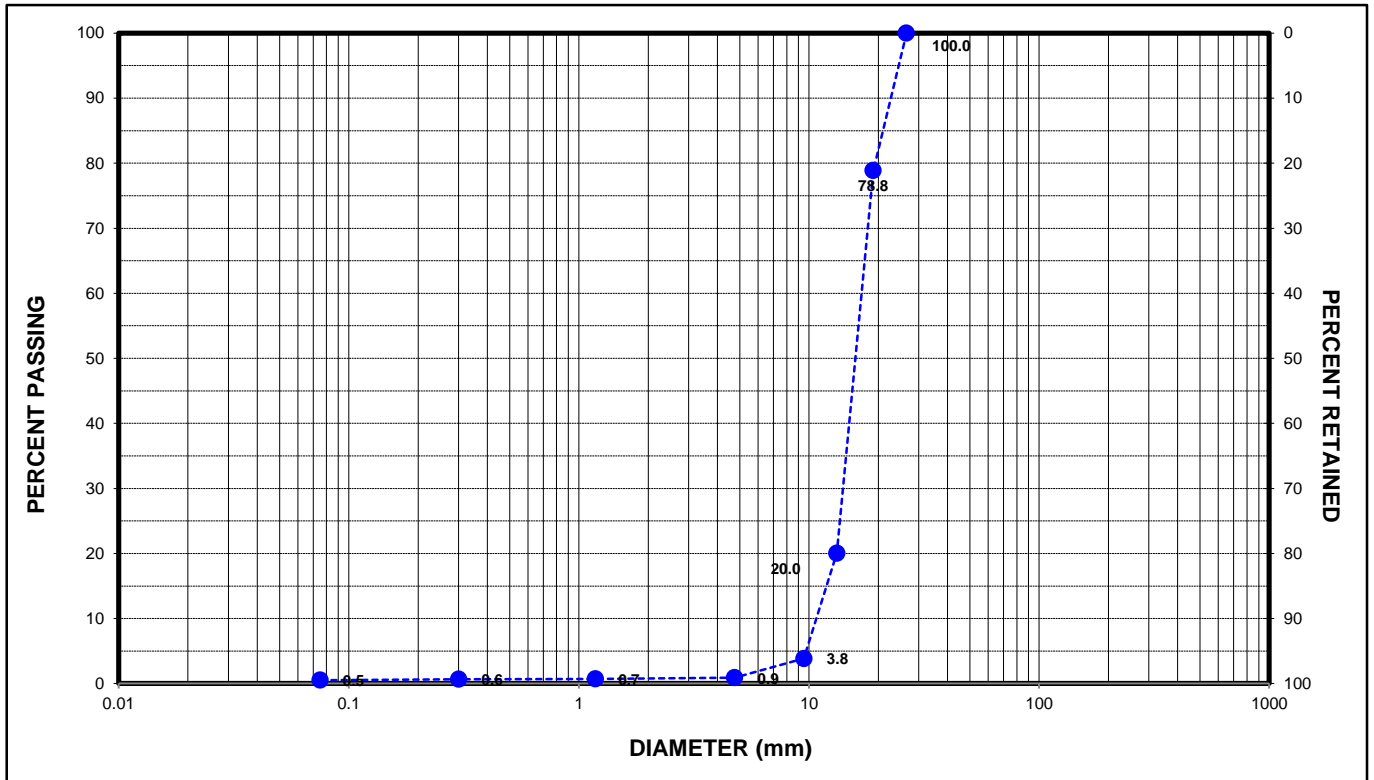


# SIEVE ANALYSIS-CLEAR STONE (LS-602)

<b>Client:</b>	<u>GHD</u>	<b>Lab no.:</b>	<u>S1307</u>
<b>Project/Site:</b>	<u>Stoney Creek Landfill Phase 8A</u>	<b>Project no.:</b>	<u>11103232b1</u>

Source:	<u>Onsite Stockpile</u>		
Sampled by:	<u>Zafar</u>	Date sampled:	<u>November 17, 2016</u>

Sieve Size (mm)	Sample % Passing	OPSS 1010 Gradation Specification	
		Minimum %	Maximum %
26.5	<b>100.0</b>	N/A	
19.0	<b>78.8</b>		
13.2	<b>20.0</b>		
9.50	<b>3.8</b>		
4.75	<b>0.9</b>		
1.180	<b>0.7</b>		
0.300	<b>0.6</b>		
0.075	<b>0.5</b>		



<b>Remarks:</b>	<u>Clear Stone</u>
-----------------	--------------------

<b>Performed by:</b>	<u>Jason Christian</u>	<b>Date:</b>	<u>December 13, 2016</u>
<b>Verified by:</b>	<u>Raj Kadia C.E.T</u>	<b>Date:</b>	<u>December 14, 2016</u>

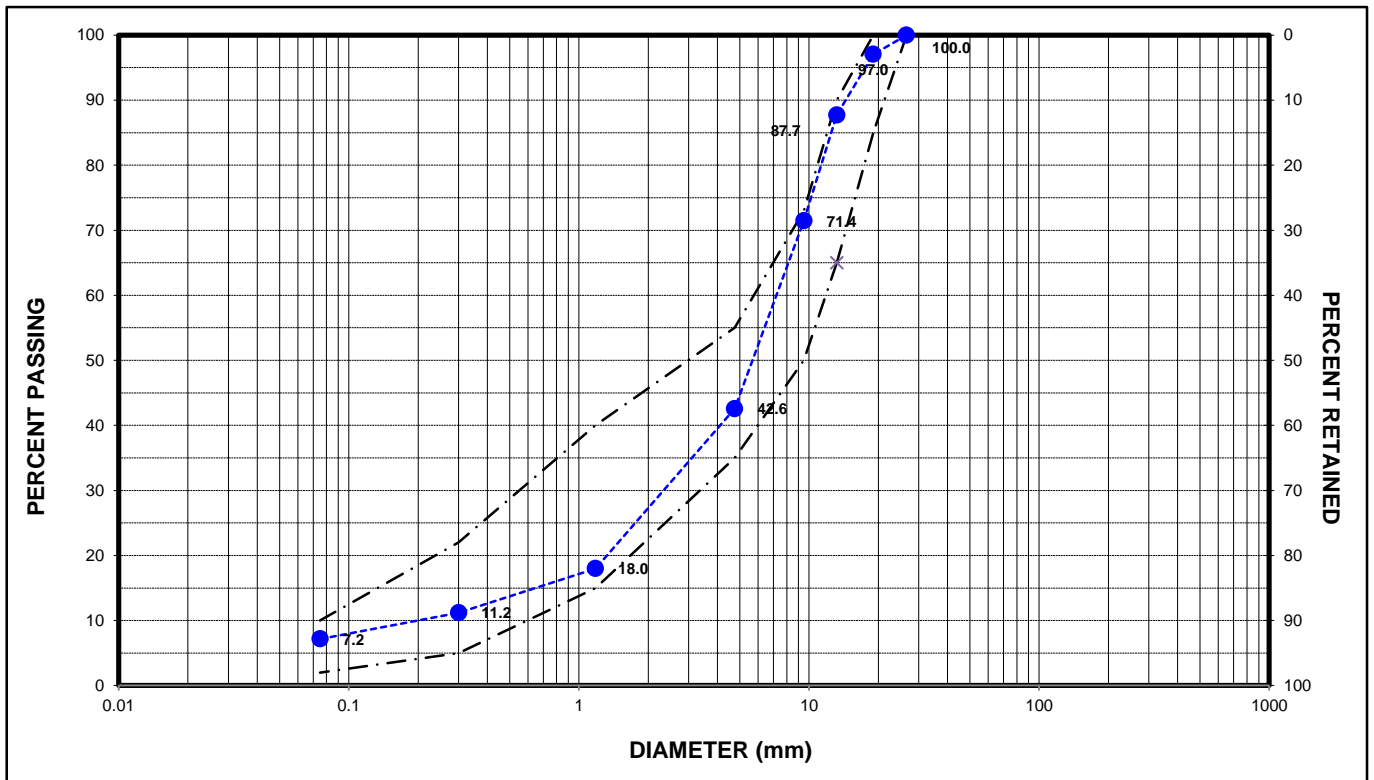


## GRANULAR A - SIEVE ANALYSIS (QUARRY) (LS-602)

<b>Client:</b>	<u>GHD Ltd.</u>	<b>Lab no.:</b>	<u>S1308</u>
<b>Project/Site:</b>	<u>Stoney Creek Landfill Phase 8A</u>	<b>Project no.:</b>	<u>11103232b1</u>

Source:	<u>Crusher Plant</u>		
Sampled by:	<u>Z.Y</u>	Date sampled:	<u>November 30, 2016</u>

Sieve Size (mm)	Sample % Passing	OPSS 1010 Gradation Specification	
		Minimum %	Maximum %
26.5	<b>100.0</b>	100	-
19.0	<b>97.0</b>	85	100
13.2	<b>87.7</b>	65	90
9.50	<b>71.4</b>	50	73
4.75	<b>42.6</b>	35	55
1.180	<b>18.0</b>	15	40
0.300	<b>11.2</b>	5	22
0.075	<b>7.2</b>	2	10



**Remarks:** Granular A (Composite mixture of crushed limestone, shale, brick fragments and gravel)  
 Sample meets the OPSS specifications for: GRANULAR A - SIEVE ANALYSIS (QUARRY)

<b>Performed by:</b>	<u>Aaron Emmanuel</u>	<b>Date:</b>	<u>December 13, 2016</u>
<b>Verified by:</b>	<u>Raj Kadia C.E.T</u>	<b>Date:</b>	<u>December 15, 2016</u>



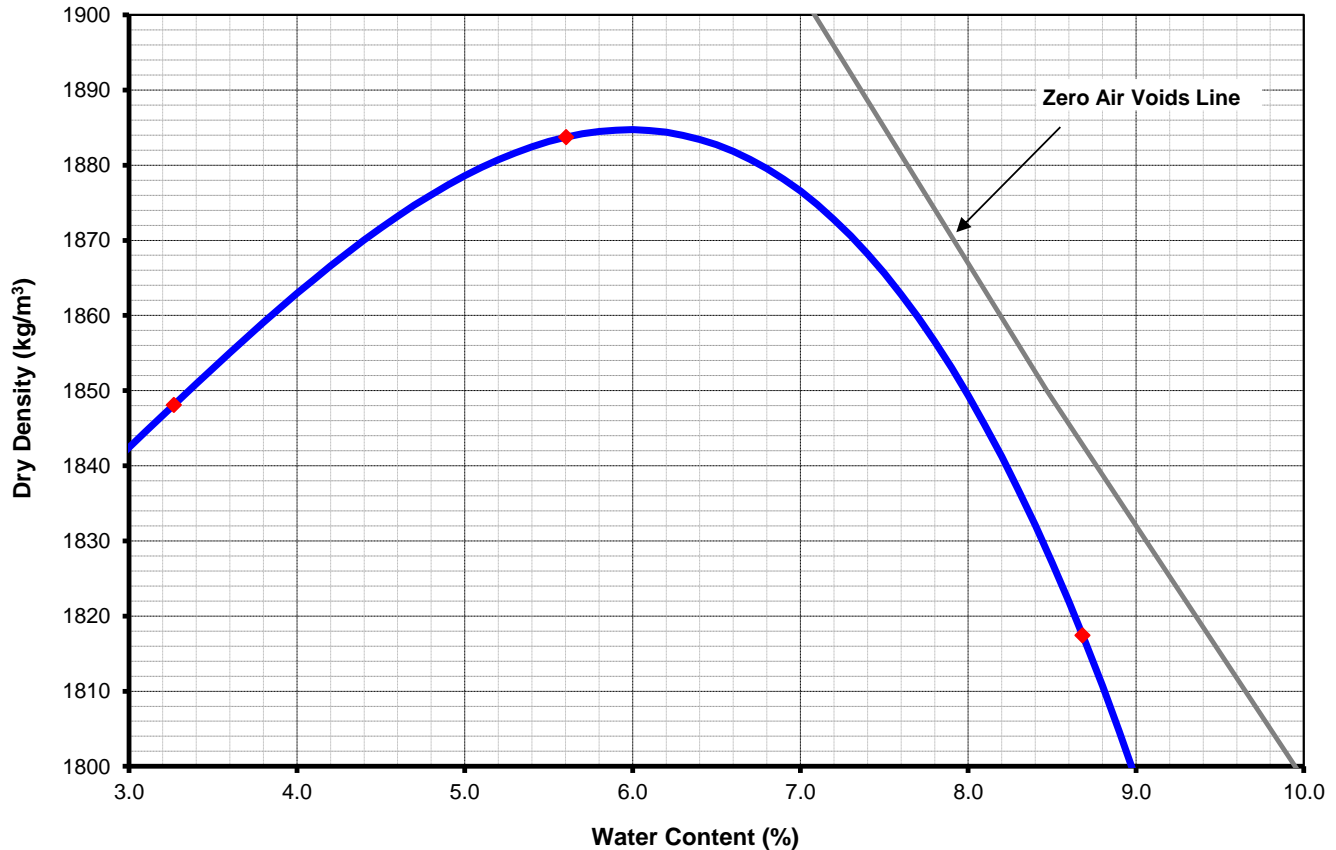
# Standard Proctor Test (ASTM D698)

Client : G.H.D

Lab No : S1308

Project/Site : Stoney Creek Landfill Phase 8A

Project No : 11103232b1



Prepared Sample: Dry  Moist  Assumed  $G_s$ : 2.75

ASTM D698 Test Method: A  B  C  Type of Hammer: Manual

Soil Type: Granular A  
 Material: Composite mixture of crushed limestone, shale, brick fragments and gravel  
 Proposed Use: Trench Backfill  
 Sample Identification: N/A  
 Sample Location: Crusher Plant  
 Aggregate Supplier / Pit Name: N/A  
 Sample Date: November 30, 2016  
 Sampled By: Zafar

Max. Dry Density:	<b>1885</b> kg/m <sup>3</sup>
Optimum Moisture:	<b>6.0</b> %
% Retained on 19.0 mm:	<b>3.7</b> %
Corrected Dry Density:	<b>1885</b> kg/m <sup>3</sup>
Corrected Opt. Moist.:	<b>6.0</b> %

Remarks : \_\_\_\_\_  
\_\_\_\_\_

Performed by : Rashid Hassan

Date : December 7, 2016

Verified by : Raj Kadia, C.E.T.

Date : December 9, 2016

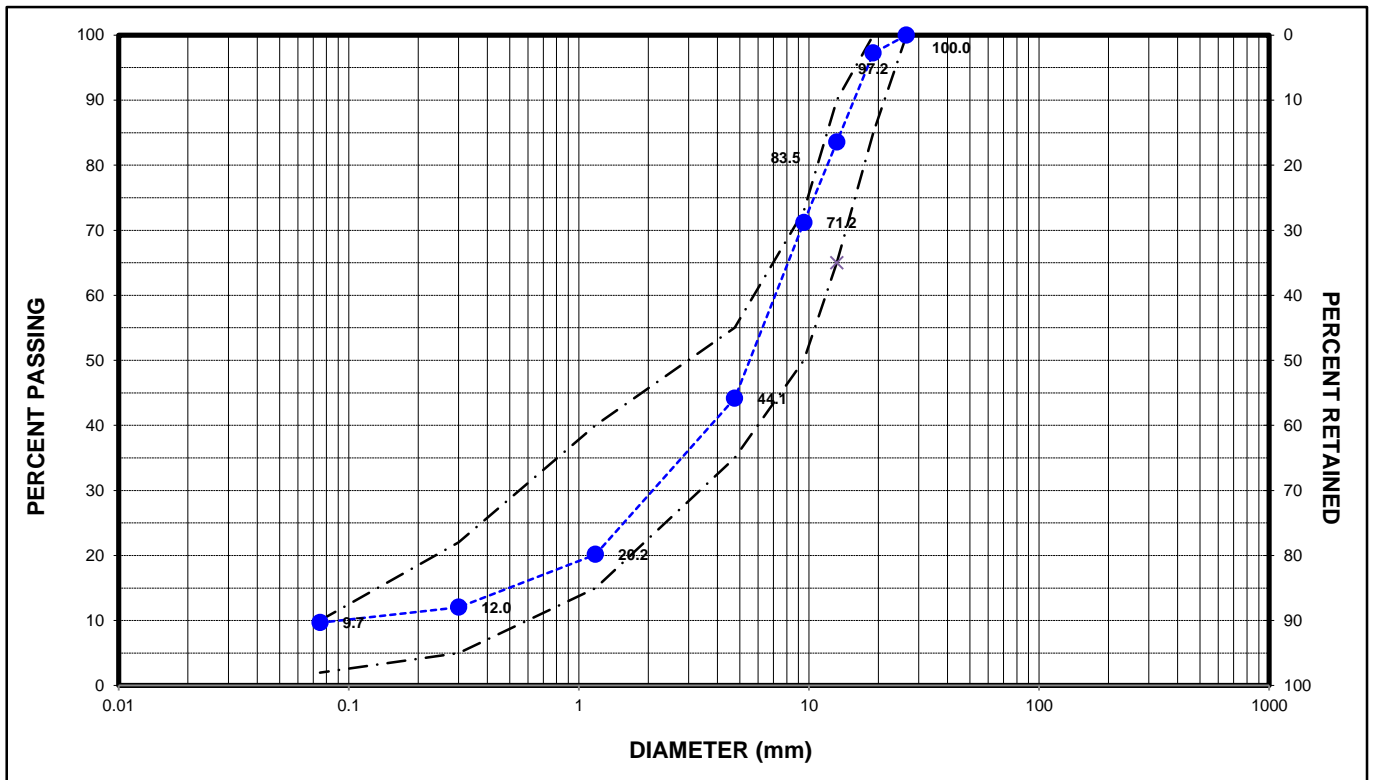


## GRANULAR A - SIEVE ANALYSIS (QUARRY) (LS-602)

<b>Client:</b>	<u>GHD Ltd.</u>	<b>Lab no.:</b>	<u>S1309</u>
<b>Project/Site:</b>	<u>Stoney Creek Landfill Phase 8A</u>	<b>Project no.:</b>	<u>11103232b1</u>

Source:	<u>Onsite Stockpile</u>		
Sampled by:	<u>Z.Y</u>	Date sampled:	<u>November 30, 2016</u>

Sieve Size (mm)	Sample % Passing	OPSS 1010 Gradation Specification	
		Minimum %	Maximum %
26.5	<b>100.0</b>	100	-
19.0	<b>97.2</b>	85	100
13.2	<b>83.5</b>	65	90
9.50	<b>71.2</b>	50	73
4.75	<b>44.1</b>	35	55
1.180	<b>20.2</b>	15	40
0.300	<b>12.0</b>	5	22
0.075	<b>9.7</b>	2	10



**Remarks:** Granular A (Composite mixture of crushed limestone, shale, brick fragments and gravel)  
 Sample meets the OPSS specifications for: GRANULAR A - SIEVE ANALYSIS (QUARRY)

<b>Performed by:</b>	<u>Aaron Emmanuel</u>	<b>Date:</b>	<u>December 14, 2016</u>
<b>Verified by:</b>	<u>Raj Kadia C.E.T</u>	<b>Date:</b>	<u>December 16, 2016</u>



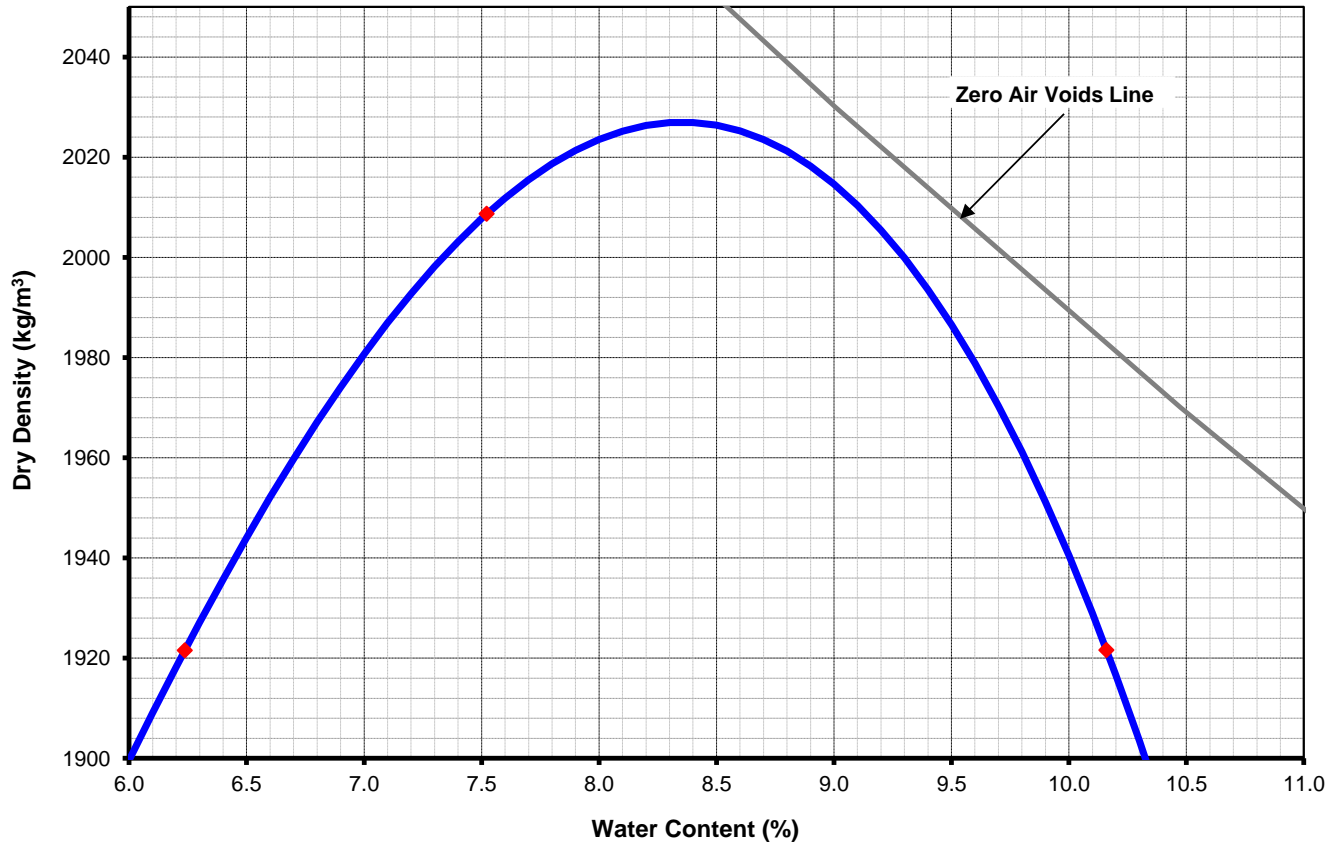
# Standard Proctor Test (ASTM D698)

Client : G.H.D

Lab No : S1309

Project/Site : Stoney Creek Landfill Phase 8A

Project No : 11103232b1



Prepared Sample: Dry  Moist  Assumed G<sub>s</sub>: 2.75

ASTM D698 Test Method: A  B  C  Type of Hammer: Manual

Soil Type: Granular A  
 Material: Composite mixture of crushed limestone, shale, brick fragments and gravel  
 Proposed Use: Trench Backfill  
 Sample Identification: N/A  
 Sample Location: Onsite Stockpile  
 Aggregate Supplier / Pit Name: N/A  
 Sample Date: November 30, 2016  
 Sampled By: Zafar

Max. Dry Density:	<b>2027</b> kg/m <sup>3</sup>
Optimum Moisture:	<b>8.4</b> %
% Retained on 19.0 mm:	<b>3.1</b> %
Corrected Dry Density:	<b>2027</b> kg/m <sup>3</sup>
Corrected Opt. Moist.:	<b>8.4</b> %

Remarks : \_\_\_\_\_  
\_\_\_\_\_

Performed by : Zafar Yaseen

Date : December 6, 2016

Verified by : Raj Kadia, C.E.T.

Date : December 9, 2016



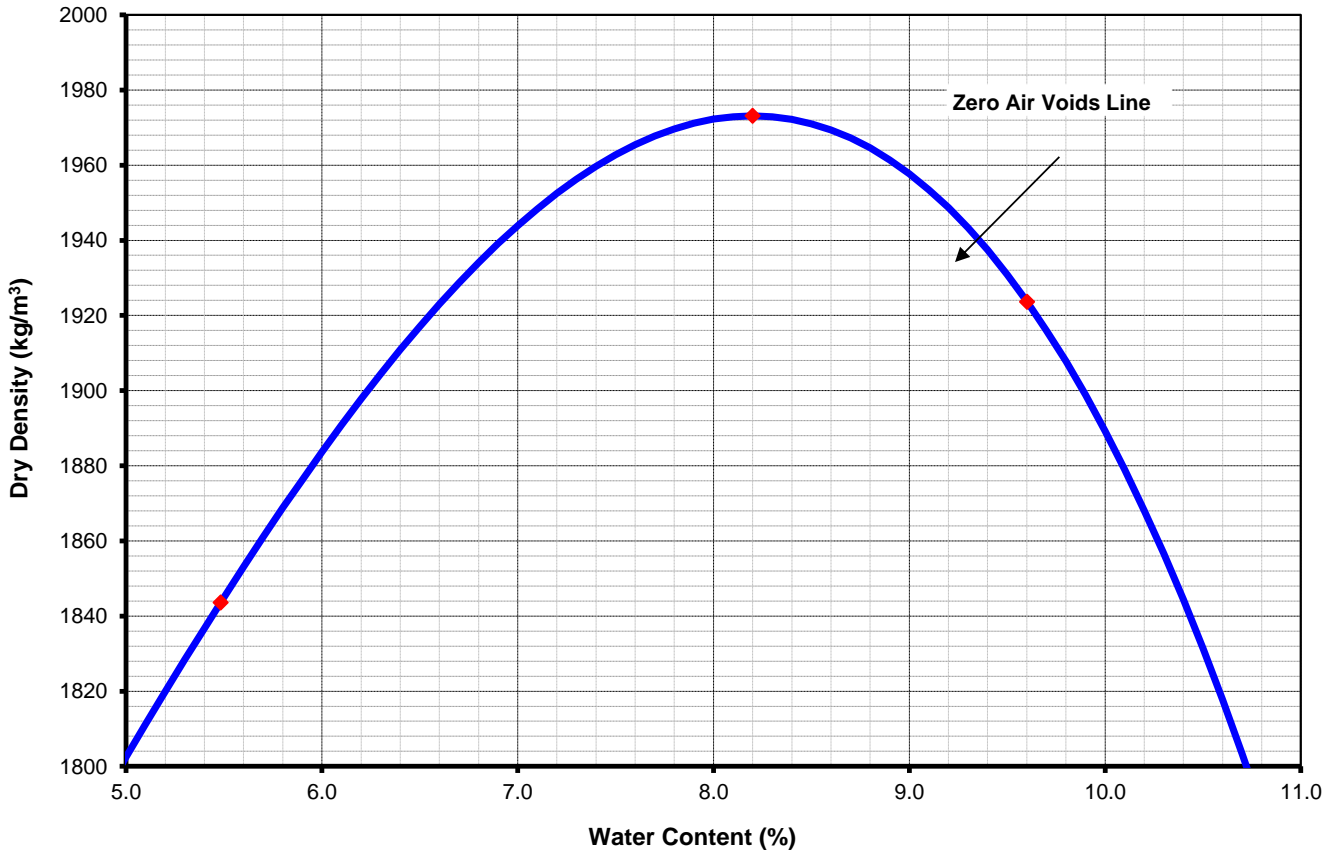
# Standard Proctor Test (ASTM D698)

Client : GHD Ltd.

Lab No : S1310

Project/Site : Stoney Creek Landfill Phase 8A

Project No : 11103232b1



Prepared Sample: Dry  Moist  Assumed G<sub>s</sub>: 2.75

ASTM D698 Test Method: A  B  C  Type of Hammer: Manual

Soil Type: Silty Clay with Crushed and Natural Gravel

Material: Native

Proposed Use: Fill

Sample Identification: Onsite Stockpile

Sample Location: N/A

Aggregate Supplier / Pit Name: N/A

Sample Date: November 30, 2016

Sampled By: Zafar

Max. Dry Density:	<b>1973</b> kg/m <sup>3</sup>
Optimum Moisture:	<b>8.2</b> %
% Retained on 4.75 mm:	<b>6.1</b> %
Corrected Dry Density:	<b>2006</b> kg/m <sup>3</sup>
Corrected Opt. Moist.:	<b>7.7</b> %

Remarks : \_\_\_\_\_

Performed by : Aaron Emmanuel

Date : December 12, 2016

Verified by : Raj Kadia, C.E.T.

Date : December 14, 2016



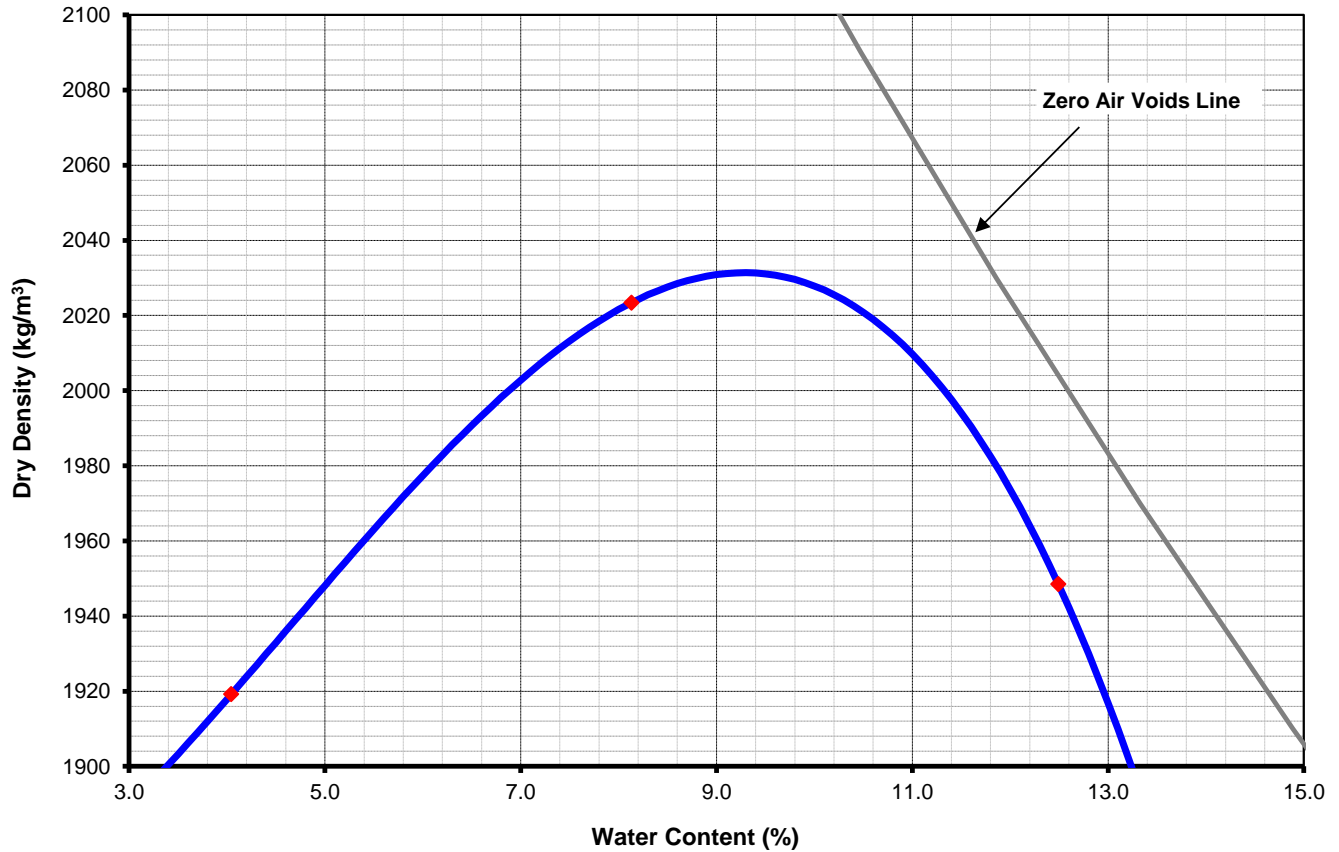
# Standard Proctor Test (ASTM D698)

Client : GHD Ltd.

Lab No : S1311

Project/Site : Stoney Creek Landfill Phase 8A

Project No : 11103232b1



Prepared Sample: Dry  Moist  Assumed  $G_s$ : 2.75

ASTM D698 Test Method: A  B  C  Type of Hammer: Manual

Soil Type: Silty Clay with Some Crushed and Natural Gravel

Material: Native

Proposed Use: Backfilling

Sample Identification: Onsite Stockpile

Sample Location: N/A

Aggregate Supplier / Pit Name: N/A

Sample Date: November 30, 2016

Sampled By: Z.Y

Max. Dry Density:	<b>2031</b>	<b>kg/m<sup>3</sup></b>
Optimum Moisture:	<b>9.3</b>	<b>%</b>
% Retained on 4.75 mm:	<b>3.9</b>	<b>%</b>
Corrected Dry Density:	<b>2031</b>	<b>kg/m<sup>3</sup></b>
Corrected Opt. Moist.:	<b>9.3</b>	<b>%</b>

Remarks : \_\_\_\_\_

Performed by : Abdou Diallo

Date : December 14, 2016

Verified by : Raj Kadia, C.E.T.

Date : December 16, 2016



# Appendix D2

## Results Dated August 30, 2017



August 30, 2017

Reference No. 11103232

Mr. Brian Dermody  
GHD Limited  
184 Front Street East Suite 302  
Toronto Ontario  
M5A 4N3

Dear Mr. Dermody:

**Re: Field Compaction Report  
Terrapure-Stoney Creek Landfill  
65 Green Mountain Road W, Hamilton, Ontario**

This report presents the results of field (compaction) and laboratory testing carried out by GHD Limited at the above noted project site. The purpose of the field and laboratory testing was to determine the degree of compaction achieved on the granular materials being used for backfilling of the groundwater collection trench, and on the native materials being used to backfill service trenches and as engineered fill to raise grades on the site.

## 1. Summary of Site Inspections

Site inspections were carried out during the period between July 6 and August 22, 2017, by one of our technicians. During our visits, a total of one hundred and twenty eight (128) in-situ density (compaction) tests were conducted using a nuclear density gauge. The compaction tests were carried out on the granular materials being used to backfill service trenches and to raise grades across the site and on the granular material being used to backfill the groundwater collection trench.

The averaged measured degree of compaction of the granular materials was about 99 percent estimated Standard Proctor Maximum Dry Density (SPMDD), after retesting.

It is noted that on July 28, 2017, four (4) out of six (6) compaction tests carried out on the native materials being used for backfilling of the service trench didn't meet the project specifications due to elevated moisture content. The area was re tested for compaction on July 31, 2017 and the test results met the project specifications.

On August 18, 2017, five (5) compaction tests carried out on the native materials being used as engineered fill to raise grades didn't meet the project specifications due to elevated moisture content. The areas were re tested for compaction on August 21, 2017 and the test results met the project specifications.

Details of our inspections and individual test locations are enclosed.



## 2. Laboratory Test Results

Laboratory testing was carried out on representative samples of the native materials for standard proctor test.

The results are summarized as follows:

Material	Lab Sample Number	Standard Proctor Maximum Dry Density (SPMDD) (kg/m <sup>3</sup> )	Optimum Water Content (%)
Excavated materials (Silty Clay with crushed stone and gravel)	S1417	2000	11.5
Excavated materials (Silty Clay with crushed stone and gravel)	S1429	2043	9.6

The results of laboratory testing are attached for reference.

## 3. Discussion

It is understood that the project specifications require the granular materials being used for backfilling of the groundwater collection trench, and the native materials being used to backfill service trenches and as engineered fill to raise grades to be compacted to a minimum of at least 98 percent SPMDD. Based on the field and laboratory test results, compaction of the materials in the areas tested meets the specifications.

We trust that this information meets with your approval. Please do not hesitate to contact us, should any questions arise.

Sincerely,

GHD

Rajendra Kadia, B.Eng., C.E.T.

RK/ss/3

Encl.

Karl Roegner, M.A.Sc., P. Eng.

# Attachments

# Attachment A Field and Laboratory Test Results



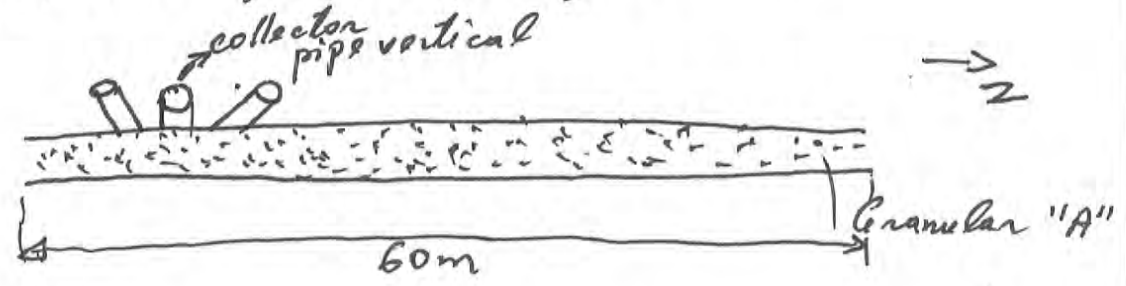
# Field Report

Project No.: 11103232	Date: 2017/07/06
Client: GHD LEA	Contractor:
Project: Terrapine - Stony Creek Landfill	<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing base evaluation <input type="checkbox"/> Subgrade evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Other (specify):
Location: 65 Green Mountain Rd Hamilton, ON	<input type="checkbox"/> Roofing <input type="checkbox"/> Structural steel <input type="checkbox"/> Reinforcing steel <input type="checkbox"/> Sampling <input type="checkbox"/> Asphalt paving

Field results      Temperature: 26 °C

The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test within the Groundwater collection trench. The contractor used the Granular "A" material, mixt with crushed limestone, shale and gravel.

After using a nuclear density gauge, all tests results showed 98% to 100% spmBS, which met the project specifications. (see sketch below for location)



Corrective action to be taken:

---

Follow up visit required:       Yes       No

Site Rep.: B. Dermody, site super	Prepared by: A.D
Of: GHD LEA	Reviewed by:







# Field Report

Project No.: 11103232	Date: 2017/07/07
Client: GHS Ltd	Contractor:
Project: Terrapure stoney creek landfill	<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing base evaluation <input type="checkbox"/> Subgrade evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Other (specify):
Location: 65 Green Mountain Rd Hamilton, ON	<input type="checkbox"/> Roofing <input type="checkbox"/> Structural steel <input type="checkbox"/> Reinforcing steel <input type="checkbox"/> Sampling <input type="checkbox"/> Asphalt paving

Field results      Temperature: 30°C







The above noted site was visited by GHD representatives as requested. The purpose of the visit was to conduct the compaction test on the excavated materials (silty clay with crushed stone and gravel) being used as Engineered fill for raising site grades. After using a nuclear density gauge, all test results varied from 95% to 98% spm00, which met the project specifications.

Corrective action to be taken:

Follow up visit required:       Yes       No

Site Rep.: B. Dermody	Prepared by: AJ
Of: GHD <i>Brian Dermody</i>	Reviewed by: <i>[Signature]</i>





# Soil Compaction Verification Report

Page of

Project no.: <u>11103232</u> Client: <u>GHD Ltd</u> Project: <u>Terrapure Stony Creek Landfill</u> Location: <u>65 Green Mountain Rd, Hamilton</u>	Date: <u>2017/07/07</u> Contractor: Site visit type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
---	---

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>silty clay with crushed stone &amp; gravel</u>	<u>2006</u>	<u>7.7</u>

Maximum dry density obtained from:  STD. test  MOD. Test  Estimated  Control strip

Sample(s) secured:  Yes  No

If yes, specify testing to be done:  
 Proctor  STD.  MOD.  Gradation

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<u>Refer all HDPE collector pipe vertical</u>							
<u>(1)</u>	<u>about 5m E &amp; 10m N</u>	<u>1st lift</u>	<u>I</u>	<u>1707</u>	<u>10.3</u>	<u>85</u>	<u>95</u>	<u>NC</u>
<u>(2)</u>	<u>Repeat test (1)</u>	<u>-11-</u>	<u>I</u>	<u>1836</u>	<u>9.8</u>	<u>91</u>	<u>95</u>	<u>NC</u>
<u>(3)</u>	<u>Repeat test (2)</u>	<u>-11-</u>	<u>I</u>	<u>1913</u>	<u>10.0</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(4)</u>	<u>about 6m E &amp; 40m N</u>	<u>2nd lift</u>	<u>I</u>	<u>1730</u>	<u>7.8</u>	<u>86</u>	<u>95</u>	<u>NC</u>
<u>(5)</u>	<u>Repeat test (4)</u>	<u>-11-</u>	<u>I</u>	<u>1865</u>	<u>8.0</u>	<u>93</u>	<u>95</u>	<u>NC</u>
<u>(6)</u>	<u>Repeat test (5)</u>	<u>-11-</u>	<u>I</u>	<u>1917</u>	<u>8.2</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(7)</u>	<u>about 3m W &amp; 16m N</u>	<u>3rd lift</u>	<u>I</u>	<u>1935</u>	<u>11.6</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(8)</u>	<u>about 4m E &amp; 50m N</u>	<u>4th lift</u>	<u>I</u>	<u>1967</u>	<u>11.4</u>	<u>98</u>	<u>95</u>	<u>C</u>
<u>(9)</u>	<u>about 2m W &amp; 32m N</u>	<u>5th lift</u>	<u>I</u>	<u>1941</u>	<u>9.9</u>	<u>97</u>	<u>95</u>	<u>C</u>

Action: C = Complying to spec. NC = Not complying to spec.

Comments:

Gauge No.	Calibration	Field Reading	Variation %
<u>7830</u>			
Density	<u>3056</u>	<u>3069</u>	<u>0.4</u>
Moisture	<u>391</u>	<u>398.3</u>	<u>1.9</u>

Gauge standard counts (acceptable variation: density 2%, moisture 4%)


Site rep.: B. Dermody - site super Prepared by: A.D  
 Of: GHD Firm Reviewed by: [Signature]






# Field Report

Project No.: 11103232	Date: 2017/07/10
Client: GHD Ltd	Contractor:
Project: Terrapine stoney creek landfill	<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing base evaluation <input type="checkbox"/> Subgrade evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Other (specify):
Location: 65 Green Mountain Rd Hamilton	<input type="checkbox"/> Roofing <input type="checkbox"/> Structural steel <input type="checkbox"/> Reinforcing steel <input type="checkbox"/> Sampling <input type="checkbox"/> Asphalt paving

Field results      Temperature: 21 °C








The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the Excavated materials (silty clay with crushed stone and gravel), being used for raising the site grades (Engineered fill). After using a nuclear density gauge, all test results showed 95% to 98% spmDD, which met the project specifications.

Corrective action to be taken:

---

Follow up visit required:       Yes       No

Site Rep.:	Prepared by: A.D
Of:	Reviewed by: 





# Soil Compaction Verification Report

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Project no.: <u>11103232</u> Client: <u>GHD Ltd</u> Project: <u>Terrapure Stony Creek Landfill</u> Location: <u>65 Green Mountain Rd, Hamilton</u>	Date: <u>2017/07/10</u> Contractor: Site visit type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
---	---

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>silty clay with crushed stone &amp; gravel</u>	<u>2006</u>	<u>7.7</u>

Maximum dry density obtained from:  STD. test  MOD. Test  Estimated  Control strip

Sample(s) secured:  Yes  No

If yes, specify testing to be done:  
 Proctor  STD.  MOD.  Gradation

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<u>Refer at HAPE collector pipe vertical</u>							
<u>(1)</u>	<u>about 3.5m W &amp; 50m N</u>	<u>1st lift</u>	<u>I</u>	<u>1926</u>	<u>9.8</u>	<u>96</u>	<u>95</u>	<u>c</u>
<u>(2)</u>	<u>about 6m E &amp; 27m N</u>	<u>-11-</u>	<u>I</u>	<u>1935</u>	<u>10.3</u>	<u>96</u>	<u>95</u>	<u>c</u>
<u>(3)</u>	<u>about 3m E &amp; 40m N</u>	<u>2nd lift</u>	<u>I</u>	<u>1938</u>	<u>9.5</u>	<u>97</u>	<u>95</u>	<u>c</u>
<u>(4)</u>	<u>about 7m E &amp; 10m N</u>	<u>3rd lift</u>	<u>I</u>	<u>1872</u>	<u>11.4</u>	<u>93</u>	<u>95</u>	<u>NC</u>
<u>(5)</u>	<u>Repeat test (4)</u>	<u>-11-</u>	<u>I</u>	<u>1907</u>	<u>11.5</u>	<u>95</u>	<u>95</u>	<u>c</u>
<u>(6)</u>	<u>about 2.5m W &amp; 25m N</u>	<u>4th lift</u>	<u>I</u>	<u>1963</u>	<u>10.6</u>	<u>98</u>	<u>95</u>	<u>c</u>
<u>(7)</u>	<u>about 6m E &amp; 55m N</u>	<u>5th lift</u>	<u>I</u>	<u>1942</u>	<u>11.0</u>	<u>97</u>	<u>95</u>	<u>c</u>
<u>(8)</u>	<u>about 9m E &amp; 20m N</u>	<u>-11-</u>	<u>I</u>	<u>1915</u>	<u>11.8</u>	<u>95</u>	<u>95</u>	<u>c</u>

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Gauge No. <u>7830</u>	Calibration	Field Reading	Variation %
	Density	<u>3056</u>	<u>3047.7</u>	<u>0.3</u>
	Moisture	<u>391</u>	<u>396.9</u>	<u>1.5</u>

Gauge standard counts (acceptable variation: density 2%, moisture 4%)

Site rep.: \_\_\_\_\_ Prepared by: A.D.

Of: \_\_\_\_\_ Reviewed by: \_\_\_\_\_



# Field Report

Project No.: 11103232	Date: 2017/07/11
Client: GHD CEA	Contractor: Bufferin
Project: Temperature stoney creek land fill	<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing base evaluation <input type="checkbox"/> Subgrade evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Other (specify):
Location: 65 Green Mountain Rd Hamilton, ON	<input type="checkbox"/> Roofing <input type="checkbox"/> Structural steel <input type="checkbox"/> Reinforcing steel <input type="checkbox"/> Sampling <input type="checkbox"/> Asphalt paving

Field results      Temperature: 28 °C








The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the Excavated materials (silty clay with crushed stone and gravel), being used as Engineered fill for raising the site grades. After using a nuclear density gauge, all tests results showed 95% to 97% spm  $\Delta$ , which met the projection specifications. Although the compaction test was found good, but the moisture content was found high. some sponginess were observed in the North side of the inspected area.

Corrective action to be taken:

---

Follow up visit required:       Yes       No

Site Rep.: B. Dermody	Prepared by: A.S
Of:	Reviewed by: 





# Soil Compaction Verification Report

Page of

Project no.: 11103232 Client: GHS Ltd Project: Terrapure stone creek Location: 65 Green Mountain Rd, Hamlet	Date: 2017/07/11 Contractor: Buffen's Site visit type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
--	---

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
I	silty clay with crushed stone & gravel	2006	7.7

Maximum dry density obtained from:  STD. test  MOD. Test  Estimated  Control strip

Sample(s) secured:  Yes  No

If yes, specify testing to be done:  
 Proctor  STD.  MOD.  Gradation

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	Refer all HDPE collector pipe vertical							
(1)	about 3m E & 52m N	1st lift	I	1824	12.5	91	95	NC
(2)	Repeat test (1)	-11-	I	1903	12.0	95	95	C
(3)	about 6m E & 12m N	-11-	I	1921	10.8	96	95	C
(4)	about 18m E & 25m N	2nd lift	I	1910	11.1	95	95	C
(5)	about 5m E & 45m N	3rd lift	I	1849	12.3	92	95	NC
(6)	Repeat test (5)	-11-	I	1917	12.1	95	95	C
(7)	about 10m E & 33m N	4th lift	I	1936	10.2	96	95	C
(8)	about 4m E & 8m N	5th lift	I	1943	9.3	97	95	C
(9)	about 15m E & 20m N	6th lift	I	1907	9.8	95	95	C
(10)	about 6m E & 49m N	-11-	I	1923	11.0	96	95	C

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Gauge No. 7880	Calibration	Field Reading	Variation %
	Density	3056	3050.3	0.2
	Moisture	391	386.3	1.2

Gauge standard counts (acceptable variation: density 2%, moisture 4%)

Site rep.: B. Dermody Prepared by: A.D.

Of: \_\_\_\_\_ Reviewed by: [Signature]



# Field Report

Project No.: 11103232	Date: 2017/07/12
Client: GHD Ltd	Contractor: <i>bufferin</i>
Project: <i>Tennapure stoney creek Land fill</i>	<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing base evaluation <input type="checkbox"/> Subgrade evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Other (specify):
Location: <i>65 Green Mountain Rd Hamilton, Ont</i>	<input type="checkbox"/> Roofing <input type="checkbox"/> Structural steel <input type="checkbox"/> Reinforcing steel <input type="checkbox"/> Sampling <input type="checkbox"/> Asphalt paving

Field results      Temperature: *24* °C







The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the Excavated materials (silty clay with crushed stone and gravel) being used as Engineered fill for raising the site grades. The nuclear density gauge was committed out to check the compaction. All tests results varied from 95% to 99% spm00, which met the project specifications.

Corrective action to be taken:

---

Follow up visit required:       Yes       No

Site Rep.: <i>B. Dermody</i>	Prepared by: <i>A.S</i>
Of: <i>GHD</i>	Reviewed by: <i>[Signature]</i>





# Soil Compaction Verification Report

Page of

Project no.: <u>11103232</u> Client: <u>GHD Ltd</u> Project: <u>Temperature storage creek</u> Location: <u>65 Green Mountain Rd,</u>	Date: <u>2017/07/12</u> Contractor: <u>Duffin</u> Site visit type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
---	---

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>silty clay with crushed stone &amp; gravel</u>	<u>2006</u>	<u>7.7</u>

Maximum dry density obtained from:  STD. test  MOD. Test  Estimated  Control strip

Sample(s) secured:  Yes  No

If yes, specify testing to be done:  
 Proctor  STD.  MOD.  Gradation

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<u>Refer at HDPE collector pipe vertical</u>							
<u>(1)</u>	<u>about 4m E &amp; 40m N</u>	<u>1st lift</u>	<u>I</u>	<u>1898</u>	<u>11.9</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(2)</u>	<u>about 15m E &amp; 20m N</u>	<u>-11-</u>	<u>I</u>	<u>1929</u>	<u>10.8</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(3)</u>	<u>about 1m W &amp; 39m N</u>	<u>2nd lift</u>	<u>I</u>	<u>1951</u>	<u>11.2</u>	<u>97</u>	<u>95</u>	<u>C</u>
<u>(4)</u>	<u>about 18m E &amp; 10m N</u>	<u>-11-</u>	<u>I</u>	<u>1864</u>	<u>11.5</u>	<u>93</u>	<u>95</u>	<u>NC</u>
<u>(5)</u>	<u>Repeat test (4)</u>	<u>-11-</u>	<u>I</u>	<u>1922</u>	<u>11.3</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(6)</u>	<u>about 9m E &amp; 45m N</u>	<u>3rd lift</u>	<u>I</u>	<u>1972</u>	<u>10.4</u>	<u>98</u>	<u>95</u>	<u>C</u>
<u>(7)</u>	<u>about 14m E &amp; 8m N</u>	<u>4th lift</u>	<u>I</u>	<u>1991</u>	<u>11.0</u>	<u>99</u>	<u>95</u>	<u>C</u>
<u>(8)</u>	<u>about 2m W &amp; 36m N</u>	<u>5th lift</u>	<u>I</u>	<u>1938</u>	<u>10.6</u>	<u>97</u>	<u>95</u>	<u>C</u>
<u>(9)</u>	<u>about 11m E &amp; 25m N</u>	<u>-11-</u>	<u>I</u>	<u>1987</u>	<u>10.3</u>	<u>99</u>	<u>95</u>	<u>C</u>

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Gauge No. <u>7830</u>	Calibration	Field Reading	Variation %
	Density	<u>3056</u>	<u>3063.1</u>	<u>0.2</u>
	Moisture	<u>391</u>	<u>399.2</u>	<u>2.0</u>

Gauge standard counts (acceptable variation: density 2%, moisture 4%)








Site rep.: \_\_\_\_\_ Prepared by: A.J

Of: \_\_\_\_\_ Reviewed by: H





# Field Report

Project No.: 11103232		Date: 2017/07/18	
Client: GHD		Contractor: Jufferin	
Project: Terrapine stoney creek land fill		<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify):	
Location: 65 Green Mountain Rd Hamilton		<input type="checkbox"/> Roofing <input type="checkbox"/> Structural Steel <input type="checkbox"/> Reinforcing Steel <input type="checkbox"/> Sampling	
Field Results		Temperature: 28 °C     	
<p>The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the following materials:</p> <ul style="list-style-type: none"> <li>- Granular "A" being used as base on top of the pipe (ground water collection system).</li> <li>- silty clay with crushed and natural gravel, being used for raising the site grades (Trench backfill).</li> </ul> <p>After using a nuclear density gauge, all test results showed:</p> <ul style="list-style-type: none"> <li>- 98% to 100% spm00 for the Granular "A", which met the project specifications.</li> <li>- 89% to 97% spm00 for the Engineered fill. Some areas did not meet the project specifications. Those areas were observed wet and spongy. It was recommended that, to let it dry, before placement of the second layer. (see the soil compaction verification report for more details).</li> </ul> <p>Corrective action to be taken:</p>			
Follow up visit required:		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Site Rep.: B. Dermody		Prepared By: A.D	
Of:		Reviewed By: 	
For Internal Use Only		Have: <input type="checkbox"/> JSA/JSEA <input checked="" type="checkbox"/> PPE <input checked="" type="checkbox"/> Training Need S-RAF: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Initials: 	





# Soil Compaction Verification Report

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Project No.: <u>11103232</u>	Date: <u>2017/07/18</u>
Client: <u>GHD</u>	Contractor:
Project: <u>Terrapure stoney creek</u>	Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
Location: <u>65 Green Mountain Rd</u>	

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>Granular "A"</u>	<u>2027</u>	<u>8.4</u>
<u>II</u>	<u>silty clay with crushed and natural gravel</u>	<u>2006</u>	<u>7.7</u>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured:  Yes  No

If yes, specify testing to be done:  
 Proctor  STD.  MOD.  Gradation

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<u>Refer to HDPE collector pipe vertical</u>							
<u>(1)</u>	<u>about 0.5m E of 20ms</u>	<u>final grade</u>	<u>I</u>	<u>1985</u>	<u>9.0</u>	<u>98</u>	<u>98</u>	<u>C</u>
<u>(2)</u>	<u>about 0.5m W of 40ms</u>	<u>-11-</u>	<u>I</u>	<u>2016</u>	<u>9.5</u>	<u>99</u>	<u>98</u>	<u>C</u>
<u>(3)</u>	<u>about 0.5m E of 76ms</u>	<u>-11-</u>	<u>I</u>	<u>1979</u>	<u>8.8</u>	<u>98</u>	<u>98</u>	<u>C</u>
<u>(4)</u>	<u>about 60m N of 20m W</u>	<u>-11-</u>	<u>I</u>	<u>2036</u>	<u>8.0</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(5)</u>	<u>about 62m N of 1m E</u>	<u>-11-</u>	<u>I</u>	<u>2003</u>	<u>9.2</u>	<u>99</u>	<u>98</u>	<u>C</u>
<u>(6)</u>	<u>about 100ms of 7m E</u>	<u>1st lift</u>	<u>II</u>	<u>1905</u>	<u>10.4</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(7)</u>	<u>about 50ms of 10m E</u>	<u>-11-</u>	<u>II</u>	<u>1790</u>	<u>13.8</u>	<u>89</u>	<u>95</u>	<u>NC</u>
<u>(8)</u>	<u>about 80ms of 3m W</u>	<u>-11-</u>	<u>II</u>	<u>1804</u>	<u>12.9</u>	<u>90</u>	<u>95</u>	<u>NC</u>
<u>(9)</u>	<u>about 24ms of 2m E</u>	<u>-11-</u>	<u>II</u>	<u>1942</u>	<u>9.7</u>	<u>97</u>	<u>95</u>	<u>C</u>

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Gauge No. <u>7830</u>	Calibration	Field Reading	Variation %
	Density	<u>3056</u>	<u>3061.4</u>	<u>0.7</u>
	Moisture	<u>391</u>	<u>398.1</u>	<u>1.8</u>

Gauge standard counts (acceptable variation: density 2%, moisture 4%)








Site Rep.: B. Kennedy Prepared By: A.J.

Of: \_\_\_\_\_ Reviewed By: \_\_\_\_\_

For Internal Use Only Have:  JSA/JSEA  PPE  Training Need S-RAF:  Yes  No Initials: JK



# Field Report

Project No.: 11103232		Date: 2017/07/19	
Client: GHD		Contractor: Bufferin	
Project: Terrapine Stony creek land fill		<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify):	
Location: 65 Green Mountain Rd Hamilton		<input type="checkbox"/> Roofing <input type="checkbox"/> Structural Steel <input type="checkbox"/> Reinforcing Steel <input type="checkbox"/> Sampling	
Field Results		Temperature: 26 °C	
    			
<p>The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the Excavated materials (silty clay with crushed and natural gravel) being used for backfilling the trench. Before placing the second layer, the compaction test was carried out on the areas found wet and spongy on 2017/07/18. All tests results varied from 95% to 98% spm 40, which met the project specifications. Although, the compaction test was good, but some areas were observed spongy due probably to high moisture content.</p>			
Corrective action to be taken:			
Follow up visit required: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Site Rep.: B. Dermody		Prepared By: A.D	
Of:		Reviewed By: 	
For Internal Use Only		Have: <input checked="" type="checkbox"/> JSA/JSEA <input checked="" type="checkbox"/> PPE <input checked="" type="checkbox"/> Training Need S-RAF: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
		Initials: 	





# Soil Compaction Verification Report

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Project No.: <u>11103232</u> Client: <u>GHD</u> Project: <u>Terrapine stoney creek</u> Location: <u>65 Green Mountain Rd</u>	Date: <u>2017/07/19</u> Contractor: <u>bufferin</u> Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
---	---

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>silty clay with crushed &amp; natural gravel</u>	<u>2006</u>	<u>7.7</u>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured:  Yes  No

If yes, specify testing to be done:  
 Proctor  STD.  MOD.  Gradation

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<u>Refer to HDPE collector pipe vertical</u>							
<u>(1)</u>	<u>Repeat test (7)</u>	<u>1st lift</u>	<u>I</u>	<u>1903</u>	<u>11.3</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(2)</u>	<u>Repeat test (8)</u>	<u>-11-</u>	<u>I</u>	<u>1919</u>	<u>10.1</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(3)</u>	<u>about 1m W &amp; 58ms</u>	<u>2nd lift</u>	<u>I</u>	<u>1960</u>	<u>9.7</u>	<u>98</u>	<u>95</u>	<u>C</u>
<u>(4)</u>	<u>about 3m E &amp; 91ms</u>	<u>-11-</u>	<u>I</u>	<u>1937</u>	<u>10.0</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(5)</u>	<u>about 10m E &amp; 30ms</u>	<u>3rd lift</u>	<u>I</u>	<u>1906</u>	<u>10.6</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(6)</u>	<u>about 2m E &amp; 10ms</u>	<u>-11-</u>	<u>I</u>	<u>1921</u>	<u>11.0</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(7)</u>	<u>about 8m E &amp; 40ms</u>	<u>4th lift</u>	<u>I</u>	<u>1944</u>	<u>10.8</u>	<u>97</u>	<u>95</u>	<u>C</u>
<u>(8)</u>	<u>about 11m E &amp; 82ms</u>	<u>-11-</u>	<u>I</u>	<u>1928</u>	<u>9.5</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(9)</u>	<u>about 6m E &amp; 50ms</u>	<u>5th lift</u>	<u>I</u>	<u>1930</u>	<u>10.3</u>	<u>96</u>	<u>95</u>	<u>C</u>

see 2017/07/19 report

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Gauge No. <u>7830</u>	Calibration	Field Reading	Variation %
	Density	<u>3056</u>	<u>3050.4</u>	<u>0.2</u>
	Moisture	<u>391</u>	<u>387.8</u>	<u>0.8</u>

Gauge standard counts (acceptable variation: density 2%, moisture 4%)



Site Rep.: B. Dermody Prepared By: A.D

Of: \_\_\_\_\_ Reviewed By: W

For Internal Use Only Have:  JSA/JSEA  PPE  Training Need S-RAF:  Yes  No Initials: W



# Field Report

Project No.: 11103232		Date: 2017/07/26	
Client: GHD		Contractor:	
Project: Terrapene Stony Creek Land fill		<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify):	
Location: 65 Green Mountain Rd Hamilton		<input type="checkbox"/> Roofing <input type="checkbox"/> Structural Steel <input type="checkbox"/> Reinforcing Steel <input type="checkbox"/> Sampling	
Field Results		Temperature: 24 °C	
    			
<p>The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the excavated materials (silty clay with crushed &amp; natural gravel) being used for raising the grades within the trench. After using a nuclear density gauge, all test results varied from 95% to 99% <sup>30mm</sup> which met the project specifications. Some areas were observed spongy due probably to high moisture content.</p>			
Corrective action to be taken:			
Follow up visit required: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Site Rep.:		Prepared By: A.D	
Of:		Reviewed By: MJ	
For Internal Use Only		Have: <input checked="" type="checkbox"/> JSA/JSEA <input checked="" type="checkbox"/> PPE <input type="checkbox"/> Training	
		Need S-RAF: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
		Initials: PJ	







# Field Report

Project no.: 11103232	Date: July 27/17
Client: GHD	Contractor: Dufferin
Project: Terrapure stoney Creek Landfill	<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing base evaluation <input type="checkbox"/> Subgrade evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Other (specify):
Location: 65 Green mountain Rd., Hamilton	<input type="checkbox"/> Roofing <input type="checkbox"/> Structural steel <input type="checkbox"/> Reinforcing steel <input type="checkbox"/> Sampling <input type="checkbox"/> Asphalt paving

Field results      Temperature: 27 °C







The above noted site was visited by GHD representative or requested. The purpose of the visit was to conduct the compaction test on the excavated materials / silty clay with crushed and natural gravel. The material is being used for back filling the trench. Lifts 10 to 12 were tested today. One or two tests were conducted ~~before~~ on each lift. All tests results ~~were~~ met the minimum SPMDD of 95%.

Corrective action to be taken:

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Follow up visit required:       Yes       No

Site rep.: B. Dermody	Prepared by: Ayman Patel
Of: GHD	Reviewed by: 





# Soil Compaction Verification Report

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Project no.: 11103232 Client: GHD Project: Terrapure Stony Creek Location: 65 Green Mountain Rd.	Date: July 27 / 17 Contractor: Dufferin Site visit type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
---	---

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
I	Silty clay with crushed and natural gravel	2006	7.7

Maximum dry density obtained from:  STD. test  MOD. Test  Estimated  Control strip

Sample(s) secured:  Yes  No

If yes, specify testing to be done:  
 Proctor  STD.  MOD.  Gradation

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	Refer at HDPE collection pipe vertical							
1	Approx 27m E & 2.5m N	1 <sup>st</sup> lift	I	1906	12.7	95%	95%	C
<i>~~~~~</i>								
2	Approx 80m E & 1.5m N	11 <sup>th</sup> lift	I	1938	14.1	97%	95%	C
3	Approx 25m E & 0m N	"	I	1904	12.3	95%	95%	C
4	Approx 70m E & 2m N	12 <sup>th</sup> lift	I	1942	9.5	97%	95%	C

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Gauge No. 67405	Calibration	Field Reading	Variation %
	Density	2668	2459	0.4
	Moisture	612	605	1.1%



Gauge standard counts (acceptable variation: density 2%, moisture 4%)

Site rep.: B. Dermody Prepared by: Ayman Patel  
 Of: GHD Reviewed by: H





# Field Report

Project No.: 11103232		Date: 2017/07/28	
Client: GHD		Contractor: bufferin	
Project: Terrapene stoney creek land fill		<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify):	
Location: 65 Green Mountain Rd Hamilton, ON		<input type="checkbox"/> Roofing <input type="checkbox"/> Structural Steel <input type="checkbox"/> Reinforcing Steel <input type="checkbox"/> Sampling	
Field Results		Temperature: 21 °C	
    			
<p>The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the Excavated materials (silty clay with crushed and natural gravel) being used for backfilling the trench. After using a nuclear density gauge, all tests results showed 90% to 95% SPMSD. The first lift met the project specifications (95%) but the second lift did not meet the project specifications. The excavated materials was found in a wet condition and the area was observed very spongy (see the soil compaction verification report for more details). It was recommended that, to let it dry at least 2 sunny days, prior of placement another layer of suitable materials.</p>			
Corrective action to be taken:			
<hr/> <hr/> <hr/>			
Follow up visit required:		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Site Rep.: B. Dermody		Prepared By: A.D	
Of:		Reviewed By: 	
For Internal Use Only		Have: <input type="checkbox"/> JSA/JSEA <input type="checkbox"/> PPE <input type="checkbox"/> Training <input type="checkbox"/> Need S-RAF: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <span style="float: right;">Initials: </span>	





# Soil Compaction Verification Report

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Project No.: <u>11103232</u> Client: <u>GHD</u> Project: <u>Terrapure stone creek</u> Location: <u>65 Green Mountain Rd</u>	Date: <u>2017/07/28</u> Contractor: Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
--	---

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>silty clay with crushed &amp; natural gravel</u>	<u>2006</u>	<u>7.7</u>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured:  Yes  No

If yes, specify testing to be done:  
 Proctor  STD.  MOD.  Gradation

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
<u>(1)</u>	<u>Refer to HDPE collector pipe vertical about 4m E &amp; 45m S</u>	<u>1st lift</u>	<u>I</u>	<u>1872</u>	<u>11.0</u>	<u>93</u>	<u>95</u>	<u>NC</u>
<u>(2)</u>	<u>Repeat test (1)</u>	<u>-11-</u>	<u>I</u>	<u>1908</u>	<u>10.8</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(3)</u>	<u>about 10m E &amp; 90m S</u>	<u>2nd lift</u>	<u>I</u>	<u>1903</u>	<u>10.5</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(4)</u>	<u>about 5m E &amp; 50m S</u>	<u>-11-</u>	<u>I</u>	<u>1836</u>	<u>12.9</u>	<u>91</u>	<u>95</u>	<u>NC</u>
<u>(5)</u>	<u>about 12m E &amp; 26m S</u>	<u>-11-</u>	<u>I</u>	<u>1812</u>	<u>13.5</u>	<u>90</u>	<u>95</u>	<u>NC</u>
<u>(6)</u>	<u>about 8m E &amp; 67m S</u>	<u>-11-</u>	<u>I</u>	<u>1823</u>	<u>13.7</u>	<u>91</u>	<u>95</u>	<u>NC</u>

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Gauge No. <u>7830</u>	Calibration	Field Reading	Variation %
	Density	<u>3056</u>	<u>3049.8</u>	<u>0.2</u>
	Moisture	<u>391</u>	<u>386.6</u>	<u>1.1</u>

Gauge standard counts (acceptable variation: density 2%, moisture 4%)






Site Rep.: B. Sermody Prepared By: A.J.

Of: \_\_\_\_\_ Reviewed By: \_\_\_\_\_

For Internal Use Only Have:  JSA/JSEA  PPE  Training Need S-RAF:  Yes  No Initials: HL



# Field Report

Project No.: 11103232		Date: 2017/07/31	
Client: GHD		Contractor: <i>Dufferin</i>	
Project: <i>Terrapene stoney creek</i>		<input checked="" type="checkbox"/> Compaction	<input type="checkbox"/> Roofing
Location: <i>65 Green Mountain Rd Hamilton, ON</i>		<input type="checkbox"/> Footing base evaluation	<input type="checkbox"/> Structural steel
		<input type="checkbox"/> Subgrade evaluation	<input type="checkbox"/> Reinforcing steel
		<input type="checkbox"/> Concrete	<input type="checkbox"/> Sampling
		<input type="checkbox"/> Other (specify):	<input type="checkbox"/> Asphalt paving
Field results      Temperature: 30 °C		    	
<p>The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the Excavated materials (silty clay with crushed and natural gravel), being used for backfilling the trench. The area which did not meet the compaction on 2017/07/28 has been re-tested (see soil compaction verification report for more details). After using a nuclear density gauge, all test results varied from 95% to 97% SPMDD, which met the project specifications.</p>			
Corrective action to be taken:			
Follow up visit required:		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Site Rep.: <i>B. Dermody</i>		Prepared by: <i>AJD</i>	
Of:		Reviewed by: <i>[Signature]</i>	





# Soil Compaction Verification Report

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Project No.: <u>11103232</u> Client: <u>GHA</u> Project: <u>Terrapine stone creek</u> Location: <u>65 Green Mountain Rd</u>	Date: <u>2017/07/31</u> Contractor: <u>Bufferin</u> Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
--	---

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
I	<u>silty clay with crushed &amp; natural gravel</u>	<u>2006</u>	<u>7.7</u>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured:  Yes  No

If yes, specify testing to be done:  
 Proctor  STD.  MOD.  Gradation

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<u>Refer at HDP E collection pipe vert</u>							
<u>(1)</u>	<u>Repeal test (B) (July 28)</u>	<u>2nd lift</u>	I	<u>1927</u>	<u>10.4</u>	<u>96</u>	<u>95</u>	C
<u>(2)</u>	<u>Repeal test (E) (July 28)</u>	<u>2nd lift</u>	I	<u>1907</u>	<u>10.6</u>	<u>95</u>	<u>95</u>	C
<u>(3)</u>	<u>about 8m E &amp; 83ms</u>	<u>3rd lift</u>	I	<u>1913</u>	<u>11.1</u>	<u>95</u>	<u>95</u>	C
<u>(4)</u>	<u>about 2m E &amp; 30ms</u>	<u>3rd lift</u>	I	<u>1939</u>	<u>10.8</u>	<u>97</u>	<u>95</u>	C
<u>(5)</u>	<u>about 10m E &amp; 60ms</u>	<u>4th lift</u>	I	<u>1932</u>	<u>11.0</u>	<u>96</u>	<u>95</u>	C

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Gauge No. <u>7830</u>	Calibration	Field Reading	Variation %
	Density	<u>305.6</u>	<u>3052.1</u>	<u>0.1</u>
	Moisture	<u>391</u>	<u>395.1</u>	<u>1.0</u>

Gauge standard counts (acceptable variation: density 2%, moisture 4%)

Site Rep.: B. Dermody Prepared By: A.D.  
 Of: \_\_\_\_\_ Reviewed By: \_\_\_\_\_

For Internal Use Only Have:  JSA/JSEA  PPE  Training Need S-RAF:  Yes  No Initials: LD



# Field Report

Project No.: 11103232		Date: 2017/08/02	
Client: GHD		Contractor: Dufferin	
Project: Terrapure Stoney Creek Land fill		<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify):	
Location: 65 Green Mountain Rd Hamilton, ON		<input type="checkbox"/> Roofing <input type="checkbox"/> Structural Steel <input type="checkbox"/> Reinforcing Steel <input type="checkbox"/> Sampling	
Field Results		Temperature: 27 °C	
<p>The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the Excavated materials (silty clay with crushed &amp; natural gravel), being used for backfilling the trench. After using a nuclear density gauge, all tests result showed 95% to 96% SPMDD, which met the project specifications. The inspected area was observed in a wet condition due probably to the overnight rain (see soil compaction verification report for more details).</p>			
Corrective action to be taken:			
Follow up visit required: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Site Rep.: B. Dermody		Prepared By: AD	
Of:		Reviewed By:	
For Internal Use Only    Have: <input type="checkbox"/> JSA/JSEA <input checked="" type="checkbox"/> PPE <input checked="" type="checkbox"/> Training    Need S-RAF: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No    Initials:			





# Soil Compaction Verification Report

Project No.: <u>11103232</u> Client: <u>GHA</u> Project: <u>Terrapine stoney creek</u> Location: <u>65 Green Mountain Rd</u>	Date: <u>2017/08/02</u> Contractor: <u>bufferin</u> Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
---	---

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>silty clay with crushed &amp; natural gravel</u>	<u>2006</u>	<u>7.7</u>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured:  Yes  No

If yes, specify testing to be done:  
 Proctor  STD.  MOD.  Gradation

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<u>Refer to HDPE collector pipe vertical</u>							
<u>(1)</u>	<u>about 10m E of 32mm</u>	<u>1st lift</u>	<u>I</u>	<u>1904</u>	<u>12.3</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(2)</u>	<u>about 12m E of 47mm</u>	<u>1st lift</u>	<u>I</u>	<u>1915</u>	<u>11.7</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(3)</u>	<u>about 8m E of 60mm</u>	<u>1st lift</u>	<u>I</u>	<u>1926</u>	<u>11.8</u>	<u>96</u>	<u>95</u>	<u>C</u>

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Gauge No. <u>7830</u>	Calibration	Field Reading	Variation %
	Density	<u>3056</u>	<u>3049.7</u>	<u>0.2</u>
	Moisture	<u>391</u>	<u>397.2</u>	<u>1.6</u>

Gauge standard counts (acceptable variation: density 2%, moisture 4%)






Site Rep.: \_\_\_\_\_ Prepared By: A.D.

Of: \_\_\_\_\_ Reviewed By: \_\_\_\_\_

For Internal Use Only    Have:  JSA/JSEA  PPE  Training    Need S-RAF:  Yes  No    Initials: AS



# Field Report

Project No.: 11103232		Date: 2017/08/08	
Client: GHD		Contractor: Briffen's	
Project: Terrapure stoney creek		<input checked="" type="checkbox"/> Compaction	<input type="checkbox"/> Roofing
Location: 65 Green Mountain Rd Hamilton, ON		<input type="checkbox"/> Footing Base Evaluation	<input type="checkbox"/> Structural Steel
		<input type="checkbox"/> Subgrade Evaluation	<input type="checkbox"/> Reinforcing Steel
		<input type="checkbox"/> Concrete	<input type="checkbox"/> Sampling
		<input type="checkbox"/> Asphalt Paving	
		<input type="checkbox"/> Other (specify):	
Field Results		Temperature: 26 °C	    
<p>The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the excavated materials (silty clay with crushed and natural gravel), being used for backfilling the trench, after using a nuclear density gauge, all test results showed 95% to 97% SPMDD, which met the project specifications.</p>			
Corrective action to be taken:			
Follow up visit required: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Site Rep.: B. Dermody		Prepared By: AD	
Of:		Reviewed By: PJ	
For Internal Use Only	Have: <input type="checkbox"/> JSA/JSEA <input checked="" type="checkbox"/> PPE <input checked="" type="checkbox"/> Training	Need S-RAF: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Initials: DJ





# Soil Compaction Verification Report

Project No.: <u>11103232</u> Client: <u>GHD</u> Project: <u>Terrapino stoney creek</u> Location: <u>65 Green Mountain Rd</u>	Date: <u>2017/08/08</u> Contractor: <u>bufferin</u> Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
---	---

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>silly clay with crushed &amp; natural gravel</u>	<u>2043</u>	<u>9.6</u>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured: <input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, specify testing to be done: Proctor <input type="checkbox"/> STD. <input type="checkbox"/> MOD. <input type="checkbox"/> Gradation
---	---

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<u>Refer at HOPE col pits pipe vertical</u>							
<u>(1)</u>	<u>about 12m E &amp; 18m S</u>	<u>1st lift</u>	<u>I</u>	<u>1975</u>	<u>9.8</u>	<u>97</u>	<u>95</u>	<u>C</u>
<u>(2)</u>	<u>about 15m E &amp; 20m S</u>	<u>1st lift</u>	<u>I</u>	<u>1951</u>	<u>10.0</u>	<u>95</u>	<u>95</u>	<u>C</u>

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Gauge No.	Calibration	Field Reading	Variation %
	Density			
	Moisture			








Gauge standard counts (acceptable variation: density 2%, moisture 4%)

Site Rep.: <u>B. Dermody</u>	Prepared By: <u>A.D</u>
Of: _____	Reviewed By: <u>[Signature]</u>

For Internal Use Only    Have:  JSA/JSEA    PPE    Training    Need S-RAF:  Yes  No    Initials: M



# Field Report

Project No.: 11103232		Date: 2017/08/09	
Client: GHD		Contractor: Dufferin	
Project: Tornapure stoney creek		<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify):	
Location: 65 Green Mountain Rd Hamilton, ON		<input type="checkbox"/> Roofing <input type="checkbox"/> Structural Steel <input type="checkbox"/> Reinforcing Steel <input type="checkbox"/> Sampling	
Field Results		Temperature: 27 °C	
    			
<p>The above noted site was visited by GHD representative as requested. The purpose of the visit was to check the compaction test on the excavated materials (silty clay with crushed and natural gravel), being used for backfilling the following areas: the Trench; around the leachate collection system pipe, and also for building the new berm close to Green Mountain Rd (East side of the site). After using a nuclear density gauge, all test results showed:</p> <ul style="list-style-type: none"> <li>- 95% to 98% spm00 for the trench, which met the project specifications.</li> <li>- 89% to 90% spm00 around the leachate collection system pipe, which did not meet the project specifications.</li> <li>- 90% to 93% spm00 for new built berm, which has no project specifications.</li> </ul>			
Corrective action to be taken:			
<hr/> <hr/> <hr/>			
Follow up visit required:		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Site Rep.: B. Dermody		Prepared By: A.D	
Of:		Reviewed By: 	
For Internal Use Only		Have: <input type="checkbox"/> JSA/JSEA <input checked="" type="checkbox"/> PPE <input checked="" type="checkbox"/> Training           Need S-RAF: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No           Initials: 	





# Soil Compaction Verification Report

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Project No.: <u>11103232</u> Client: <u>GHS</u> Project: <u>Tempure stone creek</u> Location: <u>65 Oregon Mountain Rd</u>	Date: <u>2017/08/09</u> Contractor: <u>bufferin</u> Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
---	---

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>silty clay with crushed &amp; natural gravel</u>	<u>2043</u>	<u>9.6</u>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured: <input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, specify testing to be done: Proctor <input type="checkbox"/> STD. <input type="checkbox"/> MOD. <input type="checkbox"/> Gradation
---	---

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<u>Refer at HDPE collector pipe vertical</u>							
<u>(1)</u>	<u>about 16m E &amp; 47ms</u>	<u>1st lift</u>	<u>I</u>	<u>1997</u>	<u>10.6</u>	<u>98</u>	<u>95</u>	<u>C</u>
<u>(2)</u>	<u>about 12m E &amp; 62ms</u>	<u>-11-</u>	<u>I</u>	<u>1973</u>	<u>9.3</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(3)</u>	<u>about 14m E &amp; 10ms</u>	<u>-11-</u>	<u>I</u>	<u>1934</u>	<u>5.2</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(4)</u>	<u>about 0.5ms E &amp; 1m E</u>	<u>-11-</u>	<u>I</u>	<u>1825</u>	<u>11.3</u>	<u>89</u>	<u>95</u>	<u>NC</u>
<u>(5)</u>	<u>about 0.5m W &amp; 2m N</u>	<u>2nd lift</u>	<u>I</u>	<u>1834</u>	<u>11.6</u>	<u>90</u>	<u>95</u>	<u>NC</u>
	<u>Refer at Electric light</u>							
<u>(1)</u>	<u>about 20m W &amp; 10m N</u>	<u>final grade</u>	<u>I</u>	<u>1902</u>	<u>8.5</u>	<u>93</u>	<u>N/A</u>	<u>N/A</u>
<u>(2)</u>	<u>about 19m W &amp; 15ms</u>	<u>-11-</u>	<u>I</u>	<u>1842</u>	<u>9.7</u>	<u>90</u>	<u>N/A</u>	<u>N/A</u>

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Gauge No.	Calibration	Field Reading	Variation %
	Density			
	Moisture			

Gauge standard counts (acceptable variation: density 2%, moisture 4%)

Site Rep.: <u>B. Dermody</u>	Prepared By: <u>A.D.</u>
Of: _____	Reviewed By: <u>[Signature]</u>

For Internal Use Only      Have:  JSA/JSEA  PPE  Training      Need S-RAF:  Yes  No      Initials: \_\_\_\_\_



# Field Report

Project No.: <b>11103232</b>	Date: <b>2017/08/10</b>
Client: <b>GHD</b>	Contractor: <b>bufferin</b>
Project: <b>Terrapure stoney creek land fill</b>	<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify): <span style="float: right;"> <input type="checkbox"/> Roofing  <input type="checkbox"/> Structural Steel  <input type="checkbox"/> Reinforcing Steel  <input type="checkbox"/> Sampling       </span>
Location: <b>65 Green mountain Rd Hamilton, ON</b>	
Field Results	Temperature: <u>30</u> °C <span style="margin-left: 20px;"> </span>
<p>The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the excavated materials (silty clay with crushed &amp; natural gravel), being used for raising the grades on top of the leachate collection system pipes. After using a nuclear density gauge, all tests results varied from 95% to 98% spm 00, which met the project specifications. In addition, the area which did not meet the project specifications on 2017/08/09 was recompacted and re-checked before placement of top layers (see soil compaction verification report for more details).</p>	
Corrective action to be taken:	
Follow up visit required: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Site Rep.:	Prepared By:
Of:	Reviewed By: <b>PH</b>
For Internal Use Only      Have: <input type="checkbox"/> JSA/JSEA <input type="checkbox"/> PPE <input type="checkbox"/> Training      Need S-RAF: <input type="checkbox"/> Yes <input type="checkbox"/> No      Initials: <b>H</b>	





# Soil Compaction Verification Report

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Project No.: <u>11103232</u>	Date: <u>2017/08/10</u>
Client: <u>GHD</u>	Contractor: <u>Dufferin</u>
Project: <u>Temporary stone creek</u>	Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
Location: <u>65 Green Mountain Rd</u>	

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>silty clay with crushed &amp; natural gravel</u>	<u>2043</u>	<u>9.5</u>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured:  Yes  No

If yes, specify testing to be done:  
 Proctor  STD.  MOD.  Gradation

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<u>Refer to ASPE collector pipe vertical</u>							
<u>(1)</u>	<u>Repeat test (4) Aug 9</u>	<u>1st lift</u>	<u>I</u>	<u>1964</u>	<u>9.8</u>	<u>96</u>		
<u>(2)</u>	<u>Repeat test (5) Aug 9</u>		<u>I</u>	<u>1945</u>	<u>8.5</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(3)</u>	<u>about 2m W &amp; 4m N</u>	<u>2nd lift</u>	<u>I</u>	<u>1966</u>	<u>7.2</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(4)</u>	<u>about 6m E &amp; 3m S</u>	<u>3rd lift</u>	<u>I</u>	<u>2010</u>	<u>10.3</u>	<u>98</u>	<u>95</u>	<u>C</u>
<u>(5)</u>	<u>about 4m N &amp; 10m E</u>	<u>3rd lift</u>	<u>I</u>	<u>1951</u>	<u>9.0</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(6)</u>	<u>about 0.5m N &amp; 5m E</u>	<u>4th lift</u>	<u>I</u>	<u>1985</u>	<u>8.4</u>	<u>97</u>	<u>95</u>	<u>C</u>
<u>(7)</u>	<u>about 3m S &amp; 12m E</u>	<u>4th lift</u>	<u>I</u>	<u>1979</u>	<u>6.7</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(8)</u>	<u>about 6m N &amp; 6m E</u>	<u>5th lift</u>	<u>I</u>	<u>1992</u>	<u>7.9</u>	<u>97</u>	<u>95</u>	<u>C</u>

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Gauge No.	Calibration	Field Reading	Variation %
	Density			
	Moisture			

Gauge standard counts (acceptable variation: density 2%, moisture 4%)

Site Rep.: B. Semady Prepared By: ASD

Of: \_\_\_\_\_ Reviewed By: [Signature]

For Internal Use Only Have:  JSA/JSEA  PPE  Training Need S-RAF:  Yes  No Initials: [Signature]



# Field Report

Project No.: <i>11103232</i>	Date: <i>2017/08/17</i>
Client: <i>GHD</i>	Contractor: <i>Defferin</i>
Project: <i>Terrapure stoney creek</i>	<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify): <span style="float: right;"> <input type="checkbox"/> Roofing  <input type="checkbox"/> Structural Steel  <input type="checkbox"/> Reinforcing Steel  <input type="checkbox"/> Sampling       </span>
Location: <i>65 Green Mountain Rd Hamilton, ont</i>	
Field Results                      Temperature: <u><i>28</i></u> °C	
<p><i>The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the Excavated materials (silty clay with crushed and natural gravel), being used for backfilling the trench (Engineered by). After using a nuclear density gauge, all test results showed 95% to 98% SPM50, which met the project specifications.</i></p>	
Corrective action to be taken:	
Follow up visit required: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Site Rep.:	Prepared By: <i>AD</i>
Of:	Reviewed By: <i>[Signature]</i>
For Internal Use Only     Have: <input type="checkbox"/> JSA/JSEA <input checked="" type="checkbox"/> PPE <input checked="" type="checkbox"/> Training             Need S-RAF: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No             Initials: <i>[Signature]</i>	





# Soil Compaction Verification Report

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Project No.: <u>11103232</u> Client: <u>GHD</u> Project: <u>Terrapine Stony Creek</u> Location: <u>65 Green Mountain Rd</u>	Date: <u>2017/08/17</u> Contractor: Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
--	---

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>silty clay with crushed &amp; natural gravel</u>	<u>2043</u>	<u>9.6</u>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured:  Yes  No

If yes, specify testing to be done:  
 Proctor  STD.  MOD.  Gradation

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<u>Refer to HDPE collector pipe notes</u>							
<u>(1)</u>	<u>about 20m E of 22ms</u>	<u>1st lift</u>	<u>I</u>	<u>1952</u>	<u>10.5</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(2)</u>	<u>about 18m E of 46ms</u>	<u>-11-</u>	<u>I</u>	<u>1977</u>	<u>11.9</u>	<u>97</u>	<u>95</u>	<u>C</u>
<u>(3)</u>	<u>about 20m E of 98ms</u>	<u>-11-</u>	<u>I</u>	<u>1964</u>	<u>10.3</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(4)</u>	<u>about 4m E of 30ms</u>	<u>-11-</u>	<u>I</u>	<u>1937</u>	<u>10.8</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(5)</u>	<u>about 10m E of 76ms</u>	<u>-11-</u>	<u>I</u>	<u>1959</u>	<u>11.5</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(6)</u>	<u>about 8m E of 45ms</u>	<u>2nd lift</u>	<u>I</u>	<u>1997</u>	<u>10.6</u>	<u>98</u>	<u>95</u>	<u>C</u>
<u>(7)</u>	<u>about 12m E of 100ms</u>	<u>-11-</u>	<u>I</u>	<u>1986</u>	<u>11.2</u>	<u>97</u>	<u>95</u>	<u>C</u>
<u>(8)</u>	<u>about 5m E of 28ms</u>	<u>3rd lift</u>	<u>I</u>	<u>1948</u>	<u>10.9</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(9)</u>	<u>about 11m E of 80ms</u>	<u>-11-</u>	<u>I</u>	<u>1968</u>	<u>9.9</u>	<u>96</u>	<u>95</u>	<u>C</u>

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Gauge No: <u>7830</u>	Calibration	Field Reading	Variation %
	Density	<u>2971</u>	<u>2966.3</u>	<u>0.1</u>
	Moisture	<u>393</u>	<u>389.1</u>	<u>0.9</u>

Gauge standard counts (acceptable variation: density 2%, moisture 4%)

Site Rep.: B. Dermody Prepared By: AJ

Of: \_\_\_\_\_ Reviewed By: PH

For Internal Use Only Have:  JSA/JSEA  PPE  Training Need S-RAF:  Yes  No Initials: JD





# Field Report

Project No.: 11103232	Date: 2017/08/18
Client: GHD	Contractor: O'Brien
Project: Terrapene stone creek	<input type="checkbox"/> Compaction <input type="checkbox"/> Roofing <input type="checkbox"/> Footing base evaluation <input type="checkbox"/> Structural steel <input type="checkbox"/> Subgrade evaluation <input type="checkbox"/> Reinforcing steel <input type="checkbox"/> Concrete <input type="checkbox"/> Sampling <input type="checkbox"/> Other (specify): <input type="checkbox"/> Asphalt paving
Location: 65 Arden Mountain Rd Hamilton, ON	

Field results      Temperature: 20 °C








The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the excavated materials (silty clay with crushed and natural gravel), being used as Engineered fill for raising the berm grades. After using a nuclear density gauge, all test results showed 90% to 92% spmdd, which did not meet the project specifications. The inspected area was observed wet and spongy. It was recommended that, to let it dry at least 2 sunny days, before continuing to raise the berm grades (see soil compaction verification Report for more details).

Corrective action to be taken:

Follow up visit required:       Yes       No

Site Rep.: B. Kennedy	Prepared by: A.D
Of:	Reviewed by: 



# Soil Compaction Verification Report

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Project No.: <u>11103232</u> Client: <u>GHD</u> Project: <u>Terrapene stoney creek</u> Location: <u>65 Green Mountain Rd</u>	Date: <u>2017/08/18</u> Contractor: Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
---	---

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>silty clay with crushed &amp; natural gravel</u>	<u>2043</u>	<u>9.6</u>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured:  Yes  No

If yes, specify testing to be done:  
 Proctor  STD.  MOD.  Gradation

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<u>Refer at HDPE collector pipe</u>							
<u>(1)</u>	<u>about 3m W of 8ms</u>	<u>1st lift</u>	<u>I</u>	<u>1888</u>	<u>14.1</u>	<u>92</u>	<u>95</u>	<u>NC</u>
<u>(2)</u>	<u>about 4m E of 36ms</u>	<u>-11-</u>	<u>I</u>	<u>1847</u>	<u>14.6</u>	<u>90</u>	<u>95</u>	<u>NC</u>
<u>(3)</u>	<u>about 2m E of 89ms</u>	<u>-11-</u>	<u>I</u>	<u>1855</u>	<u>14.7</u>	<u>91</u>	<u>95</u>	<u>NC</u>
<u>(4)</u>	<u>about 12m E of 40ms</u>	<u>-11-</u>	<u>I</u>	<u>1838</u>	<u>13.9</u>	<u>90</u>	<u>95</u>	<u>NC</u>
<u>(5)</u>	<u>about 8m E of 78ms</u>	<u>-11-</u>	<u>I</u>	<u>1871</u>	<u>14.4</u>	<u>91</u>	<u>95</u>	<u>NC</u>

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Gauge No. <u>7850</u>	Calibration	Field Reading	Variation %
	Density	<u>2971</u>	<u>2964.4</u>	<u>0.2</u>
	Moisture	<u>393</u>	<u>385.6</u>	<u>1.8</u>

Gauge standard counts (acceptable variation: density 2%, moisture 4%)

Site Rep.: B. Sernody Prepared By: ADJ

Of: \_\_\_\_\_ Reviewed By: \_\_\_\_\_

For Internal Use Only    Have:  JSA/JSEA  PPE  Training    Need S-RAF:  Yes  No    Initials: h





# Field Report

Project No.: 11103232	Date: 2017/08/21
Client: GHD	Contractor: <i>bufferin</i>
Project: <i>Terrapine stone creek</i>	<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing base evaluation <input type="checkbox"/> Subgrade evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Other (specify):
Location: <i>65 Green Mountain Rd Hamilton, ON</i>	<input type="checkbox"/> Roofing <input type="checkbox"/> Structural steel <input type="checkbox"/> Reinforcing steel <input type="checkbox"/> Sampling <input type="checkbox"/> Asphalt paving

Field results      Temperature: 30 °C







The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the excavated materials (silty clay with crushed & natural gravel), being used as Engineered fill for raising the site grades (berm). The area which did not meet the project specifications on 2017/08/18, was re-compacted before checking the compaction test. All tests results showed 95% to 97% spm 00, which met the project specifications. (see soil compaction verification report for more details).

Corrective action to be taken:

---

Follow up visit required:       Yes       No

Site Rep.: <i>B. Dermody</i>	Prepared by: <i>A.J</i>
Of:	Reviewed by: <i>[Signature]</i>



# Soil Compaction Verification Report

Page \_\_\_ of \_\_\_

Project No.: <u>11103232</u> Client: <u>GHD</u> Project: <u>Terrapine Stony Creek</u> Location: <u>65 Green Mountain Rd</u>	Date: <u>2017/08/21</u> Contractor: <u>Defferin</u> Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
--	---

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>silty clay with crushed &amp; natural gravel</u>	<u>2043</u>	<u>9.6</u>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured:  Yes  No

If yes, specify testing to be done: Proctor  STD.  MOD.  Gradation

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
<u>(1)</u>	<u>Repeat test (1)</u>	<u>1st lift</u>	<u>I</u>	<u>1944</u>	<u>11.2</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(2)</u>	<u>Repeat test (2)</u>	<u>-11-</u>	<u>I</u>	<u>1961</u>	<u>10.6</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(3)</u>	<u>Repeat test (3)</u>	<u>-11-</u>	<u>I</u>	<u>1938</u>	<u>11.5</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(4)</u>	<u>Repeat test (4)</u>	<u>-11-</u>	<u>I</u>	<u>1975</u>	<u>10.9</u>	<u>97</u>	<u>95</u>	<u>C</u>
<u>(5)</u>	<u>Repeat test (5)</u>	<u>-11-</u>	<u>I</u>	<u>1952</u>	<u>11.0</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(6)</u>	<u>about 5mW &amp; 5ms</u>	<u>2nd lift</u>	<u>I</u>	<u>1990</u>	<u>11.3</u>	<u>97</u>	<u>95</u>	<u>C</u>
<u>(7)</u>	<u>about 3mE &amp; 60ms</u>	<u>-11-</u>	<u>I</u>	<u>1966</u>	<u>12.4</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(8)</u>	<u>about 10mE &amp; 95ms</u>	<u>-11-</u>	<u>I</u>	<u>1945</u>	<u>12.9</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(9)</u>	<u>about 4mW &amp; 30ms</u>	<u>3rd lift</u>	<u>I</u>	<u>1983</u>	<u>12.6</u>	<u>97</u>	<u>95</u>	<u>C</u>
<u>(10)</u>	<u>about 8mE &amp; 100ms</u>	<u>-11-</u>	<u>I</u>	<u>1978</u>	<u>11.7</u>	<u>97</u>	<u>95</u>	<u>C</u>

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Gauge No. <u>7830</u>	Calibration	Field Reading	Variation %
	Density	<u>2971</u>	<u>2967.1</u>	<u>0.1</u>
	Moisture	<u>393</u>	<u>388.4</u>	<u>1.1</u>

Gauge standard counts (acceptable variation: density 2%, moisture 4%)

Site Rep.: B. Dermody Prepared By: A.D.

Of: \_\_\_\_\_ Reviewed By: H

For Internal Use Only Have:  JSA/JSEA  PPE  Training Need S-RAF:  Yes  No Initials: JD

See Report dated on 2017/08/18





# Field Report

Project No.: 11103232	Date: 2017/08/22
Client: GHD	Contractor: Bufferin
Project: Terrapene stoney creek	<input type="checkbox"/> Compaction <input type="checkbox"/> Roofing <input type="checkbox"/> Footing base evaluation <input type="checkbox"/> Structural steel <input type="checkbox"/> Subgrade evaluation <input type="checkbox"/> Reinforcing steel <input type="checkbox"/> Concrete <input type="checkbox"/> Sampling <input type="checkbox"/> Other (specify): <input type="checkbox"/> Asphalt paving
Location: 65 Green Mountain rd Hamilton, ON	

Field results      Temperature: 26°C








The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the excavated materials (silty clay with crushed and natural gravel) being used as Engineered fill to raise the berm grades. After using a nuclear density gauge, all test results varied from 95% to 97% SPM40, which met the project specifications.

Corrective action to be taken:

---

Follow up visit required:       Yes       No

Site Rep.: B. Dermody	Prepared by: H.D
Of:	Reviewed by: 



# Soil Compaction Verification Report

Project No.: <u>11103232</u> Client: <u>GHD</u> Project: <u>Terrapine stone creek</u> Location: <u>65 Green mountain rd</u>	Date: <u>2017/08/22</u> Contractor: <u>bufferin</u> Site Visit Type: <input type="checkbox"/> Full time <input type="checkbox"/> Part time
--	--

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>silty clay with crushed &amp; natural gravel</u>	<u>2043</u>	<u>9.6</u>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured:  Yes  No

If yes, specify testing to be done: Proctor  STD.  MOD.  Gradation

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
<u>(1)</u>	<u>Refer at HDPE collector pipe about 2m W &amp; 83ms</u>	<u>1st lift</u>	<u>I</u>	<u>1956</u>	<u>12.0</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(2)</u>	<u>about 12m E &amp; 32ms</u>	<u>1st lift</u>	<u>I</u>	<u>1940</u>	<u>11.5</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(3)</u>	<u>about 3m E &amp; 10ms</u>	<u>2nd lift</u>	<u>I</u>	<u>1909</u>	<u>12.4</u>	<u>93</u>	<u>95</u>	<u>NC</u>
<u>(4)</u>	<u>Repeat test (3)</u>	<u>-11-</u>	<u>I</u>	<u>1935</u>	<u>12.1</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(5)</u>	<u>about 5m E &amp; 50ms</u>	<u>-11-</u>	<u>I</u>	<u>1977</u>	<u>12.5</u>	<u>97</u>	<u>95</u>	<u>C</u>
<u>(6)</u>	<u>about 10m E &amp; 100ms</u>	<u>3rd lift</u>	<u>I</u>	<u>1848</u>	<u>13.3</u>	<u>90</u>	<u>95</u>	<u>NC</u>
<u>(7)</u>	<u>Repeat test (6)</u>	<u>-11-</u>	<u>I</u>	<u>1962</u>	<u>13.4</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(8)</u>	<u>about 4m W &amp; 65ms</u>	<u>-11-</u>	<u>I</u>	<u>1953</u>	<u>11.8</u>	<u>95</u>	<u>95</u>	<u>C</u>

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Gauge No. <u>7830</u>	Calibration	Field Reading	Variation %
	Density	<u>2971</u>	<u>2977.4</u>	<u>0.2</u>
	Moisture	<u>393</u>	<u>396.2</u>	<u>0.8</u>

Gauge standard counts (acceptable variation: density 2%, moisture 4%)

Site Rep.: B. Dermody Prepared By: A.D.

Of: \_\_\_\_\_ Reviewed By: \_\_\_\_\_

For Internal Use Only Have:  JSA/JSEA  PPE  Training Need S-RAF:  Yes  No Initials: H





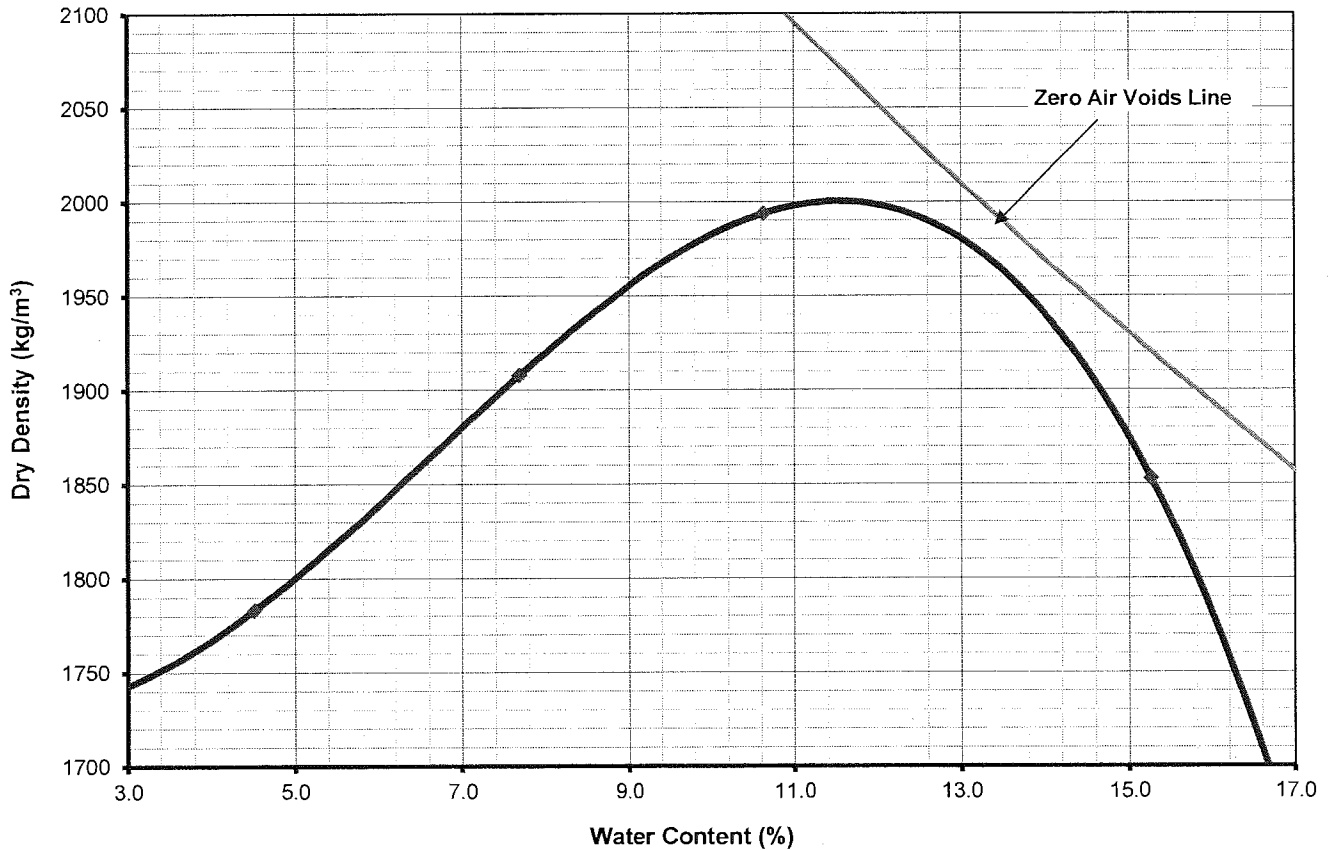
# Standard Proctor Test (ASTM D698)

Client : GHD Ltd.

Lab No : S1417

Project/Site : Stoney Creek Landfill Phase 8A

Project No : 11103232b1



Prepared Sample: Dry  Moist  Assumed G<sub>s</sub>: 2.75

ASTM D698 Test Method: A  B  C  Type of Hammer: Manual

Soil Type: Silty Clay with crushed stone and Gravel  
 Material: Native  
 Proposed Use: Engineered fill  
 Sample Identification: Onsite Stockpile  
 Sample Location: N/A  
 Aggregate Supplier / Pit Name: N/A  
 Sample Date: July 7, 2017  
 Sampled By: A.D

Max. Dry Density:	<u>2000</u> kg/m <sup>3</sup>
Optimum Moisture:	<u>11.5</u> %
% Retained on 4.75 mm:	<u>0.0</u> %
Corrected Dry Density:	<u>2000</u> kg/m <sup>3</sup>
Corrected Opt. Moist.:	<u>11.5</u> %

Remarks : \_\_\_\_\_

Performed by : Abdou Diallo

Date : July 14, 2017

Verified by : Raj Kadia, C.E.T.

Date : July 18, 2017



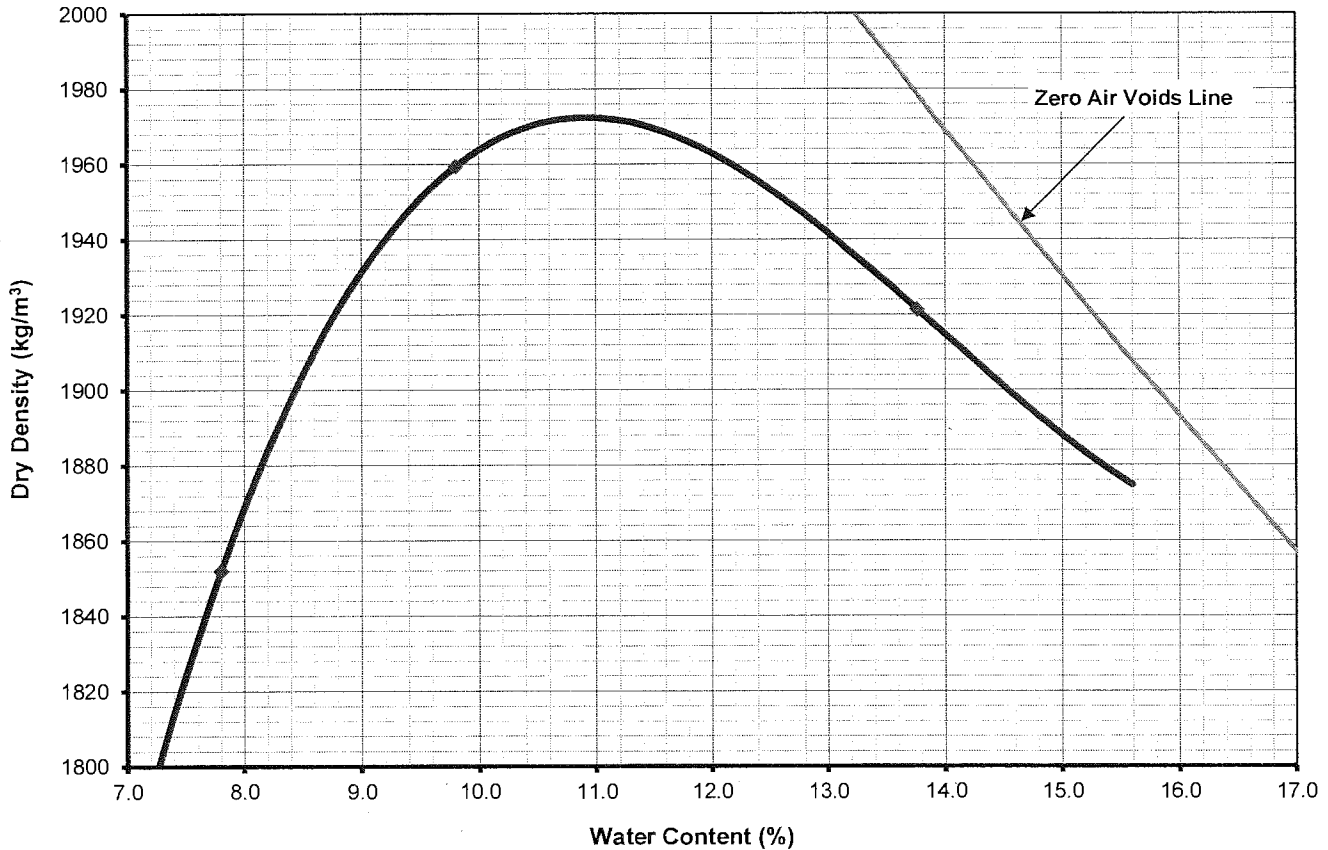
# Standard Proctor Test (ASTM D698)

Client : GHD Ltd.

Lab No : S1429

Project/Site : Stoney Creek Landfill Phase 8A

Project No : 11103232b1



Prepared Sample: Dry  Moist

Assumed G<sub>s</sub>: 2.75

ASTM D698 Test Method: A  B  C

Type of Hammer: Manual

Soil Type: Silty Clay with crushed stone and Gravel  
 Material: Native  
 Proposed Use: Engineered fill  
 Sample Identification: Onsite Stockpile  
 Sample Location: N/A  
 Aggregate Supplier / Pit Name: N/A  
 Sample Date: July 28, 2017  
 Sampled By: A.D

Max. Dry Density:	<u>1972</u>	<u>kg/m³</u>
Optimum Moisture:	<u>10.9</u>	<u>%</u>
% Retained on 4.75 mm:	<u>11.6</u>	<u>%</u>
Corrected Dry Density:	<u>2043</u>	<u>kg/m³</u>
Corrected Opt. Moist.:	<u>9.6</u>	<u>%</u>

Remarks : \_\_\_\_\_  
\_\_\_\_\_

Performed by : B.Ali

Date : July 31, 2017

Verified by : Raj Kadia, C.E.T.

Date : August 11, 2017



# Appendix D3

## Results Dated September 14, 2017



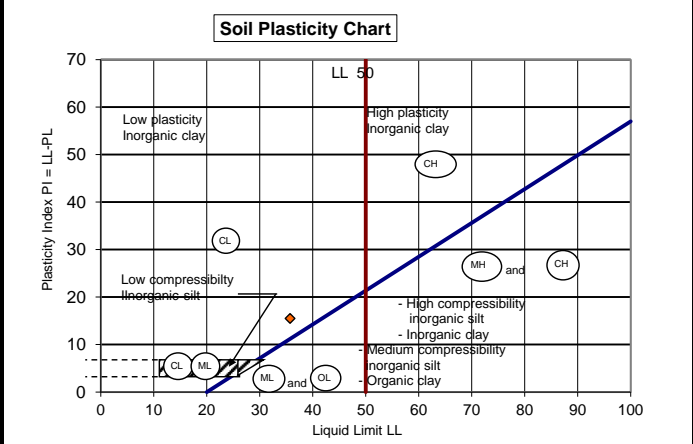
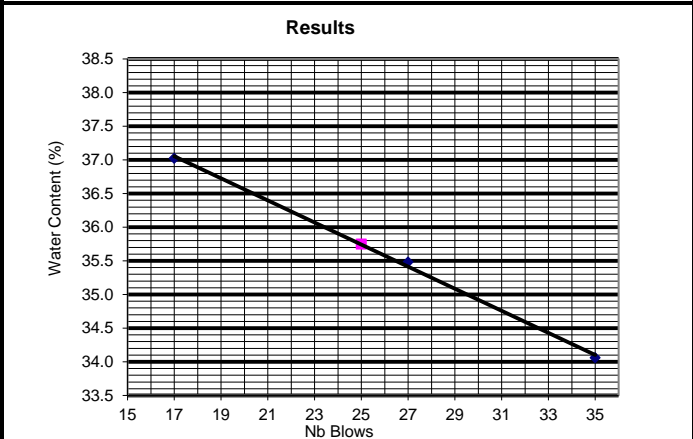
Liquid Limit, Plastic Limit and Plasticity Index of Soils  
(ASTM D4318)

<b>Client:</b>	GHD Ltd.	<b>Lab no.:</b>	G1467
<b>Project/Site:</b>	Stoney Creek Landfill Phase 8A	<b>Project no.:</b>	11103232
Borehole no.:	-	Sample no.:	-
Soil description:	Low Plasticity Inorganic Clay ( CL )	Depth:	N/A
		Date sampled:	14-Sep-17
Apparatus:	Hand Crank	Balance no.:	1
Liquid limit device no.:	1	Porcelain bowl no.:	1
Sieve no.:	40	Oven no.:	1
		Glass plate no.:	2
		Spatula no.:	1

Liquid Limit (LL):			
	Test No. 1	Test No. 2	Test No. 3
Number of blows	35	27	17
Water Content:			
Tare no.	A5	A2	A10
Wet soil+tare, g	21.79	20.68	20.44
Dry soil+tare, g	19.61	18.81	18.50
Mass of water, g	2.18	1.87	1.94
Tare, g	13.21	13.54	13.26
Mass of soil, g	6.40	5.27	5.24
Water content %	34.1%	35.5%	37.0%
Plastic Limit (PL) - Water Content:			
Tare no.	A50	A16	
Wet soil+tare, g	17.11	17.23	
Dry soil+tare, g	16.47	16.58	
Mass of water, g	0.64	0.65	
Tare, g	13.31	13.37	
Mass of soil, g	3.16	3.21	
Water content %	20.3%	20.2%	
Average water content %	20.3%		
Natural Water Content ( W <sup>n</sup> ):			
Tare no.			
Wet soil+tare, g			
Dry soil+tare, g			
Mass of water, g			
Tare, g			
Mass of soil, g			
Water content %			

**Soil Preparation:**

<input checked="" type="checkbox"/> Cohesive <425 µm	<input checked="" type="checkbox"/> Dry preparation
<input type="checkbox"/> Cohesive >425 µm	<input type="checkbox"/> Wet preparation
<input type="checkbox"/> Non-cohesive	



Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)	Natural Water Content W <sup>n</sup>
36	20	15	

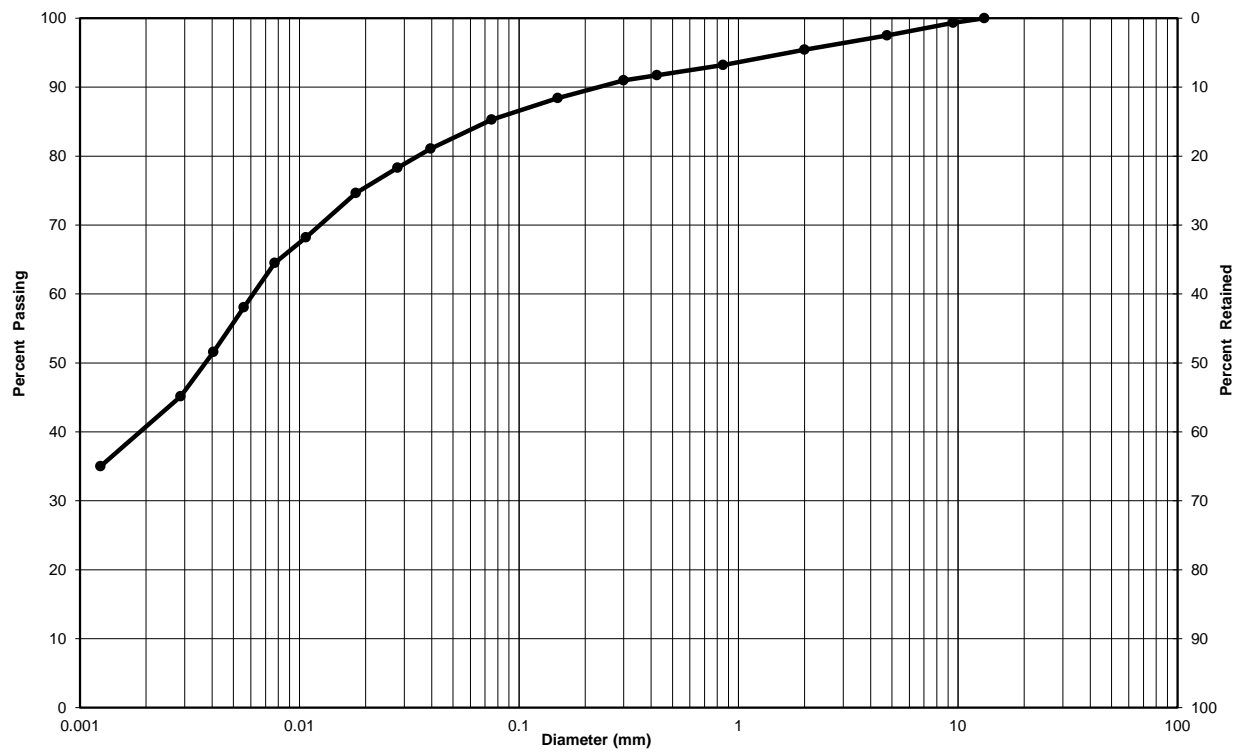
**Remarks:** The clay sample meets the project specifications for clay liner material (Plasticity Index: 30 > PI > 12)  
Section 31 05 21

<b>Performed by:</b>	Anwar Rehani	<b>Date:</b>	9/15/2017
<b>Verified by:</b>	Raj Kadia, C.E.T.	<b>Date:</b>	9/18/2017



Particle-Size Analysis of Soils  
ASTM D422 (Quality Control)

<b>Client:</b> <u>GHD Ltd.</u>	<b>Lab No.:</b> <u>S1467</u>
<b>Project, Site:</b> <u>Stoney Creek Landfill Phase 8A</u>	<b>Project No.:</b> <u>11103232</u>
Sample No.: <u>-</u>	Sampled by: <u>Abdou Diallo</u>
Proposed use: <u>Clay Liner</u>	Date sampled: <u>September 14, 2017</u>
Location: _____	Supplier/Quarry: <u>-</u>



Clay & Silt	Sand			Gravel	
	Fine	Medium	Coarse	Fine	Coarse
Particle-Size Limits as per USCS (ASTM D-2487)					

Soil Description	Gravel (%)	Sand (%)	Clay & Silt (%)
Silty Clay, Some Sand, Trace Gravel	2	13	85

**Remarks:** Silt-size particles (0.074 to 0.002 mm): 44%, Clay-size particles (<0.002 mm): 41%  
Minimum 95 percent of particles passing the No. 4 sieve (4.75 mm)- Meets project specifications for clay liner  
Minimum 80 percent fines passing the No. 200 sieve (0.075 mm)- Meets project specifications for clay liner

<b>Performed by:</b> <u>Anwar Rehani/ Pawan Jain</u>	<b>Date:</b> <u>September 15, 2017</u>
<b>Verified by:</b> <u>Raj Kadia, C.E.T</u>	<b>Date:</b> <u>September 18, 2017</u>

# Appendix D4

## Results Dated October 16, 2017



October 16, 2017

Reference No. 11103232

Mr. Brian Dermody  
GHD Limited  
184 Front Street East Suite 302  
Toronto Ontario  
M5A 4N3

Dear Mr. Dermody:

**Re: Field Compaction Report  
Terrapure-Stoney Creek Landfill  
65 Green Mountain Road W, Hamilton, Ontario**

This report presents the results of field (compaction) and laboratory testing carried out by GHD Limited at the above noted project site. The purpose of the field and laboratory testing was to determine the degree of compaction achieved on the following materials:

- Granular materials being used as bedding for the groundwater collection trench
- Native materials being used to backfill service trenches and as engineered fill to raise grades on the site
- Native materials being used for the secondary clay liner

## 1. Summary of Site Inspections

Site inspections were carried out during the period between August 28 and October 6, 2017, by one of our technicians. During our visits, a total of one hundred and eighty one (181) in-situ density (compaction) tests were conducted using a nuclear density gauge. The compaction tests were carried out on the granular and native materials being used for the groundwater collection trench engineered fill to raise Site grades, trench backfill, and for the secondary clay liner.

The averaged measured degree of compaction of the native and granular materials was as follows:

- Granular materials being used as bedding of the groundwater collection trench: 100 percent Standard Proctor Maximum Dry Density (SPMDD)
- Native materials being used to backfill service trenches and as engineered fill to raise grades on the site: 95 to 98 percent Standard Proctor Maximum Dry Density (SPMDD)
- Native materials being used as compacted secondary clay liner: 99 percent Standard Proctor Maximum Dry Density (SPMDD)

Areas with deficient compaction were re-compacted and retested to meet the project specifications.

It is noted that on September 25, 2017, the following activities were observed:

- Placement of Type A Geotextile and hydraulic control layer of 50mm clear stone on top of the secondary compacted clay liner



- Installation of Type A Geotextile prior to construction of primary compacted clay liner
- Connection of the newly constructed secondary and primary clay liners to the existing clay liners.
- Each lift of primary compacted clay liner was scarified and any rock fragments were removed by hand

The above activities were carried out as per project specifications

Details of our inspections and individual test locations are enclosed.

## 2. Laboratory Test Results

Laboratory testing was carried out on a representative sample of the native materials for standard proctor test.

The results are summarized as follows:

Material	Lab Sample Number	Standard Proctor Maximum Dry Density (SPMDD) (kg/m <sup>3</sup> )	Optimum Water Content (%)
Excavated materials (Silty Clay with Trace Sand and gravel)	S1467	1750	15.3

The results of laboratory testing are attached for reference.

## 3. Discussion

It is understood that the project specifications require the granular and native materials being used at the Site to be compacted as follows:

- Granular materials being used as bedding of the groundwater collection trench: 98 percent Standard Proctor Maximum Dry Density (SPMDD)
- Native materials being used to backfill service trenches and as engineered fill to raise grades on the site: 95 to 98 percent Standard Proctor Maximum Dry Density (SPMDD) respectively.
- Native materials being used as compacted secondary clay liner: 98 percent Standard Proctor Maximum Dry Density (SPMDD)

Based on the field and laboratory test results, compaction of the materials in the areas tested meets the specifications.





We trust that this information meets with your approval. Please do not hesitate to contact us, should any questions arise.

Sincerely,

GHD

A handwritten signature in blue ink that reads 'RJKadia'. The signature is written in a cursive style and is underlined with a single horizontal line.

Rajendra Kadia, B.Eng., C.E.T.

RK/ss/4

Encl.

A handwritten signature in blue ink that reads 'Karl Roechner'. The signature is written in a cursive style.






Karl Roechner, M.A.Sc., P. Eng.

# Attachments

# Attachment A Field and Laboratory Test Results



# Field Report

Project No.: 11103232		Date: 2017/08/28	
Client: GHD		Contractor: bufferin	
Project: Terrapine stone creek landfill		<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify):	
Location: 65 Green Mountain Rd Hamilton		<input type="checkbox"/> Roofing <input type="checkbox"/> Structural Steel <input type="checkbox"/> Reinforcing Steel <input type="checkbox"/> Sampling	
Field Results		Temperature: 23 °C	
   			
<p>The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the excavated material (silty clay with crushed &amp; natural gravel), being used as Engineered fill for backfill the trench. After using a nuclear density gauge, all test results showed 95% to 96% SPM00, which met the project specifications.</p>			
Corrective action to be taken:			
Follow up visit required: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Site Rep.: B. Dermody		Prepared By: A.D.	
Of:		Reviewed By: 	
For Internal Use Only			
Have: <input checked="" type="checkbox"/> JSA/JSEA <input checked="" type="checkbox"/> PPE <input checked="" type="checkbox"/> Training		Need S-RAF: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Initials:			



# Soil Compaction Verification Report

Page \_\_\_ of \_\_\_

Project No.: 11103232 Client: GHD Project: Terrapin stone creek Location: 65 Green Mountain Rd	Date: 2017/08/28 Contractor: Bufferin Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
---	---

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
I	silty clay with crushed & natural gravel	2006	7.7

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured:  Yes  No

If yes, specify testing to be done:  
 Proctor  STD.  MOD.  Gradation

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	Refer at electric pole							
(1)	about 5m w & 15m s	1 <sup>st</sup> lift	I	1899	10.8	95	95	C
(2)	about 4m w & 20m s	2 <sup>nd</sup> lift	I	1918	10.5	96	95	C
(3)	about 6m w & 18m s	-11-	I	1929	9.9	96	95	C
(4)	about 3.5m & 7m w	3 <sup>rd</sup> lift	I	1853	11.4	92	95	NC
(5)	Repeal test (4)	-11-	I	1905	11.2	95	95	C
(6)	about 7m w & 22m s	-11-	I	1921	10.0	96	95	C
(7)	about 5m w & 10m s	4 <sup>th</sup> lift	I	1860	11.6	93	95	NC
(8)	Repeal test (5)	-11-	I	1914	11.3	95	95	C
(9)	about 4m w & 3m s	5 <sup>th</sup> lift	I	1936	10.8	96	95	C

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)			
	Gauge No. 1775	Calibration	Field Reading	Variation %
	Density	2075	2069.2	0.3
	Moisture	448.2	440.5	1.7

Site Rep.: B. Dermody Prepared By: A.A.

Of: \_\_\_\_\_ Reviewed By: \_\_\_\_\_

For Internal Use Only Have:  JSA/JSEA  PPE  Training Need S-RAF:  Yes  No Initials: \_\_\_\_\_



# Field Report

Project No.: <i>11103232</i>	Date: <i>2017/08/29</i>
Client: <i>GHD</i>	Contractor: <i>Dufferin</i>
Project: <i>Torrapure stoney creek landfill</i>	<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify): <span style="float: right;"> <input type="checkbox"/> Roofing  <input type="checkbox"/> Structural Steel  <input type="checkbox"/> Reinforcing Steel  <input type="checkbox"/> Sampling       </span>
Location: <i>65 Green Mountain Rd Hamilton, ON</i>	
Field Results                      Temperature: <u><i>24</i></u> °C	
<p><i>The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the excavated materials (silty clay with crushed and natural gravel) being used as Engineered fill for backfilling the trench. After using a nuclear density gauge, all test results varied from 95% to 96% SPM90, which met the project specifications.</i></p>	
Corrective action to be taken:	
Follow up visit required: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Site Rep.: <i>B. Dermody</i>	Prepared By: <i>A.S</i>
Of: <i>GHD</i>	Reviewed By: <i>RA</i>
For Internal Use Only     Have: <input type="checkbox"/> JSA/JSEA <input checked="" type="checkbox"/> PPE <input checked="" type="checkbox"/> Training     Need S-RAF: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No     Initials:	





# Soil Compaction Verification Report

Project No.: <u>11103232</u> Client: <u>GHD</u> Project: <u>Terrapine stone creek</u> Location: <u>65 Green mountain rd</u>	Date: <u>2017/08/29</u> Contractor: <u>buffair</u> Site Visit Type: <input type="checkbox"/> Full time <input type="checkbox"/> Part time
--	---

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>silty clay with crushed &amp; natural gravel</u>	<u>2006</u>	<u>7.7</u>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured: <input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, specify testing to be done: Proctor <input type="checkbox"/> STD. <input type="checkbox"/> MOD. <input type="checkbox"/> Gradation
---	---

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<u>Refer at electric pole N=1</u>							
<u>(1)</u>	<u>about 4m W &amp; 2m N</u>	<u>1st left</u>	<u>I</u>	<u>1925</u>	<u>10.6</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(2)</u>	<u>about 5m W &amp; 19m N</u>	<u>-u-</u>	<u>I</u>	<u>1941</u>	<u>9.9</u>	<u>97</u>	<u>95</u>	<u>C</u>
<u>(3)</u>	<u>about 6m W &amp; 12m S</u>	<u>-u-</u>	<u>I</u>	<u>1910</u>	<u>11.1</u>	<u>95</u>	<u>95</u>	<u>C</u>

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)			
	Gauge No. <u>7830</u>	Calibration	Field Reading	Variation %
	Density	<u>2971</u>	<u>2964.8</u>	<u>0.2</u>
	Moisture	<u>393</u>	<u>390.1</u>	<u>0.7</u>

Site Rep.: <u>B. Dermody</u>	Prepared By: <u>A.D.</u>
Of: _____	Reviewed By: <u>[Signature]</u>

For Internal Use Only    Have:  JSA/JSEA    PPE    Training    Need S-RAF:  Yes    No    Initials: \_\_\_\_\_



# Field Report

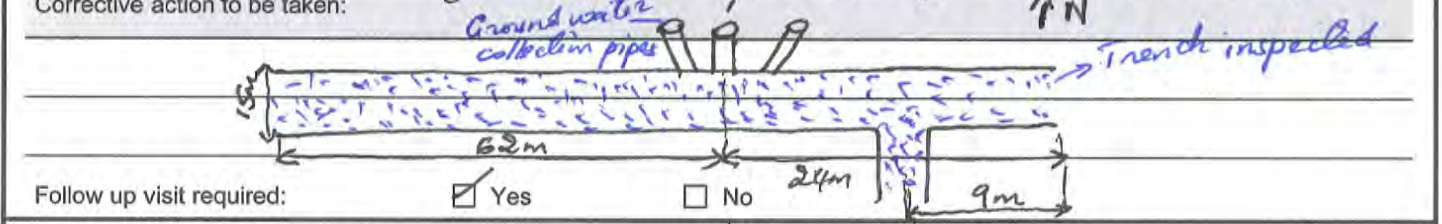
Project No.: 11103232	Date: 2017/09/07
Client: GHD	Contractor: Sufferin
Project: Terrapure stoney creek land fill	<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify):
Location: 65 Green Mountain Rd Hamilton, ON	<input type="checkbox"/> Roofing <input type="checkbox"/> Structural Steel <input type="checkbox"/> Reinforcing Steel <input type="checkbox"/> Sampling

Field Results      Temperature: 18 °C

The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the Granular "A" (comprising of crushed limestone, gravel, bricks, shale) materials, being used as bedding for the Groundwater collection trench. The compaction was performed by 24" Diesel Tamper plate. After using a nuclear density gauge, all test results showed 100% SPMOD, which met the project specifications.

It's important to notice that, before placement of Granular "A" materials, the contractor has placed the following items:

- Groundwater collection pipes
- 19mm clear stone over the pipe (one layer of 300mm)
- Type B geotextile (see attached pictures for more details).



Follow up visit required:  Yes     No

Site Rep.: B. Sermody      Prepared By: A. D

Of:      Reviewed By: [Signature]

For Internal Use Only    Have:  JSA/JSEA    PPE    Training    Need S-RAF:  Yes    No    Initials:





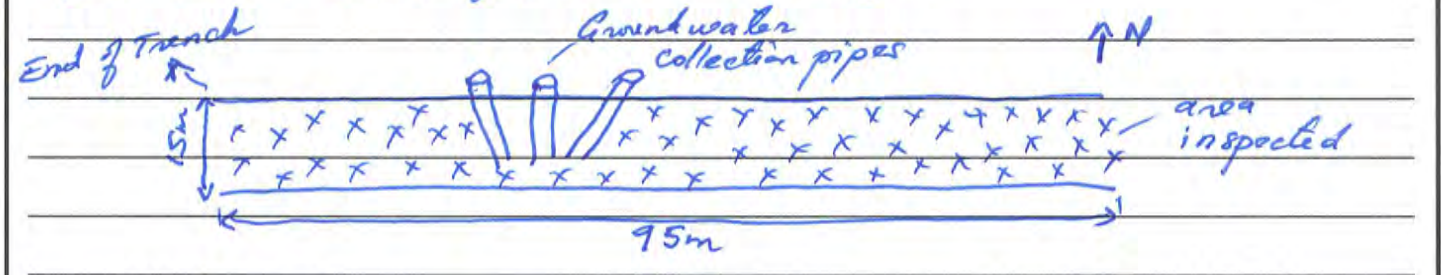


# Field Report

Project No.: 11103232	Date: 2017/09/08
Client: GHD	Contractor: bofferin
Project: Terrapine stoney creek land fill	<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify): <input type="checkbox"/> Roofing <input type="checkbox"/> Structural Steel <input type="checkbox"/> Reinforcing Steel <input type="checkbox"/> Sampling
Location: 65 Green Mountain Rd Hamilton, ON	

Field Results      Temperature: 14 °C

The above noted site was visited by GHD representative as required. The purpose of the visit was to conduct the compaction test on the excavated materials (silty clay with crushed & natural gravel), being used as Engineered fill for backfilling the trench. After using a nuclear density gauge, all tests results showed 95% to 96% SPMDD, which met the project specifications. (see sketch below for more details).



Corrective action to be taken:

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Follow up visit required:       Yes       No

Site Rep.: B. Dermody	Prepared By: A.D
Of:	Reviewed By:

For Internal Use Only      Have:  JSA/JSEA     PPE     Training      Need S-RAF:  Yes     No      Initials:



# Soil Compaction Verification Report

Page \_\_\_ of \_\_\_

Project No.: <u>11103232</u> Client: <u>GHD</u> Project: <u>Terrapure Stony Creek</u> Location: <u>65 Green Mountain Rd</u>	Date: <u>2017/09/08</u> Contractor: <u>Bufferin</u> Site Visit Type: <input type="checkbox"/> Full time <input type="checkbox"/> Part time
--	--

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>silty clay with crushed &amp; natural gravel</u>	<u>2006</u>	<u>7.7</u>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured:  Yes  No

If yes, specify testing to be done:  
 Proctor  STD.  MOD.  Gradation

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
<u>(1)</u>	<u>Refer at collector pipe vertical about 3m S &amp; 10m W</u>	<u>1st lift</u>	<u>I</u>	<u>1863</u>	<u>9.2</u>	<u>93</u>	<u>95</u>	<u>NC</u>
<u>(2)</u>	<u>Repeat test (1)</u>	<u>-11-</u>	<u>I</u>	<u>1930</u>	<u>9.0</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(3)</u>	<u>about 1m N &amp; 20m E</u>	<u>-11-</u>	<u>I</u>	<u>1904</u>	<u>8.5</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(4)</u>	<u>about 2m S &amp; 50m W</u>	<u>2nd lift</u>	<u>I</u>	<u>1912</u>	<u>9.4</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(5)</u>	<u>about 2m S &amp; 10m E</u>	<u>-11-</u>	<u>I</u>	<u>1876</u>	<u>9.8</u>	<u>93</u>	<u>95</u>	<u>NC</u>
<u>(6)</u>	<u>Repeat test (5)</u>	<u>-11-</u>	<u>I</u>	<u>1922</u>	<u>9.5</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(7)</u>	<u>about 4m N &amp; 90m W</u>	<u>-11-</u>	<u>I</u>	<u>1935</u>	<u>10.0</u>	<u>96</u>	<u>95</u>	<u>C</u>

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)			
	Gauge No. <u>5621</u>	Calibration	Field Reading	Variation %
	Density	<u>2965.5</u>	<u>2959.7</u>	<u>0.2</u>
	Moisture	<u>465.5</u>	<u>457.5</u>	<u>1.7</u>

Site Rep.: B. Bernady Prepared By: A.J  
 Of: \_\_\_\_\_ Reviewed By: [Signature]

For Internal Use Only Have:  JSA/JSEA  PPE  Training Need S-RAF:  Yes  No Initials: \_\_\_\_\_









# Soil Compaction Verification Report

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Project No.: <u>11103232</u> Client: <u>GHD</u> Project: <u>Terrapine stoney creek</u> Location: <u>65 Green Mountain Rd</u>	Date: <u>2017/09/11</u> Contractor: <u>buffen</u> Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
---	---

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>silty clay with crushed &amp; natural gravel</u>	<u>2006</u>	<u>7.7</u>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured: <input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, specify testing to be done: Proctor <input type="checkbox"/> STD. <input type="checkbox"/> MOD. <input type="checkbox"/> Gradation
---	---

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<u>Refer at collection pipe vertical</u>							
<u>(1)</u>	<u>about 2m N &amp; 6m W</u>	<u>1st lift</u>	<u>I</u>	<u>1907</u>	<u>10.5</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(2)</u>	<u>about 5m S &amp; 70m W</u>	<u>1st lift</u>	<u>I</u>	<u>1948</u>	<u>9.7</u>	<u>97</u>	<u>95</u>	<u>C</u>
<u>(3)</u>	<u>about 3m N &amp; 15m E</u>	<u>2nd lift</u>	<u>I</u>	<u>1880</u>	<u>10.1</u>	<u>94</u>	<u>95</u>	<u>NC</u>
<u>(4)</u>	<u>Repeat test (3)</u>	<u>-11-</u>	<u>I</u>	<u>1913</u>	<u>10.1</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(5)</u>	<u>about 4m S &amp; 90m W</u>	<u>-11-</u>	<u>I</u>	<u>1928</u>	<u>9.9</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(6)</u>	<u>about 6m S &amp; 10m E</u>	<u>3rd lift</u>	<u>I</u>	<u>1951</u>	<u>9.5</u>	<u>97</u>	<u>95</u>	<u>C</u>
<u>(7)</u>	<u>about 2m S &amp; 40m W</u>	<u>-11-</u>	<u>I</u>	<u>1919</u>	<u>10.4</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(8)</u>	<u>about 5m S &amp; 85m W</u>	<u>-11-</u>	<u>I</u>	<u>1932</u>	<u>9.6</u>	<u>96</u>	<u>95</u>	<u>C</u>

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)			
	Gauge No. <u>5621</u>	Calibration	Field Reading	Variation %
	Density	<u>2965.5</u>	<u>2957.6</u>	<u>0.3</u>
	Moisture	<u>465.5</u>	<u>458.8</u>	<u>1.4</u>

Site Rep.: <u>B. Dermody</u>	Prepared By: <u>A.A</u>
Of: _____	Reviewed By: <u>[Signature]</u>

For Internal Use Only    Have:  JSA/JSEA  PPE  Training    Need S-RAF:  Yes  No    Initials: \_\_\_\_\_

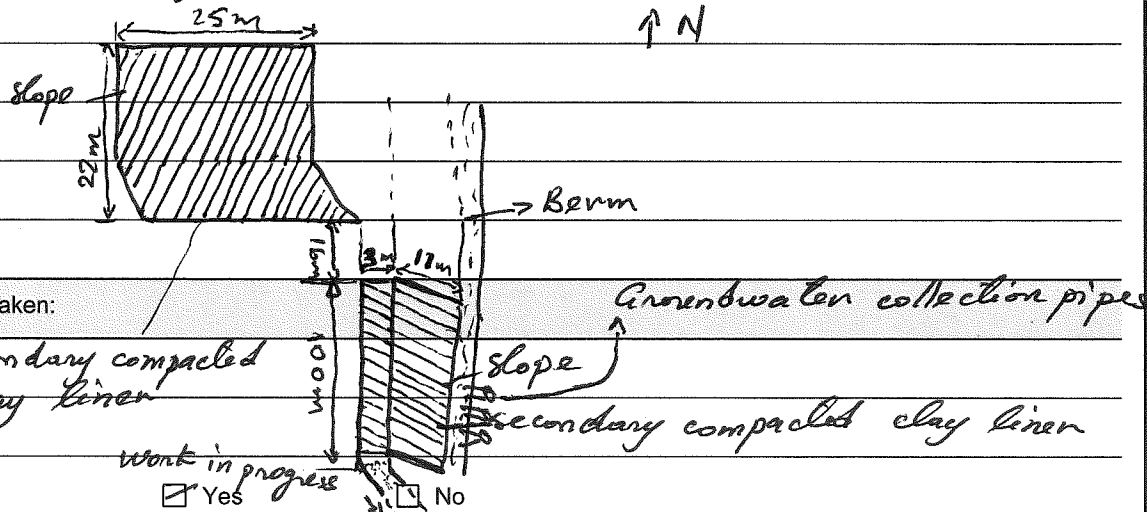


# Field Report

Project No.: 11103232	Date: 2017/09/12
Client: GHD	Contractor: Aufferin
Project: Terrapure storey creek land fill	<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify):
Location: 65 Green Mountain Rd Hamilton, ON	<input type="checkbox"/> Roofing <input type="checkbox"/> Structural Steel <input type="checkbox"/> Reinforcing Steel <input type="checkbox"/> Sampling

Field Results      Temperature: 23 °C

The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the silty clay trace sand & gravel materials, being used as secondary compacted clay liner for raising the trench grades. After using a nuclear density gauge, all test results showed 98% to 99% spmDD, which met the project specifications. (See sketch below for more details).



Corrective action to be taken:

Secondary compacted clay liner

work in progress

Follow up visit required:  Yes  No

Site Rep.: B. Dermody	Prepared By: A.M.
Of:	Reviewed By: M.

For Internal Use Only    Have:  JSA/JSEA    PPE    Training    Need S-RAF:  Yes    No    Initials: M



# Soil Compaction Verification Report

Page \_\_\_ of \_\_\_

Project No.: <u>11103232</u> Client: <u>GHD</u> Project: <u>Temperature Stoney Creek</u> Location: <u>65 Green Mountain Rd</u>	Date: <u>2017/09/12</u> Contractor: <u>Bufferin</u> Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
---	---

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>Silty clay trace sand &amp; gravel</u>	<u>1801</u>	<u>17.7</u>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured:  Yes  No

If yes, specify testing to be done:  
 Proctor  STD.  MOD.  Gradation

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<u>Refer at Groundwater collector pipe</u>							
<u>(1)</u>	<u>about 69mN &amp; 30mW</u>	<u>1st lift</u>	<u>I</u>	<u>1580</u>	<u>16.4</u>	<u>88</u>	<u>98</u>	<u>NC</u>
<u>(2)</u>	<u>Repeat test (1)</u>	<u>-11-</u>	<u>I</u>	<u>1694</u>	<u>16.2</u>	<u>94</u>	<u>98</u>	<u>NC</u>
<u>(3)</u>	<u>Repeat test (2)</u>	<u>-11-</u>	<u>I</u>	<u>1767</u>	<u>16.3</u>	<u>98</u>	<u>98</u>	<u>C</u>
<u>(4)</u>	<u>about 50mN &amp; 15mW</u>	<u>-11-</u>	<u>I</u>	<u>1759</u>	<u>16.8</u>	<u>98</u>	<u>98</u>	<u>C</u>
<u>(5)</u>	<u>about 8mN &amp; 8mW</u>	<u>-11-</u>	<u>I</u>	<u>1770</u>	<u>16.0</u>	<u>98</u>	<u>98</u>	<u>C</u>
<u>(6)</u>	<u>about 20mS &amp; 14mW</u>	<u>-11-</u>	<u>I</u>	<u>1783</u>	<u>16.5</u>	<u>99</u>	<u>98</u>	<u>C</u>
<u>(7)</u>	<u>about 65mN &amp; 28mW</u>	<u>2nd lift</u>	<u>I</u>	<u>1639</u>	<u>10.5</u>	<u>91</u>	<u>98</u>	<u>NC</u>
<u>(8)</u>	<u>Repeat test (7)</u>	<u>-11-</u>	<u>I</u>	<u>1766</u>	<u>16.1</u>	<u>98</u>	<u>98</u>	<u>C</u>
<u>(9)</u>	<u>about 48mN &amp; 18mW</u>	<u>-11-</u>	<u>I</u>	<u>1785</u>	<u>16.6</u>	<u>99</u>	<u>98</u>	<u>C</u>
<u>(10)</u>	<u>about 30mN &amp; 10mW</u>	<u>-11-</u>	<u>I</u>	<u>1641</u>	<u>14.7</u>	<u>91</u>	<u>98</u>	<u>NC</u>
<u>(11)</u>	<u>Repeat test (10)</u>	<u>-11-</u>	<u>I</u>	<u>1780</u>	<u>16.5</u>	<u>99</u>	<u>98</u>	<u>C</u>
<u>(12)</u>	<u>about 40mS &amp; 6mW</u>	<u>-11-</u>	<u>I</u>	<u>1773</u>	<u>15.9</u>	<u>98</u>	<u>98</u>	<u>C</u>
<u>(13)</u>	<u>about 67mN &amp; 32mW</u>	<u>3rd lift</u>	<u>I</u>	<u>1762</u>	<u>16.7</u>	<u>98</u>	<u>98</u>	<u>C</u>
<u>(14)</u>	<u>about 50mN &amp; 15mW</u>	<u>-11-</u>	<u>I</u>	<u>1777</u>	<u>16.0</u>	<u>99</u>	<u>98</u>	<u>C</u>

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)			
	Gauge No <u>5621</u>	Calibration	Field Reading	Variation %
	Density	<u>2965.5</u>	<u>2956.7</u>	<u>0.3</u>
	Moisture	<u>465.5</u>	<u>455.9</u>	<u>2.0</u>

Site Rep.: B. Bernody Prepared By: A.D

Of: \_\_\_\_\_ Reviewed By: \_\_\_\_\_

For Internal Use Only Have:  JSA/JSEA  PPE  Training Need S-RAF:  Yes  No Initials: J



# Field Report

Project No.: <i>11103232</i>	Date: <i>2017/09/13</i>
Client: <i>GHD</i>	Contractor: <i>Dufferin</i>
Project: <i>Terrapine stoney creek</i>	<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify): <span style="float: right;"> <input type="checkbox"/> Roofing  <input type="checkbox"/> Structural Steel  <input type="checkbox"/> Reinforcing Steel  <input type="checkbox"/> Sampling       </span>
Location: <i>65 Green Mountain Rd Hamilton, ON</i>	
Field Results                      Temperature: <u><i>22</i></u> °C	
<p><i>The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the silty clay trace sand &amp; gravel material, being used as secondary clay liner for raising the trench grades. After using a nuclear density gauge, all test results varied from 98% to 99% SPMSS, which met the project specifications. (For more details about the locations see sketch on the field report dated 2017/09/12).</i></p>	
Corrective action to be taken:	
Follow up visit required: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Site Rep.: <i>B. Dermody</i>	Prepared By: <i>A.S.</i>
Of:	Reviewed By: <i>[Signature]</i>
For Internal Use Only     Have: <input checked="" type="checkbox"/> JSA/JSEA <input checked="" type="checkbox"/> PPE <input type="checkbox"/> Training             Need S-RAF: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No             Initials: <i>[Signature]</i>	



# Soil Compaction Verification Report

Project No.: 11103232 Client: GHD Project: Ternapure stoney creek Location: 65 Green Mountain Rd	Date: 2017/09/13 Contractor: Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
---	--

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
I	silty clay some sand, trace gravel	1801	17.7

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured:  Yes  No

If yes, specify testing to be done:  
 Proctor  STD.  MOD.  Gradation

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	Refer at Groundwater collector pipe							
(1)	about 25m N & 8m W	3 <sup>rd</sup> lift	I	1735	16.5	96	98	NC
(2)	Repeat test (1)	-11-	I	1771	16.5	98	98	C
(3)	about 10m S & 14m W	-11-	I	1696	16.8	94	98	NC
(4)	Repeat test (3)	-11-	I	1765	16.6	98	98	C
(5)	about 45m S & 6m W	-11-	I	1782	17.0	99	98	C
(6)	about 66m N & 23m W	4 <sup>th</sup> lift	I	1746	14.6	97	98	NC
(7)	Repeat test (6)	-11-	I	1786	16.7	99	98	C
(8)	about 48m N & 12m W	-11-	I	1775	16.6	98	98	C
(9)	about 22m N & 13m W	-11-	I	1666	17.0	92	98	NC
(10)	Repeat test (9)	-11-	I	1758	16.8	98	98	C
(11)	about 35m S & 10m W	-11-	I	1779	16.4	99	98	C
(12)	about 4m S & 7m W	-11-	I	1790	16.5	99	98	C

Action: C = Complying to spec. NC = Not complying to spec.

Comments: Secondary clay liner	Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)			
	Gauge No. 5621	Calibration	Field Reading	Variation %
	Density	2965.5	2959.2	0.2
	Moisture	465.5	460.4	1.0

Site Rep.: B. Dermody Prepared By: A.D.

Of: \_\_\_\_\_ Reviewed By: [Signature]

For Internal Use Only Have:  JSA/JSEA  PPE  Training Need S-RAF:  Yes  No Initials: \_\_\_\_\_





# Field Report

Project No.: 11103232	Date: 2017/09/14
Client: GHD	Contractor: <i>Griffin</i>
Project: <i>Terrapine Stony creek land fill</i>	<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify): <span style="float: right;"> <input type="checkbox"/> Roofing  <input type="checkbox"/> Structural Steel  <input type="checkbox"/> Reinforcing Steel  <input type="checkbox"/> Sampling       </span>
Location: <i>65 Green Mountain Rd Hamilton, ON</i>	
Field Results                      Temperature: <u>23</u> °C	
<p><i>The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the silty clay base sand &amp; gravel material, being used as secondary clay liner for raising the trench grades. After using a nuclear density gauge, all test results showed 98% to 100% SPM 80, which met the project specifications. (For details about the locations see sketch on the field report dated 2017/09/12).</i></p>	
Corrective action to be taken:	
Follow up visit required: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Site Rep.: <i>B. Dermody</i>	Prepared By: <i>A.D</i>
Of:	Reviewed By: <i>[Signature]</i>
For Internal Use Only     Have: <input checked="" type="checkbox"/> JSA/JSEA <input checked="" type="checkbox"/> PPE <input checked="" type="checkbox"/> Training     Need S-RAF: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No     Initials:	





# Soil Compaction Verification Report

Project No.: 11103232 Client: GHD Project: Terrapine stone creek Location: 65 Green Mountain Rd	Date: 2017/09/14 Contractor: Duffen's Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
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Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
I	silty clay trace sand & gravel	1751	15.3

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured:  Yes  No

If yes, specify testing to be done:  
 Proctor  STD.  MOD.  Gradation

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	Refer at Groundwater collector pipe							
(1)	about 66m N & 29m W	5th lift	I	1681	12.8	96	98	NC
(2)	Repeat test (1)	-11-	I	1734	14.4	99	98	C
(3)	about 60m N & 13m W	-11-	I	1797	16.5	100	98	C
(4)	about 50m N & 18m W	-11-	I	1757	16.6	100	98	C
(5)	about 30m N & 6m W	-11-	I	1733	17.0	99	98	C
(6)	about 20m N & 14m W	-11-	I	1663	15.9	95	98	NC
(7)	Repeat test (6)	-11-	I	1714	16.0	98	98	C
(8)	about 12m S & 10m W	-11-	I	1726	15.7	98	98	C
(9)	about 40m S & 7m W	-11-	I	1742	15.5	99	98	C
(10)	about 30m S & 14m W	-11-	I	1760	16.2	100	98	C

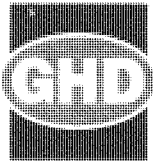
Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)			
	Gauge No. 5621	Calibration	Field Reading	Variation %
	Density	2965.5	2956.4	0.3
	Moisture	465.5	458.7	1.5

Site Rep.: B. Dermody Prepared By: A.A.

Of: \_\_\_\_\_ Reviewed By: MJ

For Internal Use Only Have:  JSA/JSEA  PPE  Training Need S-RAF:  Yes  No Initials: \_\_\_\_\_



# Field Report

Project No.: <i>11132032</i>	Date: <i>2017/09/20</i>
Client: <i>GHD</i>	Contractor: <i>Bufferin</i>
Project: <i>Terrapure stoney creek land fill</i>	<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify): <span style="float: right;"> <input type="checkbox"/> Roofing  <input type="checkbox"/> Structural Steel  <input type="checkbox"/> Reinforcing Steel  <input type="checkbox"/> Sampling       </span>
Location: <i>65 Green Mountain Rd Hamilton, ON</i>	
Field Results                      Temperature: <u><i>25</i></u> °C	
<p><i>The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the silty clay with crushed &amp; natural gravel, being used as Engineered fill for backfilling the trench. After using a nuclear density gauge all test results showed 95% to 98% spm00, which met the project specifications.</i></p>	
Corrective action to be taken:	
Follow up visit required: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Site Rep.: <i>B. Bernody</i>	Prepared By: <i>A.S</i>
Of:	Reviewed By: <i>[Signature]</i>
For Internal Use Only     Have: <input checked="" type="checkbox"/> JSA/JSEA <input checked="" type="checkbox"/> PPE <input type="checkbox"/> Training             Need S-RAF: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No     Initials:	



# Soil Compaction Verification Report

Page \_\_\_ of \_\_\_

Project No.: <u>11132032</u> Client: <u>GHD</u> Project: <u>Terrapine stoney creek</u> Location: <u>65 Green Mountain Rd</u>	Date: <u>2017/09/20</u> Contractor: <u>diffen</u> Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
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Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>silty clay with crushed &amp; natural gravel</u>	<u>2006</u>	<u>7.7</u>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured: <input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, specify testing to be done: Proctor <input type="checkbox"/> STD. <input type="checkbox"/> MOD. <input type="checkbox"/> Gradation
---	---

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<u>Refer to Groundwater collector pipe vertical</u>							
<u>(1)</u>	<u>about 2mN &amp; 20mW</u>	<u>1<sup>st</sup> lift</u>	<u>I</u>	<u>1875</u>	<u>8.2</u>	<u>93</u>	<u>95</u>	<u>NC</u>
<u>(2)</u>	<u>Repeat test (1)</u>	<u>-11-</u>	<u>I</u>	<u>1910</u>	<u>8.0</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(3)</u>	<u>about 3mS &amp; 56mW</u>	<u>-11-</u>	<u>I</u>	<u>1925</u>	<u>7.1</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(4)</u>	<u>about 3mN &amp; 12mW</u>	<u>2<sup>nd</sup> lift</u>	<u>I</u>	<u>1964</u>	<u>6.8</u>	<u>98</u>	<u>95</u>	<u>C</u>
<u>(5)</u>	<u>about 4mS &amp; 60mW</u>	<u>-11-</u>	<u>I</u>	<u>1917</u>	<u>6.0</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(6)</u>	<u>about 6mS &amp; 8mW</u>	<u>3<sup>rd</sup> lift</u>	<u>I</u>	<u>1854</u>	<u>6.5</u>	<u>92</u>	<u>95</u>	<u>NC</u>
<u>(7)</u>	<u>Repeat test (6)</u>	<u>-11-</u>	<u>I</u>	<u>1923</u>	<u>6.6</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(8)</u>	<u>about 2mS &amp; 42mW</u>	<u>-11-</u>	<u>I</u>	<u>1935</u>	<u>6.1</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(9)</u>	<u>about 4mN &amp; 10mW</u>	<u>4<sup>th</sup> lift</u>	<u>I</u>	<u>1908</u>	<u>5.9</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(10)</u>	<u>about 7mS &amp; 50mW</u>	<u>-11-</u>	<u>I</u>	<u>1944</u>	<u>6.7</u>	<u>97</u>	<u>95</u>	<u>C</u>
<u>(11)</u>	<u>about 3mN &amp; 26mW</u>	<u>5<sup>th</sup> lift</u>	<u>I</u>	<u>1930</u>	<u>6.2</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(12)</u>	<u>about 2mS &amp; 59mW</u>	<u>-11-</u>	<u>I</u>	<u>1973</u>	<u>6.3</u>	<u>98</u>	<u>95</u>	<u>C</u>

Action:  C = Complying to spec.  NC = Not complying to spec.

Comments:	Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)			
	Gauge No. <u>1775</u>	Calibration	Field Reading	Variation %
	Density	<u>2075</u>	<u>2069.1</u>	<u>0.3</u>
	Moisture	<u>448.2</u>	<u>439.6</u>	<u>1.9</u>

Site Rep.: <u>B. Sermody</u>	Prepared By: <u>AJ</u>
Of: _____	Reviewed By: <u>[Signature]</u>

For Internal Use Only    Have:  JSA/JSEA  PPE  Training    Need S-RAF:  Yes  No    Initials: \_\_\_\_\_





# Soil Compaction Verification Report

Project No.: <u>11132032</u> Client: <u>GHD</u> Project: <u>Terrapure stoney creek</u> Location: <u>65 Green Mountain Rd</u>	Date: <u>2017/09/21</u> Contractor: <u>diffenin</u> Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
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Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>silty clay with crushed &amp; natural gravel</u>	<u>2006</u>	<u>7.7</u>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured: <input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, specify testing to be done: Proctor <input type="checkbox"/> STD. <input type="checkbox"/> MOD. <input type="checkbox"/> Gradation
---	---

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<u>Refer at Groundwater collector pipe</u>							
<u>(1)</u>	<u>about 3m N &amp; 11m W</u>	<u>1st lift</u>	<u>I</u>	<u>1968</u>	<u>6.4</u>	<u>98</u>	<u>95</u>	<u>c</u>
<u>(2)</u>	<u>about 2m S &amp; 55m W</u>	<u>-11-</u>	<u>I</u>	<u>1929</u>	<u>6.0</u>	<u>96</u>	<u>95</u>	<u>c</u>
<u>(3)</u>	<u>about 4m N &amp; 23m W</u>	<u>2nd lift</u>	<u>I</u>	<u>1841</u>	<u>6.7</u>	<u>92</u>	<u>95</u>	<u>NC</u>
<u>(4)</u>	<u>Repeat test (3)</u>	<u>-11-</u>	<u>I</u>	<u>1913</u>	<u>6.6</u>	<u>95</u>	<u>95</u>	<u>c</u>
<u>(5)</u>	<u>about 3m N &amp; 15m W</u>	<u>3rd lift</u>	<u>I</u>	<u>1948</u>	<u>7.0</u>	<u>97</u>	<u>95</u>	<u>c</u>
<u>(6)</u>	<u>about 4m S &amp; 60m W</u>	<u>-11-</u>	<u>I</u>	<u>1970</u>	<u>5.8</u>	<u>98</u>	<u>95</u>	<u>c</u>
<u>(7)</u>	<u>about 1.5m N &amp; 32m W</u>	<u>4th lift</u>	<u>I</u>	<u>2014</u>	<u>6.9</u>	<u>100</u>	<u>95</u>	<u>c</u>
<u>(8)</u>	<u>about 2m S &amp; 10m W</u>	<u>-11-</u>	<u>I</u>	<u>1988</u>	<u>6.5</u>	<u>99</u>	<u>95</u>	<u>c</u>
<u>(9)</u>	<u>about 3.5m N &amp; 25m W</u>	<u>5th lift</u>	<u>I</u>	<u>1945</u>	<u>6.0</u>	<u>97</u>	<u>95</u>	<u>c</u>
<u>(10)</u>	<u>about 3m S &amp; 61m W</u>	<u>-11-</u>	<u>I</u>	<u>1967</u>	<u>6.7</u>	<u>98</u>	<u>95</u>	<u>c</u>

Action:  Complying to spec.  NC = Not complying to spec.

Comments:	Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)			
	Gauge No. <u>1775</u>	Calibration	Field Reading	Variation %
	Density	<u>2075</u>	<u>2065.8</u>	<u>0.4</u>
	Moisture	<u>448.2</u>	<u>440.3</u>	<u>1.7</u>

Site Rep.: <u>B. Dermody</u>	Prepared By: <u>A.A</u>
Of: _____	Reviewed By: <u>[Signature]</u>

For Internal Use Only      Have:  JSA/JSEA  PPE  Training      Need S-RAF:  Yes  No      Initials: \_\_\_\_\_



# Field Report

Project No.: 11103232		Date: 2017/09/25	
Client: GHD		Contractor: Boffen's	
Project: Terrapine Stony creek landfill		<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify):	
Location: 65 Green Mountain Rd Hamilton, ON		<input type="checkbox"/> Roofing <input type="checkbox"/> Structural Steel <input type="checkbox"/> Reinforcing Steel <input type="checkbox"/> Sampling	
Field Results	Temperature: 30 °C		
<p>The above noted site was visited by GHD representative as requested. The purpose of the visit was to determine the degree of compaction achieved on the silty clay trace sand &amp; gravel materials being used for primary compacted clay liner construction. The compaction was performed by the medium size sheepfoot roller. After using a nuclear density gauge, all test results showed 98% to 100% spmdd, which met the project specifications. In addition, the observations made during our visit are recorded as below:</p> <ul style="list-style-type: none"> <li>- Installation of type A Geotextile on top of the secondary compacted clay liner, and placement of hydraulic controls layer (50mm clean stone)</li> <li>- Installation of type A Geotextile prior to primary compacted clay liner construction. connection of the new secondary &amp; primary liners to the existing clay liners.</li> </ul> <p>Corrective action to be taken:</p> <ul style="list-style-type: none"> <li>- Each lift of primary compacted clay liner has been scanned and efforts were made for picking up the rocks by hands.</li> </ul>			
Follow up visit required:		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Site Rep.: B. Dermody		Prepared By: A.D	
Of:		Reviewed By:	
For Internal Use Only	Have: <input checked="" type="checkbox"/> JSA/JSEA <input checked="" type="checkbox"/> PPE <input checked="" type="checkbox"/> Training	Need S-RAF: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Initials:





# Soil Compaction Verification Report

①

Project No.: <u>11103232</u> Client: <u>GHD</u> Project: <u>Terrapine stone creek</u> Location: <u>65 Green Mountain Rd</u>	Date: <u>2017/09/25</u> Contractor: <u>bufferin</u> Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
--	---

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>silty clay loose sand &amp; gravel</u>	<u>1751</u>	<u>15.3</u>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured:  Yes  No

If yes, specify testing to be done:  
 Proctor  STD.  MOD.  Gradation

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<u>Refer at Groundwater collection pipe</u>							
<u>(1)</u>	<u>about 44m N &amp; 50m W</u>	<u>18<sup>th</sup> lift</u>	<u>I</u>	<u>1740</u>	<u>13.6</u>	<u>99</u>	<u>98</u>	<u>C</u>
<u>(2)</u>	<u>about 47m N &amp; 28m W</u>	<u>18<sup>th</sup> lift</u>	<u>I</u>	<u>1747</u>	<u>14.2</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(3)</u>	<u>about 68m N &amp; 23m W</u>	<u>-11-</u>	<u>I</u>	<u>1766</u>	<u>13.9</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(4)</u>	<u>about 71m N &amp; 52m W</u>	<u>-11-</u>	<u>I</u>	<u>1728</u>	<u>14.4</u>	<u>99</u>	<u>98</u>	<u>C</u>
<u>(5)</u>	<u>about 4m N &amp; 9m W</u>	<u>-11-</u>	<u>I</u>	<u>1683</u>	<u>15.8</u>	<u>96</u>	<u>98</u>	<u>NC</u>
<u>(6)</u>	<u>Repeat test (5)</u>	<u>-11-</u>	<u>I</u>	<u>1717</u>	<u>15.6</u>	<u>98</u>	<u>98</u>	<u>C</u>
<u>(7)</u>	<u>about 10m S &amp; 16m W</u>	<u>-11-</u>	<u>I</u>	<u>1739</u>	<u>16.1</u>	<u>99</u>	<u>98</u>	<u>C</u>
<u>(8)</u>	<u>about 36m S &amp; 8m W</u>	<u>-11-</u>	<u>I</u>	<u>1770</u>	<u>15.5</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(9)</u>	<u>about 22m S &amp; 15m W</u>	<u>-11-</u>	<u>I</u>	<u>1738</u>	<u>14.3</u>	<u>99</u>	<u>98</u>	<u>C</u>
<u>(10)</u>	<u>about 45m N &amp; 30m W</u>	<u>2<sup>nd</sup> lift</u>	<u>I</u>	<u>1677</u>	<u>15.0</u>	<u>96</u>	<u>98</u>	<u>NC</u>
<u>(11)</u>	<u>Repeat test (10)</u>	<u>-11-</u>	<u>I</u>	<u>1723</u>	<u>15.0</u>	<u>98</u>	<u>98</u>	<u>C</u>
<u>(12)</u>	<u>about 48m W &amp; 49m W</u>	<u>-11-</u>	<u>I</u>	<u>1761</u>	<u>16.3</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(13)</u>	<u>about 65m N &amp; 25m W</u>	<u>-11-</u>	<u>I</u>	<u>1734</u>	<u>15.7</u>	<u>99</u>	<u>98</u>	<u>C</u>
<u>(14)</u>	<u>about 2m S &amp; 12m W</u>	<u>-11-</u>	<u>I</u>	<u>1765</u>	<u>14.6</u>	<u>100</u>	<u>98</u>	<u>C</u>

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)			
	Gauge No. <u>785d</u>	Calibration	Field Reading	Variation %
	Density	<u>3351</u>	<u>3345.2</u>	<u>0.2</u>
	Moisture	<u>404</u>	<u>398.3</u>	<u>1.4</u>

Site Rep.: B. Dermody Prepared By: A.D.  
 Of: \_\_\_\_\_ Reviewed By: [Signature]

For Internal Use Only Have:  JSA/JSEA  PPE  Training Need S-RAF:  Yes  No Initials: \_\_\_\_\_



# Soil Compaction Verification Report

(2)

Project No.: <u>11103232</u> Client: <u>GHD</u> Project: <u>Terrapino stone creek</u> Location: <u>65 Green Mountain Rd</u>	Date: <u>2017/09/25</u> Contractor: <u>Duffen's</u> Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
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Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>silty clay trace sand &amp; gravel</u>	<u>1751</u>	<u>15.3</u>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured:  Yes  No

If yes, specify testing to be done:  
 Proctor  STD.  MOD.  Gradation

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<u>Refer at Groundwater collector pipe vertical</u>							
<u>(15)</u>	<u>about 23ms &amp; 17mw</u>	<u>2nd lift</u>	<u>I</u>	<u>1754</u>	<u>16.4</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(16)</u>	<u>about 42ms &amp; 8mw</u>	<u>-11-</u>	<u>I</u>	<u>1727</u>	<u>13.9</u>	<u>99</u>	<u>98</u>	<u>C</u>
<u>(17)</u>	<u>about 71mw &amp; 40mw</u>	<u>3rd lift</u>	<u>I</u>	<u>1781</u>	<u>15.8</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(18)</u>	<u>about 58mN &amp; 32mw</u>	<u>-11-</u>	<u>I</u>	<u>1742</u>	<u>16.0</u>	<u>99</u>	<u>98</u>	<u>C</u>
<u>(19)</u>	<u>about 40mN &amp; 39mw</u>	<u>-11-</u>	<u>I</u>	<u>1720</u>	<u>14.8</u>	<u>98</u>	<u>98</u>	<u>C</u>
<u>(20)</u>	<u>about 44mN &amp; 24mw</u>	<u>-11-</u>	<u>I</u>	<u>1733</u>	<u>15.6</u>	<u>99</u>	<u>98</u>	<u>C</u>

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)			
	Gauge No. <u>7852</u>	Calibration	Field Reading	Variation %
	Density	<u>3351</u>	<u>3345.2</u>	<u>0.2</u>
	Moisture	<u>404</u>	<u>398.3</u>	<u>1.4</u>

Site Rep.: B. Dermody Prepared By: A.D  
 Of: \_\_\_\_\_ Reviewed By: [Signature]

For Internal Use Only    Have:  JSA/JSEA  PPE  Training    Need S-RAF:  Yes  No    Initials: \_\_\_\_\_



# Field Report

Project No.: 11103232		Date: 2017/09/26	
Client: GHD		Contractor: Boffen	
Project: Terrapine stoney creek land fill		<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify):	
Location: 65 Green Mountain Rd Hamilton, ON		<input type="checkbox"/> Roofing <input type="checkbox"/> Structural Steel <input type="checkbox"/> Reinforcing Steel <input type="checkbox"/> Sampling	
Field Results		Temperature: 30 °C	
<p>The purpose of the visit was to conduct the compaction test on the silty clay trace sand &amp; gravel material being used for primary compacted clay liner construction. The compaction was performed by the medium size sheepfoot roller and all test results varied from 98% to 100% SPM10, which met the project specifications.</p> <p>Each lift of primary compacted clay liner has been scarified and efforts were made for picking-up the rocks by hands. The contractor added some water before placing the next lift of compacted clay liner.</p>			
Corrective action to be taken:			
Follow up visit required: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Site Rep.: B. Dermody		Prepared By: A.D	
Of:		Reviewed By: RM	
For Internal Use Only    Have: <input checked="" type="checkbox"/> JSA/JSEA <input checked="" type="checkbox"/> PPE <input checked="" type="checkbox"/> Training    Need S-RAF: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No    Initials:			



# Soil Compaction Verification Report

Project No.: <u>11103232</u> Client: <u>GHD</u> Project: <u>Tennessee Stony Creek</u> Location: <u>65 Green Mountain Rd</u>	Date: <u>2017/09/26</u> Contractor: <u>Buffen's</u> Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
--	---

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>silty clay trace sand &amp; gravel</u>	<u>1751</u>	<u>15.3</u>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured: <input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, specify testing to be done: Proctor <input type="checkbox"/> STD. <input type="checkbox"/> MOD. <input type="checkbox"/> Gradation
---	---

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<u>Refer at Groundwater collector pipe</u>							
<u>(1)</u>	<u>about 3m N &amp; 14m W</u>	<u>3rd lift</u>	<u>I</u>	<u>1679</u>	<u>14.7</u>	<u>96</u>	<u>98</u>	<u>NC</u>
<u>(2)</u>	<u>Repeat test (1)</u>	<u>-11-</u>	<u>I</u>	<u>1726</u>	<u>14.6</u>	<u>98</u>	<u>98</u>	<u>C</u>
<u>(3)</u>	<u>about 10m S &amp; 10m W</u>	<u>-11-</u>	<u>I</u>	<u>1772</u>	<u>15.8</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(4)</u>	<u>about 38m S &amp; 16m W</u>	<u>-11-</u>	<u>I</u>	<u>1755</u>	<u>16.3</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(5)</u>	<u>about 22m S &amp; 7m W</u>	<u>-11-</u>	<u>I</u>	<u>1737</u>	<u>14.9</u>	<u>99</u>	<u>98</u>	<u>C</u>
<u>(6)</u>	<u>about 68m N &amp; 40m W</u>	<u>2nd lift</u>	<u>I</u>	<u>1784</u>	<u>15.8</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(7)</u>	<u>about 62m N &amp; 25m W</u>	<u>-11-</u>	<u>I</u>	<u>1750</u>	<u>16.3</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(8)</u>	<u>about 45m N &amp; 38m W</u>	<u>-11-</u>	<u>I</u>	<u>1741</u>	<u>15.5</u>	<u>99</u>	<u>98</u>	<u>C</u>
<u>(9)</u>	<u>about 50m N &amp; 24m W</u>	<u>-11-</u>	<u>I</u>	<u>1763</u>	<u>16.6</u>	<u>100</u>	<u>98</u>	<u>C</u>

Action:  Complying to spec. NC = Not complying to spec.

Comments:	Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)			
	Gauge No. <u>7852</u>	Calibration	Field Reading	Variation %
	Density	<u>3351</u>	<u>3340.9</u>	<u>0.3</u>
	Moisture	<u>404</u>	<u>400.7</u>	<u>0.8</u>

Site Rep.: <u>B. Dermody</u>	Prepared By: <u>A.D.</u>
Of: _____	Reviewed By: <u>[Signature]</u>

For Internal Use Only    Have:  JSA/JSEA  PPE  Training    Need S-RAF:  Yes  No    Initials: \_\_\_\_\_

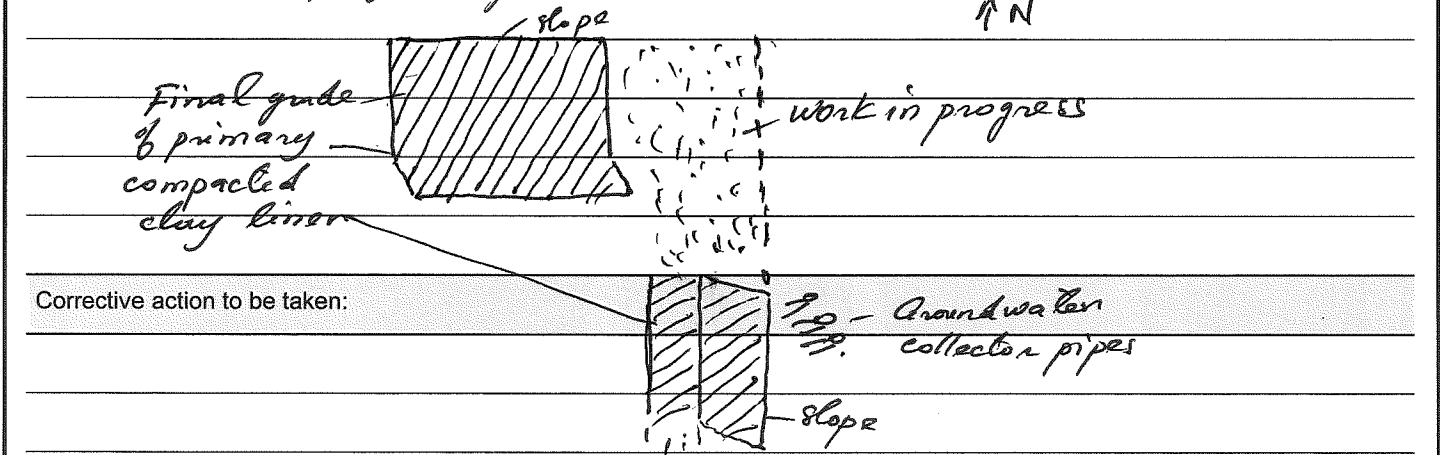


# Field Report

Project No.: 11103232	Date: 2017/09/27
Client: GHD	Contractor: Buffen's
Project: Terrapene stone creek land fill	<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify):
Location: 65 Green Mountain Rd Hamilton, ON	<input type="checkbox"/> Roofing <input type="checkbox"/> Structural Steel <input type="checkbox"/> Reinforcing Steel <input type="checkbox"/> Sampling

Field Results      Temperature: 24 °C

The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the silty clay loose sand & gravel material, being as final grade of primary compacted clay liner construction. The compaction was performed by the medium size sheepfoot roller. After using a nuclear density gauge, all test results showed 98% to 100% SPMSD, which met the project specifications.



Corrective action to be taken:

Follow up visit required:  Yes  No

Site Rep.: B. Dermody      Prepared By: A.D.

Of:      Reviewed By: [Signature]

For Internal Use Only      Have:  JSA/JSEA  PPE  Training      Need S-RAF:  Yes  No      Initials:



# Soil Compaction Verification Report

Project No.: <u>11103232</u> Client: <u>GHD</u> Project: <u>Terrapine Stony creek</u> Location: <u>65 Green Mountain Rd</u>	Date: <u>2017/09/27</u> Contractor: <u>buffer's</u> Site Visit Type: <input type="checkbox"/> Full time <input type="checkbox"/> Part time
--	--

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>silty clay trace sand &amp; gravel</u>	<u>1751</u>	<u>15.3</u>

Maximum dry density obtained from:     STD. Test     MOD. Test     Estimated     Control Strip

Sample(s) Secured: <input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, specify testing to be done: Proctor <input type="checkbox"/> STD. <input type="checkbox"/> MOD. <input type="checkbox"/> Gradation
---	---

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<u>Refer at Groundwater collector pipe</u>							
<u>(1)</u>	<u>about 70m N &amp; 40m W</u>	<u>5th off</u>	<u>I</u>	<u>1713</u>	<u>13.3</u>	<u>98</u>	<u>98</u>	<u>C</u>
<u>(2)</u>	<u>about 66m N &amp; 24m W</u>	<u>final grade</u>	<u>I</u>	<u>1760</u>	<u>14.4</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(3)</u>	<u>about 51m N &amp; 35m W</u>	<u>-11-</u>	<u>I</u>	<u>1783</u>	<u>15.0</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(4)</u>	<u>about 42m N &amp; 25m W</u>	<u>-11-</u>	<u>I</u>	<u>1739</u>	<u>15.5</u>	<u>99</u>	<u>98</u>	<u>C</u>
<u>(5)</u>	<u>about 2m N &amp; 12m W</u>	<u>-11-</u>	<u>I</u>	<u>1722</u>	<u>14.8</u>	<u>98</u>	<u>98</u>	<u>C</u>
<u>(6)</u>	<u>about 5ms &amp; 16m W</u>	<u>-11-</u>	<u>I</u>	<u>1682</u>	<u>15.1</u>	<u>96</u>	<u>98</u>	<u>NC</u>
<u>(7)</u>	<u>Repeat test (6)</u>	<u>-11-</u>	<u>I</u>	<u>1727</u>	<u>15.0</u>	<u>99</u>	<u>98</u>	<u>C</u>
<u>(8)</u>	<u>about 22ms &amp; 7m W</u>	<u>-11-</u>	<u>I</u>	<u>1759</u>	<u>15.4</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(9)</u>	<u>about 30ms &amp; 15m W</u>	<u>-11-</u>	<u>I</u>	<u>1736</u>	<u>13.9</u>	<u>99</u>	<u>98</u>	<u>C</u>
<u>(10)</u>	<u>about 42ms &amp; 8m W</u>	<u>-11-</u>	<u>I</u>	<u>1772</u>	<u>14.6</u>	<u>100</u>	<u>98</u>	<u>C</u>

Action:     C = Complying to spec.     NC = Not complying to spec.

Comments:	Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)			
	Gauge No. <u>7852</u>	Calibration	Field Reading	Variation %
	Density	<u>3351</u>	<u>3347.9</u>	<u>0.1</u>
	Moisture	<u>404</u>	<u>396.6</u>	<u>1.8</u>

Site Rep.: <u>B. Scamody</u>	Prepared By: <u>A.D</u>
Of: _____	Reviewed By: <u>[Signature]</u>






For Internal Use Only    Have:     JSA/JSEA     PPE     Training    Need S-RAF:     Yes     No    Initials: \_\_\_\_\_



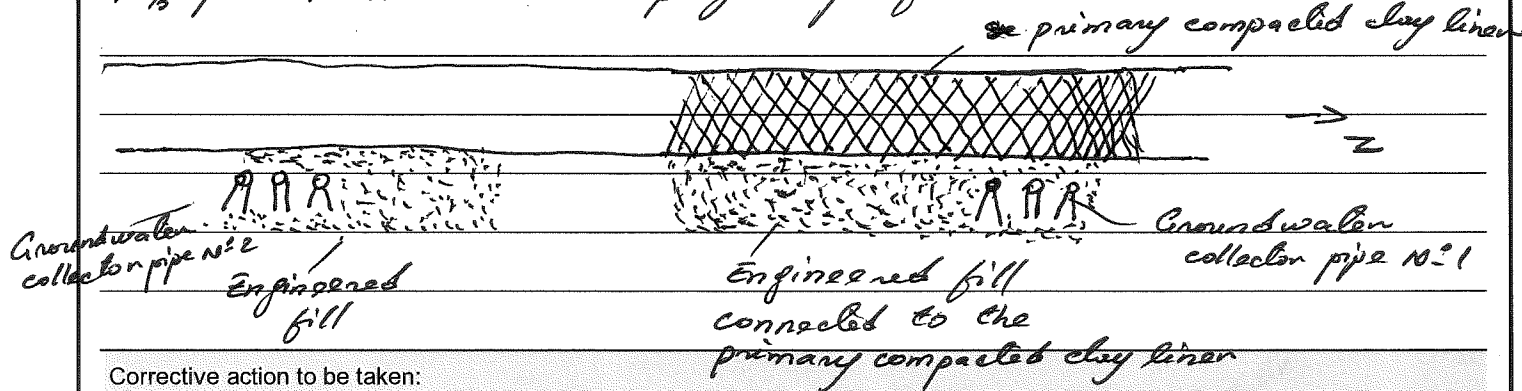


# Field Report

Project No.: 11103232	Date: 2017/09/27
Client: GHD	Contractor: bufferin
Project: Terrapin Stony Creek land fill	<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify):
Location: 65 Green Mountain Rd Hamilton, ON	<input type="checkbox"/> Roofing <input type="checkbox"/> Structural Steel <input type="checkbox"/> Reinforcing Steel <input type="checkbox"/> Sampling

Field Results Temperature: 24 °C     

The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the silty clay with crushed and natural gravel, being used as engineered fill for backfilling the trench within two areas (see sketch below). After using a nuclear density gauge, all test results showed 95% to 98% SPMAS, which met the project specifications.



Corrective action to be taken:

Follow up visit required:  Yes  No

Site Rep.: B. Bermody	Prepared By: A.S
Of:	Reviewed By: M

For Internal Use Only Have:  JSA/JSEA  PPE  Training Need S-RAF:  Yes  No Initials:



# Field Report

Project No.: 11103232	Date: 2017/09/27
Client: GHD	Contractor: Boffin
Project: Terrapure Stony Creek Landfill	<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify): <span style="float: right;"> <input type="checkbox"/> Roofing  <input type="checkbox"/> Structural Steel  <input type="checkbox"/> Reinforcing Steel  <input type="checkbox"/> Sampling       </span>
Location: 65 Green Mountain Rd Hamilton, ON	
Field Results                      Temperature: 24 °C	
<p>In addition, the compact test was carried out for backfilling the area where the Shelby tubes were installed. The contractor has placed three (3) lifts of secondary compacted clay liner. After using a nuclear density gauge, all test results varied from 98% to 99% SPMD, which met the project specifications. (see attached pictures for more details).</p>	
Corrective action to be taken:	
Follow up visit required: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Site Rep.: B. Sernody	Prepared By: A.D
Of:	Reviewed By:
For Internal Use Only     Have: <input type="checkbox"/> JSA/JSEA <input checked="" type="checkbox"/> PPE <input checked="" type="checkbox"/> Training     Need S-RAF: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No     Initials:	



# Soil Compaction Verification Report

Page \_\_\_ of \_\_\_

Project No.: 11103232 Client: GHD Project: Terrapine Stoney Creek Location: 65 Green Mountain Rd	Date: 2017/09/27 Contractor: Buffen Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
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Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
I	silty clay with crushed & natural gravel	2006	7.7
II	silty clay trace sand & gravel	1751	15.3

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured:  Yes  No

If yes, specify testing to be done:  
 Proctor  STD.  MOD.  Gradation

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	Refer at Groundwater collector Pipe N=1							
(1)	about 2m E & 12m S	1st lift	I	1966	9.5	98	95	c
(2)	about 1m W & 45m S	1st lift	I	1929	9.1	96	95	c
(3)	about 3m E & 20m S	2nd lift	I	1911	8.8	95	95	c
(4)	about 2m W & 60m S	2nd lift	I	1920	9.0	96	95	c
	Refer at Groundwater collector pipe N=2							
(5)	about 4m S & 4m W	1st lift	I	1908	10.2	95	95	c
(6)	about 3m N & 20m W	1st lift	I	1934	8.3	96	95	c
(7)	about 3m S & 2m W	2nd lift	I	1957	8.9	97	95	c
(8)	about 4m N & 30m W	2nd lift	I	1922	9.0	96	95	c
	Refer at Groundwater collector pipe N=1							
(9)	about 60m S & 7m W	1st lift	II	1715	15.0	98	98	c
(10)	about 61m S & 8m W	2nd lift	II	1727	14.4	99	98	c
(11)	about 60m S & 7.5m W	3rd lift	II	1736	14.7	99	98	c

Action:  Complying to spec. NC = Not complying to spec.

Comments:	Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)			
	Gauge No. 7852	Calibration	Field Reading	Variation %
	Density	3351	3347.9	0.1
	Moisture	404	396.6	1.8

Site Rep.: B. Dermody Prepared By: A.D

Of: \_\_\_\_\_ Reviewed By: PA

For Internal Use Only Have:  JSA/JSEA  PPE  Training Need S-RAF:  Yes  No Initials: \_\_\_\_\_



# Field Report

Project No.: <i>11103232</i>	Date: <i>2017/10/03</i>
Client: <i>GHD</i>	Contractor: <i>Bufferin</i>
Project: <i>Terrapene stoney creek land fill</i>	<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify): <span style="float: right;"> <input type="checkbox"/> Roofing  <input type="checkbox"/> Structural Steel  <input type="checkbox"/> Reinforcing Steel  <input type="checkbox"/> Sampling       </span>
Location: <i>65 Green Mountain Rd Hamilton</i>	
Field Results                      Temperature: <u><i>21</i></u> °C	
<p><i>The purpose of the visit was to follow-up the compaction test on the silty clay brace sand &amp; gravel material being used for secondary compacter clay liner construction (4th &amp; 5th lifts). The contractor used also the silty clay brace sand &amp; gravel material as Engineered fill for backfilling the Anchor Trench in order to hold the Geomembrane and Geotextile materials.</i></p> <p><i>After using a nuclear density gauge, all tests results showed 98% to 100% spmsd, which met the project specifications (see attached photos for more details).</i></p>	
Corrective action to be taken:	
Follow up visit required: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Site Rep.: <i>B. Bernady</i>	Prepared By: <i>A.J</i>
Of:	Reviewed By: <i>WJ</i>
For Internal Use Only     Have: <input checked="" type="checkbox"/> JSA/JSEA <input checked="" type="checkbox"/> PPE <input checked="" type="checkbox"/> Training             Need S-RAF: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No     Initials:	



# Soil Compaction Verification Report

Project No.: <u>11103232</u> Client: <u>GHD</u> Project: <u>Terrapine stone creek</u> Location: <u>65 Green Mountain Rd</u>	Date: <u>2017/10/03</u> Contractor: <u>Dufferin</u> Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
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Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>silty clay trace sand &amp; gravel</u>	<u>1751</u>	<u>15.3</u>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured: <input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, specify testing to be done: Proctor <input type="checkbox"/> STD. <input type="checkbox"/> MOD. <input type="checkbox"/> Gradation
---	---

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
<i>Refer to Groundwater collector pipe N° 2</i>								
<u>(1)</u>	<u>about 11ms &amp; 90mw</u>	<u>4th lift</u>	<u>I</u>	<u>1787</u>	<u>15.8</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(2)</u>	<u>about 8ms &amp; 65mw</u>	<u>-11-</u>	<u>I</u>	<u>1760</u>	<u>16.0</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(3)</u>	<u>about 10ms &amp; 22mw</u>	<u>-11-</u>	<u>I</u>	<u>1743</u>	<u>14.9</u>	<u>99</u>	<u>98</u>	<u>C</u>
<u>(4)</u>	<u>about 7ms &amp; 85mw</u>	<u>5th lift</u>	<u>I</u>	<u>1690</u>	<u>15.4</u>	<u>96</u>	<u>98</u>	<u>NC</u>
<u>(5)</u>	<u>Repeat test (4)</u>	<u>-11-</u>	<u>I</u>	<u>1725</u>	<u>16.2</u>	<u>98</u>	<u>98</u>	<u>C</u>
<u>(6)</u>	<u>about 12ms &amp; 53mw</u>	<u>-11-</u>	<u>I</u>	<u>1772</u>	<u>14.8</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(7)</u>	<u>about 8ms &amp; 20mw</u>	<u>-11-</u>	<u>I</u>	<u>1756</u>	<u>15.5</u>	<u>100</u>	<u>98</u>	<u>C</u>
<i>Refer to Groundwater collector pipe N° 1</i>								
<u>(8)</u>	<u>about 3mw &amp; 30ms</u>	<u>1st lift</u>	<u>I</u>	<u>1709</u>	<u>14.7</u>	<u>98</u>	<u>98</u>	<u>C</u>
<u>(9)</u>	<u>about 3mw &amp; 12ms</u>	<u>2nd lift</u>	<u>I</u>	<u>1718</u>	<u>15.6</u>	<u>98</u>	<u>98</u>	<u>C</u>
<u>(10)</u>	<u>about 3mw &amp; 6ms</u>	<u>3rd lift</u>	<u>I</u>	<u>1727</u>	<u>15.9</u>	<u>99</u>	<u>98</u>	<u>C</u>

Action:  Complying to spec.  NC = Not complying to spec.

Comments:	Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)			
	Gauge No. <u>2243</u>	Calibration	Field Reading	Variation %
	Density	<u>2484.7</u>	<u>2479.8</u>	<u>0.2</u>
	Moisture	<u>493.5</u>	<u>488.6</u>	<u>0.9</u>

Site Rep.: <u>B. Bermody</u>	Prepared By: <u>A.J</u>
Of: _____	Reviewed By: <u>[Signature]</u>

For Internal Use Only      Have:  JSA/JSEA  PPE  Training      Need S-RAF:  Yes  No      Initials: \_\_\_\_\_



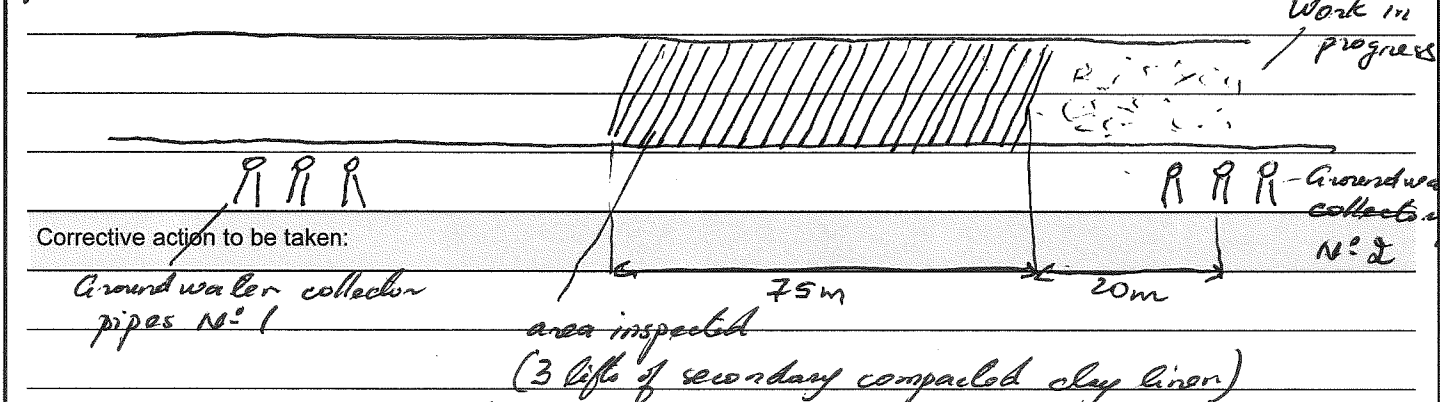
# Field Report

Project No.: 11103232	Date: 2017/10/02
Client: GHD	Contractor: Bufferin
Project: Tomapure stone creek land fill	<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify):
Location: 65 Green Mountain Rd Hamilton, ON	<input type="checkbox"/> Roofing <input type="checkbox"/> Structural Steel <input type="checkbox"/> Reinforcing Steel <input type="checkbox"/> Sampling

Field Results      Temperature: 21 °C

Sunny  
 Partly Sunny  
 Cloudy  
 Rainy  
 Snowy

The purpose of the visit was to conduct the compaction test on the silty clay brace sand & gravel material being used as secondary compacted clay liner (see sketch below for more details). The compaction was performed by the medium size sheepsfoot roller, and all test results showed 98% to 100% SPMDA, which met the project specifications. The contractor has made some efforts for picking-up the rocks, and each lift was watered before the placement of successive lifts.



Corrective action to be taken:

Follow up visit required:  Yes     No

Site Rep.: B. Dermody      Prepared By: A.D.

Of:      Reviewed By: [Signature]

For Internal Use Only    Have:  JSA/JSEA     PPE     Training    Need S-RAF:  Yes     No    Initials: [Initials]





# Soil Compaction Verification Report

Project No.: <i>11103232</i> Client: <i>GHA</i> Project: <i>Terrapin stone creek</i> Location: <i>65 Green Mountain Rd</i>	Date: <i>2017/10/02</i> Contractor: <i>Defferin</i> Site Visit Type: <input type="checkbox"/> Full time <input type="checkbox"/> Part time
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Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<i>I</i>	<i>silty clay trace sand &amp; gravel</i>	<i>1751</i>	<i>15.3</i>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured: <input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, specify testing to be done: Proctor <input type="checkbox"/> STD. <input type="checkbox"/> MOD. <input type="checkbox"/> Gradation
---	---

Area Tested: *Secondary clay liner*

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<i>Refer at Groundwater collector pipe vertical</i>							
<i>(1)</i>	<i>about 10m S &amp; 90m W</i>	<i>1st lift</i>	<i>I</i>	<i>1768</i>	<i>15.6</i>	<i>100</i>	<i>98</i>	<i>C</i>
<i>(2)</i>	<i>about 8m S &amp; 60m W</i>	<i>-11-</i>	<i>I</i>	<i>1730</i>	<i>14.5</i>	<i>99</i>	<i>98</i>	<i>C</i>
<i>(3)</i>	<i>about 12m S &amp; 25m W</i>	<i>-11-</i>	<i>I</i>	<i>1719</i>	<i>15.2</i>	<i>98</i>	<i>98</i>	<i>C</i>
<i>(4)</i>	<i>about 6m S &amp; 88m W</i>	<i>2nd lift</i>	<i>I</i>	<i>1677</i>	<i>14.0</i>	<i>96</i>	<i>98</i>	<i>NC</i>
<i>(5)</i>	<i>Repeat test (4)</i>	<i>-11-</i>	<i>I</i>	<i>1721</i>	<i>14.8</i>	<i>98</i>	<i>98</i>	<i>C</i>
<i>(6)</i>	<i>about 12m S &amp; 50m W</i>	<i>-11-</i>	<i>I</i>	<i>1758</i>	<i>15.4</i>	<i>100</i>	<i>98</i>	<i>C</i>
<i>(7)</i>	<i>about 9m S &amp; 21m W</i>	<i>-11-</i>	<i>I</i>	<i>1742</i>	<i>16.0</i>	<i>99</i>	<i>98</i>	<i>C</i>
<i>(8)</i>	<i>about 12m S &amp; 92m W</i>	<i>3rd lift</i>	<i>I</i>	<i>1702</i>	<i>14.9</i>	<i>97</i>	<i>98</i>	<i>NC</i>
<i>(9)</i>	<i>Repeat test (8)</i>	<i>-11-</i>	<i>I</i>	<i>1736</i>	<i>15.0</i>	<i>99</i>	<i>98</i>	<i>C</i>
<i>(10)</i>	<i>about 6m S &amp; 70m W</i>	<i>-11-</i>	<i>I</i>	<i>1684</i>	<i>15.7</i>	<i>96</i>	<i>98</i>	<i>NC</i>
<i>(11)</i>	<i>Repeat test (10)</i>	<i>-11-</i>	<i>I</i>	<i>1726</i>	<i>14.2</i>	<i>98</i>	<i>98</i>	<i>C</i>
<i>(12)</i>	<i>about 10m S &amp; 30m W</i>	<i>-11-</i>	<i>I</i>	<i>1781</i>	<i>15.8</i>	<i>100</i>	<i>98</i>	<i>C</i>

Action:  C = Complying to spec.  NC = Not complying to spec.

Comments:	Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)			
	Gauge No. <i>1775</i>	Calibration	Field Reading	Variation %
	Density	<i>2075</i>	<i>2071.6</i>	<i>0.2</i>
	Moisture	<i>448.2</i>	<i>439.7</i>	<i>1.8</i>

Site Rep.: <u><i>B. Dermody</i></u>	Prepared By: <u><i>A. A</i></u>
Of: _____	Reviewed By: <u><i>PH</i></u>

For Internal Use Only    Have:  JSA/JSEA  PPE  Training    Need S-RAF:  Yes  No    Initials: \_\_\_\_\_



# Field Report

Project No.: <i>11103232</i>	Date: <i>2017/10/05</i>
Client: <i>GHD</i>	Contractor: <i>Butter's</i>
Project: <i>Terrapine Stony creek Land fill</i>	<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify): <span style="float: right;"> <input type="checkbox"/> Roofing  <input type="checkbox"/> Structural Steel  <input type="checkbox"/> Reinforcing Steel  <input type="checkbox"/> Sampling       </span>
Location: <i>65 Green Mountain Rd</i>	
Field Results                      Temperature: <u><i>22</i></u> °C	
<p><i>The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the Excavated materials (silly clay with crushed &amp; natural gravel), being used as Engineered fill for backfilling the trench. The compaction was performed by the medium size sheeps foot roller. All test results, after using a nuclear density gauge, varied from 95% to 98% spmsd, which met the project specifications.</i></p>	
Corrective action to be taken:	
Follow up visit required: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Site Rep.: <i>B. Dermody</i>	Prepared By: <i>A.S</i>
Of:	Reviewed By: <i>M</i>
For Internal Use Only     Have: <input checked="" type="checkbox"/> JSA/JSEA <input checked="" type="checkbox"/> PPE <input checked="" type="checkbox"/> Training     Need S-RAF: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No     Initials:	



# Soil Compaction Verification Report

Project No.: <u>1110323 2</u> Client: <u>GHD</u> Project: <u>Ternature stoney creek</u> Location: <u>65 Green Mountain Rd</u>	Date: <u>2017/10/05</u> Contractor: <u>Bufferin</u> Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
--	---

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>silty clay with crushed &amp; natural gravel</u>	<u>2006</u>	<u>7.7</u>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured: <input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, specify testing to be done: Proctor <input type="checkbox"/> STD. <input type="checkbox"/> MOD. <input type="checkbox"/> Gradation
---	---

Area Tested:

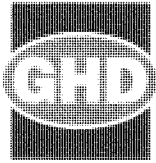
Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<u>Refer at Groundwater collection pipe N-2</u>							
<u>(1)</u>	<u>about 0.5m S &amp; 6m W</u>	<u>1st lift</u>	<u>I</u>	<u>1905</u>	<u>5.3</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(2)</u>	<u>about 1.5m S &amp; 5m E</u>	<u>1st lift</u>	<u>I</u>	<u>1856</u>	<u>5.7</u>	<u>92</u>	<u>95</u>	<u>NC</u>
<u>(3)</u>	<u>Repeat test (2)</u>	<u>-11-</u>	<u>I</u>	<u>1918</u>	<u>5.8</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(4)</u>	<u>about 4m S &amp; 20m W</u>	<u>2nd lift</u>	<u>I</u>	<u>1949</u>	<u>6.2</u>	<u>97</u>	<u>95</u>	<u>C</u>
<u>(5)</u>	<u>about 2m N &amp; 6m E</u>	<u>-11-</u>	<u>I</u>	<u>1930</u>	<u>6.7</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(6)</u>	<u>about 1m S &amp; 12m W</u>	<u>3rd lift</u>	<u>I</u>	<u>1873</u>	<u>5.6</u>	<u>93</u>	<u>95</u>	<u>NC</u>
<u>(7)</u>	<u>Repeat test (6)</u>	<u>-11-</u>	<u>I</u>	<u>1923</u>	<u>5.5</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(8)</u>	<u>about 3m S &amp; 5m E</u>	<u>-11-</u>	<u>I</u>	<u>1915</u>	<u>6.5</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(9)</u>	<u>about 5m S &amp; 16m W</u>	<u>4th lift</u>	<u>I</u>	<u>1955</u>	<u>6.0</u>	<u>97</u>	<u>95</u>	<u>C</u>
<u>(10)</u>	<u>about 1.5m N &amp; 3m E</u>	<u>-11-</u>	<u>I</u>	<u>1969</u>	<u>6.3</u>	<u>98</u>	<u>95</u>	<u>C</u>

Action: C = Complying to spec. NC = Not complying to spec.







Comments:	Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)			
	Gauge No. <u>425</u>	Calibration	Field Reading	Variation %
	Density	<u>1986.5</u>	<u>1977.8</u>	<u>0.4</u>
	Moisture	<u>460.2</u>	<u>453.7</u>	<u>1.4</u>

Site Rep.: <u>B. Dermody</u>	Prepared By: <u>A.S.</u>
Of: _____	Reviewed By: <u>[Signature]</u>

For Internal Use Only    Have:  JSA/JSEA  PPE  Training    Need S-RAF:  Yes  No    Initials: \_\_\_\_\_



# Field Report

Project No.: 11103232		Date: 2017/10/06	
Client: GHS		Contractor: Buffersin	
Project: Terrapure stoney creek Land fill		<input checked="" type="checkbox"/> Compaction	<input type="checkbox"/> Roofing
Location: 65 Green Mountain Rd Hamilton, ON		<input type="checkbox"/> Footing Base Evaluation	<input type="checkbox"/> Structural Steel
		<input type="checkbox"/> Subgrade Evaluation	<input type="checkbox"/> Reinforcing Steel
		<input type="checkbox"/> Concrete	<input type="checkbox"/> Sampling
		<input type="checkbox"/> Asphalt Paving	
		<input type="checkbox"/> Other (specify):	
Field Results		Temperature: 20 °C	    
<p>The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the Excavated materials (silty clay with crushed &amp; natural gravel) being used as Engineered fill for backfilling the trench. After using a nuclear density gauge, all test results showed 95% to 99% SPMDD, which met the project specifications.</p>			
Corrective action to be taken:			
Follow up visit required: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Site Rep.: B. Dermody		Prepared By: A.D	
Of:		Reviewed By: 	
For Internal Use Only	Have: <input checked="" type="checkbox"/> JSA/JSEA <input checked="" type="checkbox"/> PPE <input checked="" type="checkbox"/> Training	Need S-RAF: <input type="checkbox"/> Yes <input type="checkbox"/> No	Initials:



# Soil Compaction Verification Report

Project No.: <u>11103232</u> Client: <u>GHD</u> Project: <u>Tonawanda stone creek</u> Location: <u>65 Green Mountain Rd</u>	Date: <u>2017/10/06</u> Contractor: <u>bufferin</u> Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
--	---

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>silty clay with crushed &amp; natural gravel</u>	<u>2006</u>	<u>7.7</u>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured: <input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, specify testing to be done: Proctor <input type="checkbox"/> STD. <input type="checkbox"/> MOD. <input type="checkbox"/> Gradation
---	---

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<u>Refer at Groundwater collection pipe N:2</u>							
<u>(1)</u>	<u>about 4m S &amp; 10m W</u>	<u>1st lift</u>	<u>I</u>	<u>1925</u>	<u>5.4</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(2)</u>	<u>about 1.5m N &amp; 2m E</u>	<u>-11-</u>	<u>I</u>	<u>1909</u>	<u>5.2</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(3)</u>	<u>about 1m S &amp; 20m W</u>	<u>2nd lift</u>	<u>I</u>	<u>1964</u>	<u>6.0</u>	<u>98</u>	<u>95</u>	<u>C</u>
<u>(4)</u>	<u>about 5m S &amp; 4m E</u>	<u>-11-</u>	<u>I</u>	<u>1936</u>	<u>6.7</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(5)</u>	<u>about 2m N &amp; 15m W</u>	<u>3rd lift</u>	<u>I</u>	<u>1920</u>	<u>7.0</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(6)</u>	<u>about 3m S &amp; 2.5m E</u>	<u>-11-</u>	<u>I</u>	<u>1881</u>	<u>6.5</u>	<u>94</u>	<u>95</u>	<u>NC</u>
<u>(7)</u>	<u>Repeat test (6)</u>	<u>-11-</u>	<u>I</u>	<u>1917</u>	<u>6.5</u>	<u>95</u>	<u>95</u>	<u>C</u>
<u>(8)</u>	<u>about 4m S &amp; 8m W</u>	<u>4th lift</u>	<u>I</u>	<u>1992</u>	<u>6.8</u>	<u>99</u>	<u>95</u>	<u>C</u>
<u>(9)</u>	<u>about 1m N &amp; 5m E</u>	<u>-11-</u>	<u>I</u>	<u>1951</u>	<u>7.1</u>	<u>97</u>	<u>95</u>	<u>C</u>

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)			
	Gauge No. <u>425</u>	Calibration	Field Reading	Variation %
	Density	<u>1986.5</u>	<u>1979.1</u>	<u>0.4</u>
	Moisture	<u>460.2</u>	<u>455.6</u>	<u>0.9</u>

Site Rep.: <u>B. Bermody</u>	Prepared By: <u>A.D</u>
Of: _____	Reviewed By: <u>[Signature]</u>

For Internal Use Only      Have:  JSA/JSEA  PPE  Training      Need S-RAF:  Yes  No      Initials: \_\_\_\_\_



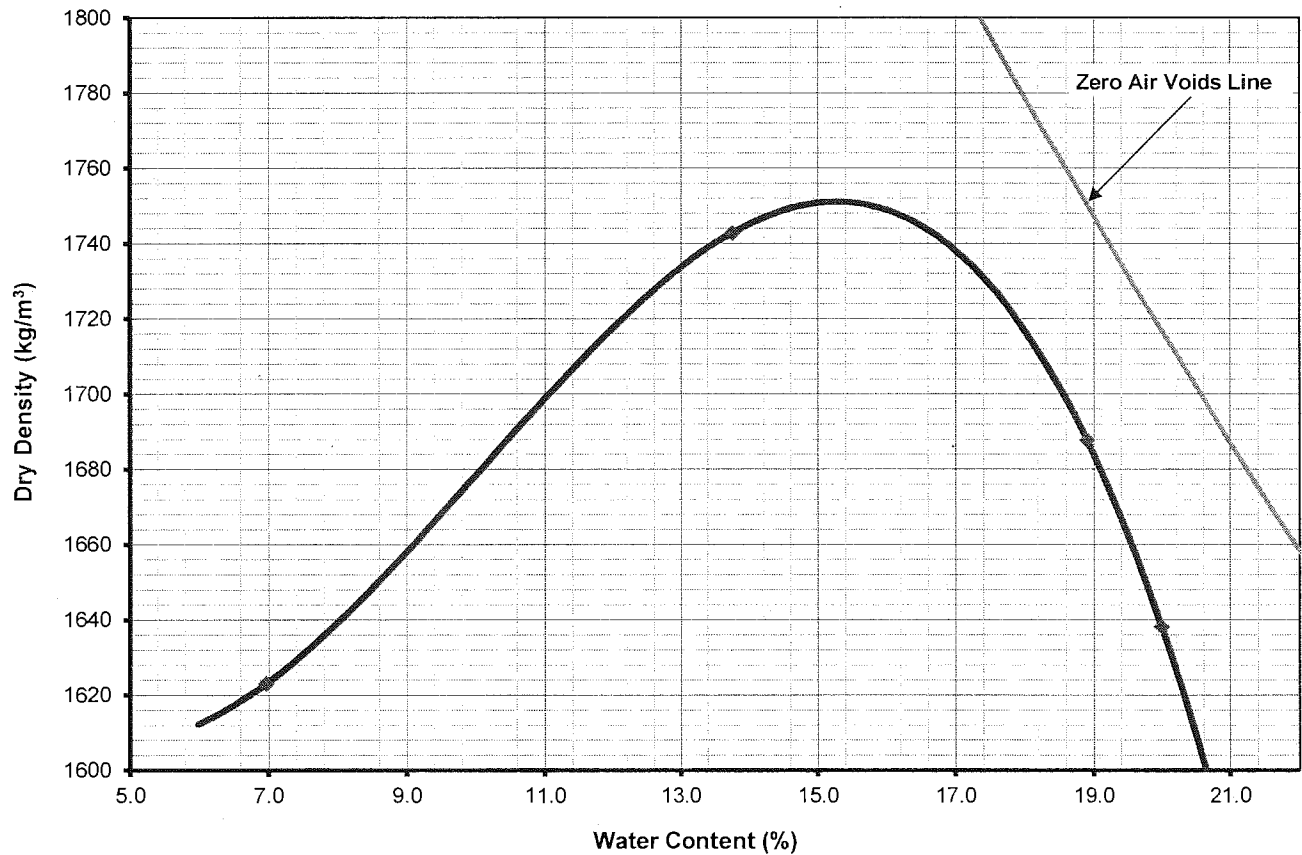
# Standard Proctor Test (ASTM D698)

Client : GHD Ltd.

Lab No : S1467

Project/Site : Stoney Creek Landfill Phase 8A

Project No : 11103232b1



Prepared Sample: Dry  Moist  Assumed G<sub>s</sub>: 2.75

ASTM D698 Test Method: A  B  C  Type of Hammer: Manual

Soil Type: Silty Clay, Trace Sand and Gravel

Material: Native

Proposed Use: Landfill

Sample Identification: Onsite Stockpile

Sample Location: N/A

Aggregate Supplier / Pit Name: N/A

Sample Date: September 14, 2017

Sampled By: A.D

Max. Dry Density:	<u>1751</u> kg/m <sup>3</sup>
Optimum Moisture:	<u>15.3</u> %
% Retained on 4.75 mm:	<u>0.0</u> %
Corrected Dry Density:	<u>1751</u> kg/m <sup>3</sup>
Corrected Opt. Moist.:	<u>15.3</u> %

Remarks : \_\_\_\_\_

Performed by : Omar.S

Date : September 14, 2017

Verified by : Raj Kadia, C.E.T.

Date : September 15, 2017



Appendix D5  
Results Dated November 30, 2017



November 30, 2017

Reference No. 11103232

Mr. Brian Dermody  
GHD Limited  
184 Front Street East Suite 302  
Toronto Ontario  
M5A 4N3

Dear Mr. Dermody:

**Re: Field Compaction Report  
Terrapure-Stoney Creek Landfill  
65 Green Mountain Road W, Hamilton, Ontario**

This report presents the results of field (compaction) and testing carried out by GHD Limited at the above noted project site. The purpose of the field and laboratory testing was to determine the degree of compaction achieved on the following materials:

- Native materials being used to backfill service trenches and as engineered fill to raise grades on the site.
- Native materials being used for the construction of primary and secondary clay liners.

## 1. Summary of Site Inspections

Site inspections were carried out during the period between October 13 and November 20, 2017, by one of our technicians. During our visits, a total of eighty six (86) in-situ density (compaction) tests were conducted using a nuclear density gauge. The compaction tests were carried out on the native materials being used to backfill service trenches, as engineered fill to raise grades on the site, and for the construction of primary and secondary clay liners.

The averaged measured degree of compaction of the native materials was as follows:

- Native materials being used to backfill service trenches and as engineered fill to raise grades on the site: 98 percent Standard Proctor Maximum Dry Density (SPMDD).
- Native materials being used for the construction of primary and secondary clay liners: 99 percent Standard Proctor Maximum Dry Density (SPMDD).

Areas with deficient compaction were re-compacted and retested to meet the project specifications. Each lift of primary compacted clay liner was scarified and any rock fragments were removed by hand.

On November 20, 2017, the final grade of the primary compacted clay liner at the north and east sides of the site was observed to be wet and some surface water was frozen. Based on the visual inspection, it was recommended to dry the area using heaters and grade it prior to placement of the geo-membrane.



Details of our inspections and individual test locations are enclosed.

## 2. Discussion

It is understood that the project specifications require the native materials being used at the Site to be compacted as follows:

- Native materials being used to backfill service trenches and as engineered fill to raise grades on the site: 95 to 98 percent Standard Proctor Maximum Dry Density (SPMDD) respectively.
- Native materials being used as compacted primary and secondary clay liners: 98 percent Standard Proctor Maximum Dry Density (SPMDD)

Based on the field test results, compaction of the materials in the areas tested meets the specifications.

We trust that this information meets with your approval. Please do not hesitate to contact us, should any questions arise.

Sincerely,

GHD

A handwritten signature in blue ink that reads 'RJKadia'. The signature is written in a cursive style and is underlined with a blue horizontal line.

Rajendra Kadia, B.Eng., C.E.T.

RK/ps/5

Encl.

A handwritten signature in blue ink that reads 'Karl Roechner'. The signature is written in a cursive style.

Karl Roechner, M.A.Sc., P. Eng.

# Attachments

# Attachment A Field Inspection Reports

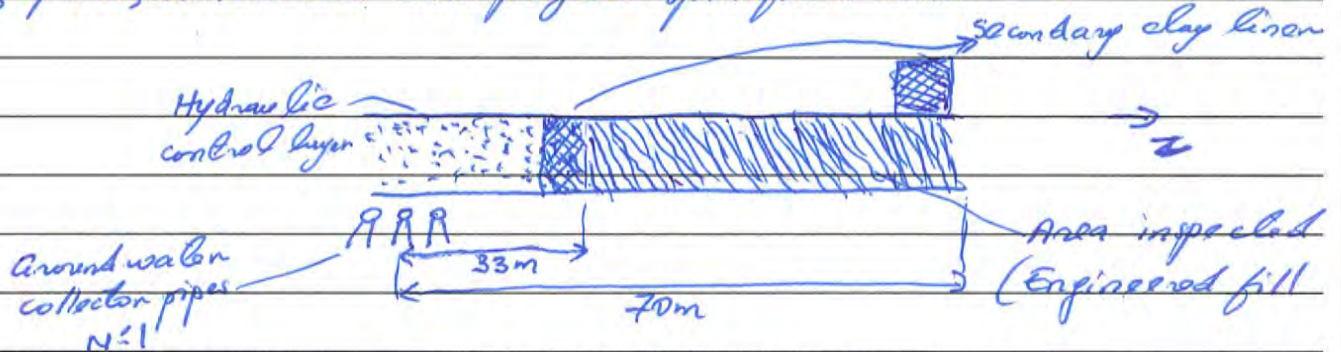


# Field Report

Project No.: <i>11103232</i>	Date: <i>2017/10/13</i>
Client: <i>GHD</i>	Contractor: <i>buffer's</i>
Project: <i>Terrapine Stony Creek</i>	<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify):
Location: <i>65 Green Mountain Rd Hamilton, OR</i>	<input type="checkbox"/> Roofing <input type="checkbox"/> Structural Steel <input type="checkbox"/> Reinforcing Steel <input type="checkbox"/> Sampling

Field Results      Temperature: 15 °C

The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the excavated material (silty clay with crushed & natural gravel) being used as Engineered fill for backfilling the trench (North side). After using a nuclear density gauge, all test results showed 96% to 99% SPMDD, which met the project specifications.



Corrective action to be taken:

Follow up visit required:  Yes       No

Site Rep.: *B. Bermody*

Prepared By: *A.D*

Of:

Reviewed By: *BL*

For Internal Use Only

Have:  JSA/JSEA     PPE     Training

Need S-RAF:  Yes     No

Initials:





# Soil Compaction Verification Report

Page \_\_\_ of \_\_\_

Project No.: <u>11103232</u> Client: <u>GHD</u> Project: <u>Terrapine stone creek</u> Location: <u>65 Green Mountain Rd</u>	Date: <u>2017/10/13</u> Contractor: <u>Dufferin</u> Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
--	---

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>silty clay with crushed &amp; natural gravel</u>	<u>2006</u>	<u>7.7</u>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured: <input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, specify testing to be done: Proctor <input type="checkbox"/> STD. <input type="checkbox"/> MOD. <input type="checkbox"/> Gradation
---	---

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
<u>(1)</u>	<u>Refer at Groundwater collector pipe N=1 about 40m N &amp; 10m W</u>	<u>1st lift</u>	<u>I</u>	<u>1927</u>	<u>9.5</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(2)</u>	<u>about 69m N &amp; 7m W</u>	<u>-11-</u>	<u>I</u>	<u>1988</u>	<u>8.9</u>	<u>99</u>	<u>95</u>	<u>C</u>
<u>(3)</u>	<u>about 36m N &amp; 5m W</u>	<u>2nd lift</u>	<u>I</u>	<u>1871</u>	<u>10.0</u>	<u>93</u>	<u>95</u>	<u>NC</u>
<u>(4)</u>	<u>Repeat test (3)</u>	<u>-11-</u>	<u>I</u>	<u>1933</u>	<u>9.6</u>	<u>96</u>	<u>95</u>	<u>C</u>
<u>(5)</u>	<u>about 42m N &amp; 3m W</u>	<u>3rd lift</u>	<u>I</u>	<u>1967</u>	<u>8.7</u>	<u>98</u>	<u>95</u>	<u>C</u>
<u>(6)</u>	<u>about 65m N &amp; 6m W</u>	<u>4th lift</u>	<u>I</u>	<u>1954</u>	<u>7.9</u>	<u>97</u>	<u>95</u>	<u>C</u>
<u>(7)</u>	<u>about 50m N &amp; 5m W</u>	<u>5th lift</u>	<u>I</u>	<u>1884</u>	<u>8.3</u>	<u>94</u>	<u>95</u>	<u>NC</u>
<u>(8)</u>	<u>Repeat test (7)</u>	<u>-11-</u>	<u>I</u>	<u>1970</u>	<u>8.7</u>	<u>98</u>	<u>95</u>	<u>C</u>
<u>(9)</u>	<u>about 58m N &amp; 7m W</u>	<u>6th lift</u>	<u>I</u>	<u>1947</u>	<u>8.0</u>	<u>97</u>	<u>95</u>	<u>C</u>

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)			
	Gauge No <u>425</u>	Calibration	Field Reading	Variation %
	Density	<u>1986.5</u>	<u>1978.1</u>	<u>0.4</u>
	Moisture	<u>460.2</u>	<u>451.7</u>	<u>1.9</u>

Site Rep.: <u>B. Bernady</u> Of: _____	Prepared By: <u>A.D</u> Reviewed By: <u>[Signature]</u>
---	--

For Internal Use Only    Have:  JSA/JSEA     PPE     Training    Need S-RAF:  Yes  No    Initials: A.D

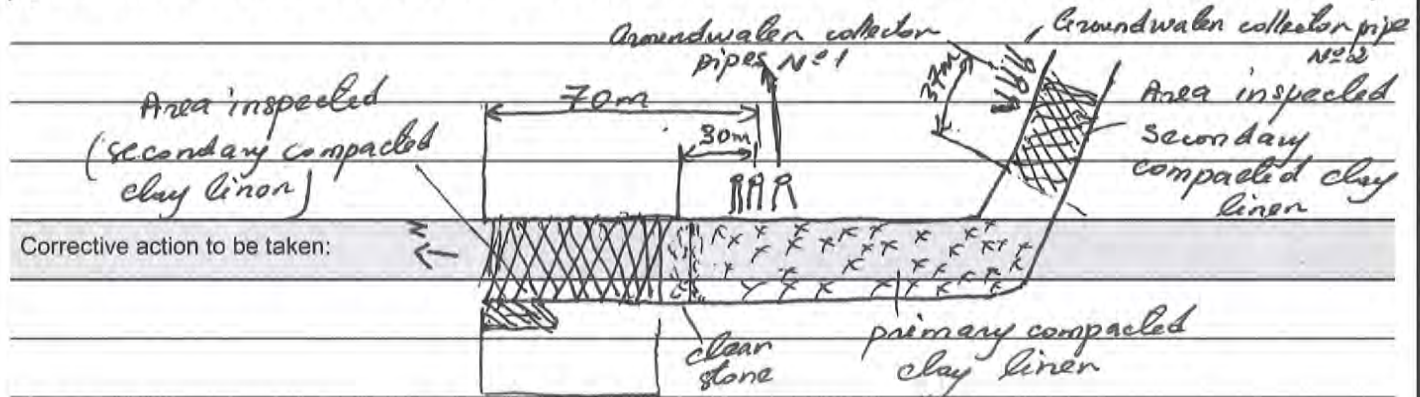


# Field Report

Project No.: 11103232	Date: 2017/10/16
Client: GHD	Contractor: Bufferin
Project: Terrapine stoney creek	<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify):
Location: 65 Green Mountain Rd Hamilton, ON	<input type="checkbox"/> Roofing <input type="checkbox"/> Structural Steel <input type="checkbox"/> Reinforcing Steel <input type="checkbox"/> Sampling

Field Results      Temperature: 6 °C

The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the silty clay trace sand & gravel material, being used for secondary compacted clay liner construction. The compaction was performed by the medium size sheepfoot roller, and all test results showed 98% to 100% spmdd, which met the projects specifications. The contractor has made some efforts for picking-up the roots. (for more details about the locations see sketch below and some photos)



Follow up visit required:       Yes       No

Site Rep.: B. Bernody      Prepared By: A.D

Of:      Reviewed By: [Signature]

For Internal Use Only      Have:  JSA/JSEA     PPE     Training      Need S-RAF:  Yes     No      Initials:





# Soil Compaction Verification Report

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Project No.: 11103232 Client: GHD Project: Terrapine stone creek Location: 65 Green Mountain Rd	Date: 2017/10/16 Contractor: Buffin Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
--	---

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
I	silty clay trace sand & gravel	1750	15.3

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured: <input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, specify testing to be done: Proctor <input type="checkbox"/> STD. <input type="checkbox"/> MOD. <input type="checkbox"/> Gradation
---	---

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	Refer at Groundwater collector pipes N°1							
(1)	about 35mW & 10mW	1st lift	I	1582	17.8	90	98	NC
(2)	Repeat test (1)	-11-	I	1711	17.0	98	98	C
(3)	about 66mW & 15mW	-11-	I	1724	16.7	98	98	C
(4)	about 43mW & 8mW	2nd lift	I	1730	16.5	99	98	C
(5)	about 59mW & 14mW	-11-	I	1721	16.3	98	98	C
	Refer at Groundwater collector pipes N°2							
(6)	about 37mW & 15mS	1st lift	I	1744	15.7	100	98	C
(7)	about 1mW & 6mS	1st lift	I	1727	16.0	99	98	C
(8)	about 30mW & 8mS	2nd lift	I	1778	15.5	100	98	C
(9)	about 5mW & 14mS	-11-	I	1739	16.2	99	98	C
(10)	about 28mW & 9mS	3rd lift	I	1718	15.9	98	98	C
(11)	about 6mW & 16mS	-11-	I	1747	16.3	100	98	C

Action: C = Complying to spec. NC = Not complying to spec.







Comments:	Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)			
	Gauge No. 425	Calibration	Field Reading	Variation %
	Density	1986.5	1979.3	0.4
	Moisture	460.2	455.5	1.0

Site Rep.: B. Dornody	Prepared By: A.D
Of:	Reviewed By: <i>[Signature]</i>

For Internal Use Only    Have:  JSA/JSEA  PPE  Training    Need S-RAF:  Yes  No    Initials: A.D



# Field Report

Project No.: 11103232		Date: 2017/10/17	
Client: GHD		Contractor: Dufferin	
Project: Terrapene stoney creek Land fill		<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify):	
Location: 65 Green Mountain Rd Hamilton, ON		<input type="checkbox"/> Roofing <input type="checkbox"/> Structural Steel <input type="checkbox"/> Reinforcing Steel <input type="checkbox"/> Sampling	
Field Results		Temperature: 15 °C	
    			
<p>The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the silty clay brace sand &amp; gravel material, being used for secondary compacted clay liner construction (North side &amp; East side of the berm) After using a nuclear density gauge, all test results varied from 98% to 100% spmAD, which met the project specifications. (see field report dated 2017/10/16 for more details about the location).</p>			
Corrective action to be taken:			
Follow up visit required: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Site Rep.: B. Dermody		Prepared By: A.D	
Of:		Reviewed By: 	
For Internal Use Only			
Have: <input checked="" type="checkbox"/> JSA/JSEA <input checked="" type="checkbox"/> PPE <input checked="" type="checkbox"/> Training		Need S-RAF: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Initials:			





# Soil Compaction Verification Report

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Project No.: <u>11103232</u> Client: <u>GHD</u> Project: <u>Temperature Stony Creek</u> Location: <u>65 Green Mountain Rd</u>	Date: <u>2017/10/17</u> Contractor: <u>Defferin</u> Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
--	---

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>silty clay brace sand &amp; gravel</u>	<u>1750</u>	<u>15.3</u>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured: <input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, specify testing to be done: Proctor <input type="checkbox"/> STD. <input type="checkbox"/> MOD. <input type="checkbox"/> Gradation
---	---

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<u>Refer at Groundwater collector pipes N#1</u>							
<u>1</u>	<u>about 70m N &amp; 14m W</u>	<u>3rd lift</u>	<u>I</u>	<u>1742</u>	<u>16.0</u>	<u>99</u>	<u>98</u>	<u>C</u>
<u>2</u>	<u>about 42m N &amp; 8m W</u>	<u>-11-</u>	<u>I</u>	<u>1723</u>	<u>15.7</u>	<u>98</u>	<u>98</u>	<u>C</u>
<u>3</u>	<u>about 63m N &amp; 6m W</u>	<u>4th lift</u>	<u>I</u>	<u>1715</u>	<u>15.3</u>	<u>98</u>	<u>98</u>	<u>C</u>
<u>4</u>	<u>about 35m N &amp; 15m W</u>	<u>-11-</u>	<u>I</u>	<u>1684</u>	<u>16.4</u>	<u>96</u>	<u>98</u>	<u>NC</u>
<u>5</u>	<u>Repeat test (4)</u>	<u>-11-</u>	<u>I</u>	<u>1726</u>	<u>16.2</u>	<u>98</u>	<u>98</u>	<u>C</u>
<u>6</u>	<u>about 67m N &amp; 12m W</u>	<u>5th lift</u>	<u>I</u>	<u>1765</u>	<u>15.5</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>7</u>	<u>about 41m N &amp; 7m W</u>	<u>-11-</u>	<u>I</u>	<u>1776</u>	<u>15.0</u>	<u>100</u>	<u>98</u>	<u>C</u>
	<u>Refer at Groundwater collector pipes N#2</u>							
<u>8</u>	<u>about 35m W &amp; 11m S</u>	<u>4th lift</u>	<u>I</u>	<u>1759</u>	<u>15.8</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>9</u>	<u>about 4m W &amp; 5m S</u>	<u>-11-</u>	<u>I</u>	<u>1743</u>	<u>14.4</u>	<u>99</u>	<u>98</u>	<u>C</u>
<u>10</u>	<u>about 30m W &amp; 14m S</u>	<u>5th lift</u>	<u>I</u>	<u>1727</u>	<u>13.9</u>	<u>99</u>	<u>98</u>	<u>C</u>
<u>11</u>	<u>about 8m W &amp; 7m S</u>	<u>-11-</u>	<u>I</u>	<u>1740</u>	<u>14.7</u>	<u>99</u>	<u>98</u>	<u>C</u>

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)			
	Gauge No <u>425</u>	Calibration	Field Reading	Variation %
	Density	<u>1986.5</u>	<u>1973.8</u>	<u>0.6</u>
	Moisture	<u>460.2</u>	<u>457.1</u>	<u>0.7</u>

Site Rep.: <u>B. Bermody</u>	Prepared By: <u>A.D</u>
Of: _____	Reviewed By: <u>[Signature]</u>

For Internal Use Only    Have:  JSA/JSEA     PPE     Training    Need S-RAF:  Yes  No    Initials: \_\_\_\_\_



# Field Report

Project No.: 11103232	Date: 2017/10/25
Client: GHD	Contractor: Bufferin
Project: Torrapue Stony creek Land fill	<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify): <span style="float: right;"> <input type="checkbox"/> Roofing  <input type="checkbox"/> Structural Steel  <input type="checkbox"/> Reinforcing Steel  <input type="checkbox"/> Sampling       </span>
Location: 65 Green Mountain Rd Hamilton, ON	
Field Results                      Temperature: 12 °C	
<p>The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the silty clay trace sand &amp; gravel material, being used for primary compacted clay liner construction. The compaction was performed by the medium size sheepsfoot roller. After using a nuclear density gauge, all tests results varied from 98% to 100% SPM00, which met the project specifications. (see attached photos for more details about the locations).</p>	
Corrective action to be taken:	
Follow up visit required: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Site Rep.: B. Donody	Prepared By: A.D
Of:	Reviewed By:
For Internal Use Only     Have: <input checked="" type="checkbox"/> JSA/JSEA <input checked="" type="checkbox"/> PPE <input checked="" type="checkbox"/> Training     Need S-RAF: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No     Initials:	





# Soil Compaction Verification Report

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Project No.: 11103232 Client: QHA Project: Terrapine stone creek Location: 65 Green Mountain Rd	Date: 2017/10/25 Contractor: <i>diffen</i> Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
--	--

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
I	silty clay brace sand & gravel	1750	15.3

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured: <input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, specify testing to be done: Proctor <input checked="" type="checkbox"/> STD. <input type="checkbox"/> MOD. <input type="checkbox"/> Gradation
---	--

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
(1)	Refer at Groundwater collection pipes N=1 about 42m S & 10m W	1st lift	I	1653	16.8	94	98	NC
(2)	Repeat test (1)	-11-	I	1717	16.6	98	98	C
(3)	about 65m S & 6m W	-11-	I	1735	15.0	99	98	C
(4)	about 80m S & 14m W	-11-	I	1762	13.9	100	98	C
(5)	about 100m S & 8m W	-11-	I	1758	14.2	100	98	C
(6)	about 120m S & 15m W	-11-	I	1740	14.6	99	98	C
(7)	about 50m S & 16m W	2nd lift	I	1786	14.4	100	98	C
(8)	about 73m S & 9m W	-11-	I	1732	14.0	99	98	C
(9)	about 92m S & 14m W	-11-	I	1723	13.8	98	98	C
(10)	about 110m S & 6m W	-11-	I	1766	14.9	100	98	C

Action: C = Complying to spec. NC = Not complying to spec.






Comments:	Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)			
	Gauge No. 7852	Calibration	Field Reading	Variation %
	Density	3351	3345.3	0.1
	Moisture	404	396.7	1.9

Site Rep.: B. Dermody Prepared By: A.D.  
 Of: \_\_\_\_\_ Reviewed By: \_\_\_\_\_

For Internal Use Only Have:  JSA/JSEA  PPE  Training Need S-RAF:  Yes  No Initials: \_\_\_\_\_



# Field Report

Project No.: <i>11103232</i>		Date: <i>2017/10/26</i>	
Client: <i>GHD</i>		Contractor: <i>Buffen's</i>	
Project: <i>Temperature stoney creek</i>		<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify):	
Location: <i>65 Green Mountain Rd Hamilton, ON</i>		<input type="checkbox"/> Roofing <input type="checkbox"/> Structural Steel <input type="checkbox"/> Reinforcing Steel <input type="checkbox"/> Sampling	
Field Results		Temperature: <u>12</u> °C	
    			
<p><i>The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the silty clay brace sand &amp; gravel material, being used for primary compacted clay liner construction. After using a nuclear density gauge, all test results showed 98% to 100% SPM00, which met the project specifications.</i></p>			
Corrective action to be taken:			
Follow up visit required: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Site Rep.:		Prepared By: <i>A.D.</i>	
Of:		Reviewed By: <i>[Signature]</i>	
For Internal Use Only		Have: <input checked="" type="checkbox"/> JSA/JSEA <input checked="" type="checkbox"/> PPE <input checked="" type="checkbox"/> Training	
		Need S-RAF: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
		Initials:	





# Soil Compaction Verification Report

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Project No.: <u>11103232</u> Client: <u>GHD</u> Project: <u>Terrapine Stony creek</u> Location: <u>65 Green Mountain Rd</u>	Date: <u>2017/10/26</u> Contractor: <u>Beffer's</u> Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
--	---

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>silty clay brace sand &amp; gravel</u>	<u>1750</u>	<u>15.3</u>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured: <input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, specify testing to be done: Proctor <input type="checkbox"/> STD. <input type="checkbox"/> MOD. <input type="checkbox"/> Gradation
---	---

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<u>Refer at Groundwater collector pipes N51</u>							
<u>(1)</u>	<u>about 45ms &amp; 8mw</u>	<u>3<sup>rd</sup> lift</u>	<u>I</u>	<u>1748</u>	<u>14.1</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(2)</u>	<u>about 60ms &amp; 16mw</u>	<u>-11-</u>	<u>I</u>	<u>1775</u>	<u>15.6</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(3)</u>	<u>about 86ms &amp; 10mw</u>	<u>-11-</u>	<u>I</u>	<u>1761</u>	<u>15.0</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(4)</u>	<u>about 98ms &amp; 7mw</u>	<u>-11-</u>	<u>I</u>	<u>1738</u>	<u>14.6</u>	<u>99</u>	<u>98</u>	<u>e</u>
<u>(5)</u>	<u>about 120ms &amp; 13mw</u>	<u>-11-</u>	<u>I</u>	<u>1759</u>	<u>15.7</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(6)</u>	<u>about 41ms &amp; 12mw</u>	<u>4<sup>th</sup> lift</u>	<u>I</u>	<u>1781</u>	<u>13.8</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(7)</u>	<u>about 67ms &amp; 10mw</u>	<u>-11-</u>	<u>I</u>	<u>1719</u>	<u>14.3</u>	<u>98</u>	<u>98</u>	<u>e</u>
<u>(8)</u>	<u>about 80ms &amp; 6mw</u>	<u>-11-</u>	<u>I</u>	<u>1691</u>	<u>14.9</u>	<u>96</u>	<u>98</u>	<u>NC</u>
<u>(9)</u>	<u>Repeat east (8)</u>	<u>-11-</u>	<u>I</u>	<u>1725</u>	<u>14.8</u>	<u>98</u>	<u>98</u>	<u>C</u>
<u>(10)</u>	<u>about 110ms &amp; 15mw</u>	<u>-11-</u>	<u>I</u>	<u>1743</u>	<u>15.8</u>	<u>99</u>	<u>98</u>	<u>e</u>

Action: C = Complying to spec. NC = Not complying to spec.


Comments:	Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)			
	Gauge No. <u>7852</u>	Calibration	Field Reading	Variation %
	Density	<u>3351</u>	<u>3345.8</u>	<u>0.1</u>
	Moisture	<u>404</u>	<u>396.7</u>	<u>1.8</u>

Site Rep.: <u>B. Dermody</u>	Prepared By: <u>A.A</u>
Of: _____	Reviewed By: <u>PV</u>

For Internal Use Only    Have:  JSA/JSEA     PPE     Training    Need S-RAF:  Yes  No    Initials: \_\_\_\_\_



# Field Report

Project No.: 11103232		Date: 2017/10/27	
Client: GHD		Contractor: Bufferin	
Project: Terrapine Stone Creek		<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify):	
Location: 65 Green Mountain Rd Hamilton, ON		<input type="checkbox"/> Roofing <input type="checkbox"/> Structural Steel <input type="checkbox"/> Reinforcing Steel <input type="checkbox"/> Sampling	
Field Results		Temperature: 12 °C	
    			
<p>The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the silty clay trace sand &amp; gravel materials, being used for Primary compacted clay liner construction (North &amp; East sides).</p> <p>The compaction was performed by the medium size sheepsfoot roller. After using a nuclear density gauge, all tests results showed 99% to 100% spm80, which met the project specifications.</p>			
Corrective action to be taken:			
Follow up visit required: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Site Rep.: B. Dermody		Prepared By: A.S	
Of:		Reviewed By: 	
For Internal Use Only			
Have: <input checked="" type="checkbox"/> JSA/JSEA <input checked="" type="checkbox"/> PPE <input checked="" type="checkbox"/> Training		Need S-RAF: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Initials:			





# Soil Compaction Verification Report

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Project No.: <u>11103232</u> Client: <u>GHA</u> Project: <u>Tempure stoney creek</u> Location: <u>65 Green Mountain Rd</u>	Date: <u>2017/10/27</u> Contractor: <u>bufferin</u> Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
---	---

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
I	<u>silty clay trace sand &amp; gravel</u>	<u>1750</u>	<u>7.3</u>

Maximum dry density obtained from:     STD. Test     MOD. Test     Estimated     Control Strip

Sample(s) Secured: <input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, specify testing to be done: Proctor <input type="checkbox"/> STD. <input type="checkbox"/> MOD. <input type="checkbox"/> Gradation
---	---

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
<i>Refer at Groundwater collector pipe N°1</i>								
(1)	<u>about 43ms &amp; 9mw</u>	<u>5th left</u>	I	<u>1776</u>	<u>15.5</u>	<u>100</u>	<u>98</u>	<u>C</u>
(2)	<u>about 56ms &amp; 15mw</u>	<u>-11-</u>	I	<u>1764</u>	<u>14.6</u>	<u>100</u>	<u>98</u>	<u>C</u>
(3)	<u>about 75ms &amp; 6mw</u>	<u>-11-</u>	I	<u>1747</u>	<u>13.9</u>	<u>100</u>	<u>98</u>	<u>C</u>
(4)	<u>about 93ms &amp; 12mw</u>	<u>-11-</u>	I	<u>1736</u>	<u>15.0</u>	<u>99</u>	<u>98</u>	<u>C</u>
(5)	<u>about 113ms &amp; 10mw</u>	<u>-11-</u>	I	<u>1762</u>	<u>15.4</u>	<u>100</u>	<u>98</u>	<u>C</u>

Action:    C = Complying to spec.    NC = Not complying to spec.

Comments:	Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)			
	Gauge No. <u>7852</u>	Calibration	Field Reading	Variation %
	Density	<u>3351</u>	<u>3346.6</u>	<u>0.1</u>
	Moisture	<u>404</u>	<u>394.9</u>	<u>2.0</u>

Site Rep.: <u>B. Bernady</u>	Prepared By: <u>A.A</u>
Of: _____	Reviewed By: <u>PH</u>

For Internal Use Only    Have:     JSA/JSEA     PPE     Training    Need S-RAF:     Yes     No    Initials: \_\_\_\_\_



# Field Report

Project No.: <i>11103232</i>	Date: <i>2017/10/20</i>
Client: <i>GHD</i>	Contractor: <i>buffon's</i>
Project: <i>Terrapure Stony creek</i>	<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify): <span style="float: right;"> <input type="checkbox"/> Roofing  <input type="checkbox"/> Structural Steel  <input type="checkbox"/> Reinforcing Steel  <input type="checkbox"/> Sampling       </span>
Location: <i>65 Green Mountain Rd Hamilton, ON</i>	
Field Results                      Temperature: <u>  8  </u> °C	
<p><i>The above noted site was visited by GHD representatives as requested. The purpose of the visit was to conduct the compaction test on the silty clay base sand &amp; gravel, being used for primary compacted clay liner construction (North &amp; East sides). After using a nuclear density gauge, all test results varied from 99% to 100% SPMSS, which met the project specifications.</i></p>	
Corrective action to be taken:	
Follow up visit required: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Site Rep.: <i>B. Bermody</i>	Prepared By: <i>A.S</i>
Of:	Reviewed By: <i>PH</i>
For Internal Use Only     Have: <input checked="" type="checkbox"/> JSA/JSEA <input checked="" type="checkbox"/> PPE <input checked="" type="checkbox"/> Training     Need S-RAF: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No     Initials:	





# Soil Compaction Verification Report

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Project No.: <u>11103232</u> Client: <u>GHD</u> Project: <u>Temperature stony creek</u> Location: <u>B5 Green Mountain Rd</u>	Date: <u>2017/10/30</u> Contractor: <u>Duffin</u> Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
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Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>Silty clay fine sand &amp; gravel</u>	<u>1750</u>	<u>15.3</u>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured:  Yes  No

If yes, specify testing to be done:  
 Proctor  STD.  MOD.  Gradation

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<u>Refer at Curindwater collector pipes N-1</u>							
<u>(1)</u>	<u>about 8mN &amp; 8mW</u>	<u>1st lift</u>	<u>I</u>	<u>1770</u>	<u>15.1</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(2)</u>	<u>about 30mN &amp; 12mW</u>	<u>-11-</u>	<u>I</u>	<u>1763</u>	<u>15.5</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(3)</u>	<u>about 56mN &amp; 14mW</u>	<u>-11-</u>	<u>I</u>	<u>1781</u>	<u>14.9</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(4)</u>	<u>about 15mN &amp; 8mW</u>	<u>2nd lift</u>	<u>I</u>	<u>1735</u>	<u>15.7</u>	<u>99</u>	<u>98</u>	<u>C</u>
<u>(5)</u>	<u>about 40mN &amp; 15mW</u>	<u>-11-</u>	<u>I</u>	<u>1760</u>	<u>14.5</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(6)</u>	<u>about 60mN &amp; 7mW</u>	<u>-11-</u>	<u>I</u>	<u>1729</u>	<u>16.0</u>	<u>99</u>	<u>98</u>	<u>C</u>
	<u>Refer at Curindwater collector pipes N-2</u>							
<u>(7)</u>	<u>about 2mW &amp; 10mS</u>	<u>1st lift</u>	<u>I</u>	<u>1746</u>	<u>15.0</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(8)</u>	<u>about 20mW &amp; 4mS</u>	<u>-11-</u>	<u>I</u>	<u>1767</u>	<u>14.3</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(9)</u>	<u>about 45mW &amp; 14mS</u>	<u>-11-</u>	<u>I</u>	<u>1785</u>	<u>15.6</u>	<u>100</u>	<u>98</u>	<u>C</u>

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)			
	Gauge No. <u>7852</u>	Calibration	Field Reading	Variation %
	Density	<u>3351</u>	<u>3345.8</u>	<u>0.1</u>
	Moisture	<u>404</u>	<u>394.8</u>	<u>2.0</u>

Site Rep.: B. Jermody Prepared By: A.D.

Of: \_\_\_\_\_ Reviewed By: \_\_\_\_\_

For Internal Use Only Have:  JSA/JSEA  PPE  Training Need S-RAF:  Yes  No Initials: \_\_\_\_\_



# Field Report

Project No.: 11103232		Date: 2017/10/31	
Client: GHD		Contractor: Bufferin	
Project: Terrapine Stony creek		<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify):	
Location: 85 Green Mountain Rd Hamilton, ON		<input type="checkbox"/> Roofing <input type="checkbox"/> Structural Steel <input type="checkbox"/> Reinforcing Steel <input type="checkbox"/> Sampling	
Field Results		Temperature: 5 °C	
<p>The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the silty clay trace sand &amp; gravel material, being used for primary compactor clean liner construction (North &amp; East sides). The compaction was performed by the medium size sheepsfoot rollers. After using a nuclear density gauge, all test results showed 98% to 100% spmdd, which met the project specifications. Each primary compacted clay liner has been scarified and some efforts were made for picking up the rocks by hands.</p>			
Corrective action to be taken:			
Follow up visit required: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Site Rep.: B. Dermody		Prepared By: A.D	
Of:		Reviewed By: [Signature]	
For Internal Use Only    Have: <input checked="" type="checkbox"/> JSA/JSEA <input checked="" type="checkbox"/> PPE <input checked="" type="checkbox"/> Training    Need S-RAF: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No    Initials:			





# Soil Compaction Verification Report

Page \_\_\_ of \_\_\_

Project No.: 11103232 Client: GHD Project: Temperature Slony Creek Location: 65 Green Mountain Rd	Date: 2017/10/31 Contractor: <i>diffen</i> Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
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Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
I	silty clay fine sand & gravel	1750	15.3

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured: <input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, specify testing to be done: Proctor <input type="checkbox"/> STD. <input type="checkbox"/> MOD. <input type="checkbox"/> Gradation
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Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	Refer at Groundwater collector pipes N=2							
①	about 5mW & 10mS	2nd lift	I	1755	14.8	100	98	C
②	about 16mW & 4mS	-11-	I	1776	15.6	100	98	C
③	about 30mW & 15mS	-11-	I	1743	14.4	99	98	C
④	about 8mW & 14mS	3rd lift	I	1726	15.0	98	98	C
⑤	about 19mW & 6mS	-11-	I	1765	14.7	100	98	C
⑥	about 36mW & 13mS	-11-	I	1741	15.4	99	98	C
	Refer at Groundwater collector pipes N=4							
⑦	about 10mN & 10mW	3rd lift	I	1757	15.6	100	98	C
⑧	about 48mN & 8mW	-11-	I	1763	14.5	100	98	C
⑨	about 60mN & 15mW	-11-	I	1749	15.5	100	98	C

Action: C = Complying to spec. NC = Not complying to spec.







Comments:	Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)			
	Gauge No. 7852	Calibration	Field Reading	Variation %
	Density	3351	3343.8	0.2
	Moisture	404	394.7	2.0

Site Rep.: B. Bermody Prepared By: A.D  
 Of: \_\_\_\_\_ Reviewed By: [Signature]

For Internal Use Only    Have:  JSA/JSEA  PPE  Training    Need S-RAF:  Yes  No    Initials: \_\_\_\_\_



# Field Report

Project No.: 11103232		Date: 2017/11/01	
Client: GHD		Contractor: Bufferin	
Project: Terrapine stone creek		<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify):	
Location: 65 Green Mountain Rd Hamilton, ON		<input type="checkbox"/> Roofing <input type="checkbox"/> Structural Steel <input type="checkbox"/> Reinforcing Steel <input type="checkbox"/> Sampling	
Field Results		Temperature: 10 °C	
    			
<p>The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the silty clay base sand &amp; gravel material, being used for primary compacted clay liner construction (North &amp; East side). The compaction was performed by the medium size sheepsfoot roller. After using a nuclear density gauge, all test results showed 99% to 100% SPMDD, which met the project specifications. Each lift has been scarified, watered and some efforts were made for picking up the rocks, <del>prior</del> before placement of 5th lift of primary clay liner. (see attached pictures for more details).</p>			
Corrective action to be taken:			
Follow up visit required: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Site Rep.: B. Bermody		Prepared By: A.D	
Of:		Reviewed By: 	
For Internal Use Only			
Have: <input checked="" type="checkbox"/> JSA/JSEA <input checked="" type="checkbox"/> PPE <input checked="" type="checkbox"/> Training		Need S-RAF: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Initials:			





# Soil Compaction Verification Report

Page \_\_\_ of \_\_\_

Project No.: 11103232 Client: GHD Project: Terrapine stoney creek Location: 65 Green Mountain Rd	Date: 2017/11/01 Contractor: <i>Buffen</i> Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
---	--

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
I	<i>silty clay brace sand &amp; gravel</i>	<i>1750</i>	<i>15.3</i>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured:  Yes  No

If yes, specify testing to be done:  
 Proctor  STD.  MOD.  Gradation

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<i>Refer at Groundwater collector pipe N-1</i>							
<i>(1)</i>	<i>about 7m N &amp; 15m W</i>	<i>4th life</i>	<i>I</i>	<i>1742</i>	<i>15.7</i>	<i>99</i>	<i>98</i>	<i>C</i>
<i>(2)</i>	<i>about 33m N &amp; 8m W</i>	<i>-11-</i>	<i>I</i>	<i>1759</i>	<i>16.2</i>	<i>100</i>	<i>98</i>	<i>C</i>
<i>(3)</i>	<i>about 58m N &amp; 20m W</i>	<i>-11-</i>	<i>I</i>	<i>1768</i>	<i>15.9</i>	<i>100</i>	<i>98</i>	<i>C</i>
	<i>Refer at Groundwater collector pipe N-2</i>							
<i>(4)</i>	<i>about 47m W &amp; 10m S</i>	<i>4th life</i>	<i>I</i>	<i>1791</i>	<i>15.4</i>	<i>100</i>	<i>98</i>	<i>C</i>
<i>(5)</i>	<i>about 26m W &amp; 14m S</i>	<i>-11-</i>	<i>I</i>	<i>1763</i>	<i>14.8</i>	<i>100</i>	<i>98</i>	<i>C</i>
<i>(6)</i>	<i>about 8m W &amp; 7m S</i>	<i>-11-</i>	<i>I</i>	<i>1758</i>	<i>15.2</i>	<i>100</i>	<i>98</i>	<i>C</i>

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)			
	Gauge No. <i>7852</i>	Calibration	Field Reading	Variation %
	Density	<i>3351</i>	<i>3342.2</i>	<i>0.2</i>
	Moisture	<i>404</i>	<i>396.6</i>	<i>1.8</i>

Site Rep.: *B. Jernody* Prepared By: *A.D*  
 Of: \_\_\_\_\_ Reviewed By: *[Signature]*

For Internal Use Only Have:  JSA/JSEA  PPE  Training Need S-RAF:  Yes  No Initials: \_\_\_\_\_



# Field Report

Project No.: 11103232		Date: 2017/11/09	
Client: GHD		Contractor: Buffen's	
Project: Tonnapure stoney creek		<input checked="" type="checkbox"/> Compaction	<input type="checkbox"/> Roofing
Location: 65 Green Mountain Rd Hamilton, ON		<input type="checkbox"/> Footing Base Evaluation	<input type="checkbox"/> Structural Steel
		<input type="checkbox"/> Subgrade Evaluation	<input type="checkbox"/> Reinforcing Steel
		<input type="checkbox"/> Concrete	<input type="checkbox"/> Sampling
		<input type="checkbox"/> Asphalt Paving	
		<input type="checkbox"/> Other (specify):	
Field Results	Temperature: 9 °C		
<p>The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the silty clay base sand &amp; gravel material, being used for primary compacted clay liner construction (North &amp; East sides). The compaction was performed by the medium size sheepfoot roller. After using a nuclear density gauge, all test results showed 99% to 100% SPMDD, which meet the project specifications. The contractor has scarified the final grade and made some efforts for picking up the rocks by hands. The final grade was observed well fine graded, prior of placement of geomembranes and granular materials. (see attached pictures for more details about the locations).</p>			
Corrective action to be taken:			
Follow up visit required: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Site Rep.: B. Dermody		Prepared By: A.D	
Of:		Reviewed By:	
For Internal Use Only	Have: <input checked="" type="checkbox"/> JSA/JSEA <input checked="" type="checkbox"/> PPE <input checked="" type="checkbox"/> Training	Need S-RAF: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Initials:





# Soil Compaction Verification Report

Project No.: <u>11103232</u> Client: <u>GHD</u> Project: <u>Temperance storage creek</u> Location: <u>65 Green Mountain Rd</u>	Date: <u>2017/11/09</u> Contractor: <u>Dufferin</u> Site Visit Type: <input checked="" type="checkbox"/> Full time <input type="checkbox"/> Part time
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Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>silty clay lime sand &amp; gravel</u>	<u>1750</u>	<u>15.3</u>

Maximum dry density obtained from:     STD. Test     MOD. Test     Estimated     Control Strip

Sample(s) Secured: <input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, specify testing to be done: Proctor <input type="checkbox"/> STD. <input type="checkbox"/> MOD. <input type="checkbox"/> Gradation
---	---

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<u>Refer to Groundwater collector pipe N=1</u>							
<u>(1)</u>	<u>about 13mN &amp; 6mW</u>	<u>final grade</u>	<u>I</u>	<u>1786</u>	<u>15.6</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(2)</u>	<u>about 43mN &amp; 16mW</u>	<u>-11-</u>	<u>I</u>	<u>1761</u>	<u>16.9</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(3)</u>	<u>about 60mN &amp; 19mW</u>	<u>-11-</u>	<u>I</u>	<u>1759</u>	<u>16.6</u>	<u>100</u>	<u>98</u>	<u>C</u>
	<u>Refer to Groundwater collector pipe N=2</u>							
<u>(4)</u>	<u>about 40mW &amp; 5mS</u>	<u>final grade</u>	<u>I</u>	<u>1738</u>	<u>16.8</u>	<u>99</u>	<u>98</u>	<u>C</u>
<u>(5)</u>	<u>about 21mW &amp; 15mS</u>	<u>-11-</u>	<u>I</u>	<u>1775</u>	<u>16.3</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(6)</u>	<u>about 10mW &amp; 10mS</u>	<u>-11-</u>	<u>I</u>	<u>1750</u>	<u>16.7</u>	<u>100</u>	<u>98</u>	<u>C</u>

Action:    C = Complying to spec.    NC = Not complying to spec.

Comments:	Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)			
	Gauge No. <u>7852</u>	Calibration	Field Reading	Variation %
	Density	<u>3351</u>	<u>3344.8</u>	<u>0.2</u>
	Moisture	<u>404</u>	<u>393.9</u>	<u>2.5</u>

Site Rep.: <u>B. Dermody</u>	Prepared By: <u>A.D.</u>
Of: _____	Reviewed By: _____

For Internal Use Only    Have:     JSA/JSEA     PPE     Training    Need S-RAF:     Yes     No    Initials: \_\_\_\_\_



# Field Report

Project No.: 11103232		Date: 2017/11/20	
Client: GHD		Contractor:	
Project: Terrapune stoney creek		<input type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input checked="" type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify):	
Location: 65 Green Mountain rd Hamilton, ON		<input type="checkbox"/> Roofing <input type="checkbox"/> Structural Steel <input type="checkbox"/> Reinforcing Steel <input type="checkbox"/> Sampling	
Field Results	Temperature: 5 °C		
<p>The purpose of the visit was to check the final grade of the primary compacted clay liner. The observations are recorded as below: The areas inspected are located in the North &amp; East sides of the solid site. The areas were found in a wet condition and having some frost materials (standing ices). The contractor has decided to heat the areas in order to get it dry. Based on visual inspection the inspected areas need to be dry out, fine graded, prior of placement of geomembrane (see attached pictures for more details).</p>			
Corrective action to be taken:			
Follow up visit required: <input type="checkbox"/> Yes <input type="checkbox"/> No			
Site Rep.: B. Bernady		Prepared By: A.W.	
Of:		Reviewed By:	
For Internal Use Only	Have: <input checked="" type="checkbox"/> JSA/JSEA <input checked="" type="checkbox"/> PPE <input checked="" type="checkbox"/> Training	Need S-RAF: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Initials:

# Appendix D6

## Results Dated December 1, 2017



January 8, 2018

Reference No. 11103232

Mr. Brian Dermody  
GHD Limited  
184 Front Street East Suite 302  
Toronto Ontario  
M5A 4N3

Dear Mr. Dermody:

**Re: Field Compaction Report  
Terrapure-Stoney Creek Landfill  
65 Green Mountain Road W, Hamilton, Ontario**

This report presents the results of field (compaction) testing carried out by GHD Limited at the above noted project site. The purpose of the field testing was to determine the degree of compaction achieved on granular materials being used as graded granular filter on top of the 19mm clear stone drainage blanket in the vicinity of groundwater collection pipe no.1.

## 1. Summary of Site Inspections

A site inspection was carried out on December 1, 2017, by one of our technicians. During our visit, a total of ten (10) in-situ density (compaction) tests were conducted using a nuclear density gauge. The compaction tests were carried out on the granular materials being used as graded granular filter on top of the 19mm clear stone drainage blanket.

The averaged measured degree of compaction of the granular materials was 99 percent Standard Proctor Maximum Dry Density (SPMDD). Details of our inspections and individual test locations are enclosed.

## 2. Discussion

It is understood that the project specifications require the granular materials being used as graded granular filter on top of the 19mm clear stone drainage blanket to be compacted to a minimum of 98 percent Standard Proctor Maximum Dry Density (SPMDD). Based on the field test results, compaction of the granular filter materials in the areas tested meets the specifications.

We trust that this information meets with your approval. Please do not hesitate to contact us, should any questions arise.

Sincerely,

GHD

Rajendra Kadia, B.Eng., C.E.T.

RK/ss/6

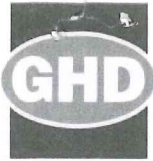
Encl.

Karl Roechner, M.A.Sc., P. Eng.

# Attachments

# Attachment A Field Inspection Reports





# Field Report

Project No.: <i>11103232</i>	Date: <i>2017/12/11</i>
Client: <i>GHD</i>	Contractor: <i>Duffin's</i>
Project: <i>Terrapine stoney creek Landfill</i>	<input checked="" type="checkbox"/> Compaction <input type="checkbox"/> Footing Base Evaluation <input type="checkbox"/> Subgrade Evaluation <input type="checkbox"/> Concrete <input type="checkbox"/> Asphalt Paving <input type="checkbox"/> Other (specify): <span style="float: right;"> <input type="checkbox"/> Roofing  <input type="checkbox"/> Structural Steel  <input type="checkbox"/> Reinforcing Steel  <input type="checkbox"/> Sampling       </span>
Location: <i>65 Green Mountain Rd Hamilton, ON</i>	
Field Results                      Temperature: <u><i>-6</i></u> °C	
<p><i>The above noted site was visited by GHD representative as requested. The purpose of the visit was to conduct the compaction test on the granular "A" materials, being used as granular filler over the completed surface of the 19mm clean stone. The Thickness of the Granular "A" materials was 150mm and the compaction was performed by the smooth drum roller. After using a nuclear density gauge, all tests results showed 98% to 100% SPMSD, which met the project specifications.</i></p>	
Corrective action to be taken:	
Follow up visit required: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Site Rep.: <i>B. Bermody</i>	Prepared By: <i>A.D</i>
Of:	Reviewed By: <i>[Signature]</i>
For Internal Use Only             Have: <input checked="" type="checkbox"/> JSA/JSEA <input checked="" type="checkbox"/> PPE <input checked="" type="checkbox"/> Training             Need S-RAF: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No             Initials: <i>[Signature]</i>	



# Soil Compaction Verification Report

Project No.: <u>11103232</u> Client: <u>GHD</u> Project: <u>Temperature storage creek</u> Location: <u>65 Green Mountain Rd, Hamilton</u>	Date: <u>2017/12/11</u> Contractor: <u>Bufferin</u> Site Visit Type: <input type="checkbox"/> Full time <input checked="" type="checkbox"/> Part time
--	---

Material Type	Material Description	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Water Content (%)
<u>I</u>	<u>Granular "A" (3/4 CRL)</u>	<u>2027</u>	<u>8.4</u>

Maximum dry density obtained from:  STD. Test  MOD. Test  Estimated  Control Strip

Sample(s) Secured:  Yes  No

If yes, specify testing to be done:  
 Proctor  STD.  MOD.  Gradation

Area Tested:

Test No.	Test Location	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	<u>Refer at Groundwater collection pipe N=1</u>							
<u>(1)</u>	<u>about 70mN &amp; 14mW</u>	<u>final grade</u>	<u>I</u>	<u>1988</u>	<u>5.4</u>	<u>98</u>	<u>98</u>	<u>C</u>
<u>(2)</u>	<u>about 50mN &amp; 9mW</u>	<u>-11-</u>	<u>I</u>	<u>2004</u>	<u>9.0</u>	<u>99</u>	<u>98</u>	<u>C</u>
<u>(3)</u>	<u>about 25mN &amp; 16mW</u>	<u>-11-</u>	<u>I</u>	<u>2035</u>	<u>6.1</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(4)</u>	<u>about 11mN &amp; 10mW</u>	<u>-11-</u>	<u>I</u>	<u>2013</u>	<u>5.7</u>	<u>99</u>	<u>98</u>	<u>C</u>
<u>(5)</u>	<u>about 2mS &amp; 12mW</u>	<u>-11-</u>	<u>I</u>	<u>2009</u>	<u>6.4</u>	<u>99</u>	<u>98</u>	<u>C</u>
<u>(6)</u>	<u>about 35mS &amp; 14mW</u>	<u>-11-</u>	<u>I</u>	<u>2047</u>	<u>6.6</u>	<u>100</u>	<u>98</u>	<u>C</u>
	<u>Refer at Groundwater collection pipe N=2</u>							
<u>(7)</u>	<u>about 5mW &amp; 10mS</u>	<u>-11-</u>	<u>I</u>	<u>2063</u>	<u>7.1</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(8)</u>	<u>about 36mW &amp; 7mS</u>	<u>-11-</u>	<u>I</u>	<u>2031</u>	<u>6.2</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(9)</u>	<u>about 57mW &amp; 13mS</u>	<u>-11-</u>	<u>I</u>	<u>2048</u>	<u>5.9</u>	<u>100</u>	<u>98</u>	<u>C</u>
<u>(10)</u>	<u>about 69mW &amp; 15mS</u>	<u>-11-</u>	<u>I</u>	<u>2007</u>	<u>6.0</u>	<u>99</u>	<u>98</u>	<u>C</u>

Action: C = Complying to spec. NC = Not complying to spec.

Comments:	Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)			
	Gauge No. <u>7852</u>	Calibration	Field Reading	Variation %
	Density	<u>3351</u>	<u>3358.5</u>	<u>0.2</u>
	Moisture	<u>404</u>	<u>410.2</u>	<u>1.5</u>

Site Rep.: B. Bermody Prepared By: A.W

Of: \_\_\_\_\_ Reviewed By: \_\_\_\_\_

For Internal Use Only Have:  JSA/JSEA  PPE  Training Need S-RAF:  Yes  No Initials: \_\_\_\_\_

# Appendix D7 Shelby Test Results



## Liquid Limit, Plastic Limit and Plasticity Index of Soils (ASTM D4318)

<b>Client:</b>	Terrapure Environmental	<b>Lab no.:</b>	WLB 1329-1
<b>Project/Site:</b>	Stoney Creek Landfill, 65 Green Mountain Road West, Hamilton, Ontario	<b>Project no.:</b>	11103232
Borehole no.:	1A	Sample no.:	-
Soil description:	Lean clay with sand (CL)	Depth:	
Soil description:	Lean clay with sand (CL)	Date sampled:	
Apparatus:	Hand Crank	Balance no.:	WLG-3
Liquid limit device no.:	WLSA-3B	Porcelain bowl no.:	RAM
Sieve no.:	WLS-47	Oven no.:	WLG-2
		Spatula no.:	2
		Glass plate no.:	1

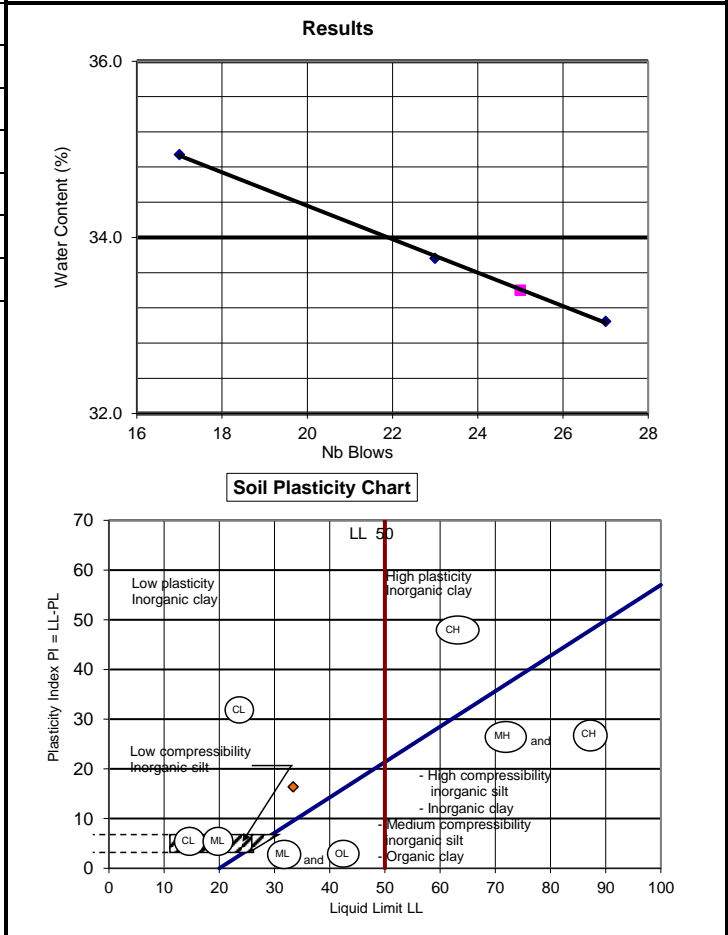
Liquid Limit (LL):			
	Test No. 1	Test No. 2	Test No. 3
Number of blows	27	23	17
Water Content:			
Tare no.	148	118	114
Wet soil+tare, g	18.29	19.79	19.13
Dry soil+tare, g	17.14	18.22	17.68
Mass of water, g	1.15	1.57	1.45
Tare, g	13.66	13.57	13.53
Mass of soil, g	3.48	4.65	4.15
Water content %	33.0%	33.8%	34.9%
Plastic Limit (PL) - Water Content:			
Tare no.	146	134	
Wet soil+tare, g	19.74	19.57	
Dry soil+tare, g	18.84	18.66	
Mass of water, g	0.90	0.91	
Tare, g	13.58	13.56	
Mass of soil, g	5.26	5.10	
Water content %	17.1%	17.8%	
Average water content %	17.5%		
Natural Water Content ( W <sup>n</sup> ):			
Tare no.	HA44		
Wet soil+tare, g	351.74		
Dry soil+tare, g	309.20		
Mass of water, g	42.54		
Tare, g	4.24		
Mass of soil, g	304.96		
Water content %	13.9%		

**Soil Preparation:**

Cohesive <425 µm                       Dry preparation

Cohesive >425 µm                       Wet preparation

Non-cohesive



**Remarks:** The material meets the project specifications

<b>Performed by:</b>	Muhammad Rauf	<b>Date:</b>	10/13/2017
<b>Verified by:</b>	Abdul Hafeez Khan, P.Eng.; Laboratory Manager	<b>Date:</b>	10/13/2017



## Liquid Limit, Plastic Limit and Plasticity Index of Soils (ASTM D4318)

<b>Client:</b>	Terrapure Environmental	<b>Lab no.:</b>	WLB 1329-2
<b>Project/Site:</b>	Stoney Creek Landfill, 65 Green Mountain Road West, Hamilton, Ontario	<b>Project no.:</b>	11103232
Borehole no.:	2A	Sample no.:	-
Soil description:	Lean clay with sand (CL)	Depth:	
Soil description:	Lean clay with sand (CL)	Date sampled:	
Apparatus:	Hand Crank	Balance no.:	WLG-3
Liquid limit device no.:	WLSA-3B	Porcelain bowl no.:	75
Sieve no.:	WLS-47	Oven no.:	WLG-2
		Spatula no.:	2
		Glass plate no.:	1

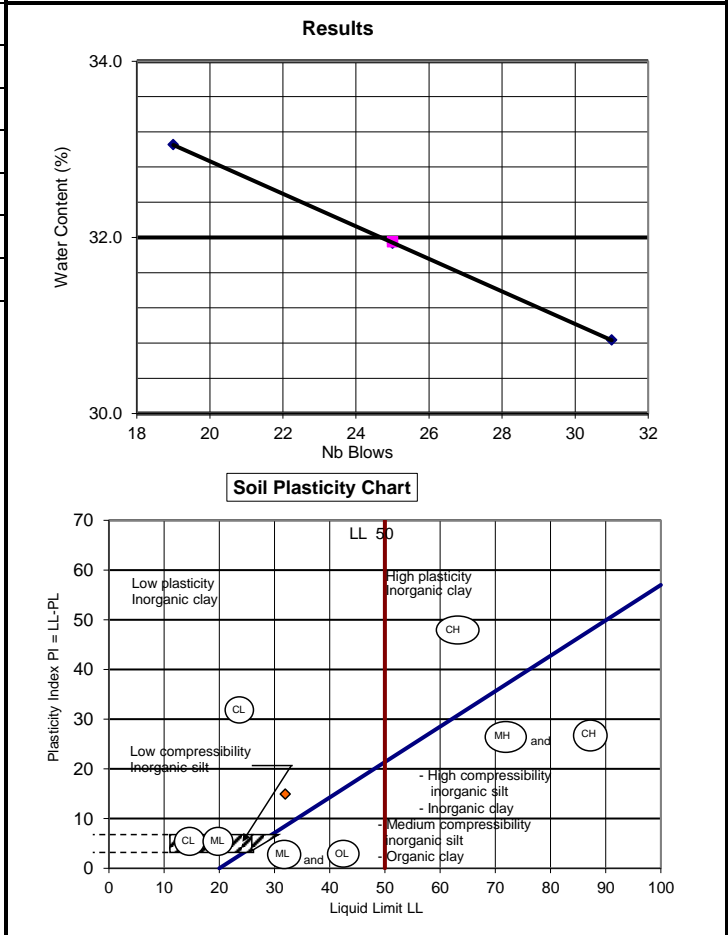
Liquid Limit (LL):			
	Test No. 1	Test No. 2	Test No. 3
Number of blows	31	25	19
Water Content:			
Tare no.	124	Q6	W3
Wet soil+tare, g	19.70	20.46	19.57
Dry soil+tare, g	18.26	19.09	18.39
Mass of water, g	1.44	1.37	1.18
Tare, g	13.59	14.80	14.82
Mass of soil, g	4.67	4.29	3.57
Water content %	30.8%	31.9%	33.1%
Plastic Limit (PL) - Water Content:			
Tare no.	126	Q3	
Wet soil+tare, g	20.93	21.19	
Dry soil+tare, g	19.85	20.20	
Mass of water, g	1.08	0.99	
Tare, g	13.55	14.59	
Mass of soil, g	6.30	5.61	
Water content %	17.1%	17.6%	
Average water content %	17.4%		
Natural Water Content ( W <sup>n</sup> ):			
Tare no.	33		
Wet soil+tare, g	451.60		
Dry soil+tare, g	409.90		
Mass of water, g	41.70		
Tare, g	91.20		
Mass of soil, g	318.70		
Water content %	13.1%		

**Soil Preparation:**

Cohesive <425 µm                       Dry preparation

Cohesive >425 µm                       Wet preparation

Non-cohesive



**Remarks:** The material meets the project specifications

<b>Performed by:</b>	Muhammad Rauf	<b>Date:</b>	10/13/2017
<b>Verified by:</b>	Abdul Hafeez Khan, P.Eng.; Laboratory Manager	<b>Date:</b>	10/13/2017





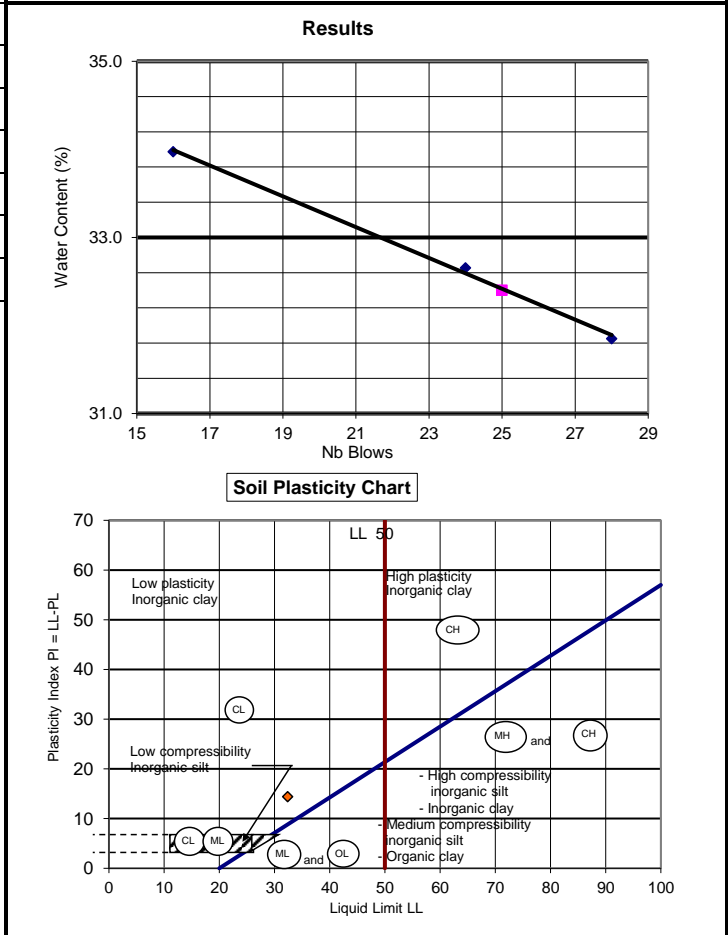
## Liquid Limit, Plastic Limit and Plasticity Index of Soils (ASTM D4318)

<b>Client:</b>	Terrapure Environmental	<b>Lab no.:</b>	WLB 1329-3
<b>Project/Site:</b>	Stoney Creek Landfill, 65 Green Mountain Road West, Hamilton, Ontario	<b>Project no.:</b>	11103232
Borehole no.:	3A	Sample no.:	-
Soil description:	Lean clay (CL)	Depth:	
Soil description:		Date sampled:	
Apparatus:	Hand Crank	Balance no.:	WLG-3
Liquid limit device no.:	WLSA-3B	Porcelain bowl no.:	B3
Sieve no.:	WLS-47	Oven no.:	WLG-2
		Spatula no.:	2
		Glass plate no.:	1

Liquid Limit (LL):			
	Test No. 1	Test No. 2	Test No. 3
Number of blows	28	24	16
Water Content:			
Tare no.	110	102	105
Wet soil+tare, g	19.14	17.50	19.24
Dry soil+tare, g	17.78	16.54	17.82
Mass of water, g	1.36	0.96	1.42
Tare, g	13.51	13.60	13.64
Mass of soil, g	4.27	2.94	4.18
Water content %	31.9%	32.7%	34.0%
Plastic Limit (PL) - Water Content:			
Tare no.	133	138	
Wet soil+tare, g	21.66	19.81	
Dry soil+tare, g	20.43	18.88	
Mass of water, g	1.23	0.93	
Tare, g	13.41	13.56	
Mass of soil, g	7.02	5.32	
Water content %	17.5%	17.5%	
Average water content %	17.5%		
Natural Water Content ( W <sup>n</sup> ):			
Tare no.	H3		
Wet soil+tare, g	468.70		
Dry soil+tare, g	427.40		
Mass of water, g	41.30		
Tare, g	115.60		
Mass of soil, g	311.80		
Water content %	13.2%		

**Soil Preparation:**

<input checked="" type="checkbox"/> Cohesive <425 µm	<input checked="" type="checkbox"/> Dry preparation
<input type="checkbox"/> Cohesive >425 µm	<input type="checkbox"/> Wet preparation
<input type="checkbox"/> Non-cohesive	



**Remarks:** The material meets the project specifications

<b>Performed by:</b>	Muhammad Rauf	<b>Date:</b>	10/13/2017
<b>Verified by:</b>	Abdul Hafeez Khan, P.Eng.; Laboratory Manager	<b>Date:</b>	10/13/2017



Liquid Limit, Plastic Limit and Plasticity Index of Soils  
(ASTM D4318)

<b>Client:</b>	Terrapure Environmental	<b>Lab no.:</b>	WLB 1367-1
<b>Project/Site:</b>	Stoney Creek Landfill, 65 Green Mountain Road West, Hamilton, Ontario	<b>Project no.:</b>	11103232
Borehole no.:	Sample no.: 4A	Depth:	
Soil description:	Lean clay with sand (CL)	Date sampled:	
Apparatus:	Hand Crank	Balance no.:	WLG-3
Liquid limit device no.:	WLSA-3B	Porcelain bowl no.:	9
Sieve no.:	WLS-47	Oven no.:	WLG-2
		Spatula no.:	2
		Glass plate no.:	1

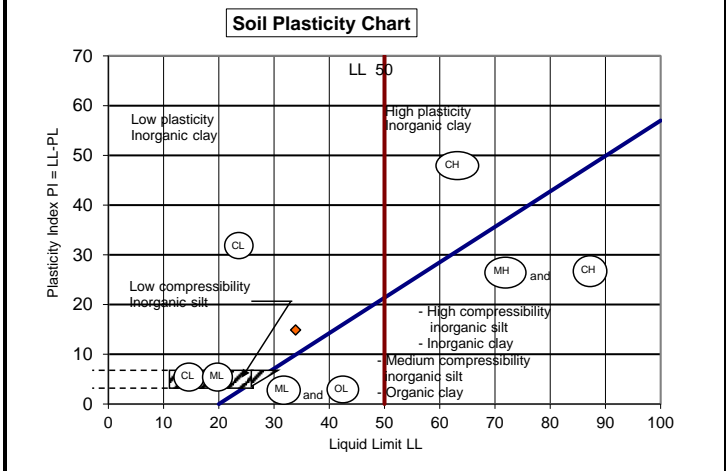
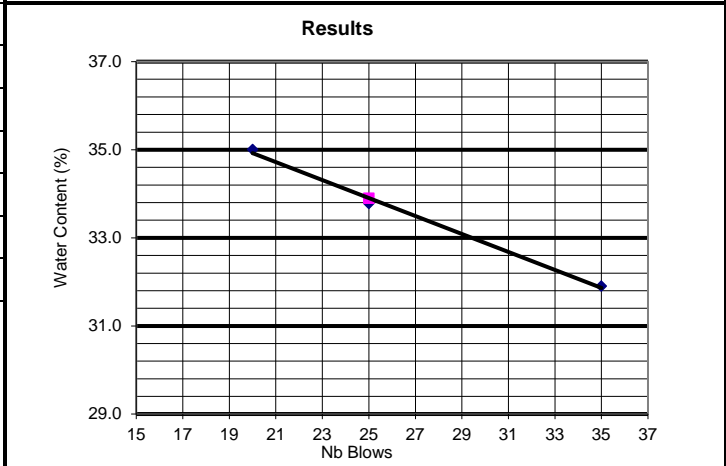
Liquid Limit (LL):			
	Test No. 1	Test No. 2	Test No. 3
Number of blows	35	25	20
Water Content:			
Tare no.	123	14	6
Wet soil+tare, g	21.85	34.20	30.39
Dry soil+tare, g	19.84	31.93	27.74
Mass of water, g	2.01	2.27	2.65
Tare, g	13.54	25.21	20.17
Mass of soil, g	6.30	6.72	7.57
Water content %	31.9%	33.8%	35.0%
Plastic Limit (PL) - Water Content:			
Tare no.	W3	104	
Wet soil+tare, g	23.17	23.30	
Dry soil+tare, g	21.82	21.78	
Mass of water, g	1.35	1.52	
Tare, g	14.81	13.55	
Mass of soil, g	7.01	8.23	
Water content %	19.3%	18.5%	
Average water content %	18.9%		
Natural Water Content ( W <sup>n</sup> ):			
Tare no.	N52		
Wet soil+tare, g	226.50		
Dry soil+tare, g	188.60		
Mass of water, g	37.90		
Tare, g	4.20		
Mass of soil, g	184.40		
Water content %	20.6%		

**Soil Preparation:**

Cohesive <425 µm       Dry preparation

Cohesive >425 µm       Wet preparation

Non-cohesive



Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)	Natural Water Content W <sup>n</sup>
34	19	15	21

**Remarks:** The material meets the project specifications

<b>Performed by:</b>	Greg Peters	<b>Date:</b>	12/7/2017
<b>Verified by:</b>	Abdul Hafeez Khan, P.Eng.; Laboratory Manager	<b>Date:</b>	12/11/2017



Liquid Limit, Plastic Limit and Plasticity Index of Soils  
(ASTM D4318)

<b>Client:</b>	Terrapure Environmental	<b>Lab no.:</b>	WLB 1367-2
<b>Project/Site:</b>	Stoney Creek Landfill, 65 Green Mountain Road West, Hamilton, Ontario	<b>Project no.:</b>	11103232
Borehole no.:	Sample no.: 5A	Depth:	
Soil description:	Lean clay with sand (CL)	Date sampled:	
Apparatus:	Hand Crank	Balance no.:	WLG-3
Liquid limit device no.:	WLSA-3B	Porcelain bowl no.:	1
Sieve no.:	WLS-47	Oven no.:	WLG-2
		Glass plate no.:	1

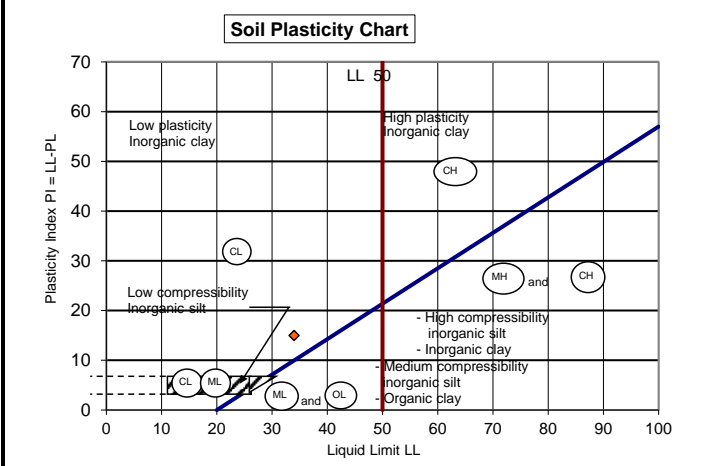
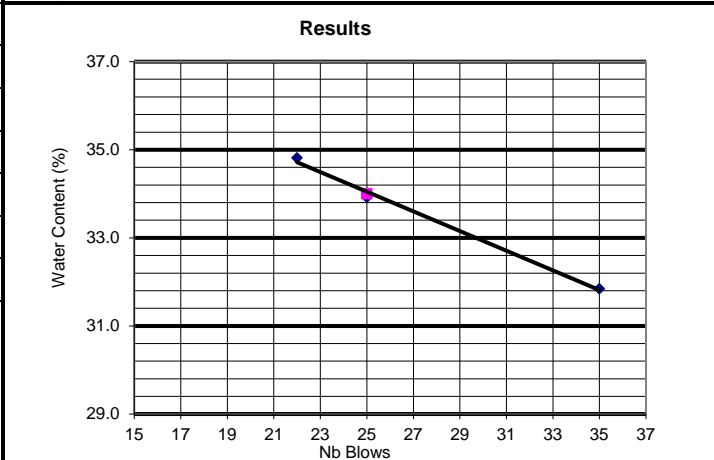
Liquid Limit (LL):			
	Test No. 1	Test No. 2	Test No. 3
Number of blows	35	25	22
Water Content:			
Tare no.	134	101	109
Wet soil+tare, g	22.99	22.00	24.45
Dry soil+tare, g	20.71	19.88	21.63
Mass of water, g	2.28	2.12	2.82
Tare, g	13.55	13.63	13.53
Mass of soil, g	7.16	6.25	8.10
Water content %	31.8%	33.9%	34.8%
Plastic Limit (PL) - Water Content:			
Tare no.	138	114	
Wet soil+tare, g	22.37	23.38	
Dry soil+tare, g	20.96	21.82	
Mass of water, g	1.41	1.56	
Tare, g	13.57	13.53	
Mass of soil, g	7.39	8.29	
Water content %	19.1%	18.8%	
Average water content %	18.9%		
Natural Water Content ( W <sup>n</sup> ):			
Tare no.	A3		
Wet soil+tare, g	320.80		
Dry soil+tare, g	271.90		
Mass of water, g	48.90		
Tare, g	4.40		
Mass of soil, g	267.50		
Water content %	18.3%		

**Soil Preparation:**

Cohesive <425 µm       Dry preparation

Cohesive >425 µm       Wet preparation

Non-cohesive



Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)	Natural Water Content W <sup>n</sup>
34	19	15	18

**Remarks:** The material meets the project specifications

<b>Performed by:</b>	Greg Peters	<b>Date:</b>	12/6/2017
<b>Verified by:</b>	Abdul Hafeez Khan, P.Eng.; Laboratory Manager	<b>Date:</b>	12/11/2017



Liquid Limit, Plastic Limit and Plasticity Index of Soils  
(ASTM D4318)

<b>Client:</b>	Terrapure Environmental	<b>Lab no.:</b>	WLB 1367-3
<b>Project/Site:</b>	Stoney Creek Landfill, 65 Green Mountain Road West, Hamilton, Ontario	<b>Project no.:</b>	11103232
Borehole no.:	Sample no.: 6A	Depth:	
Soil description:	Lean clay with sand (CL)	Date sampled:	
Apparatus:	Hand Crank	Balance no.:	WLG-3
Liquid limit device no.:	WLSA-3B	Porcelain bowl no.:	JK
Sieve no.:	WLS-47	Oven no.:	WLG-2
		Spatula no.:	2
		Glass plate no.:	1

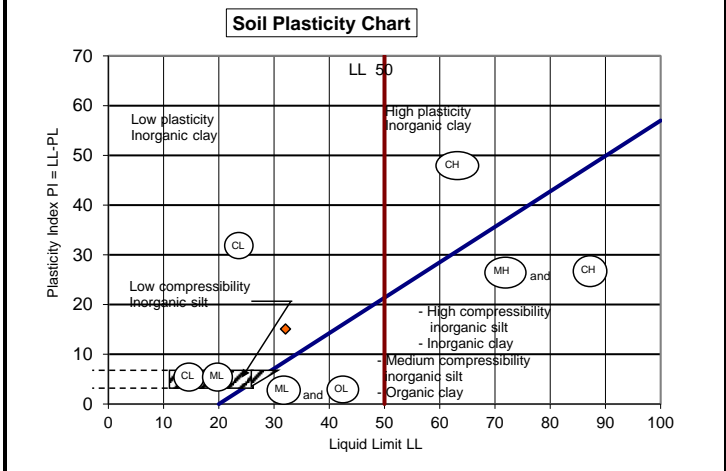
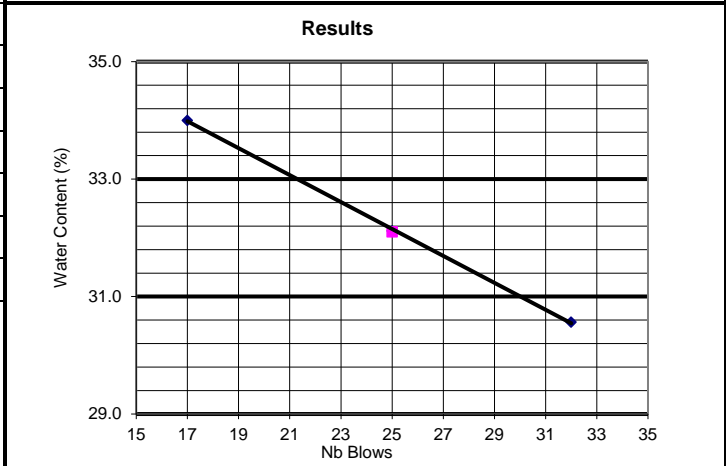
Liquid Limit (LL):			
	Test No. 1	Test No. 2	Test No. 3
Number of blows	32	25	17
Water Content:			
Tare no.	W1	114	A3
Wet soil+tare, g	25.34	23.69	25.16
Dry soil+tare, g	22.84	21.22	22.44
Mass of water, g	2.50	2.47	2.72
Tare, g	14.66	13.53	14.44
Mass of soil, g	8.18	7.69	8.00
Water content %	30.6%	32.1%	34.0%
Plastic Limit (PL) - Water Content:			
Tare no.	101	134	
Wet soil+tare, g	21.36	23.67	
Dry soil+tare, g	20.21	22.19	
Mass of water, g	1.15	1.48	
Tare, g	13.64	13.55	
Mass of soil, g	6.57	8.64	
Water content %	17.5%	17.1%	
Average water content %	17.3%		
Natural Water Content ( W <sup>n</sup> ):			
Tare no.	SL49		
Wet soil+tare, g	230.50		
Dry soil+tare, g	196.70		
Mass of water, g	33.80		
Tare, g	4.40		
Mass of soil, g	192.30		
Water content %	17.6%		

**Soil Preparation:**

Cohesive <425 µm       Dry preparation

Cohesive >425 µm       Wet preparation

Non-cohesive



Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)	Natural Water Content W <sup>n</sup>
32	17	15	18

**Remarks:** The material meets the project specifications

<b>Performed by:</b>	Greg Peters	<b>Date:</b>	12/6/2017
<b>Verified by:</b>	Abdul Hafeez Khan, P.Eng.; Laboratory Manager	<b>Date:</b>	12/11/2017

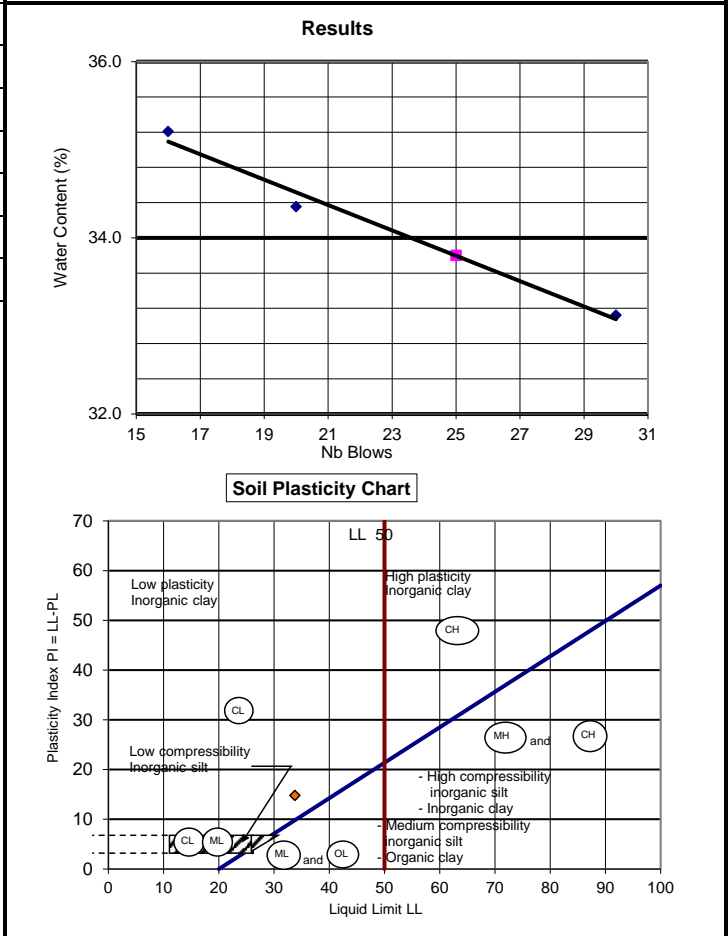


Liquid Limit, Plastic Limit and Plasticity Index of Soils  
(ASTM D4318)

<b>Client:</b>	Terrapure Environmental	<b>Lab no.:</b>	WLB 1367-4
<b>Project/Site:</b>	Stoney Creek Landfill, 65 Green Mountain Road West, Hamilton, Ontario	<b>Project no.:</b>	11103232
Borehole no.:	Sample no.:	7A	Depth:
Soil description:	Lean clay (CL)	Date sampled:	
Apparatus:	Hand Crank	Balance no.:	WLG-3
Liquid limit device no.:	WLSA-3B	Porcelain bowl no.:	44
Sieve no.:	WLS-47	Oven no.:	WLG-2
		Glass plate no.:	1

Liquid Limit (LL):			
	Test No. 1	Test No. 2	Test No. 3
Number of blows	30	20	16
Water Content:			
Tare no.	127	Q5	W1
Wet soil+tare, g	24.10	23.15	25.74
Dry soil+tare, g	21.48	21.02	22.86
Mass of water, g	2.62	2.13	2.88
Tare, g	13.57	14.82	14.68
Mass of soil, g	7.91	6.20	8.18
Water content %	33.1%	34.4%	35.2%
Plastic Limit (PL) - Water Content:			
Tare no.	Q2	135	
Wet soil+tare, g	24.40	20.41	
Dry soil+tare, g	22.89	19.34	
Mass of water, g	1.51	1.07	
Tare, g	14.75	13.63	
Mass of soil, g	8.14	5.71	
Water content %	18.6%	18.7%	
Average water content %	18.6%		
Natural Water Content ( W <sup>n</sup> ):			
Tare no.	HA20		
Wet soil+tare, g	233.70		
Dry soil+tare, g	198.70		
Mass of water, g	35.00		
Tare, g	4.30		
Mass of soil, g	194.40		
Water content %	18.0%		

Soil Preparation:	
<input checked="" type="checkbox"/>	Cohesive <425 µm
<input checked="" type="checkbox"/>	Dry preparation
<input type="checkbox"/>	Cohesive >425 µm
<input type="checkbox"/>	Wet preparation
<input type="checkbox"/>	Non-cohesive



**Remarks:** The material meets the project specifications

<b>Performed by:</b>	Greg Peters	<b>Date:</b>	12/6/2017
<b>Verified by:</b>	Abdul Hafeez Khan, P.Eng.; Laboratory Manager	<b>Date:</b>	12/11/2017





Liquid Limit, Plastic Limit and Plasticity Index of Soils  
(ASTM D4318)

<b>Client:</b>	Terrapure Environmental	<b>Lab no.:</b>	WLB 1367-5
<b>Project/Site:</b>	Stoney Creek Landfill, 65 Green Mountain Road West, Hamilton, Ontario	<b>Project no.:</b>	11103232
Borehole no.:	Sample no.:	8A	Depth:
Soil description:	Lean clay with gravel (CL)	Date sampled:	
Apparatus:	Hand Crank	Balance no.:	WLG-3
Liquid limit device no.:	WLSA-3B	Porcelain bowl no.:	13
Sieve no.:	WLS-47	Oven no.:	WLG-2
		Spatula no.:	2
		Glass plate no.:	1

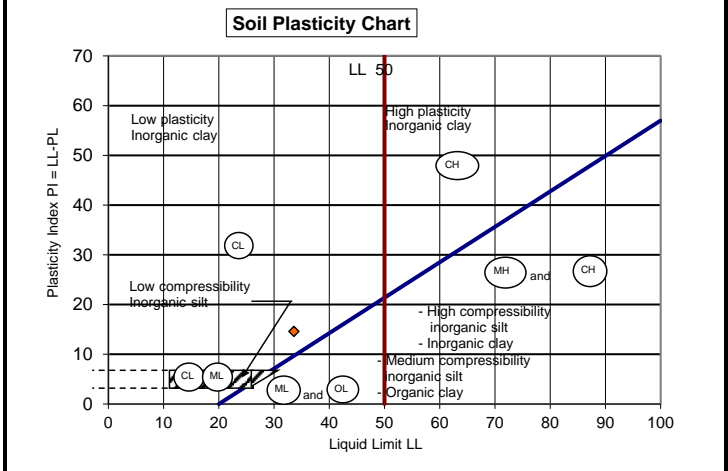
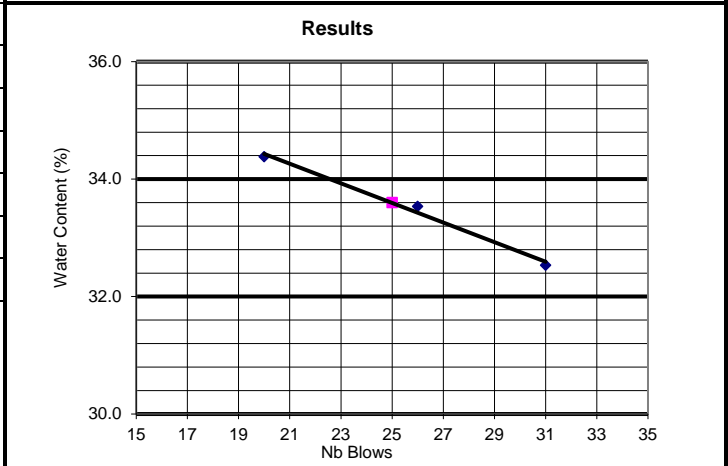
Liquid Limit (LL):			
	Test No. 1	Test No. 2	Test No. 3
Number of blows	31	26	20
Water Content:			
Tare no.	133	124	105
Wet soil+tare, g	23.35	24.61	22.62
Dry soil+tare, g	20.91	21.85	20.32
Mass of water, g	2.44	2.76	2.30
Tare, g	13.41	13.62	13.63
Mass of soil, g	7.50	8.23	6.69
Water content %	32.5%	33.5%	34.4%
Plastic Limit (PL) - Water Content:			
Tare no.	126	148	
Wet soil+tare, g	22.68	24.64	
Dry soil+tare, g	21.26	22.88	
Mass of water, g	1.42	1.76	
Tare, g	13.55	13.65	
Mass of soil, g	7.71	9.23	
Water content %	18.4%	19.1%	
Average water content %	18.7%		
Natural Water Content ( W <sup>n</sup> ):			
Tare no.	10X		
Wet soil+tare, g	286.50		
Dry soil+tare, g	249.20		
Mass of water, g	37.30		
Tare, g	4.30		
Mass of soil, g	244.90		
Water content %	15.2%		

**Soil Preparation:**

Cohesive <425 µm       Dry preparation

Cohesive >425 µm       Wet preparation

Non-cohesive



Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)	Natural Water Content W <sup>n</sup>
34	19	15	15

**Remarks:** The material meets the project specifications

<b>Performed by:</b>	Greg Peters	<b>Date:</b>	12/7/2017
<b>Verified by:</b>	Abdul Hafeez Khan, P.Eng.; Laboratory Manager	<b>Date:</b>	12/11/2017



## Liquid Limit, Plastic Limit and Plasticity Index of Soils (ASTM D4318)

<b>Client:</b>	Terrapure Environmental	<b>Lab no.:</b>	WLB 1367-6
<b>Project/Site:</b>	Stoney Creek Landfill, 65 Green Mountain Road West, Hamilton, Ontario	<b>Project no.:</b>	11103232
Borehole no.:	Sample no.: 9A	Depth:	
Soil description:	Lean clay (CL)	Date sampled:	
Apparatus:	Hand Crank	Balance no.:	WLG-3
Liquid limit device no.:	WLSA-3B	Porcelain bowl no.:	44
Sieve no.:	WLS-47	Oven no.:	WLG-2
		Spatula no.:	2
		Glass plate no.:	1

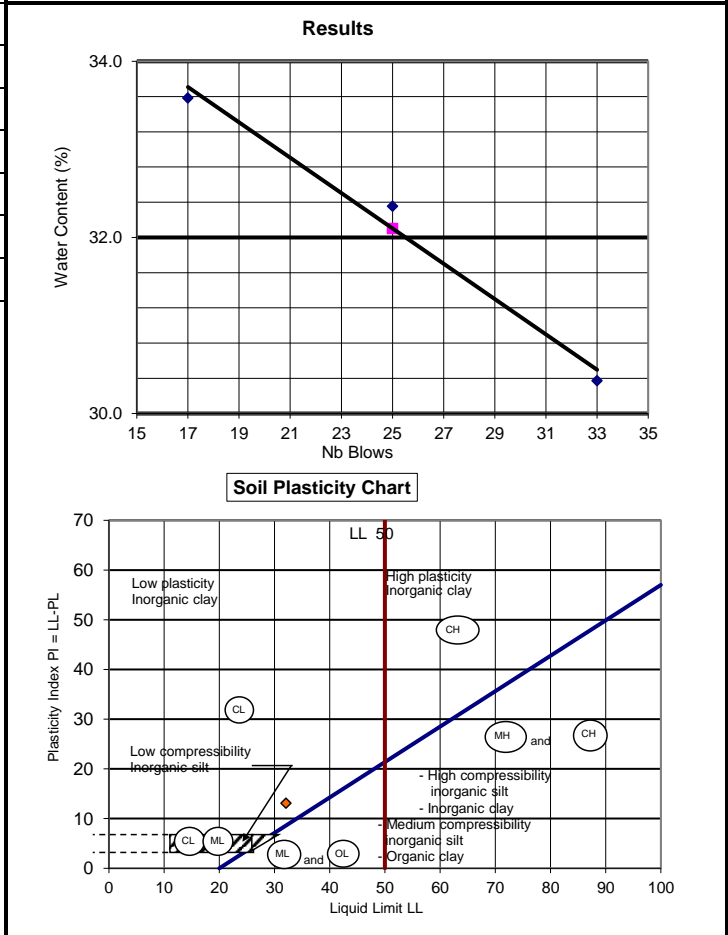
Liquid Limit (LL):			
	Test No. 1	Test No. 2	Test No. 3
Number of blows	33	25	17
Water Content:			
Tare no.	123	Q6	Q1
Wet soil+tare, g	24.40	26.50	29.08
Dry soil+tare, g	21.87	23.64	25.49
Mass of water, g	2.53	2.86	3.59
Tare, g	13.54	14.80	14.80
Mass of soil, g	8.33	8.84	10.69
Water content %	30.4%	32.4%	33.6%
Plastic Limit (PL) - Water Content:			
Tare no.	127	148	
Wet soil+tare, g	20.50	23.70	
Dry soil+tare, g	19.40	22.14	
Mass of water, g	1.10	1.56	
Tare, g	13.57	13.65	
Mass of soil, g	5.83	8.49	
Water content %	18.9%	18.4%	
Average water content %	18.6%		
Natural Water Content ( W <sup>n</sup> ):			
Tare no.	Q5		
Wet soil+tare, g	522.40		
Dry soil+tare, g	474.00		
Mass of water, g	48.40		
Tare, g	221.00		
Mass of soil, g	253.00		
Water content %	19.1%		

**Soil Preparation:**

Cohesive <425 µm       Dry preparation

Cohesive >425 µm       Wet preparation

Non-cohesive



Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)	Natural Water Content W <sup>n</sup>
32	19	13	19

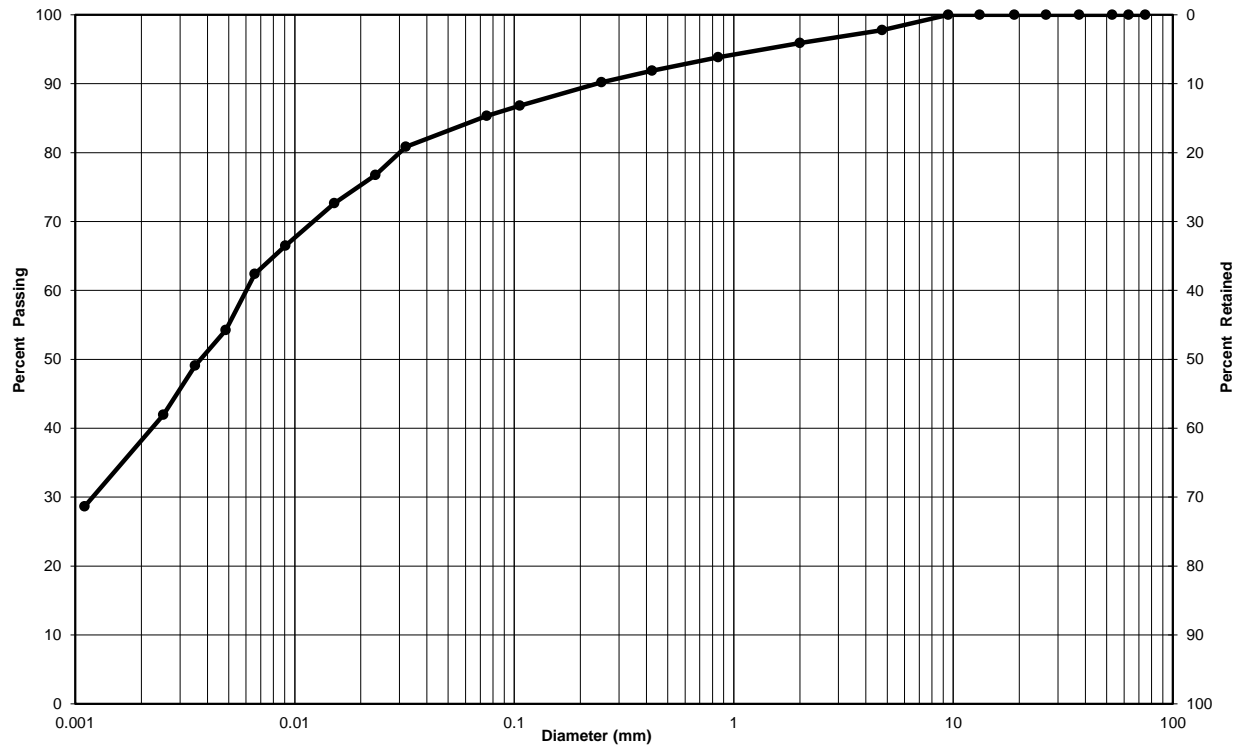
**Remarks:** The material meets the project specifications

<b>Performed by:</b>	Greg Peters	<b>Date:</b>	1/3/2018
<b>Verified by:</b>	Abdul Hafeez Khan, P.Eng.; Laboratory Manager	<b>Date:</b>	1/5/2018



**Particle-Size Analysis of Soils**  
**MTO LS-702 (Geotechnical)**

<b>Client:</b>	Terrapure Environmental	<b>Lab No.:</b>	WLB 1329-1
<b>Project, Site:</b>	Stoney Creek Landfill 65 Green Mountain Road West, Hamilton, Ontario	<b>Project No.:</b>	11103232
<b>Borehole No.:</b>		<b>Sample No.:</b>	1A
<b>Depth:</b>		<b>Enclosure:</b>	-



Clay & Silt	Sand			Gravel	
	Fine	Medium	Coarse	Fine	Coarse
Particle-Size Limits as per USCS (ASTM D-2487)					

Soil Description	Gravel (%)	Sand (%)	Clay & Silt (%)
Lean clay with sand (CL)	2	13	85
Clay-size particles (<0.002 mm):	37 %		

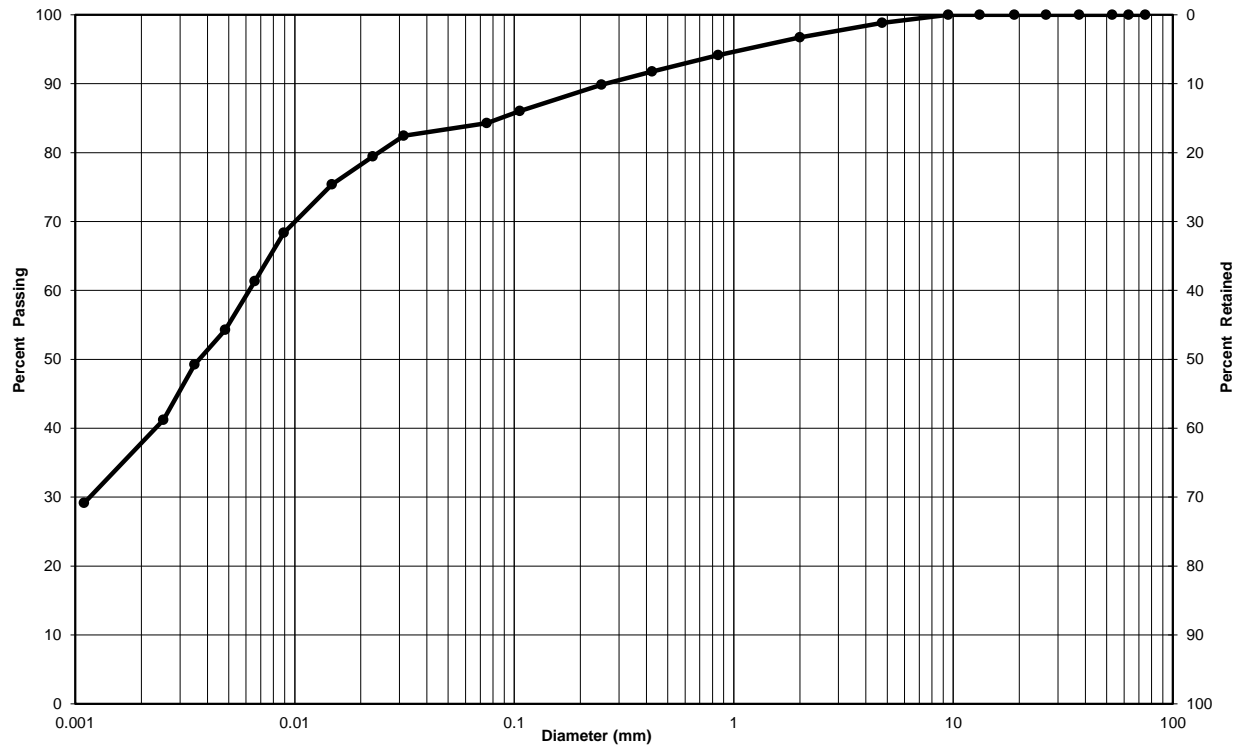
**Remarks:** The material meets the project specifications

<b>Performed by:</b>	Muhammad Rauf	<b>Date:</b>	October 13, 2017
<b>Verified by:</b>	Abdul Hafeez Khan, P.Eng.; Laboratory Manager	<b>Date:</b>	October 13, 2017



**Particle-Size Analysis of Soils**  
**MTO LS-702 (Geotechnical)**

<b>Client:</b> Terrapure Environmental	<b>Lab No.:</b> WLB 1329-2
<b>Project, Site:</b> Stoney Creek Landfill 65 Green Mountain Road West, Hamilton, Ontario	<b>Project No.:</b> 11103232
<b>Borehole No.:</b> _____	<b>Sample No.:</b> 2A
<b>Depth:</b> _____	<b>Enclosure:</b> -



Clay & Silt	Sand			Gravel	
	Fine	Medium	Coarse	Fine	Coarse
Particle-Size Limits as per USCS (ASTM D-2487)					

Soil Description	Gravel (%)	Sand (%)	Clay & Silt (%)
Lean clay with sand (CL)	1	15	84
Clay-size particles (<0.002 mm):	37 %		

**Remarks:** The material meets the project specifications

<b>Performed by:</b> Muhammad Rauf	<b>Date:</b> October 13, 2017
<b>Verified by:</b> Abdul Hafeez Khan, P.Eng.; Laboratory Manager	<b>Date:</b> October 13, 2017



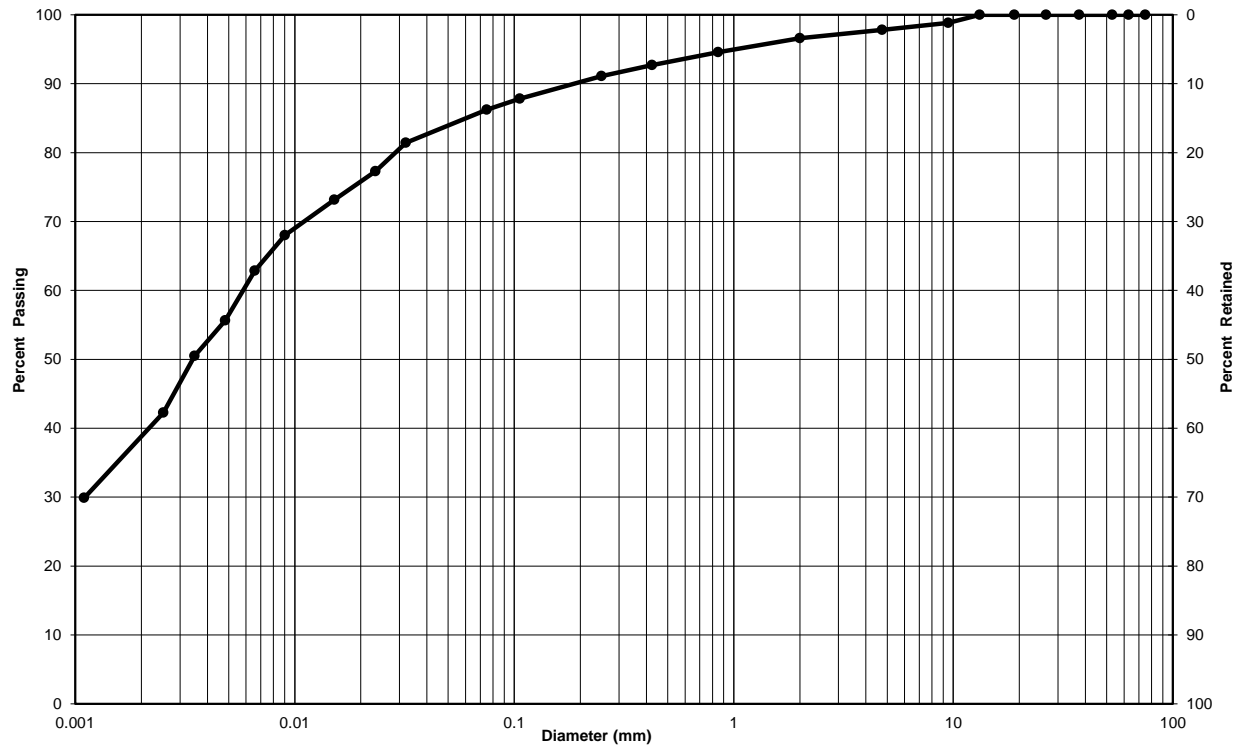
**Particle-Size Analysis of Soils**  
**MTO LS-702 (Geotechnical)**

**Client:** Terrapure Environmental **Lab No.:** WLB 1329-3

**Project, Site:** Stoney Creek Landfill  
65 Green Mountain Road West, Hamilton, Ontario **Project No.:** 11103232

**Borehole No.:** \_\_\_\_\_ **Sample No.:** 3A

**Depth:** \_\_\_\_\_ **Enclosure:** -



Clay & Silt	Sand			Gravel	
	Fine	Medium	Coarse	Fine	Coarse
Particle-Size Limits as per USCS (ASTM D-2487)					

Soil Description	Gravel (%)	Sand (%)	Clay & Silt (%)
Lean clay (CL)	2	12	86
Clay-size particles (<0.002 mm):			38 %

**Remarks:** The material meets the project specifications

**Performed by:** Muhammad Rauf **Date:** October 13, 2017

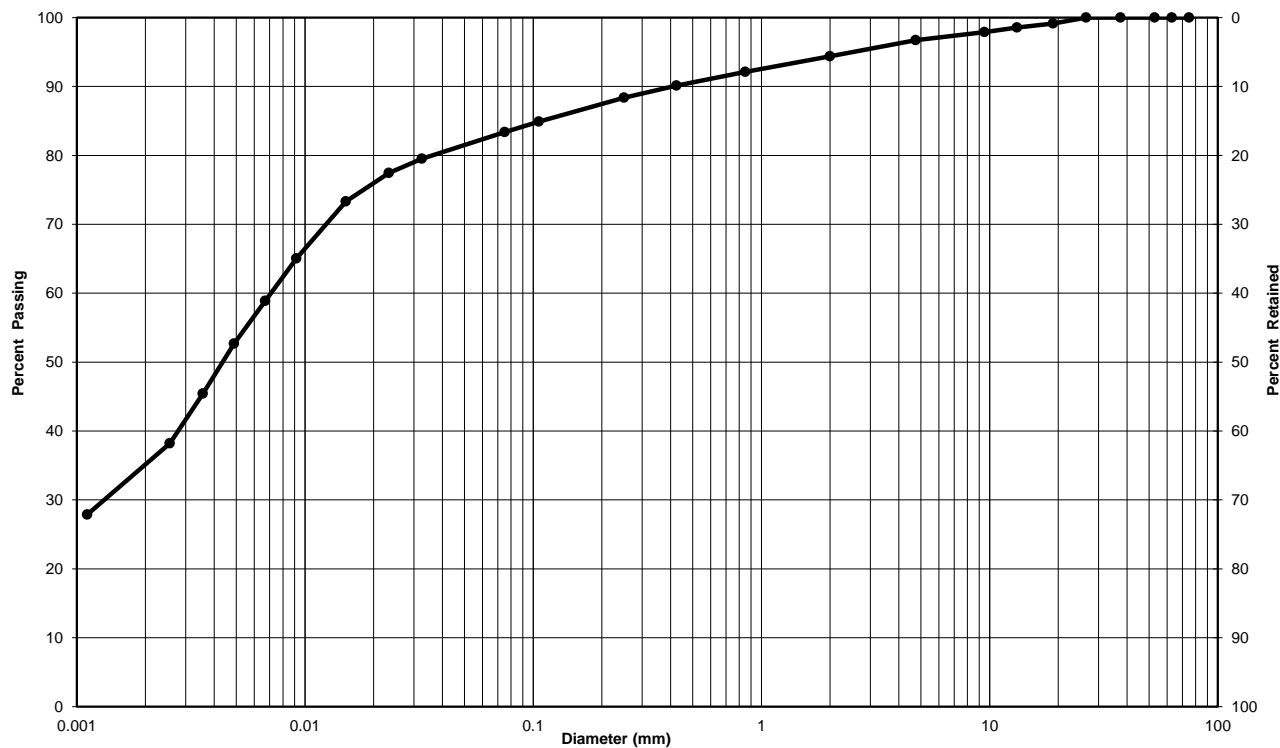
**Verified by:** Abdul Hafeez Khan, P.Eng.; Laboratory Manager **Date:** October 13, 2017



**Particle-Size Analysis of Soils**  
**MTO LS-702 (Geotechnical)**

<b>Client:</b>	<u>Terrapure Environmental</u>	<b>Lab No.:</b>	<u>WLB 1367-1</u>
<b>Project, Site:</b>	<u>Stoney Creek Landfill</u> <u>65 Green Mountain Road West, Hamilton, Ontario</u>	<b>Project No.:</b>	<u>11103232</u>

Borehole No.: _____	Sample No.: <u>4A</u>
Depth: _____	Enclosure: <u>-</u>



Clay & Silt	Sand			Gravel	
	Fine	Medium	Coarse	Fine	Coarse
Particle-Size Limits as per USCS (ASTM D-2487)					

Soil Description	Gravel (%)	Sand (%)	Clay & Silt (%)
Lean clay with sand (CL)	3	14	83
Clay-size particles (<0.002 mm):	34 %		

**Remarks:** The material meets the project specifications

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<b>Performed by:</b>	<u>Blayne Stanic</u>	<b>Date:</b>	<u>December 7, 2017</u>
<b>Verified by:</b>	<u>Abdul Hafeez Khan, P.Eng.; Laboratory Manager</u>	<b>Date:</b>	<u>December 11, 2017</u>

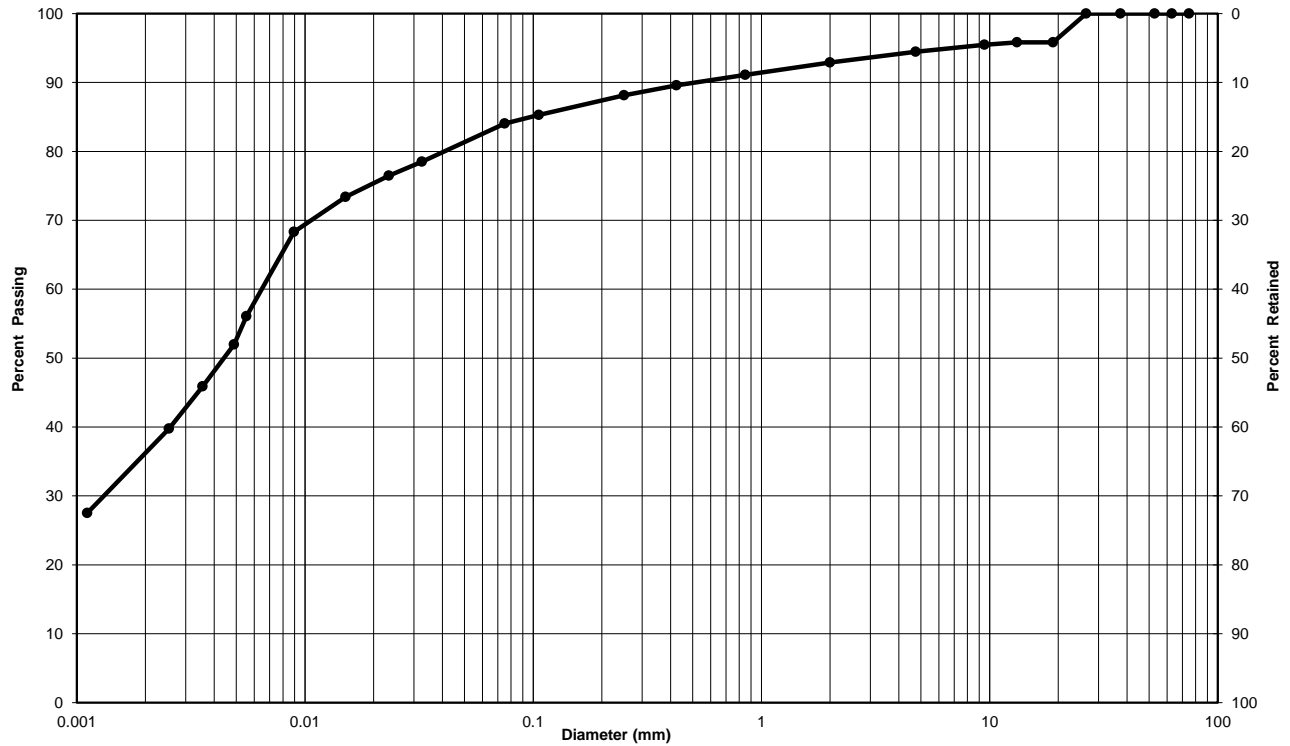




**Particle-Size Analysis of Soils**  
**MTO LS-702 (Geotechnical)**

**Client:** Terrapure Environmental **Lab No.:** WLB 1367-2  
**Project, Site:** Stoney Creek Landfill  
65 Green Mountain Road West, Hamilton, Ontario **Project No.:** 11103232

**Borehole No.:** \_\_\_\_\_ **Sample No.:** 5A  
**Depth:** \_\_\_\_\_ **Enclosure:** -



Clay & Silt	Sand			Gravel	
	Fine	Medium	Coarse	Fine	Coarse
Particle-Size Limits as per USCS (ASTM D-2487)					

Soil Description	Gravel (%)	Sand (%)	Clay & Silt (%)
Lean clay with sand (CL)	6	10	84
Clay-size particles (<0.002 mm):			35 %

**Remarks:** The material does not meet the project specifications ( 94.4% on 4.75 mm)

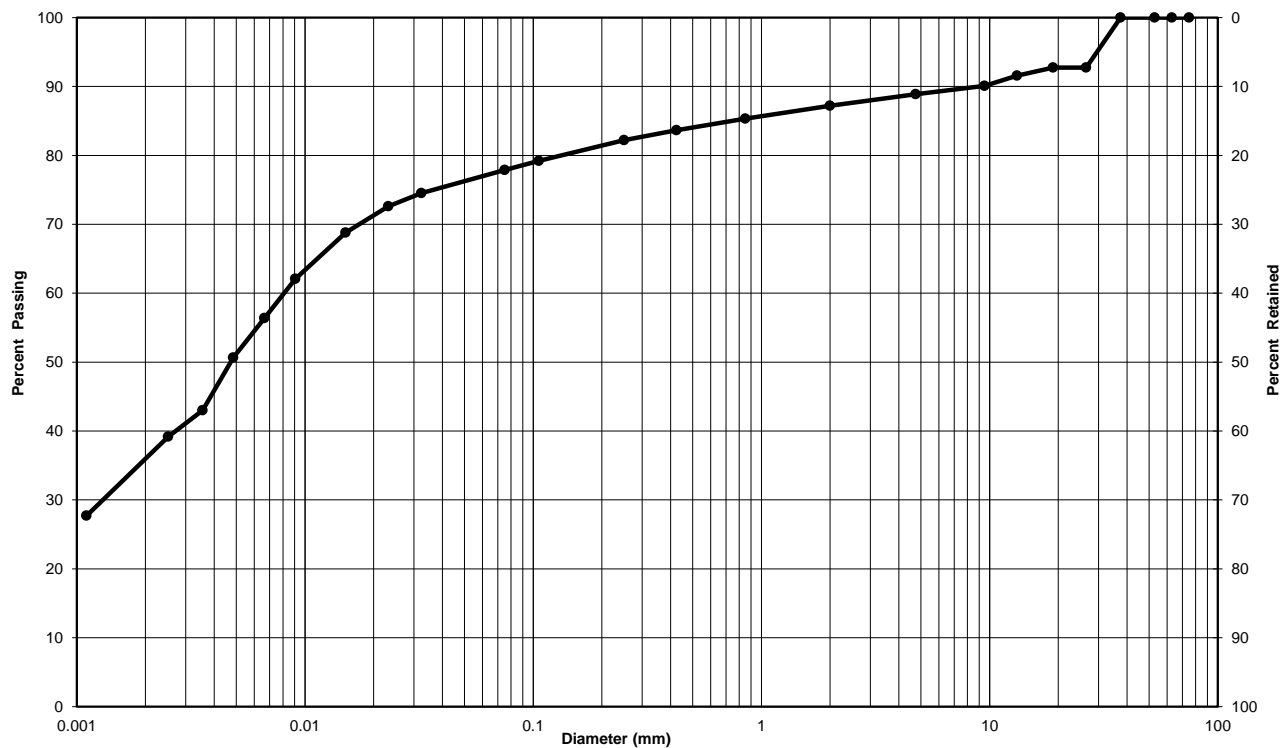
**Performed by:** Blayne Stanic **Date:** December 7, 2017  
**Verified by:** Abdul Hafeez Khan, P.Eng.; Laboratory Manager **Date:** December 11, 2017



**Particle-Size Analysis of Soils**  
**MTO LS-702 (Geotechnical)**

<b>Client:</b>	<u>Terrapure Environmental</u>	<b>Lab No.:</b>	<u>WLB 1367-3</u>
<b>Project, Site:</b>	<u>Stoney Creek Landfill</u> <u>65 Green Mountain Road West, Hamilton, Ontario</u>	<b>Project No.:</b>	<u>11103232</u>

Borehole No.: _____	Sample No.: <u>6A</u>
Depth: _____	Enclosure: <u>-</u>



Clay & Silt	Sand			Gravel	
	Fine	Medium	Coarse	Fine	Coarse
Particle-Size Limits as per USCS (ASTM D-2487)					

Soil Description	Gravel (%)	Sand (%)	Clay & Silt (%)
Lean clay with sand (CL)	11	11	78
Clay-size particles (<0.002 mm):			35 %

**Remarks:** The material does not meet the project specifications (77.9% on 0.075 mm. and 88.9% on 4.75 mm.)

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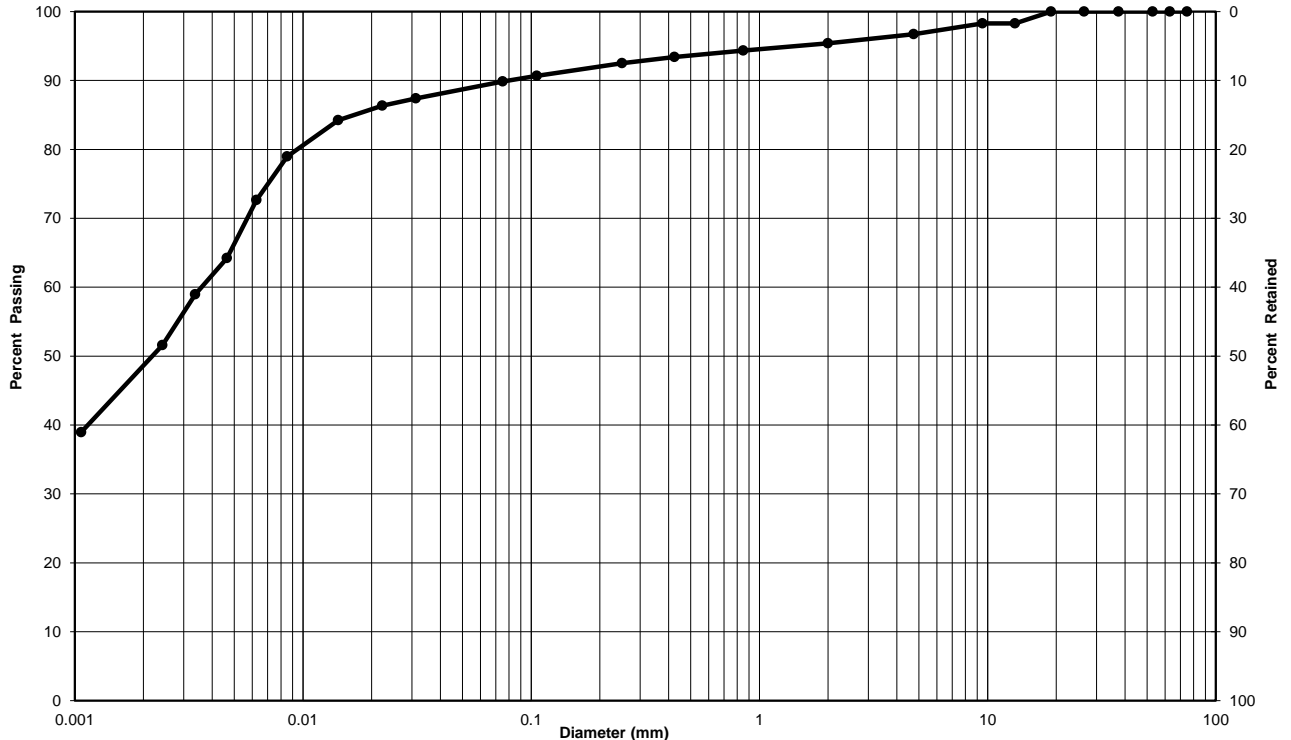
<b>Performed by:</b>	<u>Blayne Stanic</u>	<b>Date:</b>	<u>December 7, 2017</u>
<b>Verified by:</b>	<u>Abdul Hafeez Khan, P.Eng.; Laboratory Manager</u>	<b>Date:</b>	<u>December 11, 2017</u>



**Particle-Size Analysis of Soils**  
**MTO LS-702 (Geotechnical)**

**Client:** Terrapure Environmental **Lab No.:** WLB 1367-4  
**Project, Site:** Stoney Creek Landfill  
65 Green Mountain Road West, Hamilton, Ontario **Project No.:** 11103232

**Borehole No.:** \_\_\_\_\_ **Sample No.:** 7A  
**Depth:** \_\_\_\_\_ **Enclosure:** -



Clay & Silt	Sand			Gravel	
	Fine	Medium	Coarse	Fine	Coarse
Particle-Size Limits as per USCS (ASTM D-2487)					

Soil Description	Gravel (%)	Sand (%)	Clay & Silt (%)
Lean clay (CL)	3	7	90
Clay-size particles (<0.002 mm):			48 %

**Remarks:** The material meets the project specification

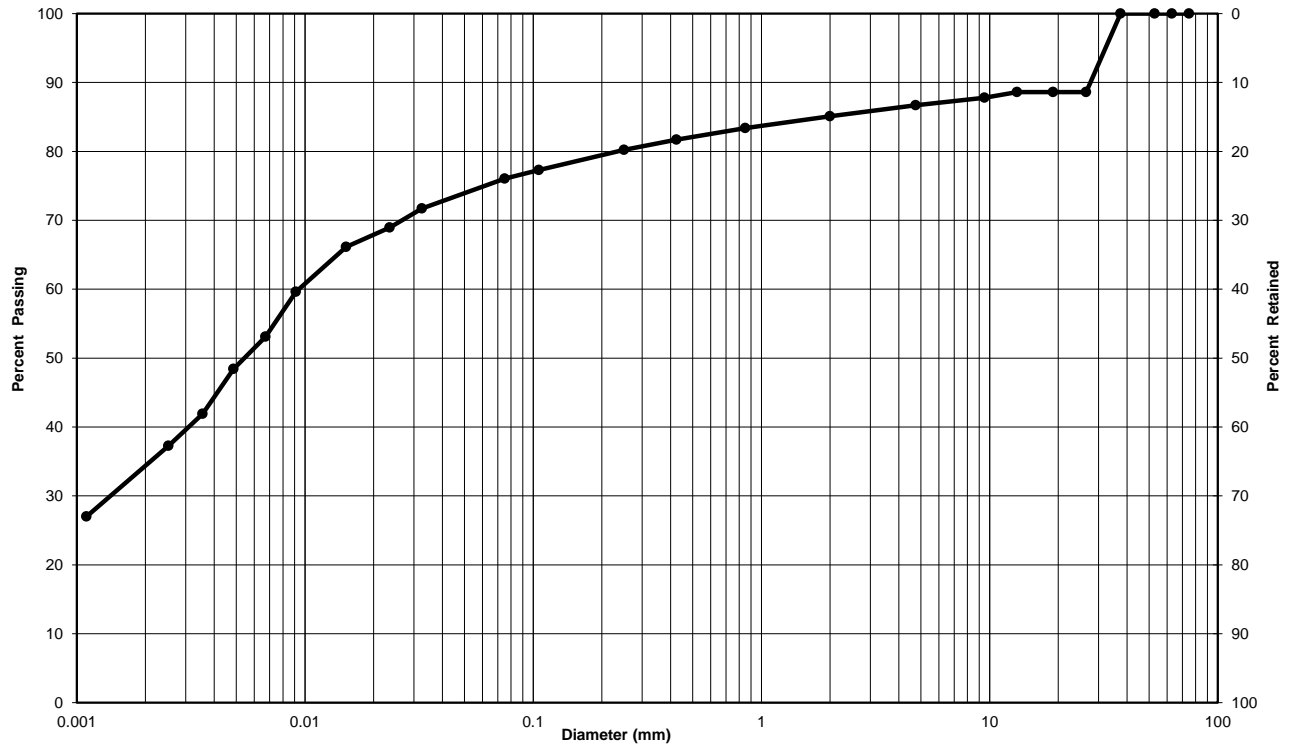
**Performed by:** Blayne Stanic **Date:** December 7, 2017  
**Verified by:** Abdul Hafeez Khan, P.Eng.; Laboratory Manager **Date:** December 11, 2017



**Particle-Size Analysis of Soils**  
**MTO LS-702 (Geotechnical)**

**Client:** Terrapure Environmental **Lab No.:** WLB 1367-5  
**Project, Site:** Stoney Creek Landfill  
65 Green Mountain Road West, Hamilton, Ontario **Project No.:** 11103232

**Borehole No.:** \_\_\_\_\_ **Sample No.:** 8A  
**Depth:** \_\_\_\_\_ **Enclosure:** -



Clay & Silt	Sand			Gravel	
	Fine	Medium	Coarse	Fine	Coarse
Particle-Size Limits as per USCS (ASTM D-2487)					

Soil Description	Gravel (%)	Sand (%)	Clay & Silt (%)
Lean clay with gravel (CL)	13	11	76
Clay-size particles (<0.002 mm):			33 %

**Remarks:** The material does not meet the project specifications (76% on 0.075 mm and 86.7% on 4.75 mm.)

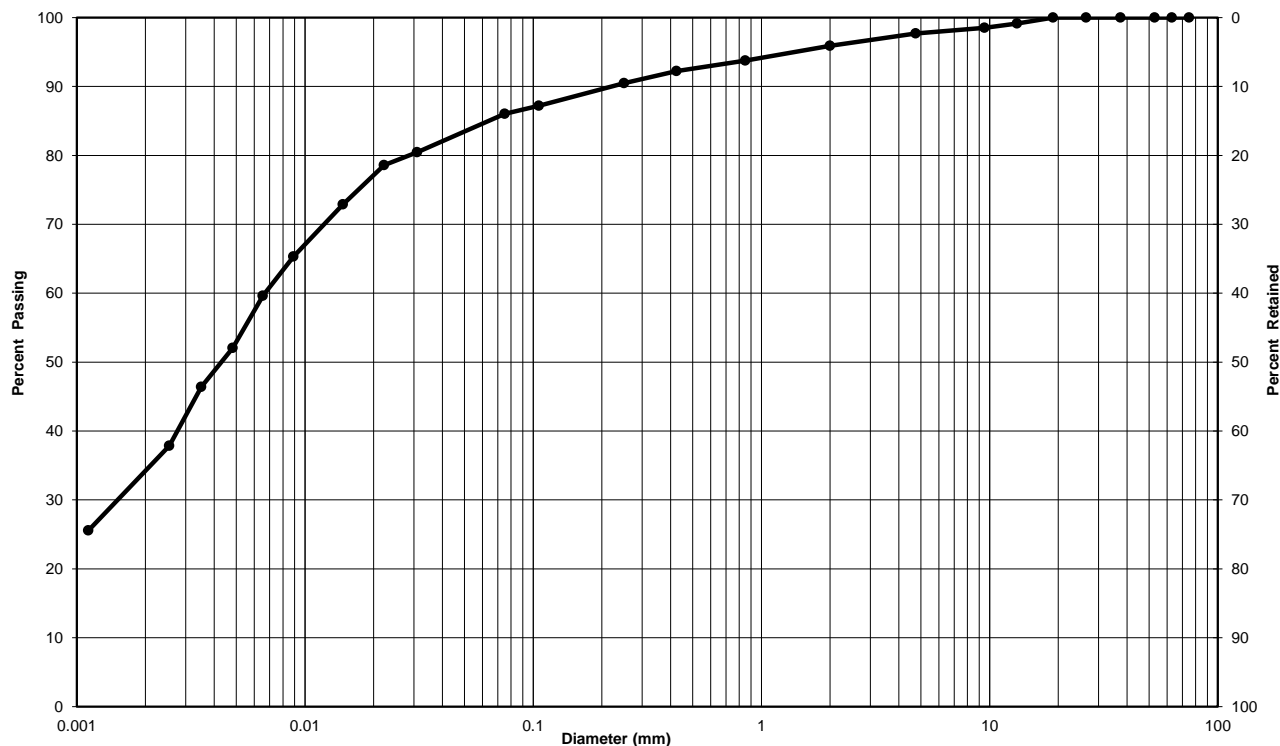
**Performed by:** Blayne Stanic **Date:** December 7, 2017  
**Verified by:** Abdul Hafeez Khan, P.Eng.; Laboratory Manager **Date:** December 11, 2017



**Particle-Size Analysis of Soils**  
**MTO LS-702 (Geotechnical)**

**Client:** Terrapure Environmental **Lab No.:** WLB 1367-6  
**Project, Site:** Stoney Creek Landfill  
 65 Green Mountain Road West, Hamilton, Ontario **Project No.:** 11103232

**Borehole No.:** \_\_\_\_\_ **Sample No.:** 9A  
**Depth:** \_\_\_\_\_ **Enclosure:** -



Clay & Silt	Sand			Gravel	
	Fine	Medium	Coarse	Fine	Coarse
Particle-Size Limits as per USCS (ASTM D-2487)					

Soil Description	Gravel (%)	Sand (%)	Clay & Silt (%)
Lean clay (CL)	2	12	86
Clay-size particles (<0.002 mm):			33 %

**Remarks:** The material meets the project specifications

**Performed by:** Blayne Stanic **Date:** January 4, 2018  
**Verified by:** Abdul Hafeez Khan, P.Eng.; Laboratory Manager **Date:** January 5, 2018