## Appendices

# Appendix A Letters to the Ministry

Reference No. 11103232



January 25, 2018

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 x 10<sup>-8</sup> 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

Brun Den

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





Photo 3 - Construction of the Engineered Fill Sidewall



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





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



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





Photo 7 - Seaming of Geotextile

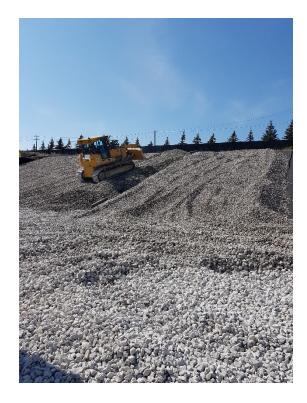


Photo 8 - Placement of Clear Stone for the Hydraulic Control Layer



## **Construction Photographs**



Photo 9 - Deploying Geomembrane on the Sidewall



Photo 10 - Air Testing Welded Geomembrane Seam





Photo 11 - Staged Construction of Base Liner Components



# Appendix C Daily Activity Logs



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

<ul> <li>Mobilized, placed signs and barrels</li> <li>Exposed liner flap on the inner side of the temporary berm between E1025 and E1075</li> </ul>		
Personnel:		
1 Foreman		
1 Laborer(s)		
1 Excavator operator(s)		
1 GHD engineer		
1 GHD inspector		
Equipment Used:	Equipment Notes:	
1 Excavator(s) John Deere 245G LC		
Other Progress Notes:		



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:	Equipment Notes:
1 Excavator(s)	John Deere 245G LC
1 Water Pump (6 inch)	
Other Progress Notes:	
<ul> <li>Water was found at the temporary berm membrane liner at the corner of the temporary berm at N1260, E1060</li> </ul>	



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)

#### 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

Equipment Notes: John Deere 245G LC



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.
	FELEI LESIECZKU		SHOWERS HUTT TT.00 A.W. 10 TZ.30 F.W.

<ul> <li>Continued removing and stockpiling 50 mm clear stone from the temporary berm between N1260 and N1300</li> <li>Stockpiled at approximately N1460, E1130</li> <li>Sand bags were placed to hold liner in place between N1260 and N1300</li> </ul>		
Personnel:		
1 Foreman 2 Laborer(s) 1 Excavator operator(s) 1 Rock truck operator(s) 1 GHD engineer 1 GHD inspector		
Equipment Used:	Equipment Notes:	
1 Excavator(s)John Deere 245G LC1 Rock Truck(s)Case 330B1 Water Pump (3/4 inch)Case 330B		
Other Progress Notes:		



11103232	Date: June 23, 2017
Terrapure Environmental	
11103232	
Dufferin Construction	
Peter Lesieczko	Weather: 20°C, Rain; Started approximately 9 am
	Terrapure Environmental 11103232 Dufferin Construction

· · · · ·	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:	Equipment Notes:		
1 Excavator(s)	John Deere 245G LC		



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:	Equipment Notes:
1 Excavator(s)	John Deere 245G LC
Other Progress Notes:	



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

Phase 8A Progress:		
<ul> <li>Stockpiled the 50 mm clear stone from within to beside the temporary berm between E1125 and E1175</li> <li>Began exposing and clearing impurities from the top of the clay from within the temporary berm between E1025 and E1075, and N1260 and N1300</li> <li>The impurities were stockpiled nearby and used later as engineered fill</li> </ul>		
Personnel:		
1 Foreman 2 Laborer(s) 1 Excavator operator(s) 1 GHD inspector 1 GHD engineer		
Equipment Used:	Equipment Notes:	
1 Excavator(s) 1 Water Pump (3/4 inch)	John Deere 245G LC	
Other Progress Notes:		
•		



11103232	Date: June 28, 2017
Terrapure Environmental	
11103232	
Dufferin Construction	
Peter Lesieczko	Weather: 23°C, Sunny
	Terrapure Environmental 11103232 Dufferin Construction

#### 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:

<u>Equipment Oseu</u> .	Equipment Notes.
1 Excavator(s)	John Deere 245G LC
1 Rock Truck(s)	Case 330B
1 Soil Tamper	PU6555
Other Brearses Netes	

uipmont No

**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



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)

#### John Deere 245G LC

Equipment Notes:

#### 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.



11103232	Date: June 30, 2017
Terrapure Environmental	
11103232	
Dufferin Construction	
Peter Lesieczko	Weather: 21°C, Cloudy
	Terrapure Environmental 11103232 Dufferin Construction

### 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:	Equipment Notes:	
1 Excavator(s)	John Deere 245G LC	
1 Water Pump (6 inch)		
Other Progress Notes:		
<ul> <li>Wrinkles in the membrane were discovered in Phase 1B between E1150 and E1200; further investigation will commence</li> </ul>		



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)	
	3	

#### Equipment Notes: John Deere 245G LC John Deere 470G LC

1 Water Pump (6 inch)

#### 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)



11103232	Date: July 5, 2017
Terrapure Environmental	
11103232	
Dufferin Construction	
Peter Lesieczko	Weather: 20°C, Sunny
	Terrapure Environmental 11103232 Dufferin Construction

#### 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:	Equipment Notes:
2 Excavator(s)	John Deere 245G LC
	John Deere 470G LC
1 Bulldozer(s)	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



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 ٠
- 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 ٠

#### 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

uipment Used:	Equipment Notes:
2 Excavator(s)	John Deere 245G LC
	John Deere 470G LC
1 Bulldozer(s)	John Deere 750K XCT
1 Rock Truck(s)	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.



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:	Equipment Notes:
1 Excavator(s)	John Deere 470G LC
1 Bulldozer(s)	John Deere 750K XCT
1 Water truck(s)	
1 Padfoot(s)	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



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:	Equipment Notes:
1 Excavator(s)	John Deere 470G LC
1 Bulldozer(s)	John Deere 750K XCT
1 Water truck(s)	
1 Padfoot(s)	CAT CS 563E
Other Progress Notes:	

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



1103232	Date:	July 11, 2017
Ferrapure Environmental	_	
1103232		
Dufferin Construction		
Brian Dermody	Weather:	29°C, Sunny
	Terrapure Environmental 1103232 Dufferin Construction	errapure Environmental 1103232 Dufferin Construction

#### 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:	Equipment Notes:
1 Excavator(s)	John Deere 470G LC
1 Bulldozer(s)	John Deere 750K XCT
1 Padfoot(s)	CAT CS 563E
Other Progress Notes:	

• Inspected stormwater management pond and groundwater detention pond



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

#### Phase 8A Progress:

- Continued placing engineered fill between E1050 and E1140. ٠
- 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:

Equipment Used:	Equipment Notes:
1 Excavator(s)	John Deere 470G LC
1 Bulldozer(s)	John Deere 750K XCT
1 Padfoot(s)	CAT CP 56B
Other Progress Notes:	

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



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

Placed geotextile A on the groundwater	r trench between E1150 and E1200		
Personnel:			
1 Foreman			
/ Padfoot operator(s)/ smooth drum ope	/ Padfoot operator(s)/ smooth drum operator(s)		
3 Laborer(s)	3 Laborer(s)		
1 Excavator operator(s)			
1 Bulldozer operator(s)			
1 Rock truck operator(s)	1 Rock truck operator(s)		
1 GHD inspector	1 GHD inspector		
1 GHD soil inspector	1 GHD soil inspector		
Environment Heads	Eminment Notoo		
Equipment Used:	Equipment Notes:		
1 Excavator(s)	John Deere 470G LC		
1 Rock Truck(s)	Case 330B		
Other Progress Notes:			

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



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



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 ٠
- 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 ٠
- 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



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

Equipment Notes: John Deere 750K XCT

Case 330B

John Deere 470G LC

Bomag BW 213 PDH-40

#### 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)

#### **Other Progress Notes:**

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

Continued placing engineered fill from The fill came from the stockpile at N13			
sonnel:			
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			
ipment Used:	Equipment Notes:		
1 Excavator(s)	John Deere 470G LC		
2 Rock Truck(s)	Case 330B		
	Caterpillar 735		
1 Padfoot(s)	Bomag BW 213 PDH-40		
1 Bulldozer(s)	John Deere 750K XCT		



11103232	Date:	July 20, 2017
Terrapure Environmental		
11103232		
Dufferin Construction		
Peter Lesieczko	Weather:	20°C, Cloudy with periods of storms
	Terrapure Environmental 11103232 Dufferin Construction	Terrapure Environmental 11103232 Dufferin Construction

#### 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:Equipment Notes:1 Excavator(s)John Deere 245G LC1 Rock Truck(s)Caterpillar 7351 Padfoot(s)Bomag BW 213 PDH-40Other Progress Notes:Image: Contemport of the second second

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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: Equipment Notes: 1 Excavator(s) John Deere 245G LC

1 Rock Truck(s)

Caterpillar 735

**Other Progress Notes:** 

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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 E <sup>2</sup>	1210
Personnel:	
1 Foreman	
2 Laborer(s)	
1 Excavator operator(s)	
1 GHD inspector	
Equipment Used:	Equipment Notes:
1 Excavator(s)	John Deere 245G LC
Other Progress Notes:	
Construction meeting #2 was held	



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: Equipment Notes: 1 Excavator(s) John Deere 245G LC 1 Rock Truck(s) Caterpillar 735



11103232	Date: July 26, 2017
Terrapure Environmental	
11103232	
Dufferin Construction	
Peter Lesieczko	Weather: 26°C, Partly Sunny
	Terrapure Environmental 11103232 Dufferin Construction

### 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:** 



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:



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

Equipment Notes:

#### 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)	John Deere 470G LC
2 Rock Truck(s)	Case 330B
	Caterpillar 735
1 Padfoot(s)	Bomag BW 213 PDH-40
1 Bulldozer(s)	John Deere 750K XCT

#### **Other Progress Notes:**



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

Equipment Notes:

#### 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)	John Deere 470G LC
2 Rock Truck(s)	Case 330B
	Caterpillar 735
1 Padfoot(s)	Bomag BW 213 PDH-40
1 Bulldozer(s)	John Deere 750K XCT

### Other Progress Notes:



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

<ul> <li>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</li> <li>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</li> <li>Added a lift of engineered fill to the outside of the Phase 8A sidewall from E1050 to E1120 from the stockpile at N1320, E1100</li> </ul>				
Personnel:				
<ol> <li>Foreman</li> <li>Laborer(s)</li> <li>Excavator operator(s)</li> <li>Padfoot operator(s)</li> <li>Bulldozer operator(s)</li> <li>Rock truck operator(s)</li> <li>Water Truck Operator(s)</li> <li>GHD inspector</li> <li>GHD engineer</li> </ol>				
Equipment Used:	Equipment Notes:			
2 Excavator(s)	John Deere 470G LC John Deere 245G LC			
2 Rock Truck(s)	Case 330B Caterpillar 735			
1 Padfoot(s)	1 Padfoot(s) Bomag BW 213 PDH-40			
1 Bulldozer(s) 1 Water Truck	John Deere 750K XCT			
Other Progress Notes:				



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:	Equipment Notes:
2 Excavator(s)	John Deere 470G LC
	John Deere 245G LC
2 Rock Truck(s)	Case 330B
	Caterpillar 735
1 Padfoot(s)	Bomag BW 213 PDH-40
1 Bulldozer(s)	John Deere 750K XCT
1 Water Truck(s)	
Other Progress Notes:	

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



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:	Equipment Notes:
2 Excavator(s)	John Deere 470G LC
	John Deere 245G LC
2 Rock Truck(s)	Case 330B
	Caterpillar 735
1 Padfoot(s)	Bomag BW 213 PDH-40
1 Bulldozer(s)	John Deere 750K XCT
1 Jumping Jack Tamper	Whacker Neuson WM100
1 Water Truck(s)	
Other Progress Notes:	



11103232	Date: August 4, 2017	
Terrapure Environmental		
11103232		
Dufferin Construction		
Peter Lesieczko	Weather: 25°C, Cloudy with rain in th	e afternoon
	Terrapure Environmental 11103232 Dufferin Construction	Terrapure Environmental 11103232 Dufferin Construction

	h the stockpile at N1360, E1175 and moving it to build a screenir from N1660, E1570 to N1660, E1740
ersonnel:	
<ol> <li>Foreman</li> <li>Laborer(s)</li> <li>Excavator operator(s)</li> <li>Padfoot operator(s)</li> <li>Bulldozer operator(s)</li> <li>Rock truck operator(s)</li> <li>Water Truck Operator(s)</li> <li>GHD inspector</li> </ol>	
<u>quipment Used</u> :	Equipment Notes:
1 Excavator(s) 2 Rock Truck(s)	John Deere 470G LC Case 330B
	Caterpillar 735
1 Padfoot(s) Bomag BW 213 PDH-40	
1 Bulldozer(s)	John Deere 750K XCT
1 Water Truck(s)	
ther Progress Notes:	



11103232	Date: August 8, 2017
Terrapure Environmental	
11103232	
Dufferin Construction	
Peter Lesieczko	Weather: 24°C, Sunny with some clouds
	Terrapure Environmental 11103232 Dufferin Construction

### 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)	John Deere 470G LC
2 Rock Truck(s)	Case 330B
	Caterpillar 735
1 Padfoot(s)	Bomag BW 213 PDH-40
1 Bulldozer(s)	John Deere 750K XCT
1 Water Truck(s)	
ther Progress Notes:	

Equipment Notes:

<u>Ot</u>



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:	Equipment Notes:
2 Excavator(s)	John Deere 470G LC
	John Deere 245G LC
2 Rock Truck(s)	Case 330B
	Caterpillar 735
1 Padfoot(s)	Bomag BW 213 PDH-40
1 Bulldozer(s)	John Deere 750K XCT
1 Water Truck(s)	
Other Progress Notes:	



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)	John Deere 470G LC
	John Deere 245G LC
2 Rock Truck(s)	Case 330B
	Caterpillar 735
1 Padfoot(s)	Bomag BW 213 PDH-40
1 Bulldozer(s)	John Deere 750K XCT
1 Jumping Jack Tamper	Whacker Neuson WM100
1 Water Truck(s)	
1 (2 inch) pump	
Other Progress Notes:	

**Equipment Notes:** 

Construction meeting #3 was held



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:	Phase 8A Progress:			
<ul> <li>and disposed of in the landfill</li> <li>The soil within the ramp that was visually lighter i testing</li> </ul>	om N1340, E1300 to N1370, E1280			
Personnel:				
<ol> <li>Foreman</li> <li>Laborer(s)</li> <li>Excavator operator(s)</li> <li>Padfoot operator(s)</li> <li>Bulldozer operator(s)</li> <li>Bulldozer operator(s)</li> <li>Rock truck operator(s)</li> <li>Water Truck Operator(s)</li> <li>GHD inspector</li> <li>GHD soil inspector</li> <li>GHD engineer</li> <li>GHD surveyor</li> </ol>				
Equipment Used:	Equipment Notes:			
2 Excavator(s) 2 Rock Truck(s)	John Deere 470G LC John Deere 245G LC Case 330B Caterpillar 735			
1 Padfoot(s)				
1 Bulldozer(s)	John Deere 750K XCT			
1 Water Truck(s)				
Other Progress Notes:				
<ul> <li>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.</li> </ul>				



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:	Equipment Notes:
2 Excavator(s)	John Deere 470G LC
	John Deere 245G LC
2 Rock Truck(s)	Case 330B
	Caterpillar 735
1 Bulldozer(s)	John Deere 750K XCT
1 Water Truck(s)	
1 Water Pump (2 inch)	
Other Progress Notes:	
•	



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 ٠
- 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:

Equipment Used:	Equipment Notes:
1 Excavator(s)	John Deere 470G LC
2 Rock Truck(s)	Case 330B
	Caterpillar 735
1 Bulldozer(s)	John Deere 750K XCT
1 Water Truck(s)	
1 Water Pump (6 inch)	
Other Progress Notes:	
•	



11103232	Date: August 16, 2017
Terrapure Environmental	
11103232	
Dufferin Construction	
Peter Lesieczko	Weather: 21°C, Cloudy
	Terrapure Environmental 11103232 Dufferin Construction

#### 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:	Equipment Notes:
2 Excavator(s)	John Deere 470G LC
	John Deere 245G LC
2 Rock Truck(s)	Case 330B
	Caterpillar 735
1 Bulldozer(s)	John Deere 750K XCT
1 Water Truck(s)	
1 Water Pump (6 inch)	
1 Water Pump (2 inch)	
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.



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 r afternoon	ain in the

#### 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

Equipment Notes: John Deere 470G LC

John Deere 750K XCT

Bomag BW 213 PDH-40

Case 330B Caterpillar 735

#### 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)

Other Progress Notes:



11103232	Date: August 18, 2017
Terrapure Environmental	
11103232	
Dufferin Construction	
Peter Lesieczko	Weather: 23°C, Cloudy
	Terrapure Environmental 11103232 Dufferin Construction

#### 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:	Equipment Notes:
1 Excavator(s)	John Deere 470G LC
2 Rock Truck(s)	Case 330B
	Caterpillar 735
1 Bulldozer(s)	John Deere 750K XCT
1 Padfoot(s)	Bomag BW 213 PDH-40
1 Water Truck(s)	
1 Water Pump (6 inch)	
1 Water Pump (2 inch)	
Other Progress Notes:	
•	



11103232	Date: August 21, 2017
Terrapure Environmental	
11103232	
Dufferin Construction	
Peter Lesieczko	Weather: 28°C, Clear skies
	Terrapure Environmental 11103232 Dufferin Construction

#### Phase 8A Progress:

- Continued hauling waste material from the south section of the ramp into the landfill ٠
- 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:

Equipment Used:	Equipment Notes:
1 Excavator(s)	John Deere 470G LC
2 Rock Truck(s)	Case 330B
	Caterpillar 735
1 Bulldozer(s)	John Deere 750K XCT
1 Padfoot(s)	Bomag BW 213 PDH-40
1 Water Truck(s)	
1 Water Pump (2 inch)	
Other Progress Notes:	
•	



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 ٠ 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:

Equipment Used:	Equipment Notes:
1 Excavator(s)	John Deere 470G LC
2 Rock Truck(s)	Case 330B
	Caterpillar 735
1 Bulldozer(s)	John Deere 750K XCT
1 Padfoot(s)	Bomag BW 213 PDH-40
1 Water Truck(s)	
1 Water Pump (2 inch)	
1 Water Pump (6 inch)	
Other Progress Notes:	



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:	Equipment Notes:
1 Excavator(s)	John Deere 470G LC
2 Rock Truck(s)	Case 330B
	Caterpillar 735
1 Bulldozer(s)	John Deere 750K XCT
1 Water Truck(s)	
1 Water Pump (2 inch)	
1 Water Pump (6 inch)	
Other Progress Notes:	
•	



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:



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:	Equipment Notes:
2 Excavator(s)	John Deere 470G LC
	John Deere 245G LC
2 Rock Truck(s)	Case 330B
	Caterpillar 735
1 Bulldozer(s)	John Deere 750K XCT
1 Water Truck(s)	
1 Water Pump (2 inch)	
Other Progress Notes:	



11103232	Date: Au	ugust 28, 2017
Terrapure Environmental		
11103232		
Dufferin Construction		
Peter Lesieczko	Weather: 2	20°C, Sunny with some clouds
	Terrapure Environmental 11103232 Dufferin Construction	Terrapure Environmental 11103232 Dufferin Construction

### 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:

Equipment Used:	Equipment Notes:
1 Excavator(s)	John Deere 470G LC
2 Rock Truck(s)	Case 330B
	Caterpillar 735
1 Bulldozer(s)	John Deere 750K XCT
1 Water Truck(s)	
1 Padfoot(s)	Bomag BW 213 PDH-40
1 Water Pump (2 inch)	

Equipment Not

Other Progress Notes:



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:	Equipment Notes:
2 Excavator(s)	John Deere 470G LC
	John Deere 245G LC
1 Rock Truck(s)	Caterpillar 735
1 Bulldozer(s)	John Deere 750K XCT
1 Water Truck(s)	
1 Padfoot(s)	Bomag BW 213 PDH-40
1 Water Pump (2 inch)	

#### Other Progress Notes:

• Construction meeting #4 was held



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:	Equipment Notes:
2 Excavator(s)	John Deere 470G LC
	John Deere 245G LC
2 Rock Truck(s)	Case 330B
	Caterpillar 735
1 Bulldozer(s)	John Deere 750K XCT
1 Water Truck(s)	
1 Padfoot(s)	Bomag BW 213 PDH-40
2 Water Pump (2 inch)	
1 Water Pump (3 inch)	
Other Progress Notes:	

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



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:	Equipment Notes:
2 Excavator(s)	John Deere 470G LC
	John Deere 245G LC
1 Rock Truck(s)	Caterpillar 735
2 Water Pump (2 inch)	
1 Water Pump (3 inch)	

### 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



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:	Equipment Notes:	
2 Excavator(s)	John Deere 470G LC	
	John Deere 245G LC	
1 Rock Truck(s)	Caterpillar 735	
2 Water Pump (2 inch)		
1 Water Pump (3 inch)		
1 Water Pump (1 inch)		
Other Progress Notes:		
The John Deere 470G LC was equipped with a hammer drill		



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

<ul> <li>Continued cutting the groundwater trench into th</li> <li>Continued removing 50 mm clear stone from the stockpiling the material at N1490, E1325</li> <li>Began removing the broken rock from the ground</li> <li>The rock was moved to N1425, E1375</li> <li>Began pulling back waste from the temporary be</li> </ul>	temporary berm from E1220 to E1300 and dwater trench
Personnel:	
1 Foreman 3 Laborer(s) 2 Excavator operator(s) 1 Rock truck operator(s) 1 GHD inspector	
Equipment Used:	Equipment Notes:
2 Excavator(s)	John Deere 470G LC John Deere 245G LC
1 Rock Truck(s) 1 Water Pump (1 inch) 1 Water Pump (2 inch)	Caterpillar 735
1 Water Pump (3 inch)	
Other Progress Notes:	
<ul> <li>The John Deere 470G LC was equipped with a h</li> </ul>	ammer drill



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:	Equipment Notes:
2 Excavator(s)	John Deere 470G LC
	John Deere 245G LC
1 Rock Truck(s)	Caterpillar 735
1 Front End Loader (Terrapure)	Caterpillar 972M
1 Water Pump (1 inch)	
1 Water Pump (2 inch)	
1 Water Pump (3 inch)	
Other Progress Notes:	
•	



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

• • • • • •	stockpiling the material at N1490, E1325 Connected the existing ground water trench (at	ig an approximately 5m long ground water trench ion pipe from N1325, E1225 to N1380, E1310 ground water trench otextile
Perso	onnel:	
	<ol> <li>Foreman</li> <li>Laborer(s)</li> <li>Excavator operator(s)</li> <li>Rock truck operator(s)</li> <li>GHD inspector</li> <li>Terrapure front end loader operator(s)</li> </ol>	
Equip	oment Used:	Equipment Notes:
	2 Excavator(s)	John Deere 470G LC John Deere 245G LC
	<ol> <li>Rock Truck(s)</li> <li>Front End Loader (Terrapure)</li> <li>Water Pump (1 inch)</li> <li>Water Pump (2 inch)</li> <li>Water Pump (3 inch)</li> </ol>	Caterpillar 735 Caterpillar 972M



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 ٠
- 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:**

#### Equipment Notes: John Deere 470G LC 2 Excavator(s) John Deere 245G LC 1 Rock Truck(s) Caterpillar 735 John Deere 750K XCT 1 Bulldozer(s) 1 Water Truck(s) 1 Padfoot(s) Bomag BW 213 PDH-40

**Other Progress Notes:** 



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:	Equipment Notes:
2 Excavator(s)	John Deere 470G LC
	John Deere 245G LC
2 Rock Truck(s)	Caterpillar 735
	Case 330B
1 Bulldozer(s)	John Deere 750K XCT
1 Padfoot(s)	Bomag BW 213 PDH-40
1 Water Truck(s)	
Other Progress Notes:	
•	

GHD | Daily Inspection Record | Appendix B | 11103232 (6)



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:

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- 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:	Equipment Notes:
2 Excavator(s)	John Deere 470G LC
	John Deere 245G LC
2 Rock Truck(s)	Caterpillar 735
	Case 330B
1 Bulldozer(s)	John Deere 750K XCT
1 Padfoot(s)	Bomag BW 213 PDH-40
2 Water Truck(s)	
Other Progress Notes:	

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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:

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- 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:	Equipment Notes:
2 Excavator(s)	John Deere 470G LC
	John Deere 245G LC
2 Rock Truck(s)	Caterpillar 735
	Case 330B
1 Bulldozer(s)	John Deere 750K XCT
1 Padfoot(s)	Bomag BW 213 PDH-40
2 Water Truck(s)	
Other Progress Notes:	

GHD | Daily Inspection Record | Appendix B | 11103232 (6)



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 ٠
- 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:

quipment Used:	Equipment Notes:
2 Excavator(s)	John Deere 470G LC
	John Deere 245G LC
2 Rock Truck(s)	Caterpillar 735
	Case 330B
1 Bulldozer(s)	John Deere 750K XCT
1 Padfoot(s)	Bomag BW 213 PDH-40
2 Water Truck(s)	

### **Other Progress Notes:**

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



11103232	Date: September 15, 2017
Terrapure Environmental	
11103232	
Dufferin Construction	
Peter Lesieczko	Weather: 27°C, Sunny
	Terrapure Environmental 11103232 Dufferin Construction

### Phase 8A Progress:

- Prepared clay source (N1650,E1350) ٠
- 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:**

quipment Used:	Equipment Notes:
2 Excavator(s)	John Deere 470G LC
	John Deere 245G LC
1 Rock Truck(s)	Case 330B
1 Bulldozer(s)	John Deere 750K XCT
2 Water Truck(s)	
ther Progress Notes:	

### Other Progress Notes:

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



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:	Equipment Notes:
1 Excavator(s)	John Deere 245G LC
2 Rock Truck(s)	Caterpillar 735
	Case 330B
2 Bulldozer(s)	John Deere 750K XCT
	John Deere 750J LT
1 Smooth Drum(s)	Caterpillar CS5333E
1 Zoom Boom	Merlo P38.13 plus
1 Water Truck(s)	
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



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:

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- 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:	Equipment Notes:	
2 Excavator(s)	John Deere 470G LC	
	John Deere 245G LC	
2 Rock Truck(s)	Caterpillar 735	
	Case 330B	
2 Bulldozer(s)	John Deere 750K XCT	
	John Deere 750J LT	
1 Smooth Drum(s)	Caterpillar CS5333E	
1 Zoom Boom	Merlo P38.13 plus	
1 Front End Loader (Terrapure)	Caterpillar 972M	
1 Water Truck(s)		
Other Progress Notes:		

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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:	Equipment Notes:
1 Excavator(s)	John Deere 470G LC
2 Rock Truck(s)	Caterpillar 735
	Case 330B
1 Bulldozer(s)	John Deere 750K XCT
1 Padfoot(s)	Bomag BW 213 PDH-40
1 Water Truck(s)	
1 Mini Excavator(s)	

### Other Progress Notes:

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



11103232	Date: September 21, 2017
Terrapure Environmental	
11103232	
Dufferin Construction	
Peter Lesieczko	Weather: 25°C, Sunny
	Terrapure Environmental 11103232 Dufferin Construction

Phase 8A Progress:		
<ul> <li>Continued adding engineered fill to the Phase 8A sidewall between E1200 and E1300 from the stockpile at N1375, E1175</li> </ul>		
ersonnel:		
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		
quipment Used:	Equipment Notes:	
2 Excavator(s)	John Deere 470G LC	
	John Deere 245G LC	
2 Rock Truck(s)	Caterpillar 735	
	Case 330B	
1 Bulldozer(s)	John Deere 750K XCT	
1 Padfoot(s)	Bomag BW 213 PDH-40	
	_	

# 1 Water Truck(s)

### Other Progress Notes:

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



11103232	Date: September 22, 2017
Terrapure Environmental	
11103232	
Dufferin Construction	
Peter Lesieczko	Weather: 27°C, Sunny
	Terrapure Environmental 11103232 Dufferin Construction

### Phase 8A Progress:

- Placed 1 lift of engineered fill on the Phase 8A sidewall between E1200 and E1300 from the ٠ 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:**

### Equipment Notes: 2 Excavator(s) John Deere 470G LC John Deere 245G LC 2 Rock Truck(s) Caterpillar 735 Case 330B 1 Bulldozer(s) John Deere 750K XCT 1 Padfoot(s) Bomag BW 213 PDH-40 1 Water Truck(s)

**Other Progress Notes:** 

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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 ٠
- 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:

Equipment Used:	Equipment Notes:
2 Excavator(s)	John Deere 470G LC
	John Deere 245G LC
2 Rock Truck(s)	Caterpillar 735
	Case 330B
1 Bulldozer(s)	John Deere 750K XCT
2 Padfoot(s)	Bomag BW 213 PDH-40
	Caterpillar CP56B
2 Water Truck(s)	

**Other Progress Notes:** .



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)
- Other Progress Notes:
  - •

Equipment Notes:

Caterpillar 735 Case 330B

John Deere 470G LC John Deere 245G LC

John Deere 750K XCT

Bomag BW 213 PDH-40 Caterpillar CP56B



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:	Equipment Notes:
3 Excavator(s)	John Deere 470G LC
	John Deere 245G LC
	Caterpillar 307E
2 Rock Truck(s)	Caterpillar 735
	Case 330B
1 Bulldozer(s)	John Deere 750K XCT
1 Padfoot(s)	Bomag BW 213 PDH-40
1 Water Truck(s)	

**Other Progress Notes:** 

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11103232	Date: September 28, 2017
Terrapure Environmental	
11103232	
Dufferin Construction	
Peter Lesieczko	Weather: 17°C, Cloudy
	Terrapure Environmental 11103232 Dufferin Construction

### 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:	Equipment Notes:
3 Excavator(s)	John Deere 470G LC
	John Deere 245G LC
	John Deere 60 D
2 Rock Truck(s)	Caterpillar 735
	Case 330B
1 Bulldozer(s)	John Deere 750K XCT
1 Padfoot(s)	Bomag BW 213 PDH-40
Other Progress Notes:	



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 ٠
- 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:

Equipment Used:	Equipment Notes:
2 Excavator(s)	John Deere 470G LC
	John Deere 245G LC
	John Deere 60 D
2 Rock Truck(s)	Caterpillar 735
	Case 330B
1 Bulldozer(s)	John Deere 750K XCT
1 Padfoot(s)	Bomag BW 213 PDH-40
1 Zoom Boom	Merlo P38.13 plus

### **Other Progress Notes:**

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11103232	Date: October 2, 2017	
Terrapure Environmental		
11103232		
Dufferin Construction		
Peter Lesieczko	Weather: 20°C, Clear sky	
	Terrapure Environmental 11103232 Dufferin Construction	Terrapure Environmental 11103232 Dufferin Construction

### 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:	Equipment Notes:
2 Excavator(s)	John Deere 470G LC
	John Deere 245G LC
2 Rock Truck(s)	Caterpillar 735
	Case 330B
1 Bulldozer(s)	John Deere 750K XCT
1 Padfoot(s)	Bomag BW 213 PDH-40
1 Zoom Boom	Merlo P38.13 plus
2 Water Truck(s)	
Other Progress Notes:	



11103232	Date: October 3, 2017
Terrapure Environmental	
11103232	
Dufferin Construction	
Peter Lesieczko	Weather: 20°C, Clear sky
	Terrapure Environmental 11103232 Dufferin Construction

### 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

Equipment Notes:

### 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)	John Deere 470G LC
	John Deere 245G LC
	John Deere 60 D
2 Rock Truck(s)	Caterpillar 735
	Case 330B
1 Bulldozer(s)	John Deere 750K XCT
1 Padfoot(s)	Bomag BW 213 PDH-40
1 Zoom Boom	Merlo P38.13 plus
2 Water Truck(s)	

### Other Progress Notes:

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



11103232	Date: (	Dctober 4, 2017
Terrapure Environmental		
11103232		
Dufferin Construction		
Peter Lesieczko	Weather:	22°C, Cloudy, rain in the P.M.
	Terrapure Environmental 11103232 Dufferin Construction	Terrapure Environmental 11103232 Dufferin Construction

### Phase 8A Progress:

- Placed 19 mm clear stone on top of geotextile B from N1260 to N1300 ٠
- 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:

Equipment Used:	Equipment Notes:
1 Excavator(s)	John Deere 470G LC
2 Rock Truck(s)	Caterpillar 735
	Case 330B
1 Bulldozer(s)	John Deere 750K XCT
1 Front End Loader (Terrapure)	Caterpillar 972M
1 Water Truck(s)	

### **Other Progress Notes:**

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



11103232	Date: October 5, 2017
Terrapure Environmental	
11103232	
Dufferin Construction	
Peter Lesieczko	Weather: 20°C, Clear sky
	Terrapure Environmental 11103232 Dufferin Construction

### Phase 8A Progress:

- Placed Granular A on top of the 19 mm clear stone from N1260 to N1300 ٠
- 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:

Equipment Used:	Equipment Notes:
2 Excavator(s)	John Deere 470G LC
	John Deere 245G LC
1 Rock Truck(s)	Caterpillar 735
1 Bulldozer(s)	John Deere 750K XCT
1 Padfoot(s)	Bomag BW 213 PDH-40
1 Water Truck(s)	

**Other Progress Notes:** 



Job Number:	11103232	Date: October 6, 2017
Client:	Terrapure Environmental	
Job Name:	11103232	
Contractor:	Dufferin Construction	
Inspected By:	Peter Lesieczko	Weather: 18°C, Cloudy
		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:	Equipment Notes:
1 Excavator(s)	John Deere 470G LC
1 Rock Truck(s)	Caterpillar 735
1 Bulldozer(s)	John Deere 750K XCT
1 Padfoot(s)	Bomag BW 213 PDH-40
	Caterpillar CS44
1 Water Truck(s)	

Other Progress Notes:

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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:	Equipment Notes:	
1 Water Pump (2 inch)		
Other Progress Notes:		
<ul> <li>Rained over the weekend which caused the work area to be wet with spots of standing water. Material placement was suspended</li> </ul>		



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:	Equipment Notes:	
1 Excavator(s)	John Deere 245G LC	
Other Progress Notes:		
Repaired and improved existing berm from N1410, E1740 to N1410, E1760 (Phase 6C)		



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	9
Personnel:	
1 Foreman 1 Laborer(s) 1 GHD inspector	
Equipment Used:	Equipment Notes:
1 Water Pump (2 inch)	
Other Progress Notes:	
•	



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

Equipment Notes:

Caterpillar 735

John Deere 470G LC

John Deere 750K XCT

Bomag BW 213 PDH-40

### 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)

Other Progress Notes:

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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:Equipment Notes:1 Excavator(s)John Deere 470G LC1 Rock Truck(s)Caterpillar 7351 Bulldozer(s)John Deere 750K XCT1 Water Pump (2 inch)Merlo P38.13 plusOther Progress Notes:Image: Contemport

- 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)



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:	Equipment Notes:
2 Excavator(s)	John Deere 470G LC
	John Deere 245G LC
2 Rock Truck(s)	Caterpillar 735
	Case 330B
1 Bulldozer(s)	John Deere 750K XCT
1 Padfoot(s)	Bomag BW 213 PDH-40
1 Water Truck(s)	
1 Zoom Boom	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)



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 ٠
- 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:

Equipment Used:	Equipment Notes:
1 Excavator(s)	John Deere 470G LC
2 Rock Truck(s)	Caterpillar 735
	Case 330B
1 Bulldozer(s)	John Deere 750K XCT
2 Padfoot(s)	Bomag BW 213 PDH-40
	Homatsu 51EX
1 Water Truck(s)	

### **Other Progress Notes:**



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
		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:

<u>1</u>		<u>aquipinent netee</u> .
	1 Excavator(s)	John Deere 245G LC
	2 Rock Truck(s)	Caterpillar 735
		Case 330B
	1 Bulldozer(s)	John Deere 750K XCT
	1 Smooth Drum Roller(s)	Caterpillar CP56B
	1 Water Truck(s)	
	1 Zoom Boom	Merlo P38.13 plus

Equipment Notes:

### **Other Progress Notes:**

• Construction meeting #6 was held



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
Contractor:	Dufferin Construction	Weather: 20°C, Clear sky

### Phase 8A Progress:

- Terrafix placed geotextile A on top of the Secondary Clay Liner along E1025 to E1075 ٠
- 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

### auinment Used<sup>.</sup>

Equipment Used:	Equipment Notes:
1 Excavator(s)	John Deere 245G LC
2 Rock Truck(s)	Caterpillar 735
	Case 330B
2 Bulldozer(s)	John Deere 750K XCT
	Komatsu 51EX
1 Smooth Drum Roller(s)	Caterpillar CP56B
1 Water Truck(s)	
1 Zoom Boom	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



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:

guip	ment <u>oseu</u> .	Equipment Notes.
	2 Excavator(s)	John Deere 470G LC
		John Deere 245G LC
	2 Rock Truck(s)	Caterpillar 735
		Case 330B
	1 Bulldozer(s)	John Deere 750K XCT
	1 Water Truck(s)	
	1 ATV	Polaris
	1 Zoom Boom	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

Equipment Notes



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

Equipment Notes:

### 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)

### Other Progress Notes:

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



11103232	Date: October 25, 2017
Terrapure Environmental	
11103232	
Dufferin Construction	
Peter Lesieczko	Weather: 9°C, Sunny with some clouds
	Terrapure Environmental 11103232 Dufferin Construction

### Phase 8A Progress:

- Began placing Primary Clay Liner from E1175 to E1250 ٠
- 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:

Equipment Used:	Equipment Notes:
1 Excavator(s)	John Deere 470G LC
2 Rock Truck(s)	Caterpillar 735
	Case 330B
1 Bulldozer(s)	John Deere 750K XCT
1 Padfoot(s)	Bomag BW 213 PDH-40
1 Water Truck(s)	

**Other Progress Notes:** 

.



11103232	Date: October 26, 2017
Terrapure Environmental	
11103232	
Dufferin Construction	
Peter Lesieczko	Weather: 13°C, Sunny with some clouds
	Terrapure Environmental 11103232 Dufferin Construction

### 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)

Other Progress Notes:

### John Deere 470G LC

Equipment Notes:

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



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 ٠
- 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:

Equipment Used:	Equipment Notes:
1 Excavator(s)	John Deere 470G LC
2 Rock Truck(s)	Caterpillar 735
	Case 330B
1 Bulldozer(s)	John Deere 750K XCT
1 Padfoot(s)	Bomag BW 213 PDH-40
1 Water Truck(s)	
Other Progress Notes:	



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	
$2 l_{aborar(s)}$	

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

# Equipment Used: Equipment Notes: 2 Excavator(s) John Deere 470G LC 2 Rock Truck(s) Caterpillar 735 1 Bulldozer(s) John Deere 750K XCT 1 Padfoot(s) Bomag BW 213 PDH-40

Other Progress Notes:



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



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

Equipment Used:	Equipment Notes:
3 Excavator(s)	John Deere 470G LC
	John Deere 245G LC
	John Deere 60 D
2 Rock Truck(s)	Caterpillar 735
	Case 330B
1 Bulldozer(s)	John Deere 750K XCT
2 Padfoot(s)	Bomag BW 213 PDH-40
	Caterpillar CP56B
1 Water Truck(s)	
1 Zoom Boom(s)	Merlo P38.13 plus
Other Progress Notes:	



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	



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

<ul><li>Pumped water around the site</li><li>Prepared and fused the leachate of</li></ul>	collection pipes
Personnel:	
1 Foreman 2 Laborer(s) 1 Excavator operator(s) 1 Sandale Welder 1 GHD inspector	
Equipment Used:	Equipment Notes:
1 Excavator(s) 1 Pump (2 inch)	John Deere 245G LC
Other Progress Notes:	



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:	Equipment Notes:
2 Pump (2 inch) 2 Pump (1 inch)	
Other Progress Notes:	



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



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:	Equipment Notes:
1 Excavator(s)	John Deere 60 D
1 Bulldozer(s)	John Deere 750K XCT



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 ٠
- 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:**

quipment Used:	Equipment Notes:
2 Excavator(s)	John Deere 60 D
	John Deere 245G LC
1 Bulldozer(s)	John Deere 750K XCT
1 Smooth Drum Roller(s)	Caterpillar CS44



11103232	Date: Novemb	per 10, 2017
Terrapure Environmental		
11103232		
Dufferin Construction		
Peter Lesieczko	Weather: -2°C,	Sunny with some clouds
	Terrapure Environmental 11103232 Dufferin Construction	Terrapure Environmental 11103232 Dufferin Construction

#### Phase 8A Progress:

- Terrafix continued geomembrane work from E1225 to E1300 ٠
- 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)

Other Progress Notes:

#### Equipment Notes:

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

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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)

#### Other Progress Notes:

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

Equipment Notes:

John Deere 750K XCT

John Deere 60 D

Caterpillar 735



#### Phase 8A Progress:

- Terrafix continued geomembrane work from E1225 to E1300 ٠
- 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:

quipment Used:	Equipment Notes:
1 Excavator(s)	John Deere 60 D
1 Rock Truck(s)	Caterpillar 735
1 Bulldozer(s)	John Deere 750K XCT
1 Padfoot(s)	Bomag BW 213 PDH-40
1 Front End Loader (Terrapure)	Caterpillar 972M

#### **Other Progress Notes:**

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



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:Equipment Notes:1 Excavator(s)John Deere 60 D1 Rock Truck(s)Caterpillar 7351 Bulldozer(s)John Deere 750K XCT1 Padfoot(s)Bomag BW 213 PDH-401 Front End Loader (Terrapure)Caterpillar 972M

#### **Other Progress Notes:**

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



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 collect	ion pipes in the area of N1319, E1183
Personnel:	
1 Foreman 3 Laborer(s) 1 Excavator operator(s) 1 GHD inspector	
Equipment Used:	Equipment Notes:
2 Excavator(s)	John Deere 470G LC John Deere 60 D
Other Progress Notes:	
•	



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	Loboror(o)

- 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:	Equipment Notes:
1 Excavator(s)	John Deere 60 D
1 Rock Truck(s)	Caterpillar 735
1 Bulldozer(s)	John Deere 750K XCT
1 Front End Loader (Terrapure)	Caterpillar 972M



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

Pumped water and dried clay liner su	urface from E1050 to E1100	
ersonnel:		
1 Foreman		
3 Laborer(s)		
1 Excavator operator(s)		
1 GHD inspector		
1 GHD soil inspector		
iquipment Used:	Equipment Notes:	
1 Excavator(s)	John Deere 60 D	
2 Frost Fighters		
Other Progress Notes:		



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	n E1050 to E1100
Personnel:	
1 Foreman	
3 Laborer(s)	
1 GHD inspector	
Equipment Used:	Equipment Notes:
2 Frost Fighters	
Other Progress Notes:	
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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	Pumped water and dried clay liner surface from E1050 to E1100		
Personnel:	Personnel:		
1 Foreman			
2 Laborer(s)			
1 GHD inspector			
Equipment Used:	Equipment Notes:		
2 Frost Fighters			
Other Progress Notes:			
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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

Terrafix began placing geomemb	rane from E1025 to E1100 and N1300 to N1325		
ersonnel:			
1 Foreman			
3 Laborer(s)			
1 GHD inspector	1 GHD inspector		
1 Terrafix Foreman			
4 Terrafix Labourers			
1 Excavator operator(s)			
quipment Used:	Equipment Notes:		
1 Excavator(s) John Deere 470G LC			
ther Progress Notes:			



11103232	Date:	November 24, 2017
Terrapure Environmental		
11103232		
Dufferin Construction		
Peter Lesieczko	Weather:	10°C, Mostly cloudy
	Terrapure Environmental 11103232 Dufferin Construction	Terrapure Environmental 11103232 Dufferin Construction

<ul> <li>Terrafix continued placing geomembrane from E1025 to E1100 and N1300 to N1325</li> <li>Dug an anchor trench from E1300 to E1325</li> </ul>		
Personnel:		
1 Foreman 2 Laborer(s) 1 GHD inspector 1 Terrafix Foreman 7 Terrafix Labourers 2 Excavator operator(s)		
Equipment Used:	Equipment Notes:	
2 Excavator(s)	John Deere 60 D John Deere 470G LC	
1 Zoom Boom Merlo P38.13 plus Other Progress Notes:		



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

<ul> <li>Terrafix worked on the geomembrane doing various tasks such as repairs and connections, from E1025 to E1100 and N1300 to N1325</li> <li>Pumped water from N1375, E1300 area</li> </ul>		
Personnel:		
1 Foreman 1 Laborer(s) 1 GHD inspector 1 Terrafix Foreman 6 Terrafix Labourers 1 Excavator operator(s)		
Equipment Used:		Equipment Notes:
1 Pump (2 inch)		



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:Equipment Notes:2 Excavator(s)John Deere 60 D1 Zoom BoomJohn Deere 470G LC1 Pump (2 inch)Merlo P38.13 plus1 Padfoot(s)Bomag BW 213 PDH-40

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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:	Equipment Notes:
2 Excavator(s)	John Deere 60 D
	John Deere 470G LC
2 Rock Truck(s)	Caterpillar 735
	Case 330B
1 Bulldozer(s)	John Deere 750K XCT
1 Padfoot(s)	Bomag BW 213 PDH-40
1 Pump (2 inch)	

#### **Other Progress Notes:**

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



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:	Equipment Notes:
3 Excavator(s)	John Deere 245G LC
	John Deere 470G LC
	John Deere 60 D
2 Rock Truck(s)	Caterpillar 735
	Case 330B
1 Bulldozer(s)	John Deere 750K XCT
1 Pump (2 inch)	
1 Pump (1 inch)	

#### Other Progress Notes:

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



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:

Equipment Used:	Equipment Notes:
2 Excavator(s)	John Deere 470G LC
	John Deere 60 D
2 Rock Truck(s)	Caterpillar 735
	Case 330B
1 Bulldozer(s)	John Deere 750K XCT
1 Zoom Boom	Merlo P38.13 plus
Other Progress Notes:	



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:	Equipment Notes:
2 Excavator(s)	John Deere 470G LC
	John Deere 60 D
2 Rock Truck(s)	Caterpillar 735
	Case 330B
1 Bulldozer(s)	John Deere 750K XCT
1 Padfoot(s)	Bomag BW 213 PDH-40
1 Pump (2 inch)	
1 Smooth Drum Roller	Caterpillar CS44
Other Progress Notes:	



Date:	December 4, 2017
ironmental	
ruction	
weather	: 10°C, Sunny with some clouds
t	truction

#### 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:

Equipment Used:	Equipment Notes:
2 Excavator(s)	John Deere 470G LC
	John Deere 60 D
1 Rock Truck(s)	Caterpillar 735
1 Zoom Boom	Merlo P38.13 plus

#### **Other Progress Notes:**

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



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:		
<ul> <li>Began connection work between Phase 1B and Phase 8A, removing temporary containment flap in the area of N1275, E1050</li> <li>Connected the remaining leachate collection pipes to the existing</li> </ul>		
Personnel:		
1 Foreman 1 Laborer(s) 1 Excavator operator(s)		
Equipment Used:	Equipment Notes:	
1 Excavator(s)	John Deere 245G LC	
Other Progress Notes:		



11103232	Date: December 6, 2017
Terrapure Environmental	
11103232	
Dufferin Construction	
Peter Lesieczko	Weather: 4°C, Clear sky
	Terrapure Environmental 11103232 Dufferin Construction

#### 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:Equipment Notes:2 Excavator(s)John Deere 470G LCJohn Deere 60 DJohn Deere 60 D1 Rock Truck(s)Case 330B1 Zoom BoomMerlo P38.13 plus1 Bulldozer(s)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



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 ٠ 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:

Equipment Used:	Equipment Notes:
2 Excavator(s)	John Deere 470G LC
	John Deere 245G LC
1 Rock Truck(s)	Case 330B
1 Bulldozer(s)	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



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:	Equipment Notes:
1 Smooth Drum Roller(s)	Caterpillar CS44
Other Progress Notes:	
Construction of Phase 8A completed	

## Appendix D Field and Laboratory Soil Testing Reports

## Appendix D1 Results Dated January <u>19, 2017</u>

Reference No. 11103232



January 19, 2017

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 x  $10^{-8}$  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 > Pl > 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.

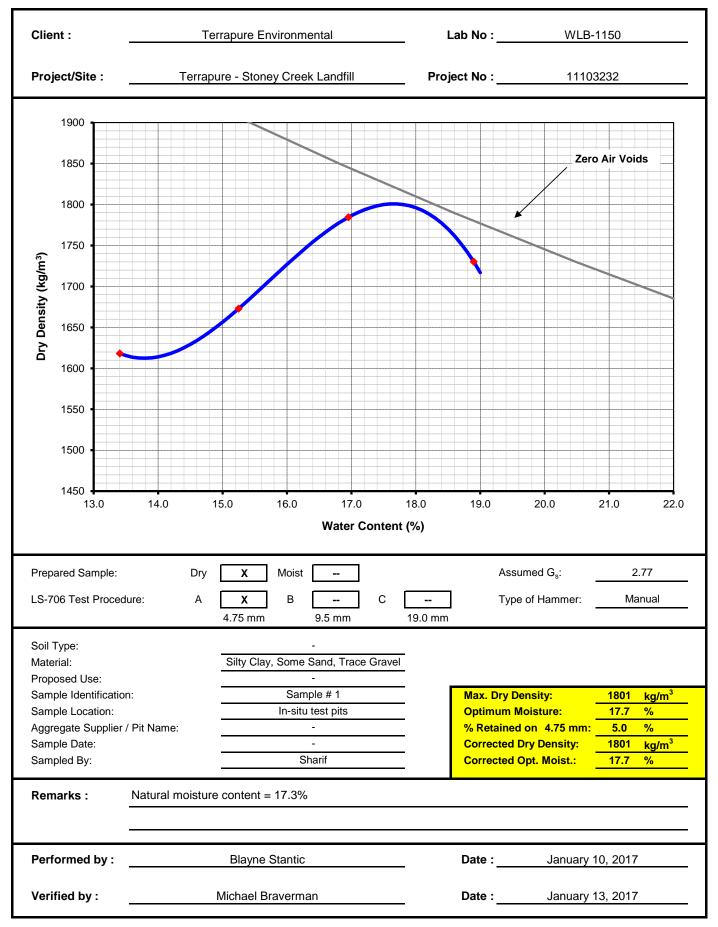
Karl Roechner, M.A.Sc., P. Eng.

## **Attachments**

## Attachment A Laboratory Test Results



#### Standard Proctor Test (MTO LS-706)



GHD FO-930.205c (ON) - Standard Protor Test - Rev.3 - 05-15-2016



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

CLIENT:	Terrapure Environmental			LAB No.:		WLB-1150
PROJECT/ SITE:	Terrapure - Stoney Creek Landfill, 65 Green Mountain Road W, Hamilton			PROJECT	No.:	11103232
Sample Location:	-		Sampled By:		Client	
Sample Height/Depth:	-		Date Sampled:	D	December 7, 2016	
Sample Identification:	Sa	mple #1	Date Tested:	Jar	Jan 13 - Jan 17, 2017	
Method C- Falling Head, Rising Tailwater Elevation						
	Sample Description: Silty Clay, some sand, trace		ce gravel	]		
Specimen Parameters	Initial	Final	Pe	rmeation Conc	lition	
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 F	ressure, kPa		20.00
Moisture, %	21.7	20.7	Volume under Steady	Flow, cm <sup>3</sup>	5.3	
Specific Gravity	2.7	79	Hydraulic Gradie	ent, <i>i</i>	18.6	
Degree of Saturation, %	100	100	Hydraulic Conductivity, $k_{20}$ , cm/sec		8.5E-08	
Largest Particle Size, mm	4.7	75				
6.00 5.00 (Eus) 4.00 3.00 1.00 0.00 0 500 REMARKS:	Sample rem	00 1500 Elapsed Tim olded to appro		5.0 4.0 3.0 2.0 1.0	HE-07 (E-07 (E-07 (E-07 (E-07 (E-07 (E-07 (E-07 (E-07 (E-07 (E-07)) (E-07 (E-07)) (E-07) (E-0	<ul> <li>Q - Inflow</li> <li>Q- Outflow</li> <li>Corrected Hydraulic Conductivity, k20</li> </ul>
PERFORMED BY:     Michael Braverman     DATE:     January 13, 2017			3, 2017			
VERIFIED BY: Michael Braverman DATE: January 18, 20		3, 2018				



#### Standard Proctor Test (MTO LS-706)

Clien	ıt:	Terrapure Enviromenntal Lab No : WLB-1151						
Proje	ect/Site :	Terrapure - Stoney Creek Landfill	Project No :	11103232				
Dry Density (kg/m³)	1790 • 1770 • 1770 • 1750 • 1730 • 1710 • 1690 • 1670 •			Zero Air Voids Line				
	1650 16.0 17.0 18.0 19.0 20.0 21.0 22.0 13.0 14.0 15.0 16.0 17.0 18.0 19.0 20.0 21.0 22.0 Water Content (%)							
Prepared Sample:       Dry       X       Moist        Assumed G <sub>s</sub> :       2.65         LS-706 Test Procedure:       A       X       B        C        Type of Hammer:       Manual         4.75 mm       9.5 mm       19.0 mm       Manual       Manual       Manual       Manual								
Soil Type:       -         Material:       Clayey Silt, Some Sand         Proposed Use:       -         Sample Identification:       Sample # 2         Sample Location:       In-situ test pits         Aggregate Supplier / Pit Name:       -			um Moisture: <u>16.8 %</u> nined on 4.75 mm: <u>0.0 %</u> ted Dry Density: <u>1741 kg/m<sup>3</sup></u>					
Remarks :								
Perfo	ormed by :	Blayne Stantic Date : January 13, 2017						
Verifi	Verified by : Michael Braverman Date : January 16, 2017			January 16, 2017				



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

CLIENT:	Terrapure Environmental			LAB No.:		WLB-1151	
PROJECT/ SITE:	Terrapure - Stoney Creek Lar Road W, Ha			PROJECT No.:		11103232	
Sample Location:	-		Sampled By:		Client		
Sample Height/Depth:	-		Date Sampled:	D	ecember	r 7, 2016	
Sample Identification:	Sa	ample #2		Date Tested:	Jar	Jan 13 - Jan 17, 2017	
<u></u>	Meth	nod C- Fallir	ng He	ead, Rising Tailwater Ele	vation		
	Sample Description:		Clayey silt, some sand				
Specimen Parameters	Initial	Final	Permeation (		meation Cond	dition	
Diameter, cm	4.97			Cell Pressure, kPa		400.0	
Length, cm	5.37			Head Pressure,	kPa	387.5	
Volume, cm <sup>3</sup>	104.2			Back Pressure, I	kPa	377.5	
Wet Mass, g	211.1		B - Value			0.98	
Dry Density, kg/m <sup>3</sup>	1707	707 1717 Effective Consolidation Pressure, kPa		ressure, kPa	20.00		
Moisture, % 18.7 20.2			Volume under Steady Flow, cm <sup>3</sup>		3.1		
Specific Gravity 2.63		63		Hydraulic Gradient, <i>i</i>		19.0	
Degree of Saturation, % 91 100		100		Hydraulic Conductivity, <i>k</i> <sub>20,</sub> cm/sec		4.0E-08	
Largest Particle Size, mm	4.	75					
4.00 (Fundamental and a second secon	1000 Sample rem	1500 24 Elapsed	000 <b>Fime</b>	2500 3000 350 (min) 98% of SPMD	<ul> <li>3.0</li> <li>2.0</li> <li>1.0</li> <li>0.0</li> </ul>	Hydraulic Conductivity, k20 (cm/sec)	Q - Inflow Q- Outflow Corrected Hydraulic Conductivity, k20
				the specification			
PERFORMED BY:	ED BY: Michael Braverman DATE: January 13, 2017				3, 2017		
VERIFIED BY:		Michael Brav	/erma	an DATE:	J	anuary 1	8, 2017



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

Client: Project, Site:		Terrapure Er	nvironmental					Lab No.:	S1316				
		Terrapure-Stor Road W, Hami		ndfill, 65 Gr	een Mo	untain		Project No.:	11103	232			
	Borehole No.: Depth:								Sample No.: Enclosure:	Sample	e #1		
Percent Passing	00 90 80 70 60 50 40 30 20 10 0.001		0.01		0.1 Diar			1				0 10 20 30 40 50 60 70 80 90 100	Percent Retained
	<b></b>					Sand				Gr	7		
			Silty Clay		Fine		e Medium Coarse			Fine	Coarse	1	
				Partic	le-Size Limits	as per l	JSCS (AS	TM D	9-2487)				
			Soil Desc	ription		Gra	avel (%)		Sand (%)	с	lay & Silt (%)		
		Si	lty Clay, Some Sa	nd, Trace Gra	ivel		5		17		78		
Rem	arks:		ize particles (0.07										
			95 percent of pa 80 percent fines					n)	Meets the Doesn't me				
Perf	ormed b				r Rehani				Date:		et the specification January 9, 2017		
Veri	ied by:			Raj Ka	idia C.E.T				Date:	Jan	uary 11, 2016	3	



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

Client:		Те	rrapure Environ	mental	Lab no.:	S1316			
Project/Site:	Terrapure-S	toney Creek L	andfill, 65 Gree	n Mountain Road W, Hamil	ton Project no.:	11103232			
Borehole no.:			Sample no.:	Sample #1	Depth:				
Soil description:			city Inorganic Clay		Depth: Date sampled:	07-Dec-16			
Apparatus:	Hand	Crank	Balance no.:	1	Porcelain bowl no.:	1			
Liquid limit device no.:		2	Oven no.:	1	Spatula no.:	1			
Sieve no.:	Sieve no.: 40 Glass plate no.:				2				
	Liquid Limit	(LL):		Soil Preparation:					
	Test No. 1	Test No. 2	Test No. 3	Cohesive <42	25 μm 🗸	Dry preparation			
Number of blows	30	25	21	Cohesive >42	25 µm	Wet preparation			
	Water Conte	ent:		Non-cohesive	9				
Tare no.	AT33	AT9	AT38		Results				
Wet soil+tare, g	20.35	19.72	20.49	31.5 -					
Dry soil+tare, g	19.08	18.63	19.16						
Mass of water, g	1.27	1.09	1.33	31.0 <sup>®</sup>					
Tare, g	14.76	14.97	14.87	30.5 Material (%)					
Mass of soil, g	4.32	3.66	4.29	er Co					
Water content %	29.4%	29.8%	31.0%	₹ 30.0 -					
Plastic Limit (Pl	L) - Water Cont	ent:		29.5					
Tare no.	AT20	AT45		29.3					
Wet soil+tare, g	17.39	17.57		29.0					
Dry soil+tare, g	16.96	17.15		20 22	2 24 26 Nb Blows	28 30			
Mass of water, g	0.43	0.42		L .	Soil Plasticity Chart				
Tare, g	14.65	14.86		70	LL 50				
Mass of soil, g	2.31	2.29		60 Low plasticity	High plasti Inorganic	city clay			
Water content %	18.6%	18.3%			Inorganic clay				
Average water content %	18	.5%		40					
Natural Wate	r Content ( W <sup>n</sup>	):		a     Inorganic clay       1     50       a     40       b     40       b     30       b     a       b     a       b     b       b     b       b     b       b     b       b     b       b     b       b     b       b     b       b     b       b     b       b     b       b     b       b     b       b     b       b     b       c     b       c     b       c     b       c     b       c     b       c     b       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c					
Tare no.	E37			Low compressibi		(MH) and (CH)			
Wet soil+tare, g	52.6				ino ino	h compressibility rganic şilt ganic qlay			
Dry soil+tare, g	44.0				- Medium or inorganic s (ML) and (OL) - Organic s	ganic day pompressibility silt			
Mass of water, g	8.60			0 10 20	30 40 50 60				
Tare, g	1.30				Liquid Limit LL				
Mass of soil, g	42.70			Liquid Limit (LL)	(PL) Plasticity Index (PI)	Natural Water Content W <sup>n</sup>			
Water content %	20.1%			30 18	12	20			
Remarks:									
Performed by:		Δηιικο	r Rehani	Date:	وا	nuary 10, 2017			
-		7.11474							
Verified by:		Raj Kao	dia, C.E.T.	Date:	Date: January 11, 2017				



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

Client:		Terrapure Environmental						Lab No.:		S131	S1316			_		
Proj	ect, Sit	e:	Terrapure-Sto Road W, Har		k Landi	fill, 65 Gi	reen Mo	ountai	ſ	Project N	lo.:	11103	3232			-
	Borehole Depth:	e No.:	-								Sample No.: Enclosure:		e #2			-
Percent Passing	100 90 80 70 60 50 40 30 20 10 0.001		0.01			0.1 Dia		m)							0 1 2 2 3 3 4 4 4 5 5 6 6 6 7 7 7 8 8 8 9 9 9 9 9 1 100	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
						Sand				Gravel			1			
			Silty Clay		F	Fin	e		u Mediu	ım Coa	irse	Fine		arse	1	
				F	Particle-S	Size Limits	s as per	USCS	ASTN	I D-2487)	•	1	•		]	,
			Soil Des	scription			G	ravel (	%)	Sand	(%)	0	Clay & Si	ilt (%)		
	Clayey Silt, Some Sand				0		12			88			]			
Rem	Min		95 percent of	particles p	assing	the No.	4 sieve	-size particles (<0.002 mm): 34% 4 sieve (4.75 mm) Meets			ts the s	specificati				-
Bert.	ormed		80 percent fine				eve (U.(	575 M	11)			specificati		2047		
	ormed fied by:				nwar R aj Kadia	ehani a C.E.T				_ Date			nuary 9 nuary 11			-



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

Client:		Те	rrapure Environ	mental	Lab no.:	S1316		
Project/Site:	Terrapure-S	Stoney Creek L	andfill, 65 Gree	n Mountain Road W, Hamili	ad W, Hamilton Project no.: 11103232			
			- ·					
Borehole no.: Soil description:		Low Plasti	Sample no.: city Inorganic Clav	Sample #2	Depth: Date sampled:	07-Dec-16		
		20111100	oky morganio ola		Bate sampled.			
Apparatus:		Crank	Balance no.:	2	Porcelain bowl no.:	6		
Liquid limit device no.: Sieve no.:		2 10	Oven no.: Glass plate no.:	1	Spatula no.:	2		
	Liquid Limit		•	Soil Preparation:				
	Test No. 1	Test No. 2	Test No. 3	Cohesive <42	5μm 🗸	Dry preparation		
Number of blows	28	25	21	Cohesive >42		Wet preparation		
	Water Conte	ent:		Non-cohesive				
Tare no.	AT8	AT17	AT15		Results			
Wet soil+tare, g	21.33	20.26	19.87	30.5				
Dry soil+tare, g	19.91	19.06	18.71					
Mass of water, g	1.42	1.20	1.16	€ 30.0				
Tare, g	15.02	14.97	14.90	(%) 30.0 (%) (%) (%) (%) (%) (%) (%) (%) (%) (%)				
Mass of soil, g	4.89	4.09	3.81	29.5				
Water content %	29.0%	29.3%	30.4%	Wate	• `			
Plastic Limit (Pl	L) - Water Cont	ent:		29.0				
Tare no.	AT41	AT42						
Wet soil+tare, g	17.60	18.06		28.5				
Dry soil+tare, g	17.19	17.58		20 2	2 24 26 Nb Blows	5 28 30		
Mass of water, g	0.41	0.48			Soil Plasticity Chart			
Tare, g	14.85	14.89		70	LL 50			
Mass of soil, g	2.34	2.69		60 Low plasticity Inorganic clay	High plasti Inorganic o	icity clay		
Water content %	17.5%	17.8%						
Average water content %	17	.7%		40				
Natural Wate	r Content ( W <sup>n</sup>	):		a     Inorganic clay       inorganic clay     inorganic clay <th></th> <th></th>				
Tare no.	1			Low compressibil		(MH) and (CH)		
Wet soil+tare, g	44.5				ino - Inpr	h complessibility rganic silt rganic day		
Dry soil+tare, g	37.5				- Medium co inorganic s	ompressibility silt		
Mass of water, g	7.00			0 10 20	30 40 50 60			
Tare, g	1.30				Liquid Limit LL	r		
Mass of soil, g	36.20			Liquid Limit (LL) Plastic Limit	(PL) Plasticity Index (PI)	Natural Water Content W <sup>n</sup>		
Water content %	19.3%			30 18	12	19		
Remarks:								
Performed by:		Anwa	r Rehani	Date:	.la	nuary 10, 2017		
						···· · · · · · · · · · · · · · · · · ·		
Verified by:		Raj Kao	dia, C.E.T.	Date:	Date: January 11, 2017			

Reference No. 11103232



January 19, 2017

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

RI na

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

RK/ss/1

Encl.

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

# **Attachments**

# Attachment A Field and Laboratory Test Results





0

Project no.: ///03232 (02)	Date: NOV 30 /2016							
Client: G.H.D Project: Stoney Creek Landfill Phase 8A Base Liner and Leachate Collection System	Contractor:       Dufferin Construction         Compaction       Roofing         Footing base evaluation       Structural steel         Subgrade evaluation       Reinforcing steel         Concrete       Sampling							
Location: 65 Green Mountain Road W Hamilton ON	Other (specify): Asphalt paving							
Field results Temperature: °C								
The above noted site has been Misite	ed by G. H.D Site representative on							
	The purpose of The visit was sile geotechnical							
investigation and Sampling of Engineering material for The laboratory analysis								
Alster The site Health and Safety Orintation and site introduction in site office								
G.H.D sile representative visited The	site with My Brian Dermody (G.H.O Project							
	lection trench and bench cut of Existing liner							
for the connection of newly constructed	Cliner was inprogress +gravel + Bricks that							
	on site material (lime stone)) was in progress							
on crushing plant located on The S	E side of site office.							
<u>G.H.D site representative</u> found 3 st Gorrective action to be taken:	tockpiles for Engineered fill material							
1) Existing Spoil Stock pile 2) Stockpile	on the us side of Existing spoil stock pile 3							
	ushing plant; G. H.D. site representative							
Secured 2 Samples from the first take	stock piles for the laboratory analysis (silty							
Clay with Some gravel )	0 0							
Follow up visit required:								
Site rep.:	Prepared by: <i>XY</i>							
Of:	Reviewed by:							



٢

Project no.: ///03232-2	ate: Nov 30/2016						
Project: Stone J Creek Landfill Phase OA Base liner and Leachate Collection System	Ontractor: Dufferin Construction         Compaction       Roofing         Footing base evaluation       Structural steel         Subgrade evaluation       Reinforcing steel         Concrete       Sampling         Other (specify):       Asphalt paving						
Field results Temperature: °C							
imported from Oufferin Mill Creek Pit 3 2 Samples of granular A has been S from The Stockpile and one from Required analysis D Engineered	) Secured for laboratory analysis, one crussed (sissed) m The Crushing Plant. (Lime stone, gravel, Brick state fill material = Proctor (M.D.D, OMC) one = Gradation only.						
<u>(3) Granutar A = Pro</u> <u>G.H.D. site representative also found</u>	a source of clay located on the E cen Mountain Rol IN, But due to unavailability						
on Encavalor 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 Somm clear stone (imported material) Scheduled =: in December Follow up visit required:							
Site rep.: Of:	Prepared by: ZY Reviewed by: W						

Field Report

FO-210.08



Project no.: ///03232	Date: December 07/2016
Client: CHD Hd	Contractor:
Project: Tempopun - Stoney cneek Landfill	Image: Footing base evaluation       Image: Structural steel         Image: Subgrade evaluation       Image: Structural steel
Location: 65 - ameen Mountain Ra Hame Hon	C, Concrete Sampling Other (specify): Asphalt paving
Field results Temperature: + 6 °C	
	ited by 6th representative as vigues
	who to andnet the compaction test
	vinnal The obsermation aneas for
@ Aneas inspected ! About	- 225m long in Bart with denietun
@ The depth of Bid of T	Franch : About 12m to 1.4m bgs.
3) The contractor placed	
	med by 24" Doursel Tempers plake.
	had been canned out to cheek
the compaction .	Der 1 lanie Company of 1 a l
	Pgx. to 1004. Spridd, which met
the project specifications	
	B
	1/
Really Rolling Rock Alex	225 m
Follow up visit required:	IN NO
Site rep .: Bytom, Site - in - change	Prepared by: Md - Sham Am
Of: 6th Utd	



## **Soil Compaction Verification Report**

												Pa	ge of
Project	no.:	///	63232	~			Dat	e: Dece	msen	07/	276		
Client:			Ltd					ntractor:		,			
Project	Ten	wap	encon L	oney ch	ick lan	Shy.	Site	visit type:	X	Full tim	ne	Part ti	me
Locatio	n: 63	- 0	encon p	countre	in Rd, Ho	milto	~						
Material	Туре	Mater	rial Description						Maximum D Density (kg/	-		Optimum W Content (%)	2
I	)		gr A	<b></b>					Density (kg/	-	1100		
						· · · · · · · · · · · · · · · · · · ·				<u> </u>	150		
Maxim	ım drv c	lensitv	obtained from:		STD.	test	1700	MOD. Test	l REstima	ated	jurni,	Control strip	
Sam	•				If yes, specif		1255640				hasal		
secu			□ <sup>Yes</sup> ヌ <sup>N</sup>	0	Proctor		STD.		Grada	tion	m		
Area Te	ested:				<u> </u>			faread	lawed		loom)		
Test No.	Test Loc	ation			Test Elevation	Material 1	Гуре	Dry	Moisture Content	Compac	tion	Specified	Action
								Density (kg/m³)	(%)	(%)		(%)	
$\delta$	Abo	nt	5m B 00	west,	Topog	I		2142	6:3	9	9	28	2
$(\mathcal{A})$			20m B	and .	Ban	I		2162		<u> </u>	1 00		C
$\sim$		л Л	35mB		4				/	+		<u> </u>	
B			50 mB		4	I		2155		10	00	и	C
(4)					Y	1		8159		10	7 <b>B</b>	r	C
D		n	65mB		4	1		215 <b>6</b>	8.0	10	26	4	C
Ø	U		80mB	·	Y Y	1		2163	7:6	10	90	4	C
Ð	Û	L	95 m B	11 4	U	1		2140	78	9	9	4	C
8		A	110 m B	6 19	V	Ŧ		2192	6.8	9	9	4	C
(9)		И	125mB	ч	Ч	2		2152		1	, 00	4	Ĉ
(10)		ы	140mB	- <i>u</i>	4	1		2135	7-4	9	9	4	
$\underbrace{\bigcirc}$		A	155 MB	и	1	1 7		2140	8.0	I	, g	<u>                                     </u>	C
		и	120mt	3_ 4		+			7-9			4	<u> </u>
			195m		l	4		2132		9	9	4	C
()		И	-		ĸ	4		2149	7.6	2	9	v	C
(14)		5	220m	<u>R</u> a		1		21,60	8-1	7	·0		C
Action:		C = C	complying to spec	. NC =	Not complying I	· · · · · · · · · · · · · · · · · · ·							
Comme	ents:					ļ	Gaug	je No. 7825	Calibratio			d Reading	Variation %
						-		Density	3419	5	33	<u>74</u>	12.
								Moisture	705	5	55	24	27.
		A		0	1 1 0			. /	4 6	- 1/	11	ion: density 2%,	moisture 4%)
Site rep	).: Z	<u>IIW</u>	vour, Site	Inpenn	tinden	Prepare	-		d-Sha	mj.	pm/	m	
Of:	(	₽Æ	p 1td .			Review	ed by	/:		-14			······



## SIEVE ANALYSIS-CLEAR STONE (LS-602)

Client:	GHD			Lab no.:	S1307	
Project/Site:	Stoney Creek Land	fill Phase 8A		Project no.:	11103232b1	
Source:	Onsite Stockpile			_		
Sampled by:	Zafar			Date sampled:	November 17, 2016	
Sieve Size (mm)	)	Sample % Passing		OPSS 1010 Gradati Minimum %	on Specification - Maximum %	
	26.5	100.0		_		
	19.0	78.8		_		
	13.2 9.50	20.0		_		
	4.75	0.9		-	N/A	
	1.180	0.7		-		
	0.300	0.6		_		
	0.075	0.5				
100 90 80 70 60 50 50 40 40 30 20 10 10 0.01	0.1	I       I	20.0 10 (mm)		0 10 20 30 40 50 60 70 60 70 80 90 100 100	
Remarks:	Clear Stone					
Performed by:	Jaso	on Christian	Date	: Decem	per 13, 2016	
Verified by:	Raj	Kadia C.E.T	Date	: Deceml	per 14, 2016	



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

Client:	GHD Ltd.			Lab no.:	S1308	
Project/Site:	Stoney Creek Landfi	ll Phase 8A		Project no.:	11103232b1	
Source:	Crusher Plant					
Sampled by:	Z.Y			Date sampled:	November 30, 2016	
Sieve Size (mm)		Sample % Passing		OPSS 1010 Gradati	-	
				Minimum %	- Maximum %	
	26.5 19.0	100.0 97.0		100 85	- - 100	
	13.2	87.7		65	- 90	
	9.50	71.4		50	- 73	
	4.75	42.6		35	- 55	
	1.180	18.0		15	- 40	
	0.300	11.2		5	- <u>22</u> - 10	
00 90 80 70 70 60 50 50 40 40 40 30			87.7 / / 87.7 / / / / / / / / / / / / / / / / / / /		0 10 20 30 40 50 50 60 70	
Remarks:	0.1	1 DIAMETER ite mixture of crushed lin S specifications for:	nestone, sha	lle, brick fragments A - SIEVE ANALYSIS (	and gravel)	
Performed by:	Aaron	Emmanuel	Date:	Decemt	per 13, 2016	
Performed by:     Aaron Emmanuel       Verified by:     Raj Kadia C.E.T			Date:		per 15, 2016	



Client :		G.H.D	Lab No :	S1308
Project/Site	e: Ston	ey Creek Landfill Phase 8A	Project No :	11103232b1
1900 • 1890 • 1880 • 1880 • 1870 • 1860 • 1850 • 1840 • 1830 • 1820 • 1810 •				Zero Air Voids Line
1800 • 3.	0 4.0	5.0 6.0 Water Conter	7.0 8.0	9.0 10.0
Prepared Sa ASTM D698	mple: Dry Test Method: A	X         Moist            X         B          C		ned G <sub>s</sub> : 2.75 of Hammer: Manual
Soil Type: Material: Proposed Us Sample Iden Sample Loca Aggregate S Sample Date Sampled By:	tification: ation: upplier / Pit Name: ::	Granular A Composite mixture of crushed limes Trench Backfill N/A Crusher Plant N/A November 30, 2016 Zafar	Max. Dry De Optimum Ma	nsity: <u>1885 kg/m<sup>3</sup></u> pisture: <u>6.0 %</u> on 19.0 mm: <u>3.7 %</u> ry Density: <u>1885 kg/m<sup>3</sup></u>
Remarks :				
Performed	by :	Rashid Hassan	Date :	December 7, 2016
Verified by	:	Raj Kadia, C.E.T.	Date :	December 9, 2016

GHD-FO-930.205a (On)-Standard Proctor Total (Rev.2) 04-28-2016



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

Client:	GHD Ltd.			Lab no.:	S1309
Project/Site:	Stoney Creek Landfill	Phase 8A		Project no.:	11103232b1
Source:	Onsite Stockpile				
Sampled by:	Z.Y			Date sampled:	November 30, 2016
Sieve Size (mm)		Sample % Passing		OPSS 1010 Gradati	on Specification
				Minimum %	- Maximum %
	26.5	100.0		100	-
	19.0 13.2	97.2 83.5		85 65	- 100 - 90
	9.50	71.2		50	- 90 - 73
	4.75	44.1		35	- 55
	1.180	20.2		15	- 40
	0.300	12.0		5	- 22
	0.075	9.7		2	- 10
100 90 80 70 60 50 50 40 30 20 10 10 0.01	0.1	1 DIAMETER (n	10		0 10 20 30 40 FRCENT RETAINED 50 60 60 70 80 90 100 100
Remarks:	Granular A (Composi	te mixture of crushed lime	stone, sha	le, brick fragments	and gravel)
	Sample meets the OPSS	specifications for: G	RANULAR	A - SIEVE ANALYSIS (	QUARRY)
Performed by:	Aaron E	Emmanuel	Date:	Decemb	per 14, 2016
Verified by:	Raj Ka	dia C.E.T	Date:	Decemb	per 16, 2016



Client :	G.H.D	Lab No : S1309
Project/Site :	Stoney Creek Landfill Phase 8A	Project No : 11103232b1
2040 • 2020 • 2000 • 1980 • 1940 • 1940 • 1920 • 1900 • 6.0	6.5 7.0 7.5 8.0 8.5 Water Conte	
Prepared Sample: ASTM D698 Test Me	Dry X Moist thod: A X B C	Assumed G <sub>s</sub> : 2.75 - Type of Hammer: Manual
Soil Type: Material: Proposed Use: Sample Identification Sample Location: Aggregate Supplier / Sample Date: Sampled By:	Trench Backfill N/A Onsite Stockpile	Answer in the sector of the
Remarks :		
Performed by :	Zafar Yaseen	Date : December 6, 2016
Verified by :	Raj Kadia, C.E.T.	Date : December 9, 2016



Client :	GHD Ltd.	Lab No :	S1310
Project/Site :	Stoney Creek Landfill Phase 8A	Project No :	11103232b1
2000 1980 1960 1940 1940		Zero	Air Voids Line
1920 1900 1800 1840 1840 1840 1840 5.0	6.0 7.0 8. Water Cont		10.0 11.0
Prepared Sample: ASTM D698 Test Metho	Dry X Moist od: A X B C		med G <sub>s</sub> : 2.75 of Hammer: Manual
Soil Type: Material: Proposed Use: Sample Identification: Sample Location: Aggregate Supplier / Pi Sample Date: Sampled By:	Silty Clay with Crushed and Natur Native Fill Onsite Stockpile N/A t Name: N/A November 30, 2016 Zafar	Max. Dry De Optimum Me	oisture: <u>8.2 %</u> on 4.75 mm: <u>6.1 %</u> ry Density: <u>2006 kg/m<sup>3</sup></u>
Remarks :			
Performed by :	Aaron Emmanuel	Date :	December 12, 2016
Verified by :	Raj Kadia, C.E.T.	Date :	December 14, 2016



Client :	GHD L	.td.	Lab No :	S1311	
Project/Site :	Stoney Creek Lan	dfill Phase 8A	Project No :	11103232b1	
2100					
2080				Zero Air Voids Line	
2060 •					
2040					
(function 2020 -					
Dry Density (kg/m <sup>3</sup> )					
ם 1980					
1960					
1940					
1920 •					
1900	5.0	7.0 9.0	11.0	13.0 15.0	I
		Water Content	(%)		
Prepared Sample:	Dry X	Moist	Assu	med G <sub>s</sub> : 2.75	
ASTM D698 Test M	ethod: A X	в С	- Туре	of Hammer: Manual	_
Soil Type: Material:	Silty Clay w	ith Some Crushed and Na Native Backfilling	tural Gravel		
Proposed Use: Sample Identification	n: (	Onsite Stockpile	Max. Dry De	ensity: 2031 kg/m <sup>3</sup>	
Sample Location:		N/A	Optimum M		_
Aggregate Supplier		N/A ovember 30, 2016	Corrected D	on 4.75 mm: <u>3.9 %</u> Dry Density: 2031 kg/m <sup>3</sup>	_
Sampled By:		Z.Y	Corrected C		_
Remarks :					_
Performed by :	Abdou E	Diallo	Date :	December 14, 2016	
Verified by :	Raj Kadia,	C.E.T.	Date :	December 16, 2016	

# Appendix D2 Results Dated August 30, 2017

Reference No. 11103232



August 30, 2017

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

# Attachments

# Attachment A Field and Laboratory Test Results



## **Field Report**

Project No.: ///03232 Date: 2017/07/06 Contractor: Client: GHA 2EA Compaction Roofing Project: Ternapure - Stoney creek Footing base evaluation Structural steel Subgrade evaluation Reinforcing steel Location: 65 GARRA Moren Cain Rd Concrete Sampling Other (specify): Asphalt paving Hamilton ON Field results Temperature: 26 °C The above noted site was visited by GHA representative as requested. The purpose of the visit was to conduct the compaction lest within the Groundwalen collection thench. The contractor used the Grand Car "A" malerial mixt with crushed limpstons, shale and gravel. After using a nuclean density gauge all lests results shound 18% to 100% spm BB, which mel the project specifications. (see skelch below fore location, collector vertical 60m Corrective action to be taken: Yes Follow up visit required: D No Prepared by: A, J Site Rep .: B. Denmody, Sile super GHA LEA Of Reviewed by:

100	10	-	-	
72	1	PT.	2	ì.
[ C	1.	21	1)	
2	44		4	
100				

## **Soil Compaction Verification Report**

						Pa	age of
Project no.: 11103232 Client: CHD LEd Project: Tennapune - Stoney c. Location: 65 Green Mountain L	reek la A, Hame	ndfrt Sit	te: 2017 intractor: e visit type:	07  0. Z	6 Full time	🔲 Partt	ime
Material Type Material Description				Maximum D Density (kg/	•	Optimum V Content (%	the second se
I Grandlan "A"		_	-	202	7	8,4	e
Maximum dry density obtained from:	STD.	test [	] MOD. Test	Estima	ated 🗖	Control strip	,
Sample(s) secured: □ <sup>Yes</sup> □ <sup>No</sup>	lf yes, speci Proctor	fy testing to b STD.		Grada	tion 🔲		
Area Tested: Test No. Test Location Defer al HSPE Collector pipe Vertical (1) about ImE & 4 m N	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
(1) about ImE & 4 m N 2) about I, 5m E & 30m N (3) about 0, 5m W & 60m N	Tapibe	I	2029	6.2	100	98	e
2) about 1, Smit & 30m nl	-11-	I	1990	5.6	98	98	C
(3) about 0,5m w & 60m N	-11-	I	2002	5.8	99	98	e
Action: C = Complying to spec. NC = Comments:	Not complying		10 No 700-	Calibratio		Field Reading	Variation %
Comments.		Gau	ge No. 7830 Density	305.6		045,8	0,3
			Moisture	391	3	82.6	2.1
Site rep.: Of:	_	Prepared by Reviewed b	y: <u>A</u> ,		(acceptable va	riation: density 2%	, moisture 4%)



# **Field Report**

Project No.: 11103232	Date: 2017/07/07	
Client: GHA LEd	Contractor:	
Project: Terrapune stoney creek Landfill Location: 65 Green Mountain Rd Hamilton, ON	Compaction Footing base evaluation Subgrade evaluation Concrete Other (specify):	<ul> <li>Roofing</li> <li>Structural steel</li> <li>Reinforcing steel</li> <li>Sampling</li> <li>Asphalt paving</li> </ul>
Field results Temperature: 30°C	12 88	
The above noted site was vis The pumpose of the visit was to the excavated materials (8 gravel) being used as Eng After using a nuclear dens. from 95% & 98% spm00, we	illy clay with c neared fill for a	rushed stone and raising sile grades
Corrective action to be taken:		
Follow up visit required: Yes	□ No	
Site Rep.: B. Dermody	Prepared by: A J	
Site Rep.: B. Dermody Of: GHD Bin Pump	Reviewed by:	

# Soil Compaction Verification Report

Droio	staa: 11/03939			-				Page of
	ct no.: 11103232 t: GHD LEA			Date: 2011	7/07/0	7		
			1.1	Contractor:				
Locat	et: Terrapure Stoney en ion: 65 Green mountain	Pet Han	16:11	Site visit type:	Đ	Full time	🔲 Par	t time
Materia	al Type Material Description	no, man	2 Lad		Maximum Density (kg		Optimum Content (	
I	- silty clay with	crushed	stone	E gravel	2 20	06	7.7	<
Maxim	num dry density obtained from:	STD.	test					
1.1	nple(s)	If yes, speci		MOD. Test	Estin	nated	Control stri	ip
sec	oured: Ves No	Proctor	ST		Grad	ation 🔲		
Area 7								A
'est No.	Refer al HSPE collecto. pipo vertical	1	Material Typ	be Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
0	about 5m E & 10m A	1st lift	I	1707	10,3	85	95	NC
2)	Repeat lest ()	-11-	I	1836	9.8	91	95	Ne
3)	Repeal Cast &	-11-	I	1913	10.0	95	95	c
il)	about GME & 40mm	2nd lift	I	1730	7.8	86	95	Ne
6)	Repeat text (4)	-11-	2	1865	8.0	93	95	No
C	lepeat test (3)	-11-	I	1917	8,2	95	95	c
T)	abril 3mw & 16ml	3nd life	I	1935	11,6	96	95	e
8)	abul 4 m E & 50m N	4th life	I	1967	11.4	98	95	C
9)	about 2mw & 32mN	5th lift	I	1941	9,9	97	95	C
Action:	C = Complying to spec. NC = 1							
Comme		Not complying to		uge No. 7830	Calibratio			1
				Density			d Reading	Variation %
				Moisture	3056	39	69	0,4
				Gauge st		(acceptable variat	-	
Site rep	: B. Dermody - site arts him Pumper	Super	Prepared b				, in the second s	incluic 4 70
Of:	atts pan fint		Reviewed b	oy:		la		



.

# **Field Report**

Project No.: 11103232	Date: 2017/07/10	
Client: GHS LEd Project: Terrapure stoney Land fill Location: 65 Green Mount Hamilton	Concrete	<ul> <li>Roofing</li> <li>Structural steel</li> <li>Reinforcing steel</li> <li>Sampling</li> <li>Asphalt paving</li> </ul>
requested. The purpo	te was visited by GHA re se of the visit was to e ated materials (silty cla d for raising the site	y with crushed ston
After using a nuclea	r density gauge, all test which met the project sp.	b results showed
After using a nuclea	r density gauge, all tes	b results showed
After using a nuclea 95% to 98% spmDD, Corrective action to be taken:	r density gauge, all tes	b results showed
After using a nuclea 95% to 98% spmDD, Corrective action to be taken:	r density gauge, all test which met the project sp	b results showed

100	Accession in which the	
200	100	
1.0	101	0.0
Ľ.,		- 1
1		_
	-	

## **Soil Compaction Verification Report**

						Pa	age of
Project no.: 1/10-3232		Da	te: 2017/	07/10			
Client: GHD LEd		Co	ntractor:	6.1			
Project: Ternapure stoney cru Location: 65 Green Moundain	eelt land	Sil Sit	e visit type:	D	Full time	D Part t	ime
Location: 65 Green Mounlain	RA, Hami	elm					
Material Type Material Description				Maximum D Density (kg/	10.2	Optimum W Content (%	
I Silly clay with	crushed a	tone &	gravel	200	6	7.7	
Maximum dry density obtained from:	STD.		MOD. Test	Estim	ated	Control strip	-
Sample(s) Ves No	If yes, specif	fy testing to b	e done:				
	Proctor	STD	MOD.	Grada	ition		
Area Tested: Test No. Test Location	Test Elevation	Material Type	Dry	Moisture	Compaction	Specified	Action
Befer at HSPE collecto, pipe vertical	-	inaterial Type	Density (kg/m³)	Content (%)	(%)	(%)	Action
() about 3.5mw & 50mN	18t Rift	I	1926	9.8	96	95	c
(2) about 6m E y 27mN	-11-	I	1935	10,3	96	95	C
(3) about 3m & 4 40m N	2 lift	I	1938	9,5	97	95	e
(3) about 3mE 9 40mm (4) about 7mE 8 10mm (5) Repeat text (4)	3nd life	I	1872	11.4	93	95	Ne
(5) Repeat test (4)	-11-	I	1907	11.5	95	95	c
6) anree Lismu y domn	4th lift	I	1963	10,6	98	95	c
7) about 6m E & 55mN		I	1942	11.0	97	95	e
(8) about 9m E & 20m N	-11-	I	1915	11,8	95	25	c
					6		
			-				
							1423
Action: C = Complying to spec. NC = N Comments:	Not complying t		ge No. 78 30	Calibrati	00 Ein	d Reading	Variation %
Commenta.		Gau	Density	3056		47.7	0, 3
			Moisture	391		96.9	1,5
			Gauge		s (acceptable varia	and the second second second	
Site rep.:		Prepared by	y: <u>A</u>	A			
Of:		Reviewed b	y:		PL		
	Research Control of Co		-				



## **Field Report**

Date: 2017/07/11 Project No .: 11103232 Client: GHD LEA Contractor: Aufferin Compaction Roofing Project: Termapure stoney creek Footing base evaluation Structural steel Subgrade evaluation Reinforcing steel Concrete Sampling Location: 65 aneen Mountain Rd Asphalt paving Other (specify): Hamilton on Temperature: 28 °C Field results The above noted site was visited by CHU representative as requested. The purpose of the visit was to conduct the compaction test on the Excavated materials (sitty clay with crusted stone and gravel), keing used as Engineered fill for raining the site grades. After using a nuclear density gauge, all test results showed 95% to 97% spmDD, which met the projection specification. Although the compaction test was found good, but the moisture content was found high. Some spongyness were observed in the North side of the inspected area. The above noted site was visited by GHU representative as Corrective action to be taken: I Yes Follow up visit required: D No Prepared by: A .S Site Rep .: B, Dermody Of: Reviewed by:

5.0				2
1.00	30	17	۰.	
1.0	6.6		Ρ.	
248			1	2

## **Soil Compaction Verification Report**

							Pa	age of
Project	:no.: 11103232		Da	ate: 2017	107/11			
Client:	and led	- 4	Co	ontractor: Bu	ferin			
Project	Terrapuse stoney c	reen		te visit type:	D	Full time	D Part	time
Locatio	on: 65 arean Mountain	Red, Han	nella					S
Material	Type Material Description				Maximum D Density (kg		Optimum V Content (%	
1	silly clay with	cruched	1 stone	& gravel	2 20	06	7.7	:
		2723		-0				
		/						
Maxim	um dry density obtained from:	STD.	test [	MOD. Test	Estim	ated 🔲	Control strip	>
	ple(s) Yes No	If yes, specif	y testing to t	be done:				
sec		Proctor	STD	. 🔲 MOD.	Grada	ation		14
Area T		1		1-	Ten e c		1	
Test No.	Refer al HDPE collector pripe vertical	Test Elevation	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
6	abril 3 m E & 52mN	1st life	I	1824	12.5	91	95	Ne
2)	Reseal test (1)	-11-	I	1903	12.0	95	95	C
2) (3)	about 6 6m E & 12mm	-11-	I	1921	10.8	96	95	c
	abul 18mE & 25mN	2nd lift	I	1910	11.1	95	95	C
(5)	about 5m E & 45mm	3nd lift	I	1849	12,3	92	95	Ne
4) (5) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2	Depeat test (5)	-11-	I	1917	12.1	95	95	C
F	about 10m E & 33mm	4th life	I	1936	10,2	96	95	C
(8)	about 4m E & 8mm	5th lift	I	1943	9.3	97	95	C
9)	about 15m E + 20MN	-40.44	I	1907	9.8	95	95	C
10)	about GmE & 49mN	-11-	I	1923	11.0	9.6	95	c
~	5				1.1.1		Y	
		1						
-								
Action:	C = Complying to spec. NC =	Not complying t	o spec.			1		
Comm	ents:		Gau	ige No.78%	Calibrat	ion F	ield Reading	Variation %
				Density	305	6 3	050.3	0,2
				Moisture	391		86.3	1,2
				Gauge	standard count	and the second	riation: density 2%	o, moisture 4%)
Site rep	B. Dermody		Prepared b	y: A.	۵			
Of:			Reviewed b	ру:		210		



# **Field Report**

Project No.: 11103232	Date: 2017/07/12	
Client: GHD LEA	Contractor: Jufferin	Roofing
Project: Ternapure stoney eres Land fill Location: 65 Green Moun Cours		<ul> <li>Structural steel</li> <li>Reinforcing steel</li> <li>Sampling</li> <li>Asphalt paving</li> </ul>
Field results Temperature: 24 °C		
The above noted sile we requested. The purpose of		
test on the Excavaled n	nalerials ( silly clay ,	with crushed stone
and gravel) being used grades. The nuclear den	sily gauge was comm	iled out to check
the compaction, All tests which met the project	specifications.	75/0 0 11/0 spm0
O		
Corrective action to be taken:		
Follow up visit required:	□ No	
Site Rep .: B. Denmo dy	Prepared by: A 1	

	-	1000
100		100
6,0		1.7
10	100	. P. J
100	india A	- 4
Sec.		-

## **Soil Compaction Verification Report**

						P	age of
Project no.: ///03232		Da	ate: 2017	107/12	-		
Client: GHD LEA		Co	ontractor: Au	Jerin			
Project: Terrapure stong	ey creek		te visit type:	Ð	Full time	D Part	time
Location: 65 Green Mount Material Type  Material Description	ain Ro,	-					
material Type material Description				Maximum D Density (kg		Optimum V Content (%	
I silly clay w	ith authed	stone	& gangel	e di	06	7.7	
Maximum dry density obtained from:	STD.	test r	MOD. Test	 [_]Estim	ated 🗆	Control strip	) )
Sample(s)	If yes, specif	fy testing to t			L		
secured: Yes No	Proctor			🔲 Grada	ation		_
Area Tested:	-	1					1.
Test No. Test Location Befer at HSPE coll pipe vertical	C Charles Sec	Material Type	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
() about 4m E & 40	ma 18t lift	I	1898	11.9	95	95	C
<ol> <li>about 4m E &amp; 40</li> <li>about 15m E &amp; 20</li> <li>about 15m E &amp; 20</li> <li>about 1mw &amp; 39</li> <li>about 18m E &amp; 10n</li> <li>Repeat test (4)</li> </ol>	MN 211-	I	1929	10.8	96	95	C
3) about Imw & 39	ma 2nd lift	I	1951	11.2	97	95	C
(4) about 18m E & 10n	nn -11-	I	1864	11.5	93	95	Ne
	-11-	I	1922	11.3	96	95	e
(6) abril 9m E & 4:	5mN 3rd lift	I	1972	10,4	98	95	c
(7) about 14mE 9 8.	mn 4th lift	I	1991	11.0	99	95	C
<ul> <li>(6) abril 9m E 9 4.</li> <li>(7) abril 14m E 9 8</li> <li>(8) abril 2mw 4 36</li> <li>(9) abril 11m E 9 25</li> </ul>		I	1938	10,6	97	95	c
(9) about 11m E & 25	5mN -11-	I	1987	10,3	99	95	e
Action: C = Complying to spec.	NC = Not complying t		No 7 62 -	0.00			1
Comments:		Gau	ge No. <b>783</b>	Calibrati		Field Reading	Variation %
			Moisture	3052		99.2	2.0
						riation: density 2%	
Site rep.:		Prepared by					
Of:		Reviewed b	y:	M	/		
				0			



**Field Report** 

Project No.: ///03232	D	ate: 2017/07/18	
Client: GHD	c	ontractor: Infferin	
Project: Torrapure stan	ey creek	Compaction Footing Base Evaluation Subgrade Evaluation	<ul> <li>Roofing</li> <li>Structural Steel</li> <li>Reinforcing Steel</li> </ul>
Location: 65 Green Mon Hamilton		] Concrete ] Asphalt Paving ] Other (specify):	☐ Sampling
		- 🏅 🌁	
The above noted.	site was vis	iled by GHA no	presentative as
requested. The purp	ose of the v	isit was to a	induct the compaction
last on the follows	no material	2 :	/
- Grane Car "A"	being used a	s base on lop	of the mipe ( Groven of
- and the carpecter	Myscence 1.		
- silty clay with	outhed and	un luna grave &	being used for
mising the site of	ades (Trench	backfill).	0
After using a nucle			world showed :
-98/ 6 100/ SPM00	for the ann	"Can"A" which	met the project specific
_ 89% to 97% spms.	I for the Engi	peared fill. som	e areas sid not
			e observed wet and
	ammended i		
Corrective action to be taken:		ling Hi a'	dry before placement
0	e second lays	er fee the son	compaction verifical
report for more a	elails .		
The second se			
Follow up visit required:	Yes 🗆	No	
Site Rep .: B. Dermody	P1	Prepared By: A.J	
Of:		Reviewed By:	
For Internal Use Only Have: BJS	A/JSEA 🖸 PPE 🛛 Traini	ng Need S-RAF: 🗌 Yes 🗔	No Initials:



Client: Projec Locatio	at No.: 11103232 GHD t: Ternapure Stoney on: 65 Green Mount	creek ain Rst	0	Date; <i>2017</i> Contractor: Site Visit Type:	É	Full time	🗌 Part t	ime
Materia	I Type Material Description				Maximum I Density (kg		Optimum V Content (%	S 1 6 7 1 1 1
I	Grane las "A'	<i>,</i>		7	202	27	8.4	/
IL	Silly clay with	crushed a	nd nal	lesel grave	0 20	06	7,7	t
Maxim	num dry density obtained from:	ESTO	). Test	MOD. Test	Estin	nated	Control Strip	0
Sec	ple(s) 🗌 Yes 🗌 No ured:	If yes, spec Proctor		to be done:	Grad	ation		
Area T Test No.	Test Location Do to all HOPE	Test Elevation	Material Type	Dry Density (kg/m³)	Moisture Content (%)	Compaction (%)	Specified (%)	Action
0	about 0.5m E 920ms	binage	I	1985	9.0	98	98	e
(2)	about 0.5mw & 40ms		I	2016	9.5	99	98	e
(2) (3) (4) (5) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4	about 0,5mE & 76ms		I	1979	8,8	98	98	C
(4)	abut Gom N 9 20mw		I	2036	8,0	100	98	C
(5)	about 62mN & IME	-11-	Ī	2003	9.2	99	98	C
(ii)	about 100ms & 7mE	1st life	I	1905	10,4	95	95	e
(7)	about 50ms & 10mE	-11-	T	1790	13,8	89	95	NC
8	about 80ms & 3mw	-11-	T	1804	12.9	90	95	Ne
(9)	about 24ms & 2m E	-11-	I	1942	9.7	97	95	C
Action	C = Complying to spec. NC =	Not complying	to spec.					
Comm				auge No. 7830	Calibra	ation Fie	eld Reading	Variation %
				Density	304	5.6 3	061.4	0.1
				Moisture	391		398,1	1.8
				Gauge star	ndard counts	(acceptable variat	ion: density 2%	6, moisture 4%)
Site R	ep .: B. Denmody		Prepared		5	A		
Of:			Reviewed			Al-		
For Int	ternal Use Only Have: JSA/J	SEA PPI	Trai	ning Need !	S-RAF: 🗌 Y	es 🔲 No	Initial	s:



Project No.: 111032	232	Date: 2017/07/19	
Client: GHO	2	Contractor: bafferin	
Location: 65 Gr	een Mountain Ro	Subgrade Evaluation	<ul> <li>Roofing</li> <li>Structural Steel</li> <li>Reinforcing Steel</li> <li>Sampling</li> </ul>
	Hamilton	Other (specify):	
Field Results	Temperature:	_ ° 🌺 🏼	
The above A	oled site was v	isiled by GHO re	presentative as
A 1			on duce the company
			with crushed an
	- 1		the trench . Refer
			- was cannied out
		spongy on 2017	
results yar	ied from 95%	to 98% spm 20, we	hich met the
			ion tast was good,
but some à	neas were obse	wed spongy du	e probably to high
moisture au		1 05	
Corrective action to be	taken:		
	taken:		
	taken:		
		□ No	
Corrective action to be	t: Yes	No Prepared By: A.A	
Corrective action to be Follow up visit required	t: Yes		

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## **Soil Compaction Verification Report**

	Ternapus on: 65 Gree Type Material Desc	ription				Maximum D Density (kg		Optimum V Content (%	
14	silty c	lay with	h crush	ed & n gra	alunal vel	, 201	2.6	7,	7
Maxim	um dry density obtaine	ed from:	STE	D. Test [	MOD. Test	Estim	ated	Control Stri	p
Sam Secu	ired:	🗌 No	If yes, spec	ify testing to	be done: ] MOD.	🗌 Grada	ation		
Area T Test No.	Test Location Refer at the collector pr	SPE DEvention	Test Elevation	Material Type	Dry Density (kg/m³)	Moisture Content (%)	Compaction (%)	Specified (%)	Actio
10	Repeat tos	EÆ	1st lift	I	1903	11,3	95	95	C
2	Repeat tes		-11-	I	1919	10.1	96	95	C
3)	blove Imu			I	1960	9,7	98	95	0
(4)	about 3m c	291ms	-11-	I	1937	10.0	96	95	(
5	about 10m	E & Boms	3 Laft	I	1906	10.6	95	95	-
6)	about 2m c	= & lom S	-11-	I	1921	11.0	96	95	
E	about 8m c			II	1944	10,8	97	95	
9	about 11mic about 6m	E & Soms	5 th life	I	1928	9,5	96	95 95	
									-
Action	C = Complying	g to spec. NC =	Not complying	g to spec.					
Comm	ents:	n.		Ga	uge No. 7830	Calibra		eld Reading	Vari
					Density	305		050.4	0
				_	Moisture	39/	3	87.8	0,



Project No.: 11103232		Date: 2017/07/26
Client: CHI		Contractor:
Project: Terrapure ste	oney creek	Compaction       Roofing         Footing Base Evaluation       Structural Steel         Subgrade Evaluation       Reinforcing Steel
Location: 65 Green Mo Hamilton		Concrete Sampling Asphalt Paving Other (specify):
Field Results	Temperature:	⊭_∘ 🌞 🧭 🎘 🧶
The above noted	s'le was u	is led by GHA representative as requeste
		to conduct the compaction last on the
Excavaled may	levials ( silly	g chay with crushed & national gravely
		grades within the French After using
		All test result varied from 95% to 99%
		cifications. Some areas were observed
		sh moislane content.
Corrective action to be taken:		
Follow up visit required:	Yes	□ No
Site Rep.:		Prepared By: A
Of:		Reviewed By:
For Internal Use Only Have: [	JSA/JSEA PPE	Training Need S-RAF: Yes No Initials:

						Page_	of
Project No.: 1/103232 Client: GHD Project: Terrapure storay Location: 65 Green mountain	creek, La	ndfill s	ite Visit Type:	ferin.	Full time	Part	lime
aterial Type Material Description		razion		Maximum Density (kg		Optimum V Content (%	
I sikty clay with	th crushe	d & na	lienal gran	al i	2006	7.7	
Maximum dry density obtained from:	If yes, spec	D. Test	MOD. Test	Estin	nated	Control Stri	p
Secured:	Proctor	]STD. [		Grad	lation		
Area Tested: est Test Location o. Refer at HSPE collecton pipe vertical () above 10m E 4 33ms	Test Elevation	Material Type	Dry Density (kg/m³)	Moisture Content (%)	Compaction (%)	Specified (%)	Action
D about 10m E 4 33ms	18t lift	I	1982	9.9	99	95	C
2) about SmE & 80ms	5 -11-	I	1938	10,5	97	95	e
3) above 3mE \$ 28ms	s 2nd left	I	1804	11.8	90	95	NC
4) Repeal text (3)	-1/-	I	1901	11.2	95	95	e
	= Not complyin						
Comments:		Ga	Density	Calibra	ation Fie	eld Reading	Variation



226.28

Project no.: 111032 32	Date: July 27/17	
Client: G1HD	Contractor: Dufferin	Roofing
Project: Terra pure stoney Creek Land fill	<ul> <li>Footing base evaluation</li> <li>Subgrade evaluation</li> </ul>	Structural steel  Reinforcing steel
Location: 65 Green mountain Rd., Hamilton	<ul> <li>Concrete</li> <li>Other (specify):</li> </ul>	☐ Sampling ☐ Asphalt paving
Field results Temperature: <u>2</u> , <b>2</b> , <sup>2</sup> , ℃	AND ESE	2 m d
The above noted site was visited	by 6HD represen	tative of sequenced.
The purpose of the visit was a on the excavated materials /si	to conduct the c	ompaction test
on the excavated materials /si	thy clay with crus	hed and natural
growel. The moterial is being Lifti 10 to 12 were tested to before on each lift. All test.	used for back fi	Ming the trench.
type 10 to 12 were reveal the	crow. One or two	teste were conducto
CPMDD daty	Mull verage	met me mininum
SPMDD of 95%.		
Corrective action to be taken:		
		- i sint
Follow up visit required:	-No	
Site rep.: B. Dermody	Prepared by: Aymom	Patel
Of: GIHD	Reviewed by:	

Gł	ID			S	oil Comp	action Ve Page	rification	
Destant			L Def	Th	0 V 1 1		01	_
	no.: 11103232		Dat	e: July	27/1	¥		
Client:	GiHO Terrapure stoney Creek		1.11	ntractor:	/	E II Contra	F7 . B. 44	
			Site	e visit type:	14	Full time	📋 Part ti	me
Locatio	n: 65 Giveen Mountain Rd Type Material Description				Maximum Dr	v	Optimum W	later
INTELEST TELL	Type material besonption				Density (kg/r		Content (%)	
T	Cilty day with	inched	analina	tural	2006		7.7	
1	Silty clay with	LYDSNEW	graup	I	2000		1.7	
			01000	il.			-	
Maxim	am dry density obtained from:	STD.	test	MOD. Test	Estima	ted	Control strip	
		If yes, specif						
	ured: Yes 🔽 No	Proctor	STD.	MOD.	Gradat	ion 🔲		
Area To	ested:		-					
Test No.	Refer at Test Location pipe vertical	Test Elevation	Material Type	Dry Density (kg/m³)	Molsture Content (%)	Compaction (%)	Specified (%)	Action
1	APProx 297mE B2.5m N	10-145+	Ŧ	1906	12.7	95%	957	C
	mente			1100	1.	10 %	1070	
	and the second	- maine	P			21.21		
2	Approse BOME & 1. SmN	11th lift	I	1938	14.1	97%	957.	C
3	APProve 25 mE& OMN	13	I	1904	12.3	9.5%	95%	6
м	APPYON FOMEB2MN	12" lift	I	1942	9.5	977.	95%	C
				-				
ten och ten och								
Action:	C = Complying to spec. NC = I	Not complying to	o spec.					
Comme	ents:		Gaug	je No.67405	Calibratio	n Fie	ld Reading	Variation %
				Density	2668	24	59	0.4
				Moisture	612	60	5	1.17.
				Gauge	slandard counts	(acceptable varia	ition: density 2%,	moisture 4%)
Site rep	B. Dermody		Prepared by		Aym	an Pate	l	
Of:	GHD		Reviewed by	/:		H		

GHD FO-210.11 (ON) - Compaction Multi-Sheet - Rev.0 - 07/01/15



roject No.: ///03232		Date: 2017/07/28	
lient: GHU		Contractor: bufferin	
roject: Terrepere 8 Land	toney creek	Compaction Footing Base Evaluation Subgrade Evaluation	<ul> <li>Roofing</li> <li>Structural Steel</li> <li>Reinforcing Steel</li> </ul>
ocation: 65 areen . Hame	Mountain Rd	<ul> <li>Concrete</li> <li>Asphalt Paving</li> <li>Other (specify):</li> </ul>	☐ Sampling
ield Results	Temperature: 21	_•c 🌺 🧭	
The above noted	sile was vi	isiled by GHD rep	resentative and
			aduct the compacted
			ith crushed and
	- 1		the Crench , After
			to showed 90/ to
			fications (95/) but
he second lift	did not mea	the project specif	heations. The excaver
			I the area was
observed very	spongy (see	the soil compaction	verification repo
for more dola	uls). It was	recommended !	that to bet it day
		-	weller layer of suited
naterials,	1 1 1	07	
Corrective action to be taken:			
<u> </u>			
	,		
Follow up visit required:	4 Yes	□ No	
ite Rep.: B. Sermody	1	Prepared By: A.J	
Df:		Deviewed Dev (1)	
71.		Reviewed By:	



Client:	No: 11103232 GHS Terrapure Stoney on: 65 Green Mount	creek		Date: 2017 Contractor: Site Visit Type:		8 }Full time	🗌 Part	time
Material	Type Material Description				Maximum Density (kg		Optimum V Content (%	
I	silly clay with	crushed	2 na	lural	20	06	7.7	Z
Maxim	um dry density obtained from:	STI	D. Test	MOD. Test	Estin	nated	Control Stri	p
Sam Secu	ole(s) 🗹 Yes 🗌 No ured:	If yes, spec	1	to be done:	Grad	lation		-
Area T Test No.	Test Location Defen at HAPE	Test Elevation	Materia Type	I Dry Density (kg/m³)	Moisture Content (%)	Compaction (%)	Specified (%)	Action
6	abril 4m E 9 45m 5	18t lift	Z	1872	11.0	93	95	Ne
23 2 m	Repeat East ()	-11-	I	1908	10,8	95	95	Q
3	done tom E & 90m	5 2nd lift	I	1903	10.5	95	95	C
(4)	about 5m E & 50m	5 -11-	I	183.6	12.9	91	95	Ne
(5)	abret 12m E & 26m	5 -11-	T	1812	13,5	90	95	Ne
(6)	abrul 8mE & 67m.	5 -11-		1823	13,7	91	95	NC
Action	C = Complying to spec. NC	= Not complyin	g to spec.					
Comm	ents:			Gauge No.7830		1.15.2	eld Reading	Variation %
			-	Density Moisture	305	6 30 38	49.8	0,2
				The second s	Constanting of the second	(acceptable variat	Charles and the	C. C. C. M. C. M. C. M.
Site Re	ep.: B, Dermody		Prepare	ed By: 🛛 🔒	4		and the second sec	
Of:			Reviewe	ed By:		py	-	17
For Int	ernal Use Only Have: JSA	JSEA PP	E Tr	aining Need	S-RAF: Y	'es No	Initia	s: t



Project No.: ///03232	Date: 2017/07/31	
Client: CHD	Contractor: Dufferin	
Project: Ternaprese Stoney cros Location: 65 Green Mountain Hamilton, on		<ul> <li>Roofing</li> <li>Structural steel</li> <li>Reinforcing steel</li> <li>Sampling</li> <li>Asphalt paving</li> </ul>
Field results Temperature: <b>3</b> 0 °C		$\mathbb{R}^{\circ}$
test on the Excavated m natural grave ), being u.	red for backfilling	the trench. The an
which did not meet the re-tested (see soil compar After using a nuclear de	compaction on 2014, clim verification rep neity gurge all lests	resulto varied
which did not meet the re-tested (see soil compar After using a nuclear de	compaction on 2014, clim verification rep neity gurge all lests	resulto varied
which did not meet the ne-tosted (see soil compare After whing a nuclear de from 95% to 97% Spm DD,	compaction on 2014, clim verification rep neity gurge all lests	resulto varied
which did not meet the ne-tested (see soil compare After whing a nuclear de from 95% to 97% Spm DD	compaction on 2014, elin verification rep noity gaurge, all lests , which met the pro	resulto varied

(e	1	B.1
<u></u>	1.1	19

Project	No.: ///03232			Date: 20171	07/31		Page_	of
	GHA Terraprise stoney on: 65 Gagen Mount	eneek ain la		Contractor: Azz Site Visit Type:	fferin	Full time	🗌 Parti	time
Material	Type Material Description				Maximum I Density (kg		Optimum V Content (%	The database second sec
I	silty clay with	th crush	ed & n gr	aleral avel	200	0.6	7.7	z
Maxim	um dry density obtained from:	PSTD	. Test	MOD. Test	Estin	nated	Control Stri	p
Sam Secu	ple(s)	If yes, spec	ify testing	to be done:	Grad	ation		
Area T Test No.	Test Location Refer at HDP E Collector pipe ver Repeat Cest (5) (July 28)	Test Elevation	Material Type	Dry Density (kg/m³)	Moisture Content (%)	Compaction (%)	Specified (%)	Action
ω	Repeat Cest (5) (July 28)	2nd lift	I	1927	10,4	96	95	C
2 3 4) 3	Repeal test Elpuly 28	and lift	I	1907	10,6	95	95	C
3	blond & m E & 82ms	3nd lift	I	1913	11.1	95	95	c
(4)	about 2mE & 30ms	3nd life	I	1939	10.8	97	95	C
3	about 10m E & Goms	4th lift	I	1932	11.0	96	95	C
				-			-	
				-				
								44
Action		= Not complying		Sauge No. 7830	Calibra	ition F	ield Reading	Variation %
Comm				Density	305		3052,1	0.1
(				Moisture	39		395,1	1.D
				Gauge star	ndard counts	(acceptable vari	ation: density 2°	%, moisture 4%)
Site R Of:	ep .: <u>B. Dermody</u>		Prepareo Reviewe		A.D	M		
	ternal Use Only Have: DSA/		E 🗗 Tra		S-RAF: Y	es No	Initia	Is:
		VC 22 - 2-2 Mar	1	n water	12202-20-20	100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100		



Project No.: ///03232	Date: 2017/08/02
Client: GHA	Contractor: brefferin
Project: Tennapune Stoney Cn Land fill	Compaction
Location: 65 Green Mountain Hamilton, on	Asphalt Paving
Field Results Temperature:	<u>27</u> ° 🖑 🖄 🗠 📅 🧶
The above noted sile ,	vas visited by GHD representative as
	the visit was to conduct the compact?
	ma linals ( silly clug with crushed &
	used for backfilling the Crench.
	sensily gauge, all lest result showed
	ich met the project specifications,
	beserved in a wel condition due
	he rain ( see soil compaction verification
report for more delait	s.
Corrective action to be taken:	
Corrective action to be taken:	
Follow up visit required:	□ No
Site Rep .: B. Dermody	Prepared By: A
Of:	Reviewed By:
	- F

-	
P-11	
51	11

Material Type

Test

(2)

No.

### **Soil Compaction Verification Report**

M

3

Initials:

11

							Page_	of
Client	No.: 11103232 GHA Terrapure stoney n: 100 65 Green More	enest plain h		Date: 2017 Contractor: by Site Visit Type:	fferin	≥ ] Full time	🗌 Part	time
laterial	Type Material Description				Maximum Density (kg		Optimum V Content (%	
I	sifty clay wi	th ones	thed &	natural grave	2 201	06	7,	7
Maxim	um dry density obtained from:	FISTE	D. Test	MOD. Test	Estir	nated	Control Stri	p
Samp Secu	ole(s)	If yes, spec	10		- 20	dation		
Area To Test No.	ested: Test Location Lefer at HDPE collector pripe vertical about 10m E & 32m N	Test Elevation	Material Type	Dry Density (kg/m³)	Moisture Content (%)	Compaction (%)	Specified (%)	Action
D D	about 10m E & 32mm	1 1st lift		1904	12:3	95	95	e
2	about 12mE & 47mm		I	1915	11.7	95	95	C
3)	abut 8m E & GomN			1926	11.8	9.6	95	c
		*						
Action	C = Complying to spec. NC	= Not complyin	ig to spec.			-		-
Comm				Gauge No. 7830	Calibr	1.0.7	ield Reading	Variation %
				Density	305	56 3	049,7	0,2
				Moisture	39		397.2	1.6
Site Re	ep.:		Prepared		ndard counts	(acceptable vari	ation: density 2	%, moisture 4%

Reviewed By: Of: Have: HJSA/JSEA PPE Training Need S-RAF: Yes No For Internal Use Only



Project No.: 11/032 32	Date: 2017/08/08
Client: CHD	Contractor: bufferen
Project: Tennapuse stoney creed	Compaction     Generation     Compaction     Footing Base Evaluation     Subgrade Evaluation     Reinforcing Steel
Location: 65 arean morenlain k Hamilton, on	Concrete Sampling Asphalt Paving Other (specify):
Field Results Temperature:	<u>26</u> ° 🌠 🦄 🦄 👘 🧶
The above noted site was	visiled by CHA representative as
requested. The perpose of the	he visit was to conduct the compaction
test on the Excavated or	naterials ( silly clay with crushed and
natural gavel, being us	ed for buckfilling the crench.
Alter using a nuclear Acros	ty gunge, all lest usult showed 95%.
to 97% SPMDD, which not	the project specifications.
Corrective action to be taken:	
Follow up visit required:  Yes	
Site Rep .: B. Dermo dy	Prepared By: A
Of:	Reviewed By:
For Internal Use Only Have: JSA/JSEA	E Training Need S-RAF: Yes No Initials:



Project No.: 111 0 3 2 3 2		D	ate: 2017	108/08	-		
	6	C	ontractor:	Herin			
Project Terrapuro stoney	creat		te Visit Type:		Full time	Part	time
Client: CHA Project: Terrapuro stoney Location: 65 Green Mount	Cain Rol			_	- 1		
Material Type Material Description				Maximum	Dry	Optimum V	Vater
				Density (kg	y/m³)	Content (%	)
I silly clay wi	th crushe	1 9 nat	Imal	20	43	9.	6
		gi	avel				
	,	1			1.1.1	1000	
Maximum dry density obtained from:	STI	D. Test [	MOD. Test	Estin	nated	Control Stri	p
Sample(s) Yes No	If yes, spec	cify testing to	be done:	10.11		1.00	
Secured:	Proctor	] STD.	MOD.	Grad	ation		
Area Tested:						T. C. ST.	
Test Test Location No. Refer at HOPE col pipe vertice	Test Elevation	Material Type	Dry Density (kg/m³)	Moisture Content (%)	Compaction (%)	Specified (%)	Action
(1) downet 12m E 4 18m	e 1st lift	I	1975	9.8	97	95	e
(1) about 12m E & 18m (2) about 15m E & 30m	15 18t lift	T	1951	10.0	95	95	e
		~					
	2						
					51		J
	IC = Not complyin						6
Comments:		Ga	uge No.	Calibra	ition Fie	ld Reading	Variation %
		_	Density				
			Moisture		(annutation 1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.	-	
		L. Allan			(acceptable variat	ion: density 29	%, moisture 4%)
Site Rep.: B. Dermoly		Prepared I	9.2 P	D	7.1		· · ·
Of:		Reviewed	Ву:		-y-		
For Internal Use Only Have: 🛃	SA/JSEA PP	E Train	ing Need	S-RAF: Y	es No	Initia	Is: M



Project No.: 111032	32	Date: 2017/08/09	× 1
Client: CHD		Contractor: Defferin	
Project: Temapus	e stoney creat	Compaction Footing Base Evaluation Subgrade Evaluation	<ul> <li>Roofing</li> <li>Structural Steel</li> <li>Reinforcing Steel</li> </ul>
ocation: 65 anerr	n Mountain Rd milton, on	Concrete Asphalt Paving Other (specify):	
Field Results	Temperature: 27	_•c 🌺 🍊	
The above n	old sile was u	isiled by CHA rep	mesentalize as
			at the compaction
			with cruthed and
			following areas !!
/ /			and also for build.
		n Mountain Rd (Ea	
the the state			at the get the get
After using a	nuclean sensity	quege all lesto res	all showed !
After using a	spm DD for the En	quige all last res	the project specification
After using a -95% to 98% s -89% to 90% sp	spm DD for the to mad ground the	quege, all tests res ench, which me	all showed !
After using a -95% to 98% s -89% to 90% sp did not me	nuclean sensity spm 00 for the to mod around the ret the project sp	quige, all tests res ench, which mel leachale collection ecifications,	the project specification
After using a -95% to 98% s -89% to 90% sp did not me	nuclean sensity spm 00 for the to mod around the ret the project sp	quige, all tests res ench, which mel leachale collection ecifications,	the project specification system pipe, which
After using a -95% to 98% s -89% to 90% sp did not me -90% to 93% s	nuclean sensity spm DD for the to mDD around the ret the project sp pm DD for new bu	quige, all tests res ench, which mel leachale collection ecifications,	the project specification
After using a -95/ to 98/ 5 -89/ to 90/ 5p did not me -90/ to 93/ 5, cations.	nuclean sensity spm DD for the to mDD around the ret the project sp pm DD for new bu	quige, all tests res ench, which mel leachale collection ecifications,	the project specification
After using a -95/ to 98/ s -89/ to 90/ sp did not me -90/ to 93/ s cations.	nuclean sensity spm DD for the to mDD around the ret the project sp pm DD for new bu	quige, all tests res ench, which mel leachale collection ecifications,	the project specification system pipe, which
After using a -95/ to 98/ 5 -89/ to 90/ 5p did not me -90/ to 93/ 5 cations.	ruclean sensity spm DD for the tra mDD around the ret the project sp pm DD for new but taken:	quige, all tests res ench, which mel leachale collection ecifications,	the project specification system pipe, which
After using a 95/ to 98/ s -89/ to 90/ sp did not me -90/ to 93/ s Corrective action to be Follow up visit required:	ruclean sensity spm00 for the tra- amound the ret the project sp pm00 for now bus taken: ::Yes	gunge, all tests res ench, which mel leachale collection secifications :	the project specification system pipe, which
After using a -95/ to 98/ s -89/ to 90/ sp did not me -90/ to 93/ s Cations. Corrective action to be	ruclean sensity spm00 for the tra- amound the ret the project sp pm00 for now bus taken: ::Yes	gunge, all tests res ench, which mel Leachale collection secifications :	the project specification system pipe, which



Projec	t No.: 11103232			Date: 2017/	08/09			
	OHA	F		Contractor:	ferin			S
Projec	t: Tempure stoney on: 65 Green Morenta	creek		Site Visit Type:	G	Full time	Part	time
Locatio	on: 65 Green Morenta	in RA	- 11.					
Materia	I Type Material Description				Maximum Density (kç	5 1 L L L L L L L L L L L L L L L L L L	Optimum V Content (%	
Z	Silty class with	the crushe	1 4.	malanal	204	3	9.4	5
	silty clay wit	C D PAL PAL	1	havel				
		-	0					
Maxim	um dry density obtained from:	STE	D. Test	MOD. Test	Estin	nated	Control Stri	р
Cost y Add by	ple(s) 🗌 Yes 🗌 No	1100 100 2	10000000	to be done:	- 21.	Chile.		
Sec	ured:	Proctor	]STD.	MOD.	Grad	ation		
	Tested:	Test	04-4-1	Der	Matation	Commention	Sec. if- d	Antion
Test No.	Refer al HAPE collector pipe vertice	Test Elevation	Materia Type	l Dry Density (kg/m³)	Moisture Content (%)	Compaction (%)	Specified (%)	Action
0	about 16m E 4 47m.	s ist life	I	1997	10,6	98	95	C
E)	about 12mE& 62ms	-11-	I	1973	9,3	96	95	C
3)	about 14mE & 10ms		I	1934	5.2	95	95	C
W	abut 0,5msy IME	-11-	I	18 25	11,3	89	95	NC
2033	ale & DEnere & 2mpl	and lift	I	1834	11,6	90	95	NC
	Refer at Electric ligh	Ø a						
(1)	Refer at Electric light about 20m w & 10m n	1 Grado	I	1902	8.5	93	NA	N/A
	about 19mw & 15ms	-11-	1	1842	9.7	90	N/A	N/A
					1			
					~			
Action	C = Complying to spec. NC	= Not complyin						
Comm		- Not complyin		Gauge No.	Calibra	ation Fie	d Reading	Variation %
001111			E F	Density				
				Moisture				
				Gauge sta	ndard counts	(acceptable variat	ion: density 2°	%, moisture 4%)
Site R	ep .: B. Dermoly		Prepare	d By:	4			
Of:			Review	101	-	M		
	ternal Use Only Have: JSA	JSEA DPP			S-RAF:	res 🗌 No	Initia	ls:
1 or m								12.



Project No.: ///0323	2	Date: 2017/08/10	
Client: 940		Contractor: bufferin	
Project: Ternapure	stoney creek	Compaction Footing Base Evaluation Subgrade Evaluation	Roofing     Structural Steel     Reinforcing Steel
Location: 65 Green Hamit		<ul> <li>Concrete</li> <li>Asphalt Paving</li> <li>Other (specify):</li> </ul>	☐ Sampling
Field Results	Temperature: 3	2 °C 🌺 🖄	
The above note	d site was vi	isited by atta repr	exentalize as require
701		conduct the comp	
		lay with crushed &	1
		ades on top of the	
system pipes.	after using a n	uclear density que	ye, all lest result
system pipes.	After using a m 95/ 6 98/ spr	non, which met	ye, all lost result
system pipes. I Savied from In addition, the	After using a m 95/ to 98/ spr anea which a	id not meet the p	the project specificate
system pipes. I savied from In addition, the on 2017/08/09	After woing a m 95/ to 98/ spr area which d was recompact	uclear density que n AA, which met i'd not meet the p led and re-checked	ye all lesto results the project specificate roject specification l'tépre placement
system pipes. I savied from In addition, the on 2017/08/09	After woing a m 95/ to 98/ spr area which d was recompact	uclear density que n AA, which met i'd not meet the p led and re-checked	ye all losto results the project specificate roject specification
system pipes. I varied from In addition, the on 2017/08/09	After woing a m 95/ to 98/ spr area which d was recompact	uclear density que n AA, which met i'd not meet the p led and re-checked	yc, all lesto results the project specificate roject specification lefore placement
system pipes. I varied from In addition, the on 2017/08/09	After woing a m 95/ to 98/ spr area which d was recompact	uclear density que n AA, which met i'd not meet the p led and re-checked	yc, all lesto results the project specificate roject specification lefore placement
system pipes. Javied from In addition, the on 2017/08/09 of top layers (s	After cering a m 95/ to 98/ spr area which d was recompac- ee soil compact	uclear density que n AA, which met i'd not meet the p led and re-checked	yc, all lesto results the project specificate roject specification lefore placement
system pipes. I varied from In addition, the on 2017/08/09	After cering a m 95/ to 98/ spr area which d was recompac- ee soil compact	uclear density que n AA, which met i'd not meet the p led and re-checked	yc, all lesto results the project specificate roject specification lefore placement
system pipes. Janied from In addition, the on 2017/08/09 of top layers (8	After cering a m 95/ to 98/ spr area which d was recompac- ee soil compact	uclear density que n AA, which met i'd not meet the p led and re-checked	yc, all lesto results the project specificate roject specification lefore placement
system pipes. Janied from In addition, the on 2017/08/09 of top layers (8	After cering a m 95/ to 98/ spr area which d was recompac- ee soil compact	uclear density que n AA, which met i'd not meet the p led and re-checked	yc, all lesto results the project specificate roject specification lefore placement
system pipes. Javied from In addition, the on 2017/08/09 of top layers (s	After cering a m 95/ to 98/ spr area which d was recompac- ee soil compact	uclear density que n AA, which met i'd not meet the p led and re-checked	yc, all lesto results the project specificate roject specification lefore placement
System pipes . Javied from In addition, the on 2017/08/09 of top layers (8 Corrective action to be take	After ceting a m 95/ to 98/ spr area which d was recompact ee soil compact	uclear density que n DA, which met i'd nol moet the p led and re-checked fin vorification rs	yc, all lesto results the project specificate roject specification lefore placement
System pipes Saved from In addition, the on 2017/08/09 of top layers [ s Corrective action to be take Follow up visit required:	After ceting a m 95/ to 98/ spr area which d was recompact ee soil compact	eclear dersity que n DA, which mat i'd nol moet the p led and re-checked i'm vorification rs	yc, all lesto results the project specificate roject specification lefore placement



			21 2017	28/10			
Project No.: 1/103232			Date: 2017/				
Client: QHD			Contractor:		1	- 1900 C	
Project: Terrapuse stoney Location: 65 Gragen mounta	creek		Site Visit Type:	C	Full time	Part	time
Location: 65 Grasso mounta	in Rd			1			1.1.1.
Material Type Material Description				Maximum   Density (kg		Optimum V Content (%	
I silly clay with	and	10	00	20	43	9.4	
I silly clay with	eurmu	0	aural				
		4					
Maximum dry density obtained from:	STC	). Test	MOD. Test	Estin	nated	Control Stri	р
Sample(s)	If yes, speci Proctor	2000	to be done:	Grad	lation		
Area Tested:							
Test Test Location No. Defen al HSPE Collector Ripe verbed	Test Elevation	Material Type	Dry Density (kg/m³)	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	18t Dift	I	19,54	9.8	96		
(2) Repeat toxt (5) Aug 9		I	1945	8.5	95	95	C
3) about 2mw & 4mN	2nd life	I	19.66	7,2	96	95	e
(4) about Em E & 3ms	3rd lift	T	2010	10,3	98	95	c
(5) almel 4m N & 10mE	3nd lift	I	1951	9.0	95	95	C
Q abut OSMN & SME	4ª lift	I	1985	8,4	97	95	C
A) about 3ms & 12mE	4th lift	I	1979	6.7	96	95	e
<ul> <li>Depend East (4) Augg</li> <li>Depend East (5) Augg</li> <li>about 2m w &amp; 4m N</li> <li>about 6m E &amp; 3m S</li> <li>about 6m E &amp; 3m S</li> <li>about 6 0,5m N &amp; 5m E</li> <li>about 3m S &amp; 12m E</li> <li>about 3m S &amp; 12m E</li> <li>about 6 0m N &amp; 6m E</li> </ul>	5ª lift	I	1992	7.9	97	95	C
			-				
	Not complying		Gauge No.	Calibra	ation E	eld Reading	Variation %
Comments:		-	Density	Calibra	ation Fie	ad Reading	Variation %
		-	Moisture				
		L		dand country	lassantable us-t-t	linn, dan-lin, Of	/ maintum 40/
		and a lot			(acceptable variat	tion: density 25	%, moisture 4%
Site Rep.: <u>B. Samoly</u>		Prepare	d By: R	0			
Of:		Reviewe	ed By:		M		
For Internal Use Only Have: DJSA/J	ISEA PPE		aining Need	S-RAF:	res 🗌 No	Initia	Is: A



Project No.: 1110323	2	Date: 2017/08/17	(a) (b)
lient: GHA		Contractor: Arefferin	
	e stoney creat	Compaction	<ul> <li>Roofing</li> <li>Structural Steel</li> <li>Reinforcing Steel</li> </ul>
ocation: 65 Green Han	Mountain 25	<ul> <li>Concrete</li> <li>Asphalt Paving</li> <li>Other (specify):</li> </ul>	☐ Sampling
ield Results	Temperature:8	_ •c 👙 🏼 🖄	
		visited by and	
requested. The	purpose of the	visit was to conta	luce the compaction
tast on the E	xcavales mal	Enials ( silly day w	ich crushed and
			1 1 1/- 1
noture an	well heind use	ed too backbilling	the cronch Engineers
natural gro	vel being use	ed for buckfilling	the crench Engineer
After using a	nuclear Aen	sity gauge, all to	to result showed
After using a	nuclear Aen	aty gruge all la me the project	to result showed
After using a	nuclear Aen	sity gauge, all to	to result showed
After using a	nuclear Aen	sity gauge, all to	to result showed
After using a	nuclear Aen	sity gauge, all to	to result showed
After using a	nuclear Aen	sity gauge, all to	to result showed
After using a	nuclear Aen	sity gauge, all to	to result showed
After using a	nuclear Aen	sity gauge, all to	to result showed
After using a	spmso, which	sity gauge, all to	to result showed
After using o 95% to 98%	spmso, which	sty gouge, all to	to result showed
After using o 95% to 98%	spmso, which	sty gouge, all to	to result showed
After using a 95% to 98%	spmso, which	sty gouge, all to	to result showed
After using a 95% to 98%	spmso, which	sty gouge, all to	to result showed
Afen using e 95% & 98%	ken:	n'ty gouge, all la	to result showed
Afen using e 95% & 98%	ken:	ne the project	to result showed



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### **Soil Compaction Verification Report**

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							Page _	of
Client: CA	11103232 AD 22 AD 5 Green Mounda	creek	C	ate: 2017 ontractor: ite Visit Type:		Full time	🗌 Part t	ime
Material Type	Material Description				Maximum I Density (kg		Optimum W Content (%	
Ī	silty clay with	crushed	& nale	vol	204	+3	9.6	
Maximum dr	/ y density obtained from:	STC	). Test	MOD. Test	Estin	nated	Control Strip	0
Sample(s) Secured:	🗌 Yes 🗌 No	If yes, spec	ify testing to ]STD. [	be done:	Grad	ation		
Area Tested: Test Test No.	Location & HAPE fer al HAPE Neclor pipe me	Test Elevation	Material Type	Dry Density (kg/m³)	Moisture Content (%)	Compaction (%)	Specified (%)	Action
(n) a6	nt 20mEq 22ms	1st lift	T	1952	10,5	95	95	C
2) 46	ve 18mE 9 46ms		I	1977	11,9	97	95	C
(3) 94	ve 20mE & 98ms		I	1964	10,3	96	95	C
(4) - ab	me 4mE 2 30ms		I	1937	10.8	95	95	e
0	E IOME & 76ms		I	1959	11.5	95	95	C
() as	ve sme 245ms		I	1997	10,6	98	95	C
	NO 12mE & Ivoms		I	1986	11.2	97	95	C
	we 5m E & 28ms	3nd gift	I	1948	10.9	96	95	C
	ut IIME & BOMS		I	1968	9,9	96	95	С
Action:	C = Complying to spec. NC =	Not complying						
Comments:			Ga	auge No <b>7840</b>	Calibra		eld Reading	Variation %
				Density	297		66.3	0,1
				Moisture	393		89.1	0.9
Site Rep.: Of:	B. Darmoly		Prepared Reviewed	By:	s-RAF:	(acceptable varia	tion: density 2%	

20000



Project No.: ///03232	Date: 2017/08/18	
Client: CHD	Contractor: <i>beflevin</i> Compaction Footing base evaluation	Roofing Structural steel
Project: Tomaprese stoney creek	Subgrade evaluation	Reinforcing steel
Location: 65 arean Moundain 23 Hamilton, 0N	Concrete	Sampling Asphalt paving
Field results Temperature: 20 °C	The State of the S	
The above noted site wa	a visited by GHO reg	presentativo aus
requested. The purpose of the test on the Excavated man	visit was to conduce	the compaction
ratural gravel), being used	an Ensingered fill	for mising the
bern grades. After using a	nuclear density gaug	e all lesto result
showed 90% to 92% spma.	D which did not.	med the project
specifications. The inspected a	area was observed	wet and spongy .
TA was seen and that the	t to let it day at	eran a many any
before continuing to raise	the berm grades ( &	es soil compaction
verification Report for more	details).	
Corrective action to be taken:		
Follow up visit required:	□_No	
Site Rep .: B. Denmody	Prepared by: A	
Of:	Reviewed by:	

GHD		-	
Chill			
	6	1	-

-	1102929			Date: 2017	108/18			
	No.: 11103232				1-0110			
Client:	GHS		C	Contractor:			-	
Project:	Terrapero stoney 1:65 Green Mounta	Creek	S	Site Visit Type:	E	Full time	Part 1	time
Location	n: 65 Green Mounta	in RSI			and and			
Material	Type Material Description				Maximum D Density (kg		Optimum V Content (%	STREET, ST
I	Silty clay with	th crush	hed &	ratural	2	043	914	5
-			7	muel				
Maximu	im dry density obtained from:		D. Test	MOD. Test	Estim	nated [	Control Stri	0
			cify testing to					P
Samp Secu		Proctor			Grada	ation		
Area Te	ested:							1
Test No.	Test Location Refer at HSPE collector pipe about 3m w & 8ms	Test Elevation	Material Type	Dry Density (kg/m³)	Moisture Content (%)	Compaction (%)	Specified (%)	Action
6	about 3 m w 2 8 ms	1st lift	I	1888	14,1	92	95	Ne
(2)	about 4m E 8 36ms	-11-	I	1847	14,6	90	95	Ne
(3)	about 2ME 9 89mg		I	1855	14.7	91	95	Ne
(4)	about 12mE & 40ms		I	1838	13,9	90	95	Ne
() () () () () () () () () () () () () (	about SmE 8 78ms		I	1871	14.4	91	95	NC
	1 (1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		1000				+	
1				-			-	
							-	-
			-					-
				-		-	-	
				-				
			-	-		-		
			-					-
Action:	C = Complying to spec. NC	= Not complyin	ng to spec.			1		1
Comme				auge No. 78%	Calibra	ation F	ield Reading	Variation %
				Density	297		964,4	0.2
			100	Moisture	393	3	85,6	1,8
1				Gauge sta	ndard counts	(acceptable varia	tion: density 2	%, moisture 4%)
Site Re	ap.: B. Sermody		Prepared	I By:	12	1000		1000
Of:			Reviewed	d By:	1	Ŋ		
For Inte	ernal Use Only Have: JSA/		PE 🗹 Trai	ining Need	S-RAF: Y	es INo	Initia	Is: M
		2111 1 2 2						



Project No.: ///03232	Date: 2017/08/21	
Client: CH1	Contractor: Sufferin	Roofing
Project: Tomapure stoney cres		Structural steel Reinforcing steel
Location: 65 Green Mountais Hamilton, on	Nd Concrete	Sampling Asphalt paving
Field results Temperature: <b>30</b> ° C	200	
The purpose of the visit u Exervated materials (sit being used as Engineered	ty also with crushed &	nates rat groupel,
The grea which did not	meet the project specif	cations on wettool
The area which did not was re-compacted before All tosts results showed specifications. [see soil con	meet the project specif	cations on wettool
The area which did not was re-compacted before All losts results showed specifications.[see soil con	meet the project specif	cations on wettool
The grea which did not was re-compacted before All tosts results showed specifications.[see soil con	meet the project open checking the compaction 95% to 97% spin 20, when apaction venification	cations on wettool

			>		- 10 1		Page _	of _			
Client:	No.: 11103232 GHD Terraprine stoney com: 65 Green Morinle	ereo k	0	Date: 2017/ Contractor: 0 Site Visit Type:	Herein	Full time	🗌 Part 1	lime			
Materia	Type Material Description	11		1	Maximum Density (kg		Optimum Water Content (%)				
I	silty clay with	crushe	d g na	lional	204	43	9.6				
Maxim	um dry density obtained from:	STI	D. Test	MOD. Test	Estin	nated	Control Strip				
Sec	ple(s)		cify testing t	o be done:	Grad	lation					
Area T Test No.	Test Location Refer all HSPE Collector pipo	Test Elevation	Material Type	Dry Density (kg/m³)	Moisture Content (%)	Compaction (%)	Specified (%)	Action			
0	Repeat test ()	18t Rift	I	1944	11.2	95	95	C			
(2)	Repart Cest (2)	-11- I		1951	10,6	9.6	95	c			
(4) (4) (5)	Repeal Cest (3)	-11-	I	1938	11.5	95	95	C			
(4)	Repeat test (4)	-11-	I	1975	10.9	97	95	C			
(5)	Repeat Cest (5)	-11-	I	1952	11.0	95	95	C			
6)	done & 5mw & 5ms	2nd life	I	1990	11.3	97	95	C			
(7)	about 3ME 2 60ms	-11-	I	1966	12.4	9.6	95	c			
(8)	about 10m E & 95ms		I	1945	and the second sec	95	95	C			
(9)	abut 4mw 230ms	3nd lift	I	1983	12,6	97	95	C			
(10)	about SME & 100ms	-11-	I	1978	11.7	97	95	c			
Action		= Not complyir									
Comm	nents:		G	auge No 7832			eld Reading	Variati			
1			_	Density	2971		67.1	0,1			



Project No.: 11103232	Date: 2017/08/22	
Client: CHD	Contractor: Bufferin	Roofing
Project: Torrapere stoney cre		<ul> <li>Structural steel</li> <li>Reinforcing steel</li> </ul>
Location: 65 arean mountain a Hamiltin ON	Concrete	Sampling Asphalt paving
Field results Temperature: 25 ° C		
The above noted site was The purpose of the visit w Excervated materials (sith being used as Engineered	is visited by CHD rep	esentative as reque
The purpose of the visit w	as to conduct the co	mpacin resi on a
by covalid materials ( Sike	with the naise the ben	m gun des.
being used as criphosened	site surver all tasto res	all varied from 9.
Aller any - means	J J J J J AT	V
1 ATICAMAN which wat	He apprect specification	no
being used as Engineered After using a nuclean Ann to 97/ spmso, which mel	the project specification	· on
to 97/ spmsD, which met	the project specification	ono.
to 97/ spmsD, which met	the project specification	, on
to 97/ spmsD, which met	the project specification	, ou
to 97/ SPMAD, which met	the project specification	, ou
to 97% SPMAD, which met	the project specification	, ou
to 97% spm 10, which met	the project specification	, ou
to 97% spm 10, which met	the project specification	, ou
to 97% spm 10, which met	the project specification	no.
	the project specification	. o.r.
Corrective action to be taken:	the project specification	
	the project specification	no .
	the project specification	
Corrective action to be taken:		· • •



Project No :	11103232			Date: 20/7	108/2	2		
Client: QA				Contractor:		0		
		creet		Site Visit Type:	F	Full time	Part t	ime
Location:	5 Green mounta	- pA		The state of the				
Naterial Type	Material Description	17 104			Maximum Density (kg		Optimum V Content (%	
I	silty clay with	crushed	1 4 1	alunal	204	13	9.6	
	silty clay with		-	gravel				
Maximum dry	y density obtained from:	STD	). Test	MOD. Test	🗌 Estim	nated	Control Stri	5
Sample(s) Secured:	🗌 Yes 📄 No	If yes, speci Proctor		g to be done:	🗌 Grad	ation		
Area Tested:								
Test Test No. Reg	Location fer at HAPE collector pipe	Test Elevation	Materia Type	al Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Specified (%)	Action
(i) a	me 2mw & 83ms	18t lift	I	1956	12.0	96	95	C
-	hel 12m E & 32ms	1st Rift	I	1940	11.5	95	95	С
(3) 95	met 3mE & 10ms	2nd lift	I	1909	12,4	93	95	Ne
41 1	lepent tost (3)	-11-	I	1935	12.1	95	95	C
5) a	but SmE 9 Soms	-11-	T	1977	12,5	97	95	e
6) as	hove 10mE & 100ms	1 1 1	I	1848	13.3	90	95	Ne
(7) A	Repeat last (6)	-11-	I	1962	13.4	96	95	C
E a	brit 4mw 2 65ms	-11-	I	1953	11.8	95	95	c
Action:	C = Complying to spec. NC =	Not complying	g to spec			A 14		-1
Comments:			-	Gauge No. 7830		10.00	eld Reading	Variation %
			F	Density Moisture	2971		777.4	0,2
			L		393	(acceptable varia		6.8 % moisture 4%
	A A 1.		-		ndard counts	(acceptable varia	tion: density 2:	6, moisture 470
Site Rep.:	B. Dermody		Prepar		0	1		
Of:			Review	ved By:		y		
For Internal	Use Only Have: 📑 JSA/J	SEA 🛛 PPE		raining Need	S-RAF: Y	'es 🛛 No	Initia	Is: H

	Geographic and a state of the					Proctor Te (ASTM D69	
Client :		GHD Ltd.		Lab No :	5:		
Project/Site :	Stoney	Creek Landfill Phase	∋ 8A	Project No :	1110323	32b1	
2100							
2050					Zero Air Voi	ds Line	
2000	1						
Е 1950 •							
(г) 1950 1950 1900 1900 1850							
<u> </u>							
1800							
1750							
1700	5.0	7.0	9.0	11.0 13.0	) 15.0	17.0	
		w	ater Conten	t (%)			
Prepared Sample:	Dry	X Moist	]	Ass	sumed G <sub>s</sub> :	2.75	
ASTM D698 Test Met	nod: A	ХВ	C	Tyr	e of Hammer: _	Manual	
Soil Type: Material: Proposed Use:		Silty Clay with crushed Native Engineere	d fill				
Sample Identification: Sample Location: Aggregate Supplier / Pit Name: Sample Date:		Onsite Stoc N/A N/A July 7, 20 A.D	· · · · · · · · · · · · · · · · · · ·	Corrected	Max. Dry Density:2000 kg/mOptimum Moisture:11.5 %% Retained on 4.75 mm:0.0 %Corrected Dry Density:2000 kg/mCorrected Opt. Moist.:11.5 %		
Sampled By: Remarks :			20-19-19-19-19-19-19-19-19-19-19-19-19-19-				
					1 I		
Performed by :		Abdou Diallo		Date :	July 14,	2017	

GHD-FO-930.205a (On)-Standard Proctor Total (Rev.2) 04-28-2016

Client :		GHD Ltd.	Lab No :	S1429
Project/Site :	Stoney Cre	ek Landfill Phase 8A	Project No :	11103232b1
2000			·	
1980				Zero Air Voids Line
1960				
1940				X
الَّهُمْ 1920				
	/			
1920 • · · · · · · · · · · · · · · · · · ·				
1860				
1840				
1820				
1800			12.0 13.0 14.0	15.0 16.0 17.
7.0 8.	9.0	10.0 11.0 1 Water Cor		13.0 10.0 17.
Prepared Sample:	Dry	X Moist	Ass	umed G <sub>s</sub> : 2.75
				umed G <sub>s</sub> : 2.75 e of Hammer: Manual
ASTM D698 Test Method	: A	X B	СТур	
ASTM D698 Test Method Soil Type: Material: Proposed Use:	: A	X B y Clay with crushed stone an Native Engineered fill	CTyp	e of Hammer: Manual
ASTM D698 Test Method Soil Type: Material: Proposed Use: Sample Identification: Sample Location:	A Silty	X B y Clay with crushed stone an Native Engineered fill Onsite Stockpile N/A	C Typ d Gravel  Max. Dry I Optimum	e of Hammer: Manual Density: <u>1972 kg/m<sup>3</sup></u> Moisture: <u>10.9 %</u>
ASTM D698 Test Method Soil Type: Material: Proposed Use: Sample Identification: Sample Location: Aggregate Supplier / Pit I	A Silty	X B y Clay with crushed stone an Native Engineered fill Onsite Stockpile N/A N/A	C Typ d Gravel  Max. Dry I Optimum % Retaine	Density: <u>1972 kg/m<sup>3</sup></u> Moisture: <u>10.9 %</u> d on 4.75 mm: <u>11.6 %</u>
ASTM D698 Test Method Soil Type: Material: Proposed Use: Sample Identification: Sample Location: Aggregate Supplier / Pit N Sample Date:	A Silty	X B y Clay with crushed stone an Native Engineered fill Onsite Stockpile N/A	C _ Typ d Gravel Max. Dry I Optimum % Retaine Corrected	e of Hammer: Manual Density: <u>1972 kg/m<sup>3</sup></u> Moisture: <u>10.9 %</u>
Prepared Sample: ASTM D698 Test Method Soil Type: Material: Proposed Use: Sample Identification: Sample Location: Aggregate Supplier / Pit M Sample Date: Sampled By: Remarks :	A Silty	X B y Clay with crushed stone an Native Engineered fill Onsite Stockpile N/A N/A July 28, 2017	C _ Typ d Gravel Max. Dry I Optimum % Retaine Corrected	be of Hammer: Manual Density: <u>1972 kg/m<sup>3</sup></u> Moisture: <u>10.9 %</u> d on 4.75 mm: <u>11.6 %</u> Dry Density: <u>2043 kg/m<sup>3</sup></u>
ASTM D698 Test Method Soil Type: Material: Proposed Use: Sample Identification: Sample Location: Aggregate Supplier / Pit M Sample Date: Sampled By:	A Silty	X B y Clay with crushed stone an Native Engineered fill Onsite Stockpile N/A N/A July 28, 2017	C _ Typ d Gravel Max. Dry I Optimum % Retaine Corrected Corrected	Density: <u>1972 kg/m<sup>3</sup></u> Moisture: <u>10.9 %</u> d on 4.75 mm: <u>11.6 %</u> Dry Density: <u>2043 kg/m<sup>3</sup></u>

GHD-FO-930.205a (On)-Standard Proctor Total (Rev.2) 04-28-2016

# Appendix D3 Results Dated September 14, 2017



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

Client:		GHD Ltd.		Lab no.:	G1467
Project/Site:		Stoney Creek Landfill I	Phase 8A	Project no.:	11103232
Borehole no.:	- Lo	Sample no.: ow Plastcity Inorganic Clay	- ( CL)	_ Depth: Date sampled:	N/A 14-Sep-17
Apparatus: Liquid limit device no.: Sieve no.:	Hand Crank 1 40	Balance no.: Oven no.: Glass plate no.:	1 1 2	Porcelain bowl no.: Spatula no.:	11
	Liquid Limit (LL):		Soil Preparation:		
	Test No. 1 Test	t No. 2 Test No. 3	Cohesive <425	µm 🗸	Dry preparation
Number of blows	35 2	27 17	Cohesive >425	µm 🗆	Wet preparation
	Water Content:		Non-cohesive		
Tare no.	A5 A	A2 A10		Results	
Wet soil+tare, g	21.79 20	0.68 20.44	38.5		
Dry soil+tare, g	19.61 18	8.81 18.50	38.0		
Mass of water, g	2.18 1	1.87 1.94	37.5 <sup>®</sup> 37.0		
Tare, g	13.21 13	3.54 13.26	% 37.0 te 36.5 O 36.0 Jan 35.5		
Mass of soil, g	6.40 5.	5.27 5.24	0 36.0		
Water content %	34.1% 35	5.5% 37.0%			
Plastic Limit (P	L) - Water Content:		35.0		
Tare no.	A50 A	A16	34.0		
Wet soil+tare, g	17.11 17	7.23	33.5		
Dry soil+tare, g	16.47 16	6.58	15 17 19	21 23 25 27 Nb Blows	29 31 33 35
Mass of water, g	0.64 0.	0.65		il Plasticity Chart	
Tare, g	13.31 13	3.37	70	LL 50	
Mass of soil, g	3.16 3.	3.21	60 Low plasticity	High plastic Inorganic cl	ity av
Water content %	20.3% 20	0.2%	러 Inorganic clay 	CF	
Average water content %	20.3%		Inorganic clay       Inorgani		
Natural Wate	er Content ( W <sup>n</sup> ):		ct.		
Tare no.			Low compressibility		(MH) and (CH)
Wet soil+tare, g			20 - Inorganic silt	+ High inorg	compressibility ganic silt janic day mpressibility
Dry soil+tare, g				norganid si	mpressibility It
Mass of water, g				(ML) <sub>and</sub> (OL) - Organic cla 30 40 50 60	<u>y</u> 70 80 90 100
Tare, g				Liquid Limit LL	
Mass of soil, g			Liquid Limit Plastic Limit (LL) (PL)	Plasticity Index (PI)	Natural Water Content W <sup>n</sup>
Water content %			36 20	15	
Remarks:	The clay sample me Section 31 05 21	eets the project specifica	tions for clay liner material (F	lasticity Index: 30 > PI	> 12)
Performed by:		Anwar Rehani	Date:		9/15/2017
Verified by:		Raj Kadia, C.E.T.	Date:		9/18/2017



### Particle-Size Analysis of Soils ASTM D422 (Quality Control)

Clie	nt:	-	GHD	Ltd.									Lab No.:	S1467		-		
Proj	ect, Site	: .	Ston	ey Cree	k Landf	ill Ph	ase	8A					Project No.:	1110	3232			-
	Sample N	0.:	-										Sampled by:	Abdou	ı Diallo			-
	Proposed	use:	Clay I	Liner								_	Date sampled: September 14, 201			2017		
	Location:											-	Supplier/Quarry:			_		
Percent Passing														0 00 00 00 00 00 00 00 00 00				
	20			0.01				0.1					1	10			9	30 90 100
								Di	ameter								-	
			Cla	y & Silt			$\vdash$	F	ine	Sand Medium Coarse		Fine	Gravel Fine Coarse					
					P	Particle	e-Siz	e Limit	s as p	er US	CS (	ASTI	M D-2487)					
			s	oil Desc	ription					Grav	el (%	6)	Sand (%)		Clay & Si	lt (%)		
		Silt	y Clay, S	Some Sa	nd, Trac	ce Gra	avel			:	2		13		85			]
Ber	orko-																	
Ken	narks:	Minim	um 95	percent	of parti	cles	pass	sing th	ne No	. 4 sie	eve	(4.7	0.002 mm): 41% 75 mm)- Meets pro mm)- Meets proje	oject speci	cification	is for c for cla	lay lin y linei	er
Peri	ormed b				Anwar F						•		Date:		tember			_
Veri	fied by:	-			Ra	j Kad	lia, C	C.E.T					Date:	Sep	tember	18, 20 <sup>.</sup>	17	-

# Appendix D4 Results Dated October 16, 2017

Reference No. 11103232



October 16, 2017

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

RN ia

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

RK/ss/4

Encl.

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

## Attachments

# Attachment A Field and Laboratory Test Results



Project No.: /// 03232	Date: 2017/08/28
Client: <i>QHD</i>	Contractor: bufferin
Project: Tanapure Stoney creet	Compaction Roofing Footing Base Evaluation Subgrade Evaluation Reinforcing Steel Comparets Sameling
Location: 65 Green Morenlain RSI Hamilton	Concrete Sampling Asphalt Paving Other (specify):
Field Results Temperature: 23	
The above noted site was vis	'led by GHA representative as requested
	5 wordered the compaction best on
	ty clay with crushed & natural
gravel), being used as Engine	need fill for buckfill the Erench.
After using a nuclear density 95% to 96% SPMDD, which me	guego all tests result showed ? the project specifications,
····	· / / / /
Corrective action to be taken:	
Follow up visit required:	□ No
Site Rep.: B. Sermody	Prepared By: A.J
Of:	Reviewed By:
For Internal Use Only Have: JSA/JSEA PPE Tr	aining Need S-RAF: 🔲 Yes 🔄 No Initials:



Project	t No.:	1110323	2			Dat	te: 2017	1081	28			
Client:	GK	45	_			Cor	ntractor: A	afferin	?			
Project	t: <i>Te</i>	mapreso	stoney (	ereek		Site	e Visit Type:	<i>10</i>	Full tim	e	🗌 Part t	ime
		5 Green										
		Material Descri						Maximum	· · .		Optimum V	
		<b>-</b>						Density (I	(g/m³)		Content (%	)
I		sifty el	ay with	h crush	82	na	lunal	200	96		7,7	
					-	gr	avel					
						-						
Maxim	um dry	density obtained	l from:	STC	. Test		MOD. Test	🗌 Esti	mated		Control Stri	0
Samp	ole(s)	□ Yes Γ		If yes, spec	ify test	ing to I	be done:					
Secu	ired:		] No	Proctor					dation			
Area T	ested:											
Test No.	Refe	ocation	ctric pol	Test Elevation	Mater Type	rial	Dry Density (kg/m³)	Moisture Content (%)	Compa (%)	ction	Specified (%)	Action
(i)	about	& Smw &	ISms	18t lift	I		1899	10,8	9.	5	95	C
() (3) (3) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4	abr	el ymw	4 Zomn	and lift		•	1918	10,5	91	A >	95	e
3)		8 6mw		-11-	I		1929	9.9	9,	S	95	C
(4)	abou	8 3.5m 8	27mN		Ī	-	1853	11.4	92	2	95	NC
(5)		gal lost		-11-	I		1905	11.2	95	-	95	c
(6)		me & 7mw	Contraction of the local data	-11-	I	-	1921	10.0			95	Ċ
(7)		8 5mw			I	•	18.60	11.6	93		95	NC
(8)	R	espal fo	st (5)	-11-	Ī		1914	11.3	9:		95	e
(9)	as	mel you	v & 3ms	5th liff	Z		1936	10,8	9.		95	C
							-					
Action:	l	C = Complying to	o spec. NC =	Not complying	to spe	eC.	I	I			<u>I</u>	I
Comme	ents:	:				Stan	dard Counts (0	OPSS 501 a	cceptable v	ariation	: density 2%, r	noisture 4%)
							je No. 1775	Calibr	1		ld Reading	Variation %
							Density	2075	<u></u>	20	69.2	0.3
							Moisture	448		44	to, 5	1.7
Site Re	ep.:	B. Derm	rodu		Prepa	red By	/:	<i>α</i> , Λ				
Of:	-		J		Revie	-	B		W			
For Inte	ernat Us	se Oniy I	Have: 🗹 JSÁ/JS	SEA 🛛 PPE	كا	raining	J Need S	S-RAF: 🔲	res L∠	NO	Initials	



Project No.: ///0.3232	Date: 2017/08/29
Client: CH1	Contractor: Dufferin
Project: Terrapure stoney creek	Compaction     Roofing     Footing Base Evaluation     Subgrade Evaluation     Reinforcing Steel
Location: 65 Green mountain Rd Hamilton, on	Concrete Sampling Asphalt Paving Other (specify):
Field Results Temperature: 24	
The above noted site was visited	by all representative as requested.
	unduct the compaction test on the
	with crushed and ratural grouped, being
used as Engineered fill for bac	
After using a nuclean density	gauge, all test result varied from
95/ to 96/ spmso, which mel	the project specifications.
Corrective action to be taken:	
	*
Follow up visit required:	□ No
Site Rep .: B, Sermody	Prepared By: A 刘
Of: CHA	Reviewed By:
For Internal Use Only Have: SA/JSEA PPE	raining Need S-RAF: Ves No Initials:



_								
Projec	ot No.: 11103232			Date: 2017	08/29			
Client	GHS			Contractor:	Merin			
Projec	t: Torrapure stoney a	neet		Site Visit Type:	E	] Full time	🗌 Part	time
	on: 65 Green moun Cain							
Materia	I Type Material Description				Maximum Density (k		Optimum V Content (%	
I	Silly class uside	Guda	10 00	ten O	20	06	7.	7
	Silly clay with	- CHARLES		gravel				
1								
Maxim	num dry density obtained from:	🗹 STC	D. Test	MOD. Test	🗌 Estir	nated	Control Stri	р
Sam	ple(s) 🗌 Yes 🗌 No	If yes, spec	cify testing	g to be done:				
Sec	ured:	Proctor	] STD.	MOD.	Grac	lation		
Area 7	Fested:							
Test No.	Test Location Refer al cleakic pole Nº1 about 4 mw & 2 mm	Test Elevation	Materia Type	l Dry Density (kg/m³)	Moisture Content (%)	Compaction (%)	Specified (%)	Action
0	about 4mw & 2mm	1st lift	I	1925	10,6	9.6	95	C
() (2) (3)	about 5m w 2 19m N		I	1941	9,9	97	95	C
(3)	ghout 6mw & 12ms	-11-	I	1910	11.1	95	95	C
			(					
						1		
	· · · · · · · · · · · · · · · · · · ·							
	- 4-				_			1
Action	: C = Complying to spec. NC =	Not complying	g to spec.					-
Comm	ients:			Standard Counts (				T
			(	Gauge No. 78 36		all the second s	ld Reading	Variation %
			-	Density	297	the second se	64.8	5.0
-				Moisture	39.3	3	90.1	0.7
Site R	ep.: <u>b. Sermody</u>		Prepare	d By: 🥖		11		
Of:			Reviewe	ed By:		N		
For Int	ernal Use Only Have: 🗍 JSA/J		Tra	aining Need	S-RAF: 🔲 Y	es 🗗 No	Initial	S
							at provides	

GHD

Project No.: 11103232		Date: 2017/09/07	
Client: CHD		Contractor: Sufferin	
Project: Terrapure 8	toney creek	Compaction Footing Base Evaluation Subgrade Evaluation	Roofing     Structural Steel     Reinforcing Steel
Location: 65 angen Manuel		Concrete Asphalt Paving Other (specify):	Sampling
Field Results	Temperature: 18	- °C * 25	
The above no led	site was vis	ted by GHD repr	esentative as nequest
			emparties lest on the
			gurel, bricks shale
			unduralen collection
- / -/ -	1.		biesel Temper plate.
	the second se		erell showed 100%
spmos, which me	I the project	specifications.	
It's important to	notice that be	fore placement	of alanular "A maler
the contractor h	splaced the	following items	,
- Groundwaller			
		pipe (one layer of	1300mm]
- 14pe 15 geolox le	Ke / see allad	red pictures for n	nove de lails).
Corrective action to be taken:	Growns worth? collection pipe	RAA	TN A moded
13 -1	Eler Et a Elerit	1	Trench inspected
2 Caller	B2m	CLUBEL COLLE	-
Follow up visit required:	Yes	□ No 24m 1 9m	1
Site Rep .: B, Sermody		Prepared By: A, D	
V			
Of:		Reviewed By: 2	



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## **Soil Compaction Verification Report**

Project	t No.: 🖊	1103230	r			Dat	e: 2017	10910	, Z		
Client:	GH.	1				Cor	ntractor:		-		
Project	t: Ter	Tapere	86ney	creek		Site	e Visit Type:		Full time	🗌 Part	time
Locatio	on: 64	E Green,	Moun Con	n RS							
Material	Туре	Material Descrip	otion					Maximum I Density (ko	-	Optimum V Content (%	
I		Grandle	an "A"					202	.7	8,0	4
Maxim	um dry	density obtained	from:		). Test		MOD. Test	Estim	nated	Control Stri	р
Samp Secu		🗌 Yes 🔲	No	If yes, spec Proctor	•	•	be done: MOD.	☐ Grad	ation		
Area T	ested:			l							
Test No.	Test L Refe	ocation r a C HDP <u>esticul p</u> et 0,5ms	E culled	Test Elevation	Mater Type	ial	Dry Density (kg/m³)	Moisture Content (%)	Compactio (%)	n Specified (%)	Action
(1)	abr	et 0,5ms	e Fmw	final grade	Ī		21.68	5,6	100	98	C
2) (3) (4)	ahr	lo,3mN	& 24mw		I		2139	6.0	100	98	C
(3)	abri	PO,2ms	E 55 mw	-1(-	7		2120	6.4	100	98	C
(4)		1 0,2mN			Ī	-	2147	7.3	100	98	C
<u>(5)</u>	abn	EISME	8311 5	-11-	I		2131	7.0	100	98	C
			i								
Action:		C = Complying to	spec. NC =	Not complying	g to spe	ec.					
Comm	ents:							1		ion: density 2%,	
							e No <u>5621</u>	Calibrat		Field Reading	Variation %
							Density Moisture	2965	1	96117	0,1
								4651.	5 4	60,2	1,1
Site Re	ер.: -	B. Derm	ody		Prepa	red By	r: <u>A</u>	<u>ک</u>			
Of:			<i>·</i>		Revie	wed B	y:	<u>N</u>			
For Inte	ernal Us	se Only H	lave: 🛛 JSA/JS	SEA 🛛 PPE	: Þ	Training	) Need	S-RAF: 🗌 Y	es 🛃 No	Initial	s:



Project No.: /// 032	32	Date: 2017/09/08	
Client: 0HD		Contractor: befferin	
Project: Torrapier	e stoney creek	Compaction       Roofing         Footing Base Evaluation       Structural Steel         Subgrade Evaluation       Reinforcing Steel	
	en Mountain Rd amilton, on	Concrete Sampling Asphalt Paving Other (specify):	
Field Results	Temperature: <u>14</u>	_• 🏠 🛎 🖉 📅 🖉	
The above no	led sile was vi	siled by GHA representative as a	que
		To conduct the compaction test	-
the Excaver	led materials ( &	illy clay with crushed & noten	al
		erred fill for tactfilling the C	
		gauge, all tests result showed	
		e project specifications.	
	below for more		
	Gamen	Awaler AN	1
End & Trench	AAR	collection pipes	
d c x	× × × × × × × × ×	x x x x x x x x x x x x x x inspected	
\$ <u></u>	TX TX Y X Y	X X X X T T X X	
	9	5m	
Corrective action to be t	aken:		
Follow up visit required:	Yes	□ No	
Site Rep.: B. Derm	ody	Prepared By: A, J	
Of:		Reviewed By:	
		~	



Project No.: 11103232			ate: 2017				
Client: GHD Project: Tennapure 86 ney Location: 65 Green Mounte	creek win es	11.0	contractor: 🔥		Full time	Part	time
Material Type Material Description				Maximum I Density (kg	1.0	Optimum V Content (%	
I silly clay with	crushad	1 & rat	unal muse	200	6	Ŧ,	7
Maximum dry density obtained from:	STD	. Test	MOD. Test	Estim	nated	] Control Stri	p
Sample(s)	If yes, spec Proctor		o be done: _ MOD.	🗌 Grada	ation		A 100 - 100
Area Tested: Test Location No. Refer al collector pipe vertical	Test Elevation	Material Type	Dry Density (kg/m³)	Moisture Content (%)	Compaction (%)	Specified (%)	Action
(1) about 3m & 2 10mW	1st life	I	1863	9,2	934	95	Ne
2) Repeat Cert () 3) about IMN & 20mE	-11-	I	1930	9.0	96	95	C
3) about IMN & 20ME	-11-	I	1904	8,5	95	95	c
(4) about 2m & 2 50mm (5) about 2ms & 10m E	2nd lift	I	1912	9.4	95	95	c
5) about 2ms & 10mE	-11-	I	1876	9.8	93	95	Ne
E) Repeat East 5)	-11-	I	1922	9.5	96	95	e
7) about 4mp & 90mw	-11-	I	1935	10.0	96	95	C
Action: C = Complying to spec. NC =	Not complying	to spec.					
Comments:			andard Counts ( uge No. <b>5</b> 62/	OPSS 501 acc Calibrat	eptable variation	n: density 2%, Id Reading	moisture 4%) Variation %
			Density	29,65,		159.7	0,2
		-	Moisture	465,	5 4:	57.5	1.7
Site Rep.: <u>B, Bennody</u> Of:		Prepared Reviewed		N			
For Internal Use Only Have: 2/JSA/JS		Train	ing Need	S-RAF: 🗌 Ye	es 🔤 No	Initials	3:



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Project No.: ///03232	Date: 2017/09/11
Client: CHI	Contractor: Bufferin
Project: Terropure stoney creek	Compaction     Roofing     Footing Base Evaluation     Subgrade Evaluation     Reinforcing Steel
Location: 65 Green mountain Rd Hamilton, onl	Concrete Sampling Asphalt Paving Other (specify):
Field Results Temperature:	
The above noted site was visit	ted by GHO representative as requested
	to conduct the compaction lest on the
	by with crushed & natural gravel
	bea backfilling the Erench . All Cests
- //	density gauge, varied from 95% to
97/ spmss, which met the	
Corrective action to be taken:	
Follow up visit required:	□ No
Site Rep.: B. Dermody	Prepared By: A, A
Of:	Reviewed By:
For Internal Use Only Have: JSA/JSEA PPE	Training Need S-RAF: Ves No Initials:



(

## **Soil Compaction Verification Report**

Project No.: 11103232		Da	ite: 20/7	109/1	1		
Client: QHD			ontractor: 🔗	·	1		
Project: Terrapure stoney	ereek		e Visit Type:		Full time	D Part	time
Location: 65 Green Mound	aip Rd						
Material Type Material Description				Maximum Density (kg		Optimum V Content (%	
I silly along w	ich erus	hed &	natura	2 20	06	F, F	
		que	wol				
Maximum dry density obtained from:	STC	D. Test	] MOD. Test	🗌 Estin	nated	Control Stri	р
Sample(s)	If yes, spec	ify testing to ∃STD. □	be done: ] MOD.	□ Grad	ation		
Area Tested:	1. 1. 1. 1. 1. L		4				
No. Refer al collector pipo vertical	Test Elevation	Material Type	Dry Density (kg/m³)	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	1 1st Rift	I	1907	10,5	95	95	e
RI about Sm S & FOM	w 1st life	I	1948	9,7	97	95	e
B) about 3mn & 15m2	= and lift	I	1880	10.1	94	95	Ne
(4) Repeat Cert (3)	-11-	T	1913	10,1	95	95	e
5) about 4ms 2 90m	0 -11-	7	1928	9,9	96	95	e
E) about 6ms & 10mE	3nd lift	I	1951	9,5	97	95	C
7) about 2ms 8 40mu	0 -11-	I	1919	10,4	96	95	C
(8) about 5ms & 85mu	0 -11-	I	1932	9.6	9.6	95	c
	= Not complying	g to spec.					
Comments:				1	ceptable variation		1
		Gau	ge No.562	Calibra 2965		Id Reading	Variation %
			Moisture	465		57.6	0,3
Site Rep .: B, Dermody		Prepared B	y: A	11	9 9	010	
Of:		Reviewed I	Зу:	HA			
For Internal Use Only Have: 🛛 JSA		Trainir	ng Need	S-RAF: 🗌 Y	'es 🔲 No	Initials	s:

(HD)

Project No.: 11103232	Date: 2017/09/12
Client: GHD	Contractor: Bufferin
Project: Terrapore storrey creek Land fill Location: 65 Green Mountain Rd	Compaction     Roofing     Footing Base Evaluation     Subgrade Evaluation     Concrete     Sampling     Asphalt Paving
Hamilton on	Other (specify):
Field Results Temperature: 23	
The above noted site was visi	'led by GHA representative as requested
	conduct the compaction test on
	gravel materials being used as
	liner for raising the brench grades.
	gunge, all lests results showed
18% to 99% spm DD, which met	the project specifications.
(See sketch below for more	
K 25m	1 N
slope	
	Berm
ही	
Corrective action to be taken:	Grovenbuaten collection pipes
Secondary compacted	Slope
- clay kinen 3	Secondary compacted clay linen
Follow up visit required:	No
Site Rep.: B, Sermody	Prepared By: A.N
Of:	Reviewed By: 1
For Internal Use Only Have: JSA/JSEA PPE T	raining Need S-RAF: Yes -No Initials:



Project	No.: 11103232			Date: 2017/09/12						
Client:	GHD			Contractor: Jufferin Site Visit Type: Tull time Part time						
Project	Terrapiere stoney	Creek		Site	e Visit Type:		Full time	•	🗌 Part t	ime
Locatio	In: 65 Green Mouston	5 DA							_	
Material	Type Material Description			I		Maximum [	Dry		Optimum V	Vater
						Density (kg	J/m <sup>3</sup> )		Content (%	)
I	Silly clay tra	ce fon	10	94	shel	18	DI		17,	7
		<u>~ ,470</u>	<u> </u>	10	q <u>ex</u>					
Maxim	um dry density obtained from:	STD	. Test		MOD. Test	Estim	nated		Control Strip	)
Samp	le(s)	If yes, speci	fy test	ng to l	be done:					
Secu		Proctor	STD.		MOD.	🗌 Grada	ation			
Area T	ested:	I								
Test	Test Location	Test	Mate	ial	Dry	Moisture	Compa	ction	Specified	Action
No.	Refer al Grovenswater	Elevation	Туре		Density (kg/m³)	Content (%)	(%)		(%)	
(1)	collector pripe about 59m N & 30mw	18t lift	3				60	,	98	
() R) 3) 4) S)	-				1580	16,4	88			Ne
5	Pepeat lest (1)	-11-	2		1694	16,2	94		98	NC
$\mathbf{Y}_{\mathbf{z}}$	Rescat Cast (2)	-11-	I		1767	16.3	98		98	e
4	about SOMN & 15mm		I		1759	16.8	98		98	C
5	about 8m N & 8m w	-11-	I		1770	16.0	98		98	C
6) #)	about 20ms & 14mw	-1(- 9nd 141	I		1783	16.5	99		98	Ċ
Ē/	about 65m N & 28 mw	P	I		1639	10,5	91		98	NC
Ø	Repeal Cest (2)	-11-	I		1766	16,1	98		98	C
(8) (9) (10)	akout 48mN 818mm	-11-	I		1785	16.6	99		98	C
(10)	abret 30MN & 10mw	-11-	I		1641	14.7	91		98	NC
	Repeat Cest (10)	-11-	I		1780	16,5	99		98	C
(2)	about 40ms & 6mw	-11-	I		1773	15.9	98		98	Ċ
(13)	about 67mN & 32mw	3rd lift	I		1762	16.7	98	_	98	C
(14)	about Somn & 15mw	-11-	I		1777	16.0	99		98	C
Action:		Not complying	to spe	C.						
Comme	ents:								: density 2%, r	· · · · · · ·
					pe No.5621	Calibrat			d Reading	Variation %
							0,3			
				<b>.</b>	Moisture	465.	5	45	5,9	2.0
Site Re	p.: <u>B. Aermody</u>		Prepa	red By	r: <u>A</u>	رل ا				
Of:	<u></u>		Revie	wed B	y:					
For Inte	ernal Use Only Have: 🗹 JSA/J	SEA 🛛 PPE	2	Fraining	g Need S	S-RAF: 🗌 Ye	es 🖂 N	lo	Initials	: J



Project No.: ///03232	Date: 2017/09/13
Client: CHJ	Contractor: Buffe 20'n
Project: Terrapure stoney creet	Compaction     Roofing     Footing Base Evaluation     Subgrade Evaluation     Reinforcing Steel
Location: 65 Green Mountain Rd Hamillin, on	Concrete Sampling Asphalt Paving Other (specify):
Field Results Temperature:	
The above noted site was a	isited by CHD representative as
	isit was to conduct the compaction
	sand & gravel material being used
	raising the brench grades. After
	ge, all tests verille varied from
981 to 991 SpMAD, which me	E che project specifications.
	locations see statch on the field report
daled 2017/09/12).	~ /
• • ·	
Corrective action to be taken:	
Follow up visit required:	□ No
Site Rep.: B. Sarmody	Prepared By: A.J
Of:	Reviewed By:
For Internal Use Only Have: I JSA/JSEA PPE Tr	aining Need S-RAF: 🛛 Yes 🗗 No Initials: M



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## **Soil Compaction Verification Report**

Project No.: /// 03232				Date: 2017/09/13						
	GHD			Contractor:						
Project	Tangana Stoper	creek			Visit Type:	Fa	Full time	🗌 Part t	ime	
Project: Terrapure stoney creek Location: 65 Green Morenlain Rd				Sile	e visit rype.		Fuirume		ime	
Material	Type Material Description					Maximum I	<u>ו</u>	Optimum V	Vator	
Iviateria						Density (kg	- <u>-</u>	Content (%	8	
								1000		
Ī	silty clay &	ome Sa.	nd,	lha	ce grave	<u>e 12</u>	801	17.	4	
Maxim	um dry density obtained from:		. Test		MOD. Test	🗌 Estim	nated	Control Stri	o	
Samp		If yes, spec	ify testi	ing to I	pe done:					
Secu		Proctor	STD.		MOD.	🗌 Grad	ation			
Area T	ested:									
Test No.	Test Location	Test	Mater Type	ial	Dry Densitv	Moisture Content	Compaction (%)	Specified (%)	Action	
NO.	Refer al Coroundwater		l she		(kg/m <sup>3</sup> )	(%)		( 70)		
Ø	about 25 min & 8mus	3nd life	Z	-	1735	16.5	96	98	NC	
¢	Repeat test ()	-11-	Z		1771	16.5	98	28	e	
61	about 10ms & 14mw		Ī	·····	1696	16.8		98	NC	
( <u>3)</u> (4)	-		I		1765	16.0	94 98	98	e	
6	Repeat test B)	-11-	1			17.0	98	98	C	
(5) (6)	about 45ms 26mm	Inthe MIR	I		1782		97			
	genel 66mN & 23mm		I		1746	14.6		98	Ne	
Ð	Repeat Cast (G)	-11-	I		1786	16.7	99	98	e	
8) (9) (0)	about 48mn & 12mw	1	I		1775	16.6	98	98	C	
(g)	about 22m N & 13mw	11-	I		1666	17.0	92	98	NC	
(0)	Repeat Cest (9)	-11-	I		1758	16.8	98	28	C	
D_	about 35ms & Down	-10-	2		1779	16.4	99	.98	C	
(12)	about 4ms 87mw	-11-	I		1790	16.5	99	98	C	
		· .								
Action:	C = Complying to spec. NC =	Not complying	to spe	C.						
Comme	ents: Socondary clay	angen				OPSS 501 acc	eptable variation	n: density 2%, r	noisture 4%)	
				Gaug	e No 5621	Calibrat	ion Fie	eld Reading	Variation %	
					Density	2963	<u>, , , , , , , , , , , , , , , , , , , </u>	959.2	0,2	
				1	Moisture	465,	5 4	60.4	1.0	
Site Re	p.: B. Darmody		Prepa	red By	: <u>A</u>	۵،		•		
Of:			Revie	wed B			M			
For Inte	ernal Use Only Have: ☑JSA/J	SEA PPE		Fraining	Need :		es 🔄 No	Initials	:	
	상품을 물건을 해야 할 때 있는 것이다. 이렇게 가지 않는 것이다. 이렇게 가지 않는 것이다. 같은 것은 것이 같은 것이 같은 것이 같은 것이 같이 같은 것이 같이 같은 것이 같이		ilija <del>en</del> diĝ			an Tatuk <mark>ta</mark> (ji				



Project No.: /// 03232	Date: 2017/09/14
Client: CH1	Contractor: Bufferin
Project: Ternapure stoney creek	Compaction       Roofing         Footing Base Evaluation       Structural Steel         Subgrade Evaluation       Reinforcing Steel         Concrete       Sampling
Location: 65 Green Mountain Rd Hamilton, one	<ul> <li>Asphalt Paving</li> <li>Other (specify):</li> </ul>
Field Results Temperature: <u>23</u>	
The above noted site was visi	Ed by CHA representative as required
	5 conduct the compaction lest on
	mavel material being used as
	insing the Creach grades. After
	ge, all lest result showed 98% to
100% Spm AD, which met the p	
	ions see sketch on the field report
Aaled 2017/09/12).	<i>0 1</i>
`\	
Corrective action to be taken:	
Follow up visit required:	□ No
Site Rep.: B. Dermody	Prepared By: A
Of:	Reviewed By:
For Internal Use Only Have: JSA/JSEA PPE T	raining Need S-RAF: Yes No Initials:



Project	No.: 11/03232		Date: 2017/09/14							
6	GHD .			Contractor: Duffenin						
Project	: Ternapuse stoney	creek			e Visit Type:	-	Full time		🗌 Part ti	me
Locatio	n: 65 Green Mounta	n 2s								
Material	Type Material Description					Maximum I Density (kg	•		Optimum Water Content (%)	
I	Silty clay tra	ce Sund	2	gri	avel	17	51		15,3	
Maxim	um dry density obtained from:	STD	. Test		MOD. Test	🗌 Estim	ated		Control Strip	)
Samp		lf yes, speci	fy testi	ng to t	pe done:					
Secu	red:	Proctor	STD.		MOD.	Grada	ation			
Area Te										
Test No.	Test Location Refer at Groundwalen Collector 5/22	Test Elevation	Mater Type	ial	Dry Density (kg/m³)	Moisture Content (%)	Compac (%)		Specified (%)	Action
(1)	about 66m N q 29m 0	5th lift	Ţ	-	1681	12,8	9.6	,	98	NC
DA WWW HER	Repeat test (1)	-11-	Ţ		1734	121.4	99		98	C
3)	about 60mN & 13mw	-11-	I		1797		100	<b>,</b>	98	c
4)	abret 50m 18 4 18mio	-11-	$\mathcal{I}$	-	1757	16,6	100	>	98	e
6	about 30 mrs 26mw		I		1733	17,0	99		98	e
6)	about 20mm & 14min		I	-	1663	15,9	95	-	9.8	NC
7)	Repeat Cest (5)	-11-	I		1714	16,0	98		98	C
(5)	about 12m S & 10mw		I		1726	15,7	98		98	C
<u>9</u> )	abut yoms & 7mw		I		1742	15,5	99		98	C
(10)	about 30ms & 14mw		Ī		1760	16,2	102	>	98	C
Action:	C = Complying to spec. NC =	Not complying	to spe	с.						
Comme					dard Counts ((		entable va	riation	density 2% r	noisture 1%
					le No <b>56 2/</b>	Calibrat			Reading	Variation %
					Density	2965	15	29:	56,4	93
				P	Vioisture	465,		45	8.7	1,5
Site Re	p.: B, Darmody		Prepa	red By	:	AL			.,	
Of:			Revie			M				
For Inte	ernal Use Only Have: 🛛 JSA/JS		2-1	Fraining	J Need S	S-RAF: 🗌 Ye	əs 🗗 Ni	о С	Initials	:



Project No.: /// 32032	Date: 2017/09/20
Client: Client:	Contractor: Aufferin
Project: Terrapure stoney creek Land fill	Compaction       Roofing         Footing Base Evaluation       Structural Steel         Subgrade Evaluation       Reinforcing Steel
Location: 65 Green Morenlain RS Hamilton, on	Concrete Sampling Asphalt Paving Other (specify):
Field Results Temperature: 25	
The above noted site was vis	led by GHQ representative as requested.
	conduct the compaction test on the
	lunal gravel, being used as Engineered
	After using a nuclean density gauge
all lest result shoused 95/ to	98/ spm0, which met the project
chard in this	10
specifications.	
Corrective action to be taken:	
Follow up visit required:	
Site Rep.: B. bermody,	Prepared By: A.S
Of:	Reviewed By:
For Internal Use Only Have: JSA/JSEA PPE	raining Need S-RAF: Yes No Initials:



Project No.: /// 32032	Date: 2017/09/20							
Client: CHA			Contractor: hefferin					
Project: Tennapune stoney Location: 65 Green Mounta	creek		Site	Visit Type:	v Ľ	Full time	🗌 Part i	ime
Location: 65 Green Mounta	in RA							
Material Type Material Description					Maximum I	Dry	Optimum V	
					Density (kg	J/m³)	Content (%	)
I silty clay wit	th cruth	ed y	e na	lund	200	6	7.7	٤
			gr	avel				
Maximum dry density obtained from:	STC	). Test		MOD. Test	Estim	nated	] Control Stri	p
Sample(s)	If yes, spec	ify testi	ng to t	be done:				
Secured:	Proctor	] STD.		MOD.	Grad	ation		
Area Tested:								
Test Test Location	Test	Mater	ial	-	Moisture	Compaction	Specified	Action
No. Refer al aroundwaten	Elevation	Туре		Density (kg/m³)	Content (%)	(%)	(%)	
() about 2mn 9 20 mus	18t Rift	I			8.2	93	95	41-
				1875	8.0			Ne
<ul> <li>(2) Repeal test ()</li> <li>(4) about 3ms &amp; 56mw</li> <li>(4) about 3mno &amp; 12mw</li> <li>(5) about 4ms &amp; 60mw</li> <li>(6) about 6ms &amp; 8mw</li> <li>(7) Repeal test (6)</li> <li>(8) about 2ms &amp; 42mw</li> <li>(9) about 4mno &amp; 10mw</li> </ul>	-11-	T		1910		95	95	C
2) about 3ms 256mw	-11- 201 AVA	I		1925	7.1	96	95	C
(4) about 3mn q 12mw	2 - Juft	I		1964	6,8	98	95	
5) about 4m 5 8 60mw	-11-	I		1917	6.0	95	95	C
6) about 6ms & 8mw	3nd lift	I		1854	6,5	92	95	Ne
7) Repeal lest (6)	-11-	I		1923	6.6	96	95	C
(8) about 2ms & 42mw	-1(-	17		1935	6,1	96	95	C
(9) about 4mrs & 10mw	4th lift	I		1908	5,9	95	95	e
10 about 7ms & 50mw	-11-	Î		1944	6.7	97	95	C
(1) about 3mn 9 26mw	5th life	I		1930	6.2	96	95	e
(12) about 2ms & 59mus	-11-	I		1973	6.3	98	95	C
	Not complying	to spe	C.					
Comments:						ceptable variation		
				e No./775	Calibrat		Id Reading	Variation %
				Density	2075		069.1	0.3
				/loisture	448.	2 4	39.6	1,9
Site Rep .: B. Scrmody		Prepa	red By	:	AJ			
Of:		Revie	ved By	/:	W			
For Internal Use Only Have: JSA/JS	SEA 🗌 PPE	[}-1	raining	Need S	S-RAF: 🗌 Yo	es 🖵-No	Initials	



Project No.: /// 32032		Date: 2017/09/21					
Client: CHO		Contractor: bufferin					
Project: Terrepuse 8 Land for	toney creek	Compaction I Roofing Footing Base Evaluation Structural Steel Subgrade Evaluation Reinforcing Steel					
-ocation: 65 Green							
Field Results	Temperature:2						
The above note.	A sile was	visiled by GHA representative as requi					
		to conduct the compaction last on the					
sifty clay with	crushed &	natural grovel, being used as Engine					
fill for backfilling the Trench. After whing a nuclean density goinge							
fill for backfiller	if the rence	h. After using a nuclear density going					
fill for backfillis all lest result	varied from	n 95/ to 100/ spman which net the					
fill for backfillin all lest result project specific	varied from	h After uning a nuclear density going n 95/, la loof spmaa, which met the					
all tests result	varied from	h After uning a nuclear density going n 95/, la loof spmaa, which met the					
all lests result	varied from	h After uning a nuclean density young on 95% to 100% spmaa, which met the					
all lests result	varied from	h After uning a nuclean density going on 95% to 100% spmaa, which met the					
all tests result	varied from	h After uning a nuclean density goung n 95% la 100% spmaa, which met the					
all lests result	varied from	h After uning a nuclean density gouy or 95% to 100% spmaa, which met the					
all lests result	varied from	A Afler uning a nuclean density going or 95% to 100% spmaa, which met the					
all tests result	varied from	A Afler uning a nuclean density going or 95% lo 100% spmaa, which nel the					
all lests result	varied from	A Afler uning a nuclean density gouy n 95% lo 100% spmaa, which nel the					
all lests results	vanied from	n 95%, la Ioo% spman, which mel the					
<i>all lesto se sulla project specific</i> Corrective action to be taken:	Vanied from	n 95% le 100% spmAD, which mel the					
all lests results project specific	Vanied from	n 95%, la Ioo% spman, which mel the					



Project No.: /// 32032				Date: 2017/09/21						
Client:	GHD	6		Cor	tractor: 🖁	hefferin				
Project	Terrapure stoney	CREEK			Visit Type:	<i>v</i>	Full time	🗌 Part i	time	
Locatio	1. Terrapure stoney on: 65 Green Mounta	in Rs								
Materia	Type Material Description			<b>.</b>		Maximum I	•	Optimum V		
						Density (kg	y/m³)	Content (%	)	
I	silly clay with	crushe	1 2	nal	tural	doc	06	7,7	Ź	
	·····		-	gra	vel					
				0						
Maxim	um dry density obtained from:	<b>E</b> STD	). Test		MOD. Test	📋 Estim	nated	Control Stri	р	
Samp	ole(s) 🗌 Yes 🗍 No	If yes, spec	ify test	ing to b	be done:					
Secu	ired:	Proctor	] STD.		MOD.	🗌 Grada	ation			
Area T	ested:				<u> </u>					
Test No.	Test Location	Test Elevation	Mate	rial	Dry Density	Moisture Content	Compacti	on Specified	Action	
	Refer al Gwundwaler collector pipe	Lievation	Туре		(kg/m <sup>3</sup> )	(%)	( 70)	(70)		
$(\mathcal{D})$	about 3mN & 11mw	1st lift	I		1968	6,4	98	95	e	
Q	about 2ms & 55mw	-11-	1		1929	6.0	96	95	C	
(3)	about 4mn y 23mw	2nd life	Ī		1841	6,7	92	95	Ne	
(4)	Repeat test (3)	~11	I		1913	6.6	95	95	e	
(3) (4) (5) (6) (7) (8) (9)	about 3mN & 15mw	3rd life	I		1948	7.0	97	95	e	
6)	about 4ms 260mio	-11-	1	,	1970	5.8	98	95	C	
(7)	about 1,5mN 932mw				2014	6.9	100	95	C	
8)	alard Imag & 10mm	-11-	I I		1988	6,5	99	95	e	
(9)	about 3.5mN & 25mio	5th life			1945		97	95	e	
(10)	about 3ms 9 61mm		I 7	-	1967	6.7	98	95	e	
9										
	· · · · · · · · · · · · · · · · · · ·									
Action:	C Complying to spec. NC =	Not complying	to spe	C.		I	1			
Comm	ents:			Stan	dard Counts (	OPSS 501 acc	ceptable varia	ation: density 2%,	moisture 4%)	
				Gaug	e No. <b>1775</b>	Calibrat	tion	Field Reading	Variation %	
					Density	207	5	2065.8	0.4	
				N	Aoisture	448		440,3	1.7	
Site Re	ep.: <u>B. Sermody</u>		Prepa	red By	:A	۵,۱				
Of:			Revie	wed By		M				
For Inte	ernal Use Only Have: 📝 JSA/JS	SEA	D.	Training	Need 1		es ITNo	Initials		
			لب	can in ig	14000 1	~ . v		nnuar		



Project No.: ///03232	Date: 2017/09/25
Client: CHU	Contractor: Bufferin
Project: Tennapure stoney creek Land fill Location: 65 Green Mountain Rd	Compaction       Roofing         Footing Base Evaluation       Structural Steel         Subgrade Evaluation       Reinforcing Steel         Concrete       Sampling         Asphalt Paving       Sampling
Hamillon, on	Other (specify):
Field Results Temperature: <u>30</u>	
The above noted site was visited	by CHO representative as requested.
	determine the degree of compaction
	ace sand & gravel malerials being
used for primary compacted	
	1 by the medium size sheeps fool rollon.
After using a nuclear sensity	gauge all tests results showed 98/
to 100/spmss, which met the p	neject specifications.
	ade during our visit are recorded as belo
	tile on top of the secondary compacted
	draulie controle layer (50mm clean store)
	prior to primary compacted clay liner
	new secondary & primary liners to the
Corrective action to be taken:	
-Each lift of primary compacted	A clay liner has been scarified and effort
Were made for picking up the n	
Follow up visit required:	No
Site Rep.: B. Dermody	Prepared By: A.
Of:	Reviewed By:
For Internal Use Only Have: 🛛 JSA/JSEA 🖸 PPE 🗗	raining Need S-RAF: 🗌 Yes 🖉 No Initials:

	Gŀ		Ĺ	- )		Soil	Compa	ction	Ver		1_ of <u>~</u>
Client: $GHD$ Contractor:       by fearing       Contractor:       Contractor:       by fearing       Contractor:       Contractor:       Batterial Description       Contractor:       Batterial Description       Contractor:       Contractor: <thcontractor:< th=""></thcontractor:<>	Project	No: 11103232			Dat	te: 2017	109/2	5			gi kanan malakan an dalam kanan manan kanan manan kanan k
Location:       GS       Grades       Material Description       Maximum Dry Density (kg/m <sup>2</sup> )       Optimum Water Content (%)         I       5/kly       clay       trace       sand g gravel       1751       15,3         Maximum dry density obtained from:       [STD. Test]       MOD. Test]       Estimated       Control Strip         Sample(s)       Ves       No       [If yes, specify testing to be done:       Proctor       Strippe       Prostor       Compaction       Specified       Action         No.       Test       Control Strip       If yes, specify testing to be done:       Proctor       Strippe       Pensity       Compaction       Specified       Action         No.       Test Control Model       If Strippe       If Strippe       Density       Compaction       Specified       Action         No.       Test Control Model       If Strippe       If Strippe       If Strippe       Pensity       Compaction       Specified       Action         No.       Test Control Model       If Strippe       If Strippe       If Strippe       Density (No)       Control Strip       Strippe         (i)       advised Hom N & Somu       If Strippe       If Strippe       If Strippe       If Strippe       Strippe       If Strippe       If Str		PULA			Col	ntractor:	Menia	~			
Location:       GS       Grades       Material Description       Maximum Dry Density (kg/m <sup>2</sup> )       Optimum Water Content (%)         I       5/kly       clay       trace       sand g gravel       1751       15,3         Maximum dry density obtained from:       [STD. Test]       MOD. Test]       Estimated       Control Strip         Sample(s)       Ves       No       [If yes, specify testing to be done:       Proctor       Strippe       Prostor       Compaction       Specified       Action         No.       Test       Control Strip       If yes, specify testing to be done:       Proctor       Strippe       Pensity       Compaction       Specified       Action         No.       Test Control Model       If Strippe       If Strippe       Density       Compaction       Specified       Action         No.       Test Control Model       If Strippe       If Strippe       If Strippe       Pensity       Compaction       Specified       Action         No.       Test Control Model       If Strippe       If Strippe       If Strippe       Density (No)       Control Strip       Strippe         (i)       advised Hom N & Somu       If Strippe       If Strippe       If Strippe       If Strippe       Strippe       If Strippe       If Str	Project	. Tannapure stoney	eneelt		Site	- Visit Type	P		<b>A</b>	Part t	time
Material Type       Material Description       Material Description       Material Description       Optimum Water Content (%)         I       5'llg clay Enges Sand g gravel $I \neq 67$ $I \leq 13$ Maximum dry density obtained from:       ©STD. Test       MOD. Test       Estimated       Control Strip         Sample(s)       Yes       No       If yes, specify testing to be done:       Gradation       Control Strip         Near Tested:       Proctor       STD.       MoD.       Gradation       Control Strip         (i)       alone & formed from:       If yes, specify testing to be done:       Control Strip       Specified       Action         (i)       alone & formed from:       Test       Moderial       Dry       Content       (%)       Specified       Action         (i)       alone & formed from:       Test       If $I \neq 20$ $I \leq 0$ $P \ll C$ (%)       Action         (i)       alone & formed from:       Test       Test       Test (%)       Content (%)       Specified       Action         (ii)       alone & formed from:       Total (%)       Total (%)       Total (%)       P %       C         (j)       alone & form form:       Estimate       I formed for       Specified		nº CS Room Mount	in DA		<b>.</b>	5 1010 1 9 90.	LJ	, <b>i u</b> n an	C		
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	Material	Type Material Description					Maximum I	Dry		Optimum V	Vater
Maximum dry density obtained from: $\square$ STD. Test $\square$ MOD. Test $\square$ Estimated $\square$ Control Strip         Sample(s) Secured: $\square$ Yes $\square$ No       If Yes, specify testing to be done: Proctor $\square$ STD. $\square$ MOD. $\square$ Gradation         Area Tested:       Test $\square$ StD. $\square$ MOD. $\square$ Gradation         No. $\square$ Secured: $\square$ StD. $\square$ MOD. $\square$ Gradation         (i) $\square$ StD. $\square$ StD. $\square$ MOD. $\square$ Gradation         (j) $\square$ StD. $\square$ StD. $\square$ MOD. $\square$ Gradation         (j) $\square$ StD. $\square$ StD. $\square$ MOD. $\square$ Gradation         (j) $\square$ StD. $\square$ StD. $\square$ StD. $\square$ StD. $\square$ StD.         (j) $\square$ StD.								· -		1 -	
Maximum dry density obtained from: $\square$ STD. Test $\square$ MOD. Test $\square$ Estimated $\square$ Control Strip         Sample(s) Secured: $\square$ Yes $\square$ No       If Yes, specify testing to be done: Proctor $\square$ STD. $\square$ MOD. $\square$ Gradation         Area Tested:       Test $\square$ StD. $\square$ MOD. $\square$ Gradation         No. $\square$ Secured: $\square$ StD. $\square$ MOD. $\square$ Gradation         (i) $\square$ StD. $\square$ StD. $\square$ MOD. $\square$ Gradation         (j) $\square$ StD. $\square$ StD. $\square$ MOD. $\square$ Gradation         (j) $\square$ StD. $\square$ StD. $\square$ MOD. $\square$ Gradation         (j) $\square$ StD. $\square$ StD. $\square$ StD. $\square$ StD. $\square$ StD.         (j) $\square$ StD.	T	silter class &		~ 1	12 1		17	:51		15	.3
Sample(s)       Yes       If yes, specify testing to be done:         Proctor       Gradation         Area Tested:         Test Location       Specified       Action         No.       If yes, specify testing to be done:         Proctor       STD.       Mode         Test Location       Specified       Action         No.       Test Location       Specified       Action         Test Location       Compaction fight       The import of the import	<u> </u>	- of pay change of	nger on	170	2-7	naver		<u> </u>			
Sample(s)       Yes       If yes, specify testing to be done:         Proctor       Gradation         Area Tested:         Test Location       Specified       Action         No.       If yes, specify testing to be done:         Proctor       STD.       Mode         Test Location       Specified       Action         No.       Test Location       Specified       Action         Test Location       Compaction fight       The import of the import											
Sample(s)       Yes       If yes, specify testing to be done:         Proctor       Gradation         Area Tested:         Test Location       Specified       Action         No.       If yes, specify testing to be done:         Proctor       STD.       Mode         Test Location       Specified       Action         No.       Test Location       Specified       Action         Test Location       Compaction fight       The import of the import	Maxim	um dry density obtained from:	STD	. Test		MOD. Test	LEstim	nated		Control Stri	p
Secured:       Ves       No       Proctor       STD.       MOD.       Gradation         Area Tested:         Test Location         By Ex all Constant Musely Elevation       Type       Dry       Moisture       Compaction       Specified       Action         (1)       abruel 44m N & 50mu       17 GLB & T       17 420       13,6       99       98       C.         (3)       abruel 58 mN       2 3mu       -11_       T       17 427       14.2       1+00       98       C.         (4)       abruel 58 mN       2 3mu       -11_       T       17 428       14.42       1+00       98       C.         (5)       abruel 71mN 9 52mu       -11_       T       17 428       14.44       99       98       C.         (5)       abruel 41mN 9 9mu       -11_       T       1683       15.18       96       98       C.         (5)       abruel 42min 9 9mu       -11_       T       1747       15.6       98       98       C.         (6)       Bapzal test       (5)       -11_       T       1739       16.11       97       78       C.         (7)       abruel 45min 4 9 30mu       <											
Area Tested:         Test Location       Test Consetted wale televation       Type       Dry Density       Compaction       Specified       Action         Test Location       Specified       Compaction       Specified       Action         (i)       admet #4 mm N & 50mu       If $\mathcal{P}_{4}^{(1)}$ I 1747       II.6       Of the test form of the test form of the test form of the test form of test f		Y LIYES LINO		-			Grad	ation			
Test No.       Test $l_c l_c r all Gradial water Elevation(l_collactor pp2       TestElevation(l_g)       MaterialType       DryDensity(l_g)       MoistureContent(l_g)       Compaction(l_g)       Specified(l_g)       Action         (i)       about 8 44mm N & 50mw       13 5 496       I       17270       13.6       99       98       C         (about 8 44mm N & 50mw       18 61/6       I       1747       14.2       1 & 0 & 98       C         (about 8 47m N & 28mw       18 61/6       I       1747       14.2       1 & 0 & 98       C         (j)       about 8 50mN & 23mw       -11-       I       1766       13.9       1 & 0 & 98       C         (j)       about 8 40mN & 52mw       -11-       I       1728       14.4       99       98       C         (j)       about 8 40mN & 52mw       -11-       I       1728       14.1       99       98       C         (j)       about 8 40mN & 90mw       -11-       I       1717       15.6       78       98       C         (j)       about 8 42mN & 90mw       -11-       I       1770       15.5       1 & 79       98       C         (j)       about 8 42mN & 90mw       21-       I       1723$	Area To	ested:									
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Test No.	Test Location Refer al Grandwale Collector pipe	Test Elevation	1	ial	Density	Content		ction	1 -	Action
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	67	about 44mn & 50mw	186 left	Ī	-	1720	13.6	9.	7	98	C
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	1/31	al A HZMAN Q 28 MM	18t litte					1	0		e
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	(2)	alme & B8 MN & 23mw		1							
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	(in)			1		1	1			1	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	(5)						1	1			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	(G)					1	1				
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	12.			<u> </u>	-			1			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	(8)		-/(	T			1	1			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	a		-11-			1	1	1			1
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	1/10)		2nd lift			1 .					
12)       abrall 48mw 9 49mw -11-       I       17/61       16.3       1000       98       c         (13)       abralt 65m N g 25mw -11-       I       1734       15.7       99       98       c         (4)       abralt 2m5 g (2mw -11-       I       1765       14.6       1000       98       c         Action:       C = Complying to spec.       NC = Not complying to spec.       I 765       14.6       1000       98       c         Action:       C = Complying to spec.       NC = Not complying to spec.       Variation (OPSS 501 acceptable variation: density 2%, moisture 4%)       Gauge No. 7852       Calibration       Field Reading       Variation %         Density       33 51       33 45,2       0.2       Noisture       Moisture       40 4       39 8,3       1,4         Site Rep.:       B, Dermody       Prepared By:       A.D       A.D       Reviewed By:       Mu       Mu						1	1				
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	171										-
If j         abrul 2mS g (2mw)         -11-         I         I765         14, b         100         98         C           Action:         C = Complying to spec.         NC = Not complying to spec.         I <tdi< td=""><td>127</td><td></td><td></td><td></td><td></td><td></td><td>1</td><td></td><td></td><td>1</td><td></td></tdi<>	127						1			1	
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       33 51       33 45,2       0.2         Moisture       40 4       39 8,3       1,4         Site Rep.:       B. Denmody       Prepared By:       A.D.         Of:       Prepared By:       M.J.				1			1	1		1	+
Comments:       Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)         Gauge No. 7852       Calibration       Field Reading       Variation %         Density       33 5/       33 45,2       0.2         Moisture       40 4       39 8,3       1,4         Site Rep.:       B. Denmody       Prepared By:       A.D         Of:       Reviewed By:       M	Action:		<u>_</u>		C.	1722	1910		10	/ 0	
Gauge No. 7852       Calibration       Field Reading       Variation %         Density       33 51       33 45,2       0.2         Moisture       40 4       398,3       1,4         Site Rep.:       B. Denmody       Prepared By:       A.D         Of:			•			ndard Counts (	OPSS 501 acr	ceptable \	ariation	n: density 2%,	moisture 4%)
Moisture         404         398,3         1,4           Site Rep.:         B. Darmody         Prepared By:         A.D           Of:          Reviewed By:         M								1			1
Moisture         404         398,3         1,4           Site Rep.:         B. Dermody         Prepared By:         A.D           Of:          Reviewed By:         M						Density	335,	/	33	145,2	0.2
Of: Reviewed By:						Moisture	1				1,4
Of: Reviewed By:	Site Re	D.: B handy		Prepa	red B	v: /					
			N								
									Na	Initial	~

	Ð			(2)	)		Soil	Compa	ction V	<b>erificatio</b> Page <u>-</u>	<b>n Report</b> <u>え</u> of <u>え</u>
Project	t No.:	111032	32			Daf	te: 2017	2/09/2	5		
Client	0	UN					ntractor: 🔏				
Projec	t: Te	napen	e stoney Mountai	creek		Site	e Visit Type:	20	Full time	🗌 Part	time
Locatio		Material Des		n 1260				Maximum	Der	Optimum \	Notor
Materia	пуре	Material Des	cription					Density (ko		Content (%	
I	-	silly	clay tra	aco Sai	18 9	· In	2100	175	51	15	3
						0					
Maxim	um dry	density obtair	ned from:	STC	). Test	[	] MOD. Test	Estim	nated	Control Stri	p
Samı Secu	ple(s) ured:	☐ Yes	🗋 No	If yes, spec Proctor	-	-	be done: ] MOD.	Grad	ation		
Area T	ested:										
Test No.	Test L	ocation er al G	novenduraler ospe vertical ns g 17mw	Test Elevation	Mater Type	ial	Dry Density (kg/m³)	Moisture Content (%)	Compacti (%)	on Specified (%)	Action
(15)	abr	rel 23m	is & 17mw	2nd lift	Z		1754	16.4	100	98	C
(5) (6) (7) (18)			5 8 8mw	~	Ī		1727		99	98	C
(4)	ab	ul 71mi	N 9 40mw	3nd lift			1781	15,8	100	98	C
(18)			N & 32mro		I I I		1742		99	98	C
191			N & 39mw		I		1720		98	98	Ċ
ko)			N ZZYMW		Z		1733	15.6	99	98	C
		•									
					1						
						*******					
					-	·					
Action	:	C = Complyin	ig to spec. NC =	Not complying	g to spe	ю.					
Comm	ients:		e.			Star	ndard Counts (	OPSS 501 acc	ceptable varia	ation: density 2%,	moisture 4%)
						Gau	ge No. 78.55	Calibra	tion	Field Reading	Variation %
							Density	335	1	3345,2	0,2
							Moisture	40	4.	398.3	1.4
Site Re	ep.:	B. Der	mody		Prepa	red By	y:	·			
Of:					Revie	wed B	By:		N	, e -	
For Int	ternal U	se Only	Have: JSA/JS	SEA 🗗 PPE		Trainin	ig Need	S-RAF: 🔲 Y	es 🗗 No	Initial	s:



Project No.: ///03232	Date: 2017/09/26
Client: CHA	Contractor: Bufferin
Project: To rupuse stoney esect Land fill Location: 65 Green morentain Rd Hamilton, one	Compaction       Roofing         Footing Base Evaluation       Structural Steel         Subgrade Evaluation       Reinforcing Steel         Concrete       Sampling         Asphalt Paving       Other (specify):
Field Results Temperature: <u>30</u>	
compacted eley liner constru by the medium size shoopsfrot n 98%, to 100% spmAD, which me Each lift of primary compacted efforts were made for picking	el malerial seing used for primary clim. The compaction was performed other and all losts results varied from I the project specifications; A cley liner has been scarified and -up the rocks by hands. The contractor ing the next lift of compacted clay lip
Corrective action to be taken:	
Follow up visit required:	□ No
Site Rep.: B. Dermody Of:	Prepared By: A.J. Reviewed By: W
For Internal Use Only Have: JSA/JSEA PPE 21	· ,



Page <u>/</u> of <u>1</u>

Project No.: ///03232								Date: 2017/09/25							
Client: CHA							Contractor: Bufferin Site Visit Type: T Full time Part time								
Project: Termepute stoney creek Location: 65 Green Mountain RS								e Visit Type:	🗌 Part	time					
Locatio	on: 💪	5 G.	uen	mounto	via RA										
Material	Туре	Material	Descri	otion					Maximum		Optimum V				
									Density (ko	y/m³)	Content (%)				
I		81	`I &	clay t	huce sa	nd	8 9	havel	13	751	15.3				
							-0								
Maxim	um dry	density of	obtained	from:	STC	). Test		MOD. Test	🗌 Estin	nated [	Control Stri	р			
Samp	ole(s)		V	1	If yes, spec	ify testi	ng to	be done:							
Secu	ired:	□ `	res 🗋	] No	Proctor	] STD.		MOD.	🗌 Grad	ation					
Area T	ested:				L										
Test	Test L	ocation	a a	1 8	Test	Mater	ial	Dry	Moisture	Compaction	· ·	Action			
No.	Kef	er al	t Gre I	nindwalen	Elevation Type		Density (kg/m <sup>3</sup> )		Content (%)	(%)	(%)				
1/12				eipe & 14mw	3nd lift	Z		1679	14.7	96	98	NC			
() 2) (3) (4) (3)				e ()	-11-	Ī		1726	1	98	98	C			
121		/		S & 10m w		I			15.8	100	98	e			
(4)		-		8 16mw		Ī		1755		100	98	c			
5)				E 7mw		Ī		1737	1	99	98	c			
				2 40mu				1784	15,8	100	98	Ċ			
(4) (7) (8) (9)				2 25mw	-	T			16,3	100	98	C			
K)				936mw		I		1741		99	98	e			
(a)	I .	-		2 24 mw		7		1763	16,6 100		98	C			
e_	7.014	2 31	/////	2 241047				1103	10,0	700	10				
							·								
				1		+									
						<u> </u>									
Action:	۱ ۱	C ¥ Corr	nplying to	o spec. NC =	Not complying	to spe		I	]	<u> </u>		1			
Comme			130			,	[	dard Counts (	OPSS 501 ac	ceptable variatio	n' density 2%	moisture 4%)			
								ge No.7852	1		eld Reading	Variation %			
								Density			40.9	0,3			
								Moisture	404		0.7	0,8			
Site Re	ep.:	B	Barm	e du		Prepa	red By	i: A	 Л	• •					
Of:			97 2.01	J		Revie	-		M						
									<u>,</u>						
For Inte	ərnal U	se Only	ŀ	Have: 🛛 JSA/JS	SEA 🛛 PPE	: 12 ·	Training	g Need	S-RAF: 🗌 Y	es 🛃 No	Initial	5:			



Project No.: ///03232	Date: 2017/09/27
Client: CHA	Contractor: Buffere's
Project: Tanapune stoney creek	Compaction       Roofing         Footing Base Evaluation       Structural Steel         Subgrade Evaluation       Reinforcing Steel         Concrete       Sampling
Location: 65 Green Mountain la Hamillon, ON	<ul> <li>Asphalt Paving</li> <li>Other (specify):</li> </ul>
Field Results Temperature: 24	
The above noted site was vis	iled by GHA representative as requested
	conduct the compaction last on the
silly chay truce sand & graves	el malerial, being as final quade
- /	iser construction. The compaction was
	e sheepsfool roller. After using a nesult shoused 98% to 100% spman,
which met the project specifica	
1 Stop2	1 N
Final gude Alla (.	is work in progress
compacted VIIIIA	
clay liner	
Corrective action to be taken:	20 - around water 29. collector pipes
	P. collector pipes
	- Slope
Follow up visit required:	
Site Rep.: B, Dermody	Prepared By: A, I
Of:	Reviewed By:
For Internal Use Only Have: JSA/JSEA PPE 1	raining Need S-RAF: Yes -No Initials:



Project	No.: /// 6	13232	Date: 2017/09/27										
	GHD				Contractor: Bufferin								
Project	: Tern	spure	stoney				e Visit Type:						
			munt										
L	Type Mater					I		Maximum I	Dry		Optimum V	Vater	
								Density (kg	J/m³)		Content (%)		
Ī		ilt.	clay la	ace sar	AS	2 24	man l	1751			15,3		
			<u> </u>										
Maxim	um dry densit	y obtained	d from:	STD	. Test		MOD. Test	Estim	ated		] Control Strip	)	
Samp	le(s)		¬	If yes, speci	fy testi	ng to l	be done:						
Secu	· ·	]Yes [	] No	Proctor	STD.		MOD.	🗌 Grada	ation				
Area Te	ested:			L,									
Test	Test Locatio	on		Test	Mater	ial	Dry	Moisture	Compa	ction	Specified	Action	
No.	Refer al	e Grove A	nd waler	Elevation	Туре		Density (kg/m³)	Content	(%)		(%)		
62		stor p	npe	5th all	I	-		· ,	98	~	98		
3	gland C	tomr	v & 40mw	· · · · · · · · · · · · · · · · · · ·	I		17/3	13.3	<u> </u>			C	
	assit	<u>bbm</u>	N & 24mu	O grade			1760	1	100		98	C	
3	about 5/mN 235mic			I		1783 15.0		100		98	c		
3 (4) (1) (1) (2) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4			825mw		Ī		1739	15,5	9.	4	98	C	
5			9 12mw	_11-	I		1722	14,8	98		98	C	
6		-	2 16mw	-11-	I	-	1682		96		98	NC	
(F)			est 6	-11-	Ī		1727	15.0	99		98	C	
(8)			5 g 7mw		I		1759	15.4	100		98	C	
(9)	abriel	30ms	215mus	-1(-	I		1736	13,9	99		98	C	
(0)	aboret	42ms	48mw	-11-	I		1772	14,6	15	P	98	C	
			1										
									L				
Action:		omplyi <mark>ng</mark> t	o spec. NC =	Not complying	to spe	C.		······					
Comme	ents:						dard Counts (	T	eptable v		-	noisture 4%)	
							ge No. <b>7852</b>				ld Reading	Variation %	
					•••••	Density	335	1		47.9	0,1		
						l	Moisture	409	F	39	6,6	1.8	
Site Re	р.: <u>В</u> ,	Dear	noby		Prepa	red By	/:	4. <u>s</u>					
Of:							y:	N					
For Inte	ernal Use Onl	у	Of:										



Project No.: ///03232	Date: 2017/09/27
Client: CHD	Contractor: Bufferin
Project: Tennapure stoney land fill	Subgrade Evaluation 🛛 Reinforcing Steel
Location: 65 Green Moren Co Hamilton	Concrete     Sampling       Sampling     Asphalt Paving       Other (specify):
Field Results Temper	
The above noted site	was visiled by GHU representative as requ
	t was to conduct the compaction last on
	ed and national guesel, being used as Engin
	Le trench within two avers (see slatch below)
After using a nuclear	density gauge, all tests result showed 95%
7 8/ SPMAO, Which mex	<sup>2</sup> the project specifications, se primary compacted day to
19. 11 R	Composed
don pipe Nº2 En pipe nº2 En pipe nº2	Engines red fill collector pipe Nº
Engingened fill	connected to the
Corrective action to be taken:	primary compacted chay liner
	7
Follow up visit required:	Yes No
Site Rep .: B . bermody	Prepared By: A.
Of:	Reviewed By:



Project No.: ///03232	Date: 2017/09/27
Client: GHA	Contractor: Aufferin
Project: Terrapure stoney creek	Compaction       Roofing         Footing Base Evaluation       Structural Steel         Subgrade Evaluation       Reinforcing Steel         Concrete       Sampling
Location: 65 Green Monenlain Rd Hamillon, ON	<ul> <li>Asphalt Paving</li> <li>Other (specify):</li> </ul>
Field Results Temperature:	
In addition the compact last	was carried out for backfilling
	the were installed. The contractor
	- condary compacted chay linen,
	gauge, all lest recelt varied from
98% to 99% spmAD, which me	
(see attached pictures for	
Corrective action to be taken:	
Follow up visit required:	□ No
Site Rep.: B, Sarmody	Prepared By: A.
Of:	Reviewed By:
For Internal Use Only Have: 🔄 JSA/JSEA 🖸 PPE 🖸 T	raining Need S-RAF: □ Yes ⁄□ No Initials: 🕅



Project	No.: 11103232	Date: 2017/09/27								
Client:	GHS		Contractor: byfferin							
Project	: Terrapure stoney c. m: 65 Green Mountai			e Visit Type:	•	Full time	•	□ Part t	🔲 Part time	
Locatio	D. 65 Caro Marcha							<u> </u>		
	Type Material Description					Maximum [	Drv		Optimum V	/ater
						Density (kg	-		Content (%	
Ī	sill aline in the	a. A.A	er ,		¢ 17	200	6		7,7	
	silly clay with	Crue theo	Enakenak Jravel							
T	Silty clay trace	e sund	2 9	rav	gQ	175	7		15.3	3
Maxim	um dry density obtained from:	STD		Γ	] MOD. Test	Estim	ated		Control Strip	
Samp	ple(s)	If yes, speci	fy testi	ng to	be done:				<u> </u>	
Secu		Proctor	STD.		MOD.	Grada	ation			
Area T	ested:								900 8 0	
Test	Test Location	Test	Mater	ial	Dry	Moisture	Compa	ction	Specified	Action
No.	Refer at aroundwalen	Elevation	Туре		Density	Content	(%)		(%)	
<u> </u>	Collector Pipe Nº1	18E life			(kg/m³)	(%)				
0	about 2mE 4 12ms	V	1		1966	9.5	98		95	C
R)	abult Imw & 45ms	1st lift I			1929	9.1	96		95	e
3)	about 3m EX doms	2nd life	I		1911	8,8	95		95	C
2) 3) (4)	afret 2mw 460ms	2nd lift	T		1920	9.0	96	2	95	e
		V								
	lefer at annoburg ten collector pipe N: 2									
(5) (E) (7) (8)	about 4ms & 4mw	18t lift	Ī		1908	10.2	95		95	e
6)	abret 3mn & 20mw	1st lift	I		1934	8.3	96		95	C
(7)	about 3ms & 2mw	2nd fife	Ĩ		1957	8,9	97		95	C
(8)	abril 4mm & 30mw	2nd left	Z		1922	9.0	96		95	C
	lefer at amenduration colled	or .								
Ð	about 60ms 47mw	18th lift	TT	0	1715	15.0	98	ŝ	98	e
[10]	about 61ms & 8mw	2nd lift	Ĩ		1727	14.4	99	,	98	e
Tu	about 60ms & 7.5mw	3nd lift	ū	• •	1736	14.7	99		98	C
Action:	C = Complying to spec. NC =	Not complying	to spe	eC.						
Comm	ents:			Star	ndard Counts (0	OPSS 501 acc	ceptable va	ariation	: density 2%, r	noisture 4%)
				Gau	ge No. <b>7852</b>	Calibrat	ion	Fie	ld Reading	Variation %
				Density	335	(	33	47.9	0,1	
				Moisture				96.6 1.8		
Site Re	p.: B. Darmody		Prepa	red B	y: A,					
Of:		Revie	-		Ple	1				
							, 			
For Inte	ernal Use Only Have: 🛛 JSA/J	SEA 🗗 PPE	<b>D</b> .	Trainin	g Need S	S-RAF: 🗌 Yi	es 🖂 N	10	Initials	1



Project No.: 11103232	Date: 2017/10/03
Client: CHU	Contractor: Bufferin
Project: Terreporere stoney creek Land fill	Compaction       Roofing         Footing Base Evaluation       Structural Steel         Subgrade Evaluation       Reinforcing Steel         Concrete       Sampling
Location: 65 Green Mountain No Hamilton	Asphalt Paving     Other (specify):
Field Results Temperature:	
The purpose of the visit was	to follow up the compaction test
	& gravel material being used for
	ner construction (4th & 5th lifts). The
	Ity clay brace sand & gravel malered
as Engineered fill por facth	Iling the Anchon Trench in order
to Hold the Geomembrane an	A Cestrolile malerials.
After wing a nuclear sensity	gauge all test result showed 98
to 100/ spin AD, which med the	2 project specifications (see attached
photos for more selaits).	
Corrective action to be taken:	
Follow up visit required:	
Site Rep.: B. bermody	Prepared By: A D
Of:	Reviewed By: W
For Internal Use Only Have: SJSA/JSEA PPE T	raining Need S-RAF: 🗌 Yes 🔄 No Initials:



Project	t No.: 11103232	Date: 2017/10/03									
	GHD		Contractor: Drefferin Site Visit Type: Tull time Part time								
Project	: Ternapune stoney cr	eek		Site	Site Visit Type: 📑 Full time 🔲 Part time						
Locatic	n: 65 Green Mountain	r RS									
Material	Type Material Description					Maximum I			Optimum V Content (%		
					<u> </u>	Density (kg			Content (70	,	
2	Silly clay true	ce sund	1 2	gr	avel	17	51		15,	3	
				<i>v</i>	·····						
					· <b>_</b> ·						
Maximu	um dry density obtained from:				MOD. Test	Estim	nated		Control Strip		
Samp		If yes, speci	•	ng to l	be done:						
Secu		Proctor	Proctor STD. MOD. Gradation								
Area Te		1	T	• _ 1	ا <u>ہ .</u>	Ing_!_4	10		0		
Test No.	Test Location Refer al Groundwalen	Test Elevation	Mater Type	ial	Dry Density	Moisture Content	Compaction		Specified (%)	Action	
	collector pipe Nº 2				(kg/m <sup>3</sup> )	(%)					
$\bigcirc$	about 11ms & 90mw	4th lift	H I		1787	15,8	100		98	C	
	abril 8ms & 65mw	-11-	I		1760	16.0	100		98	C	
Ì)	abret 10ms & 22mw	-1(-	7		1743	14.9	99		98	e	
(4)	about 7ms 4 85mw	5th lift	T		1690	1 .	96		98	Ne	
(4) (1) (1) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4	Repeat lest (4)	-11-	I		1725	16.2	98		98	C	
G)	ahrel 12ms & 53mio		I		1772	14,8	100		98	e	
7)	about 8ms & 20mw	-16	I		1756	15.5	1000		98	C	
-	Refer al arandualen						1				
	collector pipe Nº=1						1				
1	abrel 3m w & 30ms	18t life	I		1709	1417	98		98	e	
(4) (10)	about 3mw & 12ms	and life	I		1718	1516	98		98	C	
(10)	abril 3mw & 6ms	3rd lift	T		1727	15,9	9	9	98	c	
					h <del></del>						
Action:	(C) Complying to spec. NC =	Not complying	to spe	C.		J					
Comme	ents:						ceptable v	ariation	n: density 2%, r	noisture 4%)	
					je No.2243	Calibrat	tion	Fie	ld Reading	Variation %	
				Density				179,8	0.2		
				1	Voisture	493,	5	48	38.6	0.9	
Site Re	ep.: B. Dermody		Prepa	red By	r: <u>A</u>						
Of:			Review	wed B	y:	el j					
For Inte	ernal Use Only Have: 🗹 JSA/JS	SEA 🗁 PPE	2	Fraining	g Need		es 🕗	No	Initials	:	
289480340366							a a state a serie a se				

(HD)

Date: 2017/10/02 Project No.: 11103232 Contractor: Defferin Client: QHA Compaction Roofing Project: Tomopure stoney creek Footing Base Evaluation Structural Steel Subgrade Evaluation Reinforcing Steel **Concrete** Sampling Location: 65 Green mountain Rd Asphalt Paving Hamilton, on Other (specify): X Temperature: 🎝 °C Field Results The purpose of the visit was to conduct the compaction lest on the clay brace sand & growel material being used as secondary compacted clay liner (see setetch below for more detail and all lest result showed 98/ to 100/ spmal, which mel specifications, The contractor has made some afforts for picking up the works, and each lift was walkned before the placeme of successive lifts. 7N Work in Progress 5.1 - Gunend well -collecto . Corrective action to be taken: NSE around water collector Zom ZSM pipes Inspec secondary compacted clay linen 7 Yes Follow up visit required: No Site Rep .: B. Dermody Prepared By: ALA Of: Reviewed By: For Internal Use Only Have: JSA/JSEA PPE Training M Need S-RAF: Ves 2 No Initials:



4

#### **Soil Compaction Verification Report**

Project No.: 11/03232							Date: 2017/10/02							
Client: CHA							Contractor: Buffers in							
Project: Terrapure stoney creek Location: 65 aneen Mountain Rd							Site Visit Type:   Full time				🔲 Part ti	Part time		
Locatio	on: G	5 Green	Marsta	in Rd										
Material	Туре	Material Des	cription			L		Maximum I			Optimum W			
								Density (kg	/m³)		Content (%	)		
Ī		silly	cluy tre	rce San	d 3	2 9	navel	17	51		15.	3		
			<i></i>											
Maxim	um dry	density obtair	ned from:	STD	. Test		] MOD. Test	Estim	ated		Control Strip	)		
Samp	ole(s)			If yes, speci	ify test	ng to	be done:							
Secu	ired:	🗌 Yes	🗌 No	Proctor	STD.		] MOD.	🗌 Grada	ation					
Area T	ested:	Secondo	any clay &	linar										
Test	Test I	ocation		Test	Mate	ial	Dry	Moisture	Compac	tion	Specified	Action		
No.	lefe	r al Gr	orendura br	Elevation	Туре		Density (kg/m <sup>3</sup> )	Content (%)	(%)		(%)			
$\overline{0}$			2 90mW	1st lift	5		1768	15,6	109	<u> </u>	98	C		
151	Î		2 GOMW	-11-	Ī		1730	14.5	99		98	c		
21			& 25mm		Ī		1719	15,2	98		98	e		
(in)	alm	ef Gra G	2 88 min	2nd leff	Ž		1677	14.0	91		98	NC		
2 3 4 5 6 7 8 9			2 00 mm	-11-	1	<u> </u>	1721	14,8	98	*	98	C		
(c)			5 & SOMW		Ī		1758	15,4	100		98	e		
121			S & ZIMM		T		1	16.0	_		98	e		
(0)			5 & 92mm				1742 1702	14.9	97		98	NC		
				v	1		1736	15.0	99		1			
(m)		seal les	-	-11-							98	C		
(10)			2 70mW	-11-	I -		1684	15.7	96		98	Ne		
(11) (2)		veat b		-11-	I		1726	14,2	98		98	C		
	ah	net lom	5 <u>8</u> 30 mW	-11-	1		1781	15.8	109	2	98	C		
Action:	L(	C)= Complying	a to spec NC =	Not complying	to spe		<u> </u>				L	1		
Comme			g to spee. No -		to spe				ontoble ve	riation	donoity 20/ n	noioturo (19/)		
							ge No./775	Calibrat			i: density 2%, moisture 4%			
							Density	207			71,6	0.2		
							Moisture				39.7	1,8		
Site Re		R. Da	ana a A.I		Prepa	rod D.		A·A	l.	.~	<u>e v · 1</u>	L		
						wed E	·	011						
	Of: R(							<u></u>						
For Inte	ernal U	se Only	Have: 🖂 JSA/JS	SEA 🔄 PPE	Ŀ,	Frainin	g Need	S-RAF: 🗌 Ye	es 🗁 N	0	Initials	;		



Dient: 948 Contractor: Brifen's Project: Ternapure Planey creek Compaction Contractor: Brifen's Contractor: Brifen		
Project: To rap une florag creek       Compaction       Roofing         Broder       Studiation       Studiation       Studiation         .coad fill       Subgrade Evaluation       Reinforcing Steel         .coation: 65 Craen Moundewn 2d       Asphalt Paving       Sampling         .coation: 65 Craen Moundewn 2d       Other (specify):       Sampling         .coation: 65 Craen Moundewn 2d       Sampling       Sampling         .coation: 64 Sile usaw 2d       Coate an alwaw 2d       Sampling         .coation: 64 Sile usaw 2d       Sampling       Sampling         .coation: 64 Sile usaw 2d       Sampling       Sampling         .coation down performed by Cle undewn 2d       <	Project No.: ///0.3232	Date: 2017/10/05
Project: Janapha (2012)   Image: Land fill   Image: Land fill <t< td=""><td>Client: GHL</td><td>Contractor: Bufferin</td></t<>	Client: GHL	Contractor: Bufferin
cocation: 65 Graen Morshlain 2d       Cother (specify):         Cother (specify):       Cother (specify):         Field Results       Temperature: 22 °C       Cother (specify):         The above noled to'le was vitible by AHB representative as negued         The purpose of the wint was to conduct the compaction lest on         the purpose of the wint was to conduct the compaction lest on         grave(), twing weed as Engineered for for backpilling the trench.         The compaction was performed by the modulum to's theops for antic.         All test new the after word on the project to be taken:         Follow up visit required:         Follow up visit required:         Yes         No         Site Rep: B, bermody         Prepared By: A.A.         Reviewed By: No	Project: Tanapuse stoney creek	Compaction     Roofing     Footing Base Evaluation     Subgrade Evaluation     Reinforcing Steel
The above noted site was visited by Atth representative as request         The purpose of the visit was to conduct the compaction text on         the Execused of malaxiels [silly clay with crucked & natural         gravel) teins used as Engineered pill for buckpilling the trench.         The compaction was performed by the medium size theory fool notto.         All tests result, after which met the project specification.         95// to 78// spm40, which met the project specifications.         Follow up visit required:         Site Rep: B, bermedy         Prepared By: A.A.         Reviewed By: No.		Asphalt Paving
The purpose of the visit was to conduct the compaction last an         the Execovaled malerials (Silly clay with crushed & national         gravel), twing used as Engineered fill for buckfilling the trench.         The compaction was performed by the modium size sheeps foll colle.         All lett results, after which mell the project specifications.         95% to 98% spm64, which mell the project specifications.         Follow up visit required:         Ø Yes         No         Site Rep.: B, bermely         Prepared By: M.	Field Results Temperature:	<u>za</u> « 🚰 🖑 🖓 🧖 👘
The purpose of the visit was to conduct the compaction last an         the Execovaled malerials (Silly clay with crushed & national         gravel), twing used as Engineered fill for buckfilling the trench.         The compaction was performed by the modium size sheeps foll colle.         All lett results, after which mell the project specifications.         95% to 98% spm64, which mell the project specifications.         Follow up visit required:         Ø Yes         No         Site Rep.: B, bermely         Prepared By: M.	The above noted site was	a visiled by GHI representative as requester
the Executed malerials (rilly clay with crushed & nalumal gravel) leing used as Engineered fill for backfilling the trench.         The compaction was performed by the matiem rize sheeps for solle.         All last result, after using a nuclear donsity gauge, varied from 95% to 98%, spm40, which met the project specifications.         Corrective action to be taken:		· /
gravel), teing used as Engineened fill for bactfilling the trench. The compaction was performed by the medium size sheeps for notice All lest result, after using a nuclean stonely gauge, varied from 95% to 98% spm49, which met the project specifications. Corrective action to be taken: Follow up visit required: ØYes □ No Site Rep: B, bernody Prepared By: A.A Cf: Reviewed By: No		
The compaction was performed by the medium type theops for anti-   All tests results, after using a nuclean density gauge, varied from   95/ to 98/ spm44, which met the project specifications.   Corrective action to be taken:		
All lest servelle, after using a nuclean dentity gauge, varied from 95% to 98% spmAA, which mel the project specifications. Corrective action to be taken: Follow up visit required: Yes No Site Rep.: B, bermody Prepared By: A.A Prepared By: M		
95/, to 98/, spm40, ushich mat the project specifications.		
Corrective action to be taken:         Follow up visit required:         Yes         No         Site Rep.:         B. Bernody         Prepared By:         Previewed By:		
Follow up visit required:     Yes     No       Site Rep.:     B, bermody     Prepared By: A.A.       Of:     Reviewed By:     M		
Follow up visit required:     Yes     No       Site Rep.:     B, bermody     Prepared By: A.A.       Of:     Reviewed By:     M		
Follow up visit required:     Yes     No       Site Rep.:     B, bermody     Prepared By: A.A.       Of:     Reviewed By:     M		
Follow up visit required:     Yes     No       Site Rep.:     B, bermody     Prepared By: A.A.       Of:     Reviewed By:     M		
Follow up visit required:     Yes     No       Site Rep.:     B, bermody     Prepared By: A.A.       Of:     Reviewed By:     M	····	
Site Rep.: B, bermody Of: Prepared By: A.A Reviewed By:	Corrective action to be taken:	
Site Rep.: B, bermody Of: Prepared By: A.A Reviewed By:		
Site Rep.: B, bermody Of: Prepared By: A.A Reviewed By:		
Of: Reviewed By:	Follow up visit required:	□ No
	Site Rep.: B, bermody	Prepared By: A
For Internal Use Only Have: 🖉 JSA/JSEA 🖉 PPE 🖉 Training Need S-RAF: 🗌 Yes 🖉 No Initials:	Of:	Reviewed By:
	For Internal Use Only Have: D JSA/JSEA	PPE Training Need S-RAF: Yes The Initials:



500 mm - 22

#### **Soil Compaction Verification Report**

Project No.:	11103232			Date: 2017/	10/05			
Client: CA		قر		Contractor: 🛃	efferin			
Project: Te	5 aneen Mounta	enee/C		Site Visit Type:		Full time	📋 Part t	ime
Location:	5 areen Mounta	in Rd						
Material Type	Material Description		······		Maximum I		Optimum V	
					Density (kg	ı/m°)	Content (%	)
Ī	silty clay with	crushed	1 p na	lunal	200,	6	7.7	•
			9	navel				
	/ density obtained from:	Ø STD		MOD. Test	Estim	lated	] Control Stri	0
Sample(s) Secured:	🗋 Yes 📋 No	If yes, speci						
		Proctor	] STD.		Grade	ation		
Area Tested:	Location	Teet	Bateriol		BARIANNA	Commention	Casalfied	
	n at aroundwaler	Test Elevation	Material Type	Dry Density	Moisture Content	Compaction (%)	Specified (%)	Action
cal	lection pipe Nº 2			(kg/m³)	(%)			
1) ab	to.sms & 6mw	18 life	I	1905	5,3	95	95	e
2) ab	PISMS & SME	18t life	I	1856	5,7	92	95	NC
2) abu 3) /2	upeal test 2)	-11-	I	1918	5.8	96	95	C
(4) ali	t 4ms & 20mw	2nd life	I	1949	6.2	97	95	C
5) ala	NE 2MN & GME	-11-	I	1930	6.7	96	95	c
6 al	no Ims & Izmw	3nd gift	Ī	1873	5,6	93	95	NC
	epeat test (6)	-11-	I	1923	5.5	96	95	C
8 2	hal 3ms 25mE		I	1915	6,5	95	95	e
9) ab	net 5ms & 16mw	4 ch lift		1955	6.0	97	95	C
(0) <u>ab</u>	net 1,5 mN & 3mE	-11-	I	1969	6.3	98	95	c
	, 							
			-					
Action:	C = Complying to spec. NC =	Not complying						
Comments:				Standard Counts (	4			1
			-	auge No. <u>425</u> Density	Calibrat		Id Reading	Variation
				Moisture	1986		977.8	0.4
0#+- D-	D A A		l		460	10 7.	53,7	1,4
	B. Dermody		Prepared		.O M			
Of:			Reviewe	d By:	14			
For Internal L	Jse Only Have: 🕞 JSA/J		<i>⊟</i> Trai	ning Need	S-RAF: 🗌 Ye	es 🖵-No	Initials	i;
For Internal L	ise Only Have: LardSAJ	ISEA 🕗 PPE	drai	ning Need :	S-RAF: ∐ Y	es LJ-No	Initials	



ne 2019 für die Kanade eine gestellte eine Kanade eine Gestellte eine Kanade eine Kanade eine Kanade eine Kanad Ne	Manatakan kana salah sana sana kana kana kana kana kana kana	
Project No.: ///03232		Date: 2017/10/06
Client: <i>GHS</i>		Contractor: Buffers'n
Project: Terrepure Land fil		Compaction     Roofing     Footing Base Evaluation     Subgrade Evaluation     Concrete     Asphalt Paving     Concrete     Subgrade Evaluation     Concrete     Sampling
Har	rillon, ON	Other (specify):
Field Results	Temperature: 🛛 🎝	_ • 🕸 🛎 🖓 🥮
The above notes	A sile was rivis	led by GHA representative as requested.
		conduct the compaction bat on the
		with crushed & notural gravel ) bain
		etfilling the trench.
		project specifications.
·		
Corrective action to be take	n:	
· · · · · · · · · · · · · · · · · · ·		
·		
Follow up visit required:	₽ Yes	□ No
Site Rep.: B. Jermod	4	Prepared By: A.J
Of:		Reviewed By:
For Internal Use Only Ha	ave: 🛛 JSA/JSEA 🖉 PPE 🖉 🕅	Training Need S-RAF: ☐ Yes ☐-No Initials:



Project No.: 11103232			Date: 2017	10/06			
Client: GHD	la		Contractor:				
Project: Tomapune stoney Location: 65 Green mounda	Cro. C		Site Visit Type:		Full time	📋 Part t	ime
Location: 65 Barron mounta	in RS						
Material Type Material Description		I		Maximum I	Dry	Optimum V	Vater
				Density (kg	J/m <sup>3</sup> )	Content (%	)
I silly clay with	h arush	Ay	nolunal	200	6	7.7	
I silly clay with			gravel				
Maximum dry density obtained from:	STD	. Test	MOD. Test	Estim	nated	] Control Stri	о С
Sample(s)	If yes, speci	ify testing	to be done:				
Secured: Yes No	Proctor	] STD.	🗍 MOD.	Grada	ation		
Area Tested:		-					
Test Test Location No. Refer al Groundwaler	Test Elevation	Materia Type	Density	Moisture Content (%)	Compaction (%)	Specified (%)	Action
() about 4ms \$ 10mo	186 0.24	I	(kg/m <sup>3</sup> )		0.0	ar	
			1925	5.4	96	95	C
2) about 1.5 mrs & 2mE	-11- and A.11	2	1909	5.2	95	95	C
(3) about Ims & 20mw		Z	1964	6,0	98	95	e
4) about 5m3 & 4mE		I	1936	1	96	95	C
5) about 2mal & 15m W		Z	1920	7.0	96	95	C
(C) about 3ms & 2.5mE	-11-	Ī	1881	6,5	94	95	NC
(7) Repeat lost (6)	-11-	I	1917	6,5	95	95	د
(E) about 4ms 4 8mw	ych fife	Z	1992	6.8	99	95	C
(9) About IMAN & SME	-11-	I	1951	7.1	97	95	C
	Not complying	to spec.					
Comments:			Standard Counts (	η			T i
			Gauge No. 425	Calibrat		ld Reading	Variation %
			Density	1986		979.1	0,4
			Moisture	460	1.2 4	55.6	0.9
Site Rep.: B. Bermody		Prepare	d By: <u>A</u> ,	٩	•10		
Of:		Reviewe	ed By:	utras for a second s	PM		
For Internal Use Only Have: JSA/JS	SEA 🖸 PPE	[]-∕⊤ra	ining Need		es 🕢 No	Initials	;;

GID			Standard Proctor Test (ASTM D698)
Client :	GHD Ltd.	Lab No :	S1467
Project/Site :	Stoney Creek Landfill Phase 8A	Project No :	11103232b1
1800 1780 1780 1760 1740 1740 1720 1720 1720 1680			Zero Air Voids Line
1660 • 1640 • 1620 • 1600 •	7.0         9.0         11.0         13.0           Water Conter	15.0 17.0 nt (%)	19.0 21.0
Prepared Sample: ASTM D698 Test M	Dry X Moist ethod: A X B C		med G <sub>s</sub> : 2.75 of Hammer: Manual
Soil Type: Material: Proposed Use: Sample Identification Sample Location: Aggregate Supplier, Sample Date: Sampled By: Remarks :	N/A	Max. Dry De Optimum M % Retained Corrected D Corrected C	oisture: <u>15.3 %</u> on 4.75 mm: <u>0.0 %</u> ry Density: <u>1751 kg/m<sup>3</sup></u>
Performed by :	Omar.S	Date :	September 14, 2017
Verified by :	Raj Kadia, C.E.T.	Date :	September 15, 2017

GHD-FO-930.205a (On)-Standard Proctor Total (Rev.2) 04-28-2016

# Appendix D5 Results Dated November 30, 2017

Reference No. 11103232



November 30, 2017

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

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

RK/ps/5

Encl.

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

# Attachments

# Attachment A Field Inspection Reports

GHD

Project No.: ///0323	2	Date: 2017/10/13	
Client: CHL		Contractor: Dufferin	
Project: Tarupure	stoney creek	Compaction Footing Base Evaluation Subgrade Evaluation	Roofing     Structural Steel     Reinforcing Steel
Location: 65 Gree	en morenlain 23	Concrete	☐ Sampling
Field Results	Temperature:/	<u>5</u> ℃	
The above no	la sile was	visiled by CHA rep	resentativo as requi
		to conduct the com	
		clay with crushed &	
used as com	The they ber how	Gackpling the tren	on proven sice 19
		backfiling the tren	
After using a r	welean densil	ly gauge, all Cesto resu	It showed 96% to
After using a r	welean densil	-	lt showed 96% to
After using a p 99% Spm DD, use	wclear densit	ly gauge, all Cesto resu	lt showed 96% to
After using a r 99% Spm SD, well	welean densil	ly gauge, all Cesto resu	It showed 96% to
After using a r 99/ Spm M, use Hy cont	hich mel the p that lic hol hyper state	ly gauge, all Cesto resu	to showed 96% to secondary clay linen
After using a r 99% Spm SD, well	hich mel the p that lic hol hyper state	ly gauge, all lest resur reject specifications	lt showed 96% to
After using a r 99/ Spm M, use Hy cont	hich mel the p that lic hol hyper state	ly gauge, all lest resur reject specifications	to showed 96% to secondary clay linen
After using a r 99/ Spm M, use Hy cont	travelic Anaulic Anaulic ARR ARR 33	ly gauge, all test resurreged specifications	to showed 96% to secondary clay linen
After using a r 99% Spm M, ush Hy cont around waller collector pipe N=1	travelic Anaulic Anaulic ARR ARR 33	ly gauge, all test resurreged specifications	to showed 96% to secondary clay linen
After using a r 99% Spm M, ush Hy cont around usa br collector pipe N=1	travelic Anaulic Anaulic ARR ARR 33	ly gauge, all test resurreged specifications	to showed 96% to secondary clay linen
After using a r 99% SpmM, use Hyd conte around wallor collector pipe N=1 Corrective action to be tal	ken:	ty gauge, all Cest reserveyed specifications	to showed 96% to secondary clay linen
Affac whing a r 99% SpmM, use Hy cont around wallow collector ppe N=1 Corrective action to be tal Follow up visit required:	ken:	gouge, all lest rese reject specifications m 70m	to showed 96% to secondary clay linen
After using a r 99% SpmM, ush Hyd conte around wallsr collector pipe N=1 Corrective action to be tal	ken:	ty gauge, all Cest reserveyed specifications	to showed 96% to secondary clay linen



Project No.: 11103232 Client: GHA Project: Terrepune Stoney Location: 65 Green Mounta	creat	C	ate: 2017 ontractor: 8 te Visit Type:	fein	Full time	🗌 Part	time
Location: 65 Green Mounta Material Type Material Description	u'n Ro			Maximum Density (k	V 10 2	Optimum \ Content (%	
I silly clay with	the crush	Ped 2 -	raberal travel	20	P6	717	1
Maximum dry density obtained from:	STC	). Test [	_ MOD. Test	Estin	nated [	Control Stri	p
Sample(s)	If yes, spec	ify testing to	be done:	Grad	lation		
Area Tested: Test Test Location No. Refer at Conversionalen collector Pipa N-1	Test Elevation	Material Type	Dry Density (kg/m³)	Moisture Content (%)	Compaction (%)	Specified (%)	Action
1) abriet 40m N & 10m w	1st life	I	1927	9.5	96	95	C
2) about 69mN & Fmw	-11-	2	1988	8,9	99	95	e
3) abril 36mN & 5mio	2nd life	I	1871	10.0	93	95	Ne
	-11-	I	1933	9.6	96	95	C
4) Repeat Cest (3) 5) about 42m N & 3mu 6) about 65m N & 6mu 7) about 50m N & 5m w	3rd life	I	1967	8.7	98	95	C
6) about 65mN & 6mio	4th aft	I	1954	7.9	97	95	c
Z) almel 50m N & 5m w	5th lift	I	1884	8,3	94	95	NC
8) Repeat lest (7)	-11-	T	1970	8,7	98	95	C
9) about 58mn 97mm	, 6th lift	I	1947	810	97	95	C
Action: C = Complying to spec. NC =	= Not complying	to spec.					
Comments:	. ist somprying		andard Counts (	OPSS 501 ac	ceptable variation	n: density 2%	moisture 49
			uge No425	Calibra		d Reading	Variation
			Density	198	6.5 19	78.1	0.4
			Moisture	46	0,2 4.	51,7	1.9
Site Rep.: <u>B. Bermody</u> Of:		Prepared E Reviewed		A	All		_
For Internal Use Only Have: JSA/		Traini		S-RAF: 🗌 Y		····	s: A.D



Date: 2017/10/16 Project No .: 11103232 Client: GHU Contractor: Bufferin Compaction Roofing Project: Tennapure Stoney creek Footing Base Evaluation Structural Steel Subgrade Evaluation **Reinforcing Steel** Concrete Sampling Location: 65 Green Mountain Rol Asphalt Paving Hamilton on Other (specify): Temperature: 6 °C **Field Results** The above noted site was visited by GHA representative as The purpose of visit was to requested. Che conduc compacter Filly clay crace sand & gravel malerial, being use lest for Secondary compacted lisen construction. The compacte clay by the medium size sheeps for notter, and all tests projects specificate 100/ Spmal, which met Nº Sulla 98/ 6 The contractor has made some efferte for picking up the noc so tails about the locations see skelch below and some plats Gon more collector Groundwaten collector annahualen 100/2 pipes Nº 1 Area inspected inspected Anea 300 ndary compacted Sciondau comparte d clay linon linen Corrective action to be taken: clay liner clear stone P Yes □ No Follow up visit required: Site Rep .: B, Dermoly Prepared By: A,A Of: Reviewed By: Have: JSA/JSEA PPE Training Need S-RAF: Yes Yo For Internal Use Only Initials:

	-	-
29	PP	
(0	161	11)
	de la	-

Client	et No.: 11103232 : CHD	Ł		Date: 2017 Contractor:		,	130	2.1
Projec Locati	on: 65 Green Moundain	al		Site Visit Type:	Z	Full time	Part	time
Materia	Il Type Material Description				Maximum Density (k		Optimum \ Content (%	
I	sifty clay tra	ce sund	1 gr	avel	175	D	15.	3
Maxim	num dry density obtained from:	<b>₫</b> STD	). Test	MOD. Test	Estir	nated [	Control Stri	p
	ple(s)	If yes, spec Proctor	말 옷만 먹	to be done:	🗌 Grad	lation		
Area 1	Fested:				1.1.1.1.1		100.000	V. 1
Test No.	Test Location Refer al Groundwalen collector pipes Nº 1	Test Elevation	Material Type	Dry Density (kg/m³)	Moisture Content (%)	Compaction (%)	Specified (%)	Action
(1)	about 35mn & 10mw	Ist life	I	1582	17.8	90	98	Ne
() (2)	Repeat lest ()	-11-	I	1711	17.0	98	98	с
(3)	about 66mN & 15mm	1	-	1724		98	98	C
(41	abuel 43mN & 8mw	and life	II	1730	16.5	99	98	C
(3) (4) (5)	about 59mn & 14mil Refer at Croundwalen collector pipes Nº 2	-11-	I	1721	16.3	98	98	c
15	abril 37mw & 15ms	18t life	I	1744	15,7	100	98	C
12)	about Imw & 6ms	INE Rife	T	1727	16.0	99	98	c
OH CH CH	about 30mis 28ms	and life	Ī	1727	15,5	100	98	e
61	about 5mw & 14ms			1739	16.2	99	98	C
1	about 28 mus & 9 ms.	-11- 3nd life	I	1718	15,9	98	98	c
(II)	abril 6m w & 16ms	-11-	T	1747	16,3	160	98	e
Action	: C = Complying to spec. NC =	Not complying	to spec.	4				
Comm	nents:			Standard Counts ( auge No.425	OPSS 501 ac Calibra		n: density 2%, eld Reading	moisture 4%) Variation %
				Density	198	6,5 1	979.3	014
1.1				Moisture	4.61		455,5	1.0
Site R	ep .: B, Dermody		Prepared			RIL		
Of:			Reviewe	d By:	_	M		
For In	ternal Use Only Have: I JSA/JS	SEA 🗹 PPE	🖻 Trai	ning Need	S-RAF: 🗌 Y	es 🖻 No	Initial	s: A.I



e

Project No.: 11103232	Date: 2017/10/17
Client: CHA	Contractor: Defferin
Project: Tennapuse stoney creek	Compaction     Roofing     Footing Base Evaluation     Subgrade Evaluation     Reinforcing Steel
ocation: 65 Green Moundain 2d Hamilton, one	Concrete Sampling Asphalt Paving Other (specify):
Field Results Temperature: 15	
The above roled sile was y	isiled by CHA representative as request
	a conduct the compaction best on the
sifty change brace sund of graves	I material, being used for secondary
	clion (North side & East side of the bermi)
After using a nuclear density	quege, all lest results varied from 98,
to 100/ spinal, which met the	project specifications.
to 100/ spinal, which met the	
to 100/ spinal, which met the	project specifications.
to 100/ spinal, which met the	project specifications.
to 100/ spinal, which met the	project specifications.
to 100/ spinal, which met the	project specifications.
to 100/ spinal, which met the	project specifications.
to 100% spman, which met the (see field report dated 2017	project specifications.
to 100% spman, which met the (see field report dated 2017	project specifications.
to 100% spman, which met the (see field report dated 2017	project specifications.
Corrective action to be taken:	E/10/16 for more delai'le abril de localita
Corrective action to be taken:	Project specifications. Z/10/16 for more delaids about the location



Client: Proiect	t No.: 11103232 GHS t: Ternupure stoney cr on: 65 Green Mountain	reek Pd		Date: 2017 Contractor: Au Site Visit Type:	ferin	Full time	☐ Part	time
Material	Type Material Description				Maximum I Density (kg		Optimum V Content (%	
I	silly clay ena	ce sand	12,	gravel	17.	50	15,3	:
Maxim	um dry density obtained from:	STD	). Test	MOD. Test	Estim	nated [	Control Stri	ip
Samp Secu	TYPE INO	If yes, speci Proctor	0.540.06973	g to be done:	🗌 Grada	ation		
Area To Test No.	ested: Test Location Defer al Grown dwalen Collector poper Nº 1	Test Elevation	Materia Type	al Dry Density (kg/m³)	Moisture Content (%)	Compaction (%)	Specified (%)	Action
6	about 70mN & 14mw	3nd life	I	1742	16.0	99	28	c
	abriel 42mn & 8mw	-11-	I	1723	15,7	98	98	C
(3)	abre & 63mN & 6mw	4th lift		1715	15,3	78	98	C
(4)	about 35mN & 15mw	~	T	1684	16.4	96	98	Ne
5)	Repeat test (4)	-11-	I	1726	16,2	98	98	C
6)	abrie 67m N& 12mw		I	1765	15,5	100	98	C
234500	about 41mon & 7mw Refer al aroundwaler collector pipes 10=2	-11-	I	1776	15,0	100	98	¢
(8)	abrel 35m w & 11m So	4th aft	I	1759	15.8	100	98	c
(9)	about 4mw & 5ms	-11-	I	1743	14,4	99	98	c
10)		5th lift		1727	13,9	99	98	e
(1)	about 8mw & 7ms	-11-	I	1740		99	98	C
Action:	C = Complying to spec. NC =	Not complying	to spec		I			
Comme	ents:		-	Standard Counts (	OPSS 501 acc	and the second se		1
			F	Gauge No425 Density			eld Reading	Variation 9
			F	Moisture	1986		57.1	0.6
Site Re Of:	ep .: <u>B. bermody</u>	-	Prepare	ed By:	D	RI 7	JTIL	
	ernal Use Only Have: JSA/JS	SEA PPE			S-RAF: Y	es 🗹 No	Initial	e:



	32	Date: 2017/10/25	
Client: CHA		Contractor: Dufferin	
Project: Tomapre v	e sloney creak	Compaction Footing Base Evaluation Subgrade Evaluation	Roofing     Structural Steel     Reinforcing Steel     Samelian
ocation: 65 Green	milton, on	<ul> <li>Concrete</li> <li>Asphalt Paving</li> <li>Other (specify):</li> </ul>	Sampling
Field Results	Temperature:	iz_c 🏠 🖄	
The above no	led site was	usiled by GHO repre	sentative as request
		to conduct the comp	
		vel malerial, being	
		Ruction, The compacted	
		/	
	-		
by the media	n size sheeps fro	C rollon. After using	a nuclear density
by the media. gauge, all &	n size sheeps for	ed from 98% to 100	a nuclear densily
by the media. gauge, all & the project of	n size sheeps for isto results vari saufications, (so	C rollon. After using	a nuclear densily
by the media. gauge, all &	n size sheeps for isto results vari saufications, (so	ed from 98% to 100	a nuclear density
by the media. gauge, all & the project of	n size sheeps for isto results vari saufications, (so	ed from 98% to 100	a nuclear density
by the media. gauge, all & the project of	n size sheeps for isto results vari saufications, (so	ed from 98% to 100	a nuclear densily
by the mediu. gauge, all & the project of	n size sheeps for isto results vari saufications, (so	ed from 98% to 100	a nuclear density
by the mediu. gauge, all & the project of	n size sheeps for ish results varis saufications, (so calions).	ed from 98% to 100	a nuclear density
by the medice. gauge, all the the project of about the lo	n size sheeps for ish results varis saufications, (so calions).	ed from 98% to 100	a nuclear density
by the medice gauge, all the the project of about the lo	n size sheeps for ish results varis saufications, (so calions).	ed from 98% to 100	a nuclear density
by the medice gauge, all the the project of about the lo	n size sheeps fro iests results vanis soufications, (so calions).	ed from 98% to 100	a nuclear density
by the medice gauge, all the the project of about the the Corrective action to be Follow up visit required	n size sheeps fro est results vanis soufications, (so calions).	ed from 98% to 100, a from 98% to 100, a attached pholos fo	a nuclear density
by the medice gauge, all the the project of about the la	n size sheeps fro est results vanis soufications, (so calions).	Challon. After using ed from 98% to 100 a Hached pholos fo	a nuclear densily

Soil	Compaction	Varification	Ponort
301	Compaction	vermcation	Report

Page \_\_\_\_ of \_\_\_\_

Project No.: 11103232 Client: GHA Project: Terrapure Stoney Location: 65 Green Mounda		c	Date: 2017/ Contractor: 6 Site Visit Type:	ferin	Full time	Part	time
Material Type Material Description				Maximum Density (kş		Optimum V Content (%	
I silly clay ena	ce sand	2 grav	el	170	50	15.3	
Maximum dry density obtained from:	STC	). Test	🗌 MOD. Test	Estin	nated	] Control Stri	p
Sample(s) □ Yes □ No Secured:	If yes, spec	. J. M. M. M.		🗌 Grad	ation		
Area Tested: Test Test Location No. Refer at Cronendusale Collector pipes No - 1	Test Elevation	Material Type	Dry Density (kg/m³)	Moisture Content (%)	Compaction (%)	Specified (%)	Action
(1) about 42ms 210mu		I	1653	16,8	94	28	NC
2) Repeat Cert ()	-11-	1	1717	16.6	98	98	C
3) almet 65m s & 6mu		T	1735	15,0	99	98	e
(4) abre 80m 5 & 14m	and the second sec	I	1762	13.9	100	98	c
4) about 80m & 2 14mi 6) about 100m & 2 8mi 6) about 120m & 2 15mi		I	1758	14,2	100	98	C
6) about 120ms & 15m.	2 -11-	I	1740	14,6	99	98	c
7) abrie Soms & 16me		I	1786	14.4	100	28	C
8) abret 73ms 2 9mu	2 -11-	I	1732	14.0	99	98	c
9] about 92ms & 14mi		I	1723	13.8	98	98	C
10) about 110ms & 6mu	a per la printe de la companya de la	F	17.66	14.9	100	98	C
	C = Not complying						-
Comments:			tandard Counts ( auge No.7852	OPSS 501 acc Calibra	tion Fie	: density 2%, Id Reading	Moisture 4%
		08	Density	335		345,3	- SALLY COLLEG
			Moisture	404		96.7	0.1
Site Rep.: <u>B. Sarmody</u> Of:		Prepared	ву:	1000	- J J	1.011	
For Internal Use Only Have: LJS		Train		S-RAF: 🗌 Y		Initial	

t

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Project No.: 11103232		Date: 2017/10/26
Client: GHJ		Contractor: Bufferin
Project: Terrapure 8	toney creek	Compaction Compaction Roofing
Location: 65 Green Han	nounlain Rd wilton, on	Concrete Sampling Asphalt Paving Other (specify):
Field Results	Temperature:/	<u>12_0</u> 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
The above notes	1 site was v.	inced by GHD representative as requised
		to conduct the compaction last on the
		vol malerial, sing used for primary
	sector and an end of the sector of the sector and	
	y linen conse	
compacted cla	y linen const	Eruction . After using a nuclear density
gauge, all lest	5 results sh	
compacted cla	5 results sh	Eruction . After using a nuclear density
gauge, all lest	5 results sh	Eruction . After using a nuclear density
gauge, all lest	5 results sh	Eruction . After using a nuclear density
gauge, all lest	5 results sh	Eruction . After using a nuclear density
gauge, all lest	5 results sh	Eruction . After using a nuclear density
gauge all lest	5 results sh	Eruction . After using a nuclear density
compacted cla gauge, all test the project spec	s results sh ificalions.	Eruction . After using a nuclear density
gauge, all lest	s results sh ificalions.	Eruction . After using a nuclear density
compacted cla gauge, all test the project spec	s results sh ificalions.	Eruction . After using a nuclear density
compacted cla gauge, all test the project spec	s results sh ificalions.	Eruction . After using a nuclear density
compacted cla gauge, all test the project spec	s results sh ificalions.	Eruction . After using a nuclear density
<u>compacted</u> cla gauge, all test the project spec	s results sh ificalions.	Enertion After using a nuclear density housed 98% to 100% spm00, which met
Corrective action to be taken	s results sh ificalions.	Involion Aflen using a nuclean density housed 98% to 100% spm00, which met



Projec	t No.: 11103232			Date: 2017	10/26		-	
Client: GH-0				Contractor: the	Beren			
Project: Terrapure stoney creek Location: 65 Green Mountain Rd				Site Visit Type:	Part time			
Material Type Material Description					Maximum Dry Density (kg/m³)		Optimum Water Content (%)	
I	Silly clay la	ce sand	1 2 %	havel	17:	50	15.3	3
Maxim	um dry density obtained from:	STC	). Test	MOD. Test	Estin	nated [	] Control Stri	p
Sam	ple(s)		ify testing	g to be done:	Grad			
Area 7	ested:			and the second	and shares	10		(
Test No.	Test Location Refer al Conventionlon collector pipes Nº 1		Materia Type	ll Dry Density (kg/m³)	Moisture Content (%)	Compaction (%)	Specified (%)	Action
(1)	about 46ms 9 8mw	3nd life	I	1748	14.1	100	98	C
	abril 60ms 9 16mw	-11-	1	1775	15,6	100	98	C
(3)	abriel 86ms & 10mm		I	1761	15,0	100	98	c
3 4 5 6 7 5	abut 98ms & Fmw	the second second second second	I	1738	14.6	99	98	e
5)	abut 120ms & 13mio	the second se	I	1759	15.7	100	98	c
6)	abrel 41ms & 12mw	4th life	I	1781	13.8	100	98	C
(7)	abrel 67ms & 10mm		I	1719	14,3	98	98	e
8)	about 80ms & 6mio	the second se	1	1691	14.9	9.6	98	NC
91	Depeat cast (8)	-11-	I	1725	14.8	98	98	e
6)	about 110ms & 15mw	-1(-	I	1743	15,8	99	98	2
				_				
Action	C = Complying to spec. NC =	Not complying						
Action Comm		Not complying		Standard Counts (	0000 504		density on	in a latitude and i
				Gauge No. 7852	-		Id Reading	Variation %
				Density	335		345.8	0,1
				Moisture	404		76.7	1.8
Site R	ep .: B. Dermody		Prepare		7.1 f	U		
Of:			Review	and the second	+	V	_	
For In	ernal Use Only Have: SA/JSA/JS	SEA PPE	Tr	aining Need	S-RAF: 🗌 Y	es 🖾 No	Initial	S:



-

Project No.: /// ク3232	Date: 2017/10/27
Client: CHA	Contractor: Bufferin
Project: Terrypune stone cree	Compaction       Roofing         Footing Base Evaluation       Structural Steel         Subgrade Evaluation       Reinforcing Steel
Location: 65 Green Mountain . Hamilton, on	Concrete      Sampling     Asphalt Paving     Other (specify):
Field Results Temperature	: <u>12 °</u> 🖄 🖉 🖓 🕅 🖉
clay liner construction (M Clay liner construction (M The compaction was perf After using a nuclear sea	as to conduct the compaction lost on the silly malinials, Leing used for Primary compacted with & East sides). Knowed by the medium size sheeps foll rollen with gauge, all losts result showed 99%. to the project specificulions.
Corrective action to be taken:	
Follow up visit required:	s 🗌 No
Site Rep .: B, Darmody	Prepared By: A.A
Of:	Reviewed By:
For Internal Use Only Have: JSA/JSEA	PPE Training Need S-RAF: Yes No Initials:



Project No.: ///03 232	Date: 2017/10/27						
Client: CHA Project: Termprene Stoney C Location: 65 Green Mountain Material Type Material Description		Contractor: <b>b</b>			☐ Part time Optimum Water Content (%)		
Material Type Material Description	-						
I silly chy tra	ce sand	8 92	wel	175	50	7.3	
Maximum dry density obtained from:	STD	). Test	🗌 MOD. Test	Estim	nated [	] Control Stri	p
Sample(s) □ Yes □ No Secured:	If yes, speci Proctor		to be done:	🗌 Grad	ation		
Area Tested: Test Test Location No. Refer al Groundwaler bolle elon pripe Mª1	Test Elevation	Material Type	Dry Density (kg/m³)	Moisture Content (%)	Compaction (%)	Specified (%)	Action
	5th life	I	1776	15.5	100	98	c
(1) about 43m 5 4 9mm (2) about 56ms & 15mm (3) about 75ms & 6mm (4) about 93ms & 12mm (5) about 113ms & 10mm		I	1764	19,6	100	98	c
(3) abrel 75ms & 6min	-11-	I	1747	13,9	100	98	e
(4) about 93ms & 12mus	-11-	I	1736	15,0	99	98	c
(5) about 113ms & 10mus	-11-	I	1762	15.4	100	98	C
				2j			
Action: C = Complying to spec. NC =	Not complying	to spec.					
Comments:	The completion	St	andard Counts ( auge No. 7852		ceptable variation	n: density 2%, r Id Reading	moisture 4%) Variation %
		-	Density	335		346,6	0,1
			Moisture	240	4 3	9419	20
Site Rep.: <u>Bibermody</u> Of:		Prepared Reviewed		AIA	₽U		_
For Internal Use Only Have: 🖵 JSA/J		🛛 🖂 Train			es 🖉 No		



Project No.: 11103232	Date: 2017/10/20
Client: GHD	Contractor: beforen
Project: Terrapure stoney or	Compaction     Compaction     Footing Base Evaluation     Subgrade Evaluation     Reinforcing Steel
Location: 65 Green Moun Cain, Hamillon, on	
Field Results Temperature:	<u>*</u> • 🖄 🚿 🖓 🌰
The above noted sile	was winded by OHA representative as
requested. The purpose of	the visit was to conduct the
	silly clay trace sand & gravel, being
	acted clay linen construction (North &
	a nuclear density gauge, all last
result varies from 99	To 100% spmso, which mel the
project specifications,	
Corrective action to be taken:	
Follow up visit required:	□ No
Site Rep .: B. bermody	Prepared By: A.L
Of:	Reviewed By:
For Internal Use Only Have: JSA/JSEA	PPE Training Need S-RAF: Yes No Initials:



Client Proje Locat	ct No.: 11103232 t: GHD ct: Terrupure stoney en tion: B5 Green Mountain		c	ate: 2017-) contractor: By ite Visit Type:	lferin E	Full time	□ Part t	
Materia	al Type Material Description					Maximum Dry Density (kg/m³)		Vater )
I	Billy clay trace	sand e	e grave	e	17:	50	15,3	
Maxir	num dry density obtained from:	EST	D. Test	🗌 MOD. Test	Estir	nated	] Control Strij	0
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	nple(s)	If yes, specer Proctor	cify testing t	o be done: ] MOD.	🗌 Grac	lation		
Area	Tested:							
Test No.	Test Location Defer al ansis dwalen collector pipa Nº 1	Test Elevation	Material Type	Dry Density (kg/m³)	Moisture Content (%)	Compaction (%)	Specified (%)	Action
0	abut 8m 1 2 8min	1st lift	I	1770	15.1	100	98	e
2)	abut 30mN & 12mm	-11-	I	17.63	15.5	100	98	c
(3)	abril 56mN & 14mw	-11-	I	1781	14.9	100	98	c
(4)	abril ISmal & Boww	and life	I	1735	15.7	99	98	c
(5)	abut 40mn & 15mw	-11-	I	1760	14,5	100	98	C
3450	about BOMN & 7mw	-11-	I	1729	16.0	99	98	C
12	Refer at annatwater							1
	collector pipes N 22	192.10	1.1	10.01	1127.1			
(7)	about 2mw & 10ms	IN CITE	I	1746	15.0	100	98	C
(8)	ahet 20mw & 4ms	-11-	I	1767	14.3	100	98	c
(7) (8) (9)	about 45mw & 14ms	-11-	I	17-85	15.6	1000	98	c
Antic		Networkt						
Action	n: C = Complying to spec. NC = ments:	Not complyin					التقديق وال	
John	indi indi			andard Counts ( luge No7852	OPSS 501 ac Calibra	ceptable variation	i: density 2%, r	variation %
				Density	3351		345.8	0,1
				Moisture	404		94,8	2.0
Site F	Rep .: B. Darmody		Prepared	L	7.D			_
Of:			Reviewed			1		
For In	ternal Use Only Have: Z JSA/J	SEA 🗹 PPI	E 🛛 Train	ing Need	S-RAF: S	es PNo	Initials	K.



Project No.: 11103232	Date: 2017/10/31
Client: CHD	Contractor: Bufferin
Project: Ternypure thoney cre	Compaction Compaction Footing Base Evaluation Subgrade Evaluation Reinforcing Steel
Location: 65 Green Moren Car's Hamillon, ON	Concrete Sampling Asphalt Paving Other (specify):
Field Results Temperature	<u>. 5</u> ° 🖉 🖉 🍘 🌰
compactor clean linor of The compaction was per After whing a nuclear de 100% spmos, which mel	gravel malerial, being used for primary moleration (Morth & East sides). formed by the medium size sheeps fool rollen. passity gauge, all lests results showed 98% to the project specifications. Each primary a been scarified and some efforts were made to by hands.
Corrective action to be taken:	
Follow up visit required:	s 🗌 No
Site Rep.: B, Dermody	Prepared By: A.A
Of:	Reviewed By: Py
For Internal Use Only Have: JSA/JSEA	PPE Training Need S-RAF: Yes No Initials:



Project No.: 11103232 Client: GHD Project: Termprine Stoney Location: \$5 Green Mountain			Date: 2017 / Contractor: 4 Site Visit Type:	Marin	Full time	Part	time
Material Type Material Description			- 1.1	Maximum Density (kg		Optimum 1 Content (%	
I silty chay en	ce sand.	2 22	evel	17.	50	15	,3
Maximum dry density obtained from:	ST	D. Test	🗌 MOD. Test	Estin	nated [	] Control Stri	p
Sample(s)	If yes, spec		g to be done:	🗌 Grad	ation		
Area Tested: Test Test Location No. Refer al Groundwald Collector pipes N=2 D about 5mw & 10m.	Test Elevation	Materia Type	l Dry Density (kg/m³)	Moisture Content (%)	Compaction (%)	Specified (%)	Action
( about 5mu & 10m.	s and life	I	1755	14.8	100	98	c
D about 5mw & 10m.		I	1776	15,6	100	98	C
3) about 30m as & 15ms	-11-	I	1743	14.4	99	98	C
3) about 30m 2 9 15m3 4) about 8mw & 14m3 5) about 19mw & 6m3 (c) about 36mw & 13m	3th lift	I	1726	15.0	98	98	e
(5) abret 19mw & 6ms		I	17.65	14.7	100	98	c
C) ghut 36mas & 13m. Repr at aroundwater collector pipes no=4	-11-	I	1741	15,4	99	98	c
(7) abut 10mn & 10mm	3th lift	I	1757	15.6	100	98	e
(8) about 48mal & 8mi	-11-	I	1763	14.5	100	98	c
(8) about 48mil & Imu (9) about 60mil & 15mu	2 -11-	I	1749	15,5	100	28	c
Action: C = Complying to spec. NC	= Not complying	g to spec.					
Comments:	1969 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 -		Standard Counts ( Gauge No.7852	OPSS 501 acc	the second se	n: density 2%, Id Reading	Variation %
		_	Density	3351		43.8	0,2
A			Moisture	404	39	4.7	2.0
Site Rep.: <u>B. bermody</u> Of:		Prepare Reviewe	1.	7.0	W		_
For Internal Use Only Have: DISA	USEA DEPPE			S-RAF: 🗌 Y	es P No	Initial	s:



Project No.: 11103232	2	Date: 2017/11/01			
Client: CHI		Contractor: Aufferin			
Project: Tanaquene stoney creek		Compaction Footing Base Evaluation Subgrade Evaluation Reinforcing Steel			
Location: 65 Green N Hamile	nountain his	Concrete Asphalt Paving Other (specify):	Sampling		
Field Results	Temperature:/	<u>o</u> •c 11 3			
The above not	ed site was visit	ad by CHO represent	alive as requested.		
		enduct the compact			
		malerial, being uses	A second se		
		how [ North & East side			
		C			
was performent	by the medium	size sheeps for Prollan	After using a nucle		
		size shaepsfrot notion showed 991 to 1001	0		
density gauge,	all less result	showed 99/ to 100/	spmas, which met		
density gauge,	all less result	showed 991 to 1001 Rift has been scuri	spmas which net		
density gauge , the project spece some efforts use	all less result ipications . Each remade for pic	showed 99% to 100% Rift has been scuring ching up the rocks,	pied, wale red and		
density gauge , the project spec some efforts use	all less result ipications . Each remade for pic	showed 991 to 1001 Rift has been scuri	pied, wale red and		
density gauge , the project spec some efforts use	all less result ipications . Each remade for pic	showed 99% to 100% Rift has been scuring ching up the rocks,	pied, wale red and		
density gauge , the project spec some efforts use	all less result ipications . Each remade for pic	showed 99% to 100% Rift has been scuring ching up the rocks,	pied, wale red and		
density gauge , the project spec some efforts use	all less result ipications · Each ne made for pic rimary clay line	showed 99% to 100% Rift has been scuring ching up the rocks,	pied, wale red and		
density gauge, the project spece some efforte use of 5th lift of pr	all less result ipications · Each ne made for pic rimary clay line	showed 99% to 100% Rift has been scuring ching up the rocks,	pied, wale red and		
density gauge, the project spece some efforte use of 5th lift of pr	all less result ipications · Each ne made for pic rimary clay line	showed 99% to 100% Rift has been scuring ching up the rocks,	pied, wale red and		
density gauge, the project spece some efforte use of 5th lift of pr	all less result ipications · Each ne made for pic rimary clay line	showed 99% to 100% Rift has been scuring ching up the rocks,	pied, wale red and		
density gauge the project spece some efforts use of 5 th lift of pr	all less result ipications · Each ne made for pic umany clay lines ken:	showed 99% to 100% Rift has been scuring eking up the rocks, a. (see attached p'alu	pied, wale red and		

	200			I.
2				5
0		-	B	)
	240			1
12				В.

Material Type       Material Description       Maximum Dry Density (kg/m <sup>3</sup> )       Optimum Water Content (%)         I       Silly clay time to Stand to gravel       1750       15.3         Maximum dry density obtained from: $\square$ STD. Test       MOD. Test       Estimated       Control Strip         Maximum dry density obtained from: $\square$ STD. Test       MOD. Test       Estimated       Control Strip         Sample(s)       Yes       No       If yes, specify testing to be done:       Free       Gradation         Area Tested:       Test       Material       Dry       Molisture       Compaction (%)       Specified         (1)       akweet from all environd wallow       Test       Test Strip       If 242       15.7       9.9       9.8       c.         (2)       drace 33mol et Smoll et Smoll et Image       -1/-       I       1759       16.2       1 wo       9.8       c.         (3)       akweet from wet 10ms       44% effet       I       1742       15.7       9.9       9.8       c.         (4)       akweet from wet 20 m wet -1/-       I       1759       16.2       1 wo       9.8       c.         (3)       akweet from wet 10ms       44% effet       I       1741       15.4	Project No.: 11/03232 Client: GHA Project: Terrypure stoney c Location: 65 Green Mounta	reek in Rd		Date: 2017 / Contractor: Ø Site Visit Type:	genin	] Full time	🗌 Part	time
Maximum dry density obtained from:       If STD. Test       MOD. Test       Estimated       Control Strip         Sample(s)       Yes       No       If yes, specify testing to be done:       Prodor       Gradation         Area Tested:       Prodor       STD.       MOD.       Gradation         No.       Density       Molsture       Compaction       Specified         Action       Dry       Dry       Molsture       Compaction       Specified         No.       Density       Molsture       Compaction       Specified       Action         No.       Dry       Dry       Molsture       Compaction       Specified       Action         (1)       aford 2 mode       No.       -1(-       I       1742       15.7       97       98       C         (2)       diract 3 and 4 mode       -1(-       I       1757       16.2       1 wp       98       C         (3)       about 5 Smal       2 wp w       -1(-       I       1768       1 wp       98       C         (4)       about 5 Smal       2 wp w       -1(-       I       1768       1 wp       98       C         (4)       about 5 Ton w f 10ms       14th Cliff       I <td>Material Type Material Description</td> <td></td> <td></td> <td></td> <td>And a second second second second</td> <td>100 E 4 1</td> <td>the second s</td> <td></td>	Material Type Material Description				And a second second second second	100 E 4 1	the second s	
Sample(s) Secured:       If yes, specify testing to be done: Proctor $\Box$ STD. $\Box$ MOD. $\Box$ Gradation         Area Tested:         Test Location Define a C Convertion Content Con	I Sikty clay Ena	e sand	2 7.	nvel	17	50	15	3
Secured:         Yes         No         Proctor         STD.         MOD.         Gradation           Area Tested:         Test         Bifer all Grundwalen         Test         Dry         Moisture         Compaction         Specified         Action           (i)         direction pipe         No1         If each of the second walen         Test         Dry         Moisture         Compaction         Specified         Action           (i)         direction pipe         No1         If each of the second walen         Test         Dry         Density         Moisture         Compaction         Specified         Action           (i)         directification pipe         No1         If each of the second walen         If each         Specified         Action         Action         <	Maximum dry density obtained from:	,⊉STI	D. Test	🗌 MOD. Test	Estir	nated [	] Control Stri	p
Test Location         No.       Befor all anumducation       Test Elevation       Dry Under the Density       Moisture Content (%)       Compaction (%)       Action         (1)       abult Frond & Isone Hittig       I       I742 IS.7       99       98       c         (2)       abult Frond & Isone Hittig       I       I742 IS.7       99       98       c         (2)       abult Frond & Isone Hittig       I       I749 IS.7       99       98       c         (3)       abult Frond & Isone Hittig       I       I749 IS.7       99       98       c         (4)       abult Frond & Isone Hittig       I       I749 IS.7       100       98       c         (5)       abult Frond & Isone Hittig       I       I749 IS.9       100       98       c         (6)       abult Frond & Iones       444.000       I       If 79       15.4       100       98       c         (5)       abult Frond & Iones       444.000       I       If 74       Isone 98       c         (6)       abult Frond & Iones       444.000       I       If 74       Isone 98       c         (6)       abult Frond & Iones       -11       If 758       Isone 98					🗌 Grad	dation		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Test Test Location No. Befer at Commodwalen	Elevation	10001007	Density	Content	The second se		Action
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	(1) about 7mal & 15mm	4th life	I	1742	15.7	99	98	e
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	(2) about 33mm 4 8mm		I	and the second sec		100	98	C
H)       ahndl 47mw 2 10ms       4dd.0ff       I       1791       15.4       100       28       C         G)       ahndl 26mw 4 14ms       -11-       I       1763       14.8       100       98       C         G)       ahndl 26mw 4 14ms       -11-       I       1763       14.8       100       98       C         G)       ahndl 8mw 2 7ms       -11-       I       1758       15.2       160       98       C         G)       ahndl 8mw 2 7ms       -11-       I       1758       15.2       160       98       C         G)       ahndl 8mw 2 7ms       -11-       I       1758       15.2       160       98       C         G)       ahndl 8mw 2 7ms       -11-       I       1758       15.2       160       98       C         G)       ahndl 8mw 2 7ms       -11-       I       1758       15.2       160       98       C         Action:       C = Complying to spec.       NC = Not complying to spec.       Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)       Gauge No. 7852       Calibration       Field Reading       Variation %         Density       33 51       33 42.2       0.2       Mois	Rofer at Groundwalen	2 -16-	I	1768	15,9	100	98	c
(b)       a fm # 8 m w g 7 ms       -1       I       17.5 8       15.2       1 h0       9 8       C         Image: Standard Counts       Image: Standard Count					1			
(b)       a fm # 8 m w g 7 ms       -1       I       17.5 8       15.2       1 h0       9 8       C         Image: Standard Counts       Image: Standard Count	( almat 47m w & 10ms	4th aft	Z	1791	15.4	100	28	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         Pensity       33 5/1         Site Rep.:       B. Asymody         Of:       Prepared By:         Actione       Action		-11-	-	1763	14.8	100	98	c
Comments:       Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)         Gauge No. 7852       Calibration       Field Reading       Variation %         Density       33 51       33 42.2       0.2         Moisture       404       396.6       1.8         Site Rep.:       B. Anmody       Prepared By:       A.A         Of:       Reviewed By:       Moisture       Moisture	(6) about 8mw & 7ms	-11-	-11- I 1758		15,2 100		98	c
Comments:       Standard Counts (OPSS 501 acceptable variation: density 2%, moisture 4%)         Gauge No. 7852       Calibration       Field Reading       Variation %         Density       33 51       33 42.2       0.2         Moisture       404       396.6       1.8         Site Rep.:       B. Anmody       Prepared By:       A.A         Of:       Reviewed By:       Moisture       Moisture								
Gauge No. 7852     Calibration     Field Reading     Variation %       Density     33 5/1     33 42.2     0.2       Moisture     2404     396.6     1.8       Site Rep.:     B. Denmody     Prepared By:     A.D       Of:     Reviewed By:     M	Action: C = Complying to spec. NC	= Not complying	g to spe	ec.				
Moisture     2F04     396.6     1.8       Site Rep.:     B. Janmody     Prepared By:     A.A       Of:     Reviewed By:     M	Comments:			and the second se	1			moisture 4%) Variation %
Site Rep.: <u>B. Janmody</u> Prepared By: <u>A.A</u> Of: <u>Reviewed By:</u>				Density	335	7 33	42,2	0,2
Of: Reviewed By:				Moisture	404	4 3	96.6	1.8
			1.1.1		AID	RM		
		JSEA PPP	1.1.2.2014		S-RAF:		Initial	s.



Project No.: /// 03232	Date: 2017/11/09
Client: CHU	Contractor: Bufferin
Project: Torrapiere stoney cr	eck Compaction Roofing Footing Base Evaluation Structural Steel Subgrade Evaluation Reinforcing Steel
Location: 65 Green Movenhouse Hamilton, on	Concrete Sampling
	ature: °C 🎬 🥙 🥙 🕅 🧶
The purpose of the visit of silty clay lince sund i compare led clay liner The compaction was per After using a nuclean to 100% spm 38, which n hus scarified the final the weeks by hunds. The price of placement of c	was visited by GHA representative as requested was to conduct the compaction last on the gravel material, teing used for primary construction (North & East sides). formed by the medium size sheepsfol rollen density gauge, all tests result showed 99%, nel the project specifications. The anounclose ligned and made some effects for picking. for all succes observed well fine graded. Seconembranes and Granular materials. for more details about the location).
Corrective action to be taken:	
Follow up visit required:	Yes No
Site Rep .: B. Sermody	Prepared By: A.1
Of:	Reviewed By:
For Internal Use Only Have: DISA/JSE	EA PPE Training Need S-RAF: Yes No Initials:



Project No.: 11/03232 Client: GHD Project: Termpure stoney c Location: 65 Green Mountai		c	Date: 2017/ Contractor: 34	ljerin E	Full time	☐ Part	
Material Type Material Description				Maximum I Density (kg		Optimum \ Content (%	
I silty clay tru	e sand	2 gr	wel	17	50	15,	3
Maximum dry density obtained from:	STC	D. Test	🗌 MOD. Test	Estin	nated	] Control Stri	p
Sample(s) ☐ Yes ☐ No Secured:	If yes, spec	cify testing t ] STD.	o be done:	🗌 Grad	ation		
Area Tested: Test Test Location No. Defen al Groundwalen collector pipe N=1	Test Elevation	Material Type	Dry Density (kg/m³)	Moisture Content (%)	Compaction (%)	Specified (%)	Action
( abriet 13mm & 6mm	6male	Z	1786	15,6	100	98	e
E) about 43mn & 16mm		I	1761	16.9	100	98	e
(3) abril 60m & 19mw Refer al armentwalin collector pipe Nº2	-14	I	1759	16,6	100	98	C
(4) Abriel 40mw & 5ms	final	I	1738	16,8	99	28	e
	-11-	I	1775	16,3	100	98	e
(5) about 2 mw & 15ms (5) about 10 mw & 10ms	-11-	7	1750	16,7	100	98	e
Action: C = Complying to spec. NC =	Not complying	g to spec.					
Comments:			andard Counts ( auge No. <b>785</b> 2	OPSS 501 acc Calibra	ceptable variation	n: density 2%, Id Reading	moisture 4%) Variation %
			Density	3357		44,8	0,2
			Moisture	400	7 34	13.9	2.5
Site Rep.: <u>Br barmsdy</u> Of:	-	Prepared Reviewed		<u>م</u> ,	PA		
For Internal Use Only Have: JSA/J		E Train		S-RAF: 🗌 Y	es 🛛 No	Initial	s:



Project No.: 11103232	Date: 2017/11/20		
Client: CHD	Contractor:		
Project: Terraprine stoney creek	Compaction     Roofing     Footing Base Evaluation     Subgrade Evaluation     Reinforcing Steel		
Location: 65 Green Moren Racin No Hamilton, Ort	Concrete Sampling Asphalt Paving Other (specify):		
Field Results Temperature: 5	_~ 🕸 🛎 👄 📅 💩		
below! The areas inspected as the woled site. The areas wer some post materials (standing to heat the areas is order t	in. The abarevations are recented as a localed in the North & East sides of a found in a well contribution and having ices). The contraction has decided to get it dry. Based on virual inspect be dry out, fine graded prior of places pictures for more delaids).		
Corrective action to be taken:			
Follow up visit required:	□ No		
Site Rep.: B, bermoly Of:	Prepared By: A D Reviewed By:		
For Internal Use Only Have: DJSA/JSEA PPE	Training Need S-RAF: Yes No Initials:		

# Appendix D6 Results Dated December 1, 2017

Reference No. 11103232



January 8, 2018

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

GHD

Project No.: ///03232	Date: 2017/12/11				
Client: CHD	Contractor: buffenin				
Project: Terrapure stoney creek	Compaction       Roofing         Footing Base Evaluation       Structural Steel         Subgrade Evaluation       Reinforcing Steel				
Location: 65 Green mountain Rd Hamilton, on	Concrete Sampling Asphalt Paving Other (specify):				
Field Results Temperature:6					
The above noted site was vis	led by CHO representative as requested				
	anduct the compaction test on				
	ing used as grand lan fillen over the				
	lean stone . The Thickness of the Caranular				
A"malerials was 150mm and the compaction was performed by					
the smooth drug soller. After using a nuclear sensity gauge, all					
tests result showed 98% to 100% spm 00, which met the project					
specifications,					
Corrective action to be taken:					
	·				
Follow up visit required:	No				
Site Rep.: b. bermody	Prepared By: A				
Of:	Reviewed By:				
For Internal Use Only Have: I JSA/JSEA PPE Training Need S-RAF: Yes No Initials:					



## **Soil Compaction Verification Report**

Page \_\_\_\_ of \_\_\_\_

Project	No.: 11103232			Date: 2017/12/11							
Client:	GHD			Co	ntractor: 🍌	ferin					
Project	Terrapune stoney a	reelC			e Visit Type:		Full time		🖸 Part t	ime	
Locatio		in Ro Ham	"flore								
Material	Type Material Description				2	Maximum [			Optimum V	A REAL PROFESSION	
						Density (kg	ı/m³)		Content (%)		
I	Granular "A"	13/4 CRO	()		2027				8,4	4	
	5										
Maxim	um dry density obtained from:	STD.	. Test		] MOD. Test	🗌 Estim	ated		Control Strip	)	
Samp	ole(s) 🗌 Yes 🗌 No	If yes, speci	fy testi	ng to	be done:						
Secu		Proctor	STD.		] MOD.	🗌 Grada	ation				
Area T											
Test No.	Test Location Refer al Groundwalen Collecton pipe Nº1	Test Elevation	Mater Type		Dry Density (kg/m³)	Moisture Content (%)	Compac (%)	tion	Specified (%)	Action	
$\bigcirc$	dont 70mn & 14mw	binal grade	• 7		1988	5.4	98		98	C	
	ahet 50mn & 9mw	-11-	I		2004	9.0	99	7	78	e	
(2) (3)	abut 25mN 216mus	_11_	7	-	2035	6,1	100	>	78	C	
(4)	about 11mn & 10mm	A 100	T		2013	5.7	99		98	e	
(4) (5) (6)	and 2ms 2 12mw		I	-	2009	6,4	99		98	C	
(6)	almet 35m 5 & 14m w	1.1.1.1	5		2047	6.6	100		98	C	
	Refer at Ground walen		C			T.					
Ð	about 5 mil & 10ms	-11-	I		2063	7.1	In	2-,	28	C	
(8) (9) (0)	about 36mw & 7ms	-11-	2	-	2031	6,2	100	>	98	C	
(9)	about 57mw & 13ms	-11-	2		2048	5,9	100	7	98	C	
(0)	about 68 mw & 15ms	100 M 10 V	2		2007	6.0	99		28	e	
	1										
1.1	v	2									
2	· · ·										
Action:		Not complying	to spe	C.							
Comme	ents:				ndard Counts (0	1	· ·			· · · · ·	
		Gau	ge No. 7852	Calibrat			d Reading	Variation %			
					Density Moisture	335	-		358,5	0,2	
						404		9	410,2	1,5	
Site Re	p.: B. bermody		Prepa	red B	y: <u>A</u>	- <b>L</b>	01				
Of:			Revie	wed B	у:		RY	/			
For Inte	ernal Use Only Have: 🗾 JSA/J	SEA PPE		Frainin	g Need S	S-RAF: 🗌 Ye	es 🗹 No	C	Initials		

# Appendix D7 Shelby Test Results



Client:		Te	errapure Environr	mental		Lab no.: WLB 132		
Project/Site:	Stoney Creel	k Landfill, 65	Green Mountain	Road West, H	lamilton, Ontario	Project no.:	11103232	
Borehole no.:	1A		Sample no.:		-	Depth:		
Soil description:		Lean	clay with sand (CL	)		Date sampled:		
Apparatus:	Hand	Crank	Balance no.:	V	/LG-3	Porcelain bowl no .:	RAM	
Liquid limit device no.:		A-3B	Oven no.:	V	/LG-2	Spatula no.:	2	
Sieve no.:	WL	S-47	Glass plate no.:		1	-		
<b></b>	Liquid Limit (	(LL):		Soil Preparati				
	Test No. 1	Test No. 2	Test No. 3	$\checkmark$	Cohesive <425 µm		Dry preparation	
Number of blows	27	23	17		Cohesive >425 µn	י 🗆	Wet preparation	
	Water Conte	ent:			Non-cohesive			
Tare no.	148	118	114			Results		
Wet soil+tare, g	18.29	19.79	19.13	36.0				
Dry soil+tare, g	17.14	18.22	17.68					
Mass of water, g	1.15	1.57	1.45	t (%)				
Tare, g	13.66	13.57	13.53	onten				
Mass of soil, g	3.48	4.65	4.15	Water Content (%)				
Water content %	33.0%	33.8%	34.9%	Š				
Plastic Limit (P	L) - Water Cont	ent:	•					
Tare no.	146	134	+					
Wet soil+tare, g	19.74	19.57	•	32.0	16 18	20 22	24 26 28	
Dry soil+tare, g	18.84	18.66	+			Nb Blows	2. 20 20	
Mass of water, g	0.90	0.91	•	70 —	Soil	Plasticity Chart		
Tare, g	13.58	13.56	•			LL 50		
Mass of soil, g	5.26	5.10	+	60 — 군	Low plasticity Inorganic clay	High plastic Inorganic cl	ity ay	
Water content %	17.1%	17.8%	•	Ц -1 50 + = Ц × ай 40 +		Ch		
Average water content %	17.	5%	+					
Natural Wate	er Content ( W <sup>n</sup>	):	•	Plasticity Inc			(MH) and (CH)	
Tare no.	HA44		•	20 -	Low compressibility	- High		
Wet soil+tare, g	351.74		•	10 -		inorg     - Inorg	compressibility ganic silt janic day mpressibility	
Dry soil+tare, g	309.20		•			- Medium cor inorganic si ML and OL - Organic cla	lt	
Mass of water, g	42.54		+	0 +	10 20 3		70 80 90 100	
Tare, g	4.24		•	Linuid Linuit	Disatis Limit			
Mass of soil, g	304.96			Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)	Natural Water Content W <sup>n</sup>	
Water content %	13.9%			33	17	16	14	
Remarks:	The material	meets the pro	pject specification	าร				
Performed by:		Muhan	nmad Rauf		Date:		10/13/2017	
Verified by:	Abdul Ha		Eng.; Laboratory	/ Manager	Date:		10/13/2017	



Client:		Te	errapure Environ	mental		Lab no.:	WLB 1329-2
Project/Site:	Stoney Creel	k Landfill, 65	Green Mountain	Road West, H	lamilton, Ontario	Project no.:	11103232
Borehole no.:	2A		Sample no.:		-	Depth:	
Soil description:		Lean	clay with sand (CL	_)		Date sampled:	
Apparatus:	Hand	Crank	Balance no.:	N	/LG-3	Porcelain bowl no.:	75
Liquid limit device no.:	WLS		Oven no.:	<u> </u>	WLG-2 Spatula no.: 2		
Sieve no.:	VVL	S-47	Glass plate no.:		1	-	
r	Liquid Limit (		I	Soil Preparati			
	Test No. 1	Test No. 2	Test No. 3	$\checkmark$	Cohesive <425 µm		Dry preparation
Number of blows	31	25	19		Cohesive >425 µm	n 🗌	Wet preparation
	Water Conte				Non-cohesive		
Tare no.	124	Q6	W3			Results	
Wet soil+tare, g	19.70	20.46	19.57	34.0			
Dry soil+tare, g	18.26	19.09	18.39				
Mass of water, g	1.44	1.37	1.18	nt (%)			
Tare, g	13.59	14.80	14.82	Water Content (%)			
Mass of soil, g	4.67	4.29	3.57	0 32.0			
Water content %	30.8%	31.9%	33.1%	Š			
Plastic Limit (P	1		+				
Tare no.	126	Q3					
Wet soil+tare, g	20.93	21.19	+	30.0	18 20	22 24 26	28 30 32
Dry soil+tare, g	19.85	20.20				Nb Blows	
Mass of water, g	1.08	0.99	+	70 —	Soil	Plasticity Chart	
Tare, g	13.55	14.59				LL 50	
Mass of soil, g	6.30	5.61		60 — 군	Low plasticity Inorganic clay	High plastic Inorganic cl	ity ay
Water content %	17.1%	17.6%		Б 1- 1- 50 — В		C+	
Average water content %		4%		ĕ <sup>40</sup> +			
Natural Wate	er Content ( W <sup>n</sup>	):		Plasticity In 19	CL		(MH) and (CH)
Tare no.	33			<u>ه</u> 20 –	Low compressibility	- High	
Wet soil+tare, g	451.60			10 —		♦ inorg - Inorg	compressibility janic slit janic dlay mpressibility
Dry soil+tare, g	409.90			·		ML and OL Organic cla	It y
Mass of water, g	41.70		-	0 +	10 20 3	0 40 50 60 Liquid Limit LL	70 80 90 100
Tare, g	91.20			Liquid Limit	Plactic Limit		l
Mass of soil, g	318.70		-	Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)	Natural Water Content W <sup>n</sup>
Water content %	13.1%			32	17	15	13
Remarks:	The material	meets the pro	pject specification	ns			
Performed by:		Muhan	nmad Rauf		Date:		10/13/2017
Verified by:	Abdul Ha	feez Khan, P.	Eng.; Laboratory	y Manager	Date:		10/13/2017



Client:		Te	errapure Environ	mental		WLB 1329-3		
Project/Site:	Stoney Creel	k Landfill, 65	Green Mountain	Road West, H	lamilton, Ontario	Project no.:	11103232	
Borehole no.:	ЗA		Sample no.:		-	Depth:		
Soil description:			Lean clay (CL)			Date sampled:		
Apparatus:	Hand	Crank	Balance no.:	V	/LG-3	Porcelain bowl no.:	B3	
Liquid limit device no.:	WLS		Oven no.:	V	/LG-2	Spatula no.:	2	
Sieve no.:	WLS	5-47	Glass plate no.:		1	-		
[	Liquid Limit (	-		Soil Preparati				
	Test No. 1	Test No. 2	Test No. 3	$\checkmark$	Cohesive <425 µm		Dry preparation	
Number of blows	28	24	16		Cohesive >425 µm	n 🗌	Wet preparation	
	Water Conte				Non-cohesive			
Tare no.	110	102	105	25.0		Results		
Wet soil+tare, g	19.14	17.50	19.24	35.0				
Dry soil+tare, g	17.78	16.54	17.82	_				
Mass of water, g	1.36	0.96	1.42	nt (%)				
Tare, g	13.51	13.60	13.64	Conter				
Mass of soil, g	4.27	2.94	4.18	Water Content (%)				
Water content %	31.9%	32.7%	34.0%	≥				
Plastic Limit (P	· ·							
Tare no.	133	138	•					
Wet soil+tare, g	21.66	19.81		31.0		19 21 23	25 27 29	
Dry soil+tare, g	20.43	18.88			Soil	Nb Blows Plasticity Chart		
Mass of water, g	1.23	0.93		70 —				
Tare, g	13.41	13.56	+	60 -		LL 50		
Mass of soil, g Water content %	7.02	5.32	+		Low plasticity Inorganic clay	High plastic Inorganic cl	ay	
	17.5%	17.5% 5%	ł	Б 1- 1- 50 — В		(CH		
Average water content %	r Content ( W <sup>n</sup>			ĕ <sup>40</sup> −	$\frown$			
Tare no.	H3			Plasticity In-			(MH) and (CH)	
Wet soil+tare, g	468.70			Ē 20 —	Low compressibility	- High	compressibility nanic stilt	
Dry soil+tare, g	427.40			10 —		Inorg     - Inorg     - Medium cor	compressibility ganic silt janic day moressibility	
Mass of water, g	41.30			0		ML and OL - Organic sil		
Tare, g	115.60			0	10 20 3	0 40 50 60 Liquid Limit LL	70 80 90 100	
Mass of soil, g	311.80		ł	Liquid Limit	Plastic Limit	Plasticity Index (PI)	Natural Water Content W <sup>n</sup>	
Water content %	13.2%		ł	(LL) 32	(PL) 18	14	13	
Remarks:		meets the pro	pject specification			1	l	
	. no material							
Performed by:		<b>F 4 I</b> _	med Daví		Date:		10/42/2047	
			nmad Rauf				10/13/2017	
Verified by:	Abdul Ha	ieez Khan, P.	Eng.; Laboratory	y Manager	Date:	10/13/2017		



Client:		Te	errapure Environ	nental Lab no.: WLB 1367-1	
Project/Site:	Stoney Creel	k Landfill, 65	Green Mountain	Road West, Hamilton, Ontario Project no.: 11103232	
Borehole no.:			Sample no.:	4A Depth:	
Soil description:		Lean	clay with sand (CL	Date sampled:	
Apparatus:	Hand	Crank	Balance no.:	WLG-3 Porcelain bowl no.: 9	
Liquid limit device no.:	WLS		Oven no.:	WLG-2 Spatula no.: 2	
Sieve no.:	WL	S-47	Glass plate no.:	1	
r	Liquid Limit (	LL):	1	Soil Preparation:	
	Test No. 1	Test No. 2	Test No. 3	✓ Cohesive <425 µm ✓ Dry preparation	
Number of blows	35	25	20	Cohesive >425 µm Wet preparation	
	Water Conte	ent:	1	Non-cohesive	
Tare no.	123	14	6	Results	
Wet soil+tare, g	21.85	34.20	30.39	37.0	
Dry soil+tare, g	19.84	31.93	27.74		
Mass of water, g	2.01	2.27	2.65	ê 35.0 · · · · · · · · · · · · · · · · · · ·	
Tare, g	13.54	25.21	20.17	utent	
Mass of soil, g	6.30	6.72	7.57	(%) 35.0 33.0 33.0	
Water content %	31.9%	33.8%	35.0%	Mai	
Plastic Limit (P	L) - Water Cont	ent:		31.0	
Tare no.	W3	104			
Wet soil+tare, g	23.17	23.30		29.0	
Dry soil+tare, g	21.82	21.78		15 17 19 21 23 25 27 29 31 33 35 37 Nb Blows	
Mass of water, g	1.35	1.52		Soil Plasticity Chart	
Tare, g	14.81	13.55			
Mass of soil, g	7.01	8.23		60 Low plasticity Inorganic clay	
Water content %	19.3%	18.5%	_	Inorganic clay     Inorganic clay       1     50       I     Inorganic clay	
Average water content %	18.	9%			
Natural Wate	er Content ( W <sup>n</sup>	):	-	30 CL MHH and CH	
Tare no.	N52		_		
Wet soil+tare, g	226.50				
Dry soil+tare, g	188.60			10 	
Mass of water, g	37.90		_	0 10 20 30 40 50 60 70 80 90 100	
Tare, g	4.20		_	Liquid Limit LL	
Mass of soil, g	184.40			Liquid Limit Plastic Limit (LL) (PL) Plasticity Index (PI) Natural Water Content V	<b>/</b> <sup>n</sup>
Water content %	20.6%			34         19         15         21	
Remarks:	The material	meets the pro	pject specification	S	
Performed by:		Gree	g Peters	Date: 12/7/2017	
Verified by:	Abdul Ha		Eng.; Laboratory		



Client:		Te	errapure Environ	nental Lab no.: WLB 1367-2
Project/Site:	Stoney Cree	k Landfill, 65	Green Mountain	Road West, Hamilton, Ontario Project no.: 11103232
Borehole no.:			Sample no.:	Depth:
Soil description:		Lean	clay with sand (CL	Date sampled:
Apparatus:	Hand	Crank	Balance no.:	WLG-3 Porcelain bowl no.: 1
Liquid limit device no.:		A-3B	Oven no.:	WLG-2 Spatula no.: 2
Sieve no.:	VVL	S-47	Glass plate no.:	1
	Liquid Limit (		1	Soil Preparation:
	Test No. 1	Test No. 2	Test No. 3	Cohesive <425 µm     Dry preparation
Number of blows	35	25	22	Cohesive >425 µm Wet preparation
	Water Conte	ent:	-	Non-cohesive
Tare no.	134	101	109	Results
Wet soil+tare, g	22.99	22.00	24.45	37.0
Dry soil+tare, g	20.71	19.88	21.63	
Mass of water, g	2.28	2.12	2.82	§ 35.0
Tare, g	13.55	13.63	13.53	(%) 35.0 33.0 33.0
Mass of soil, g	7.16	6.25	8.10	
Water content %	31.8%	33.9%	34.8%	
Plastic Limit (P	T T			31.0
Tare no.	138	114		
Wet soil+tare, g	22.37	23.38		29.0 29.0 15 17 19 21 23 25 27 29 31 33 35 37
Dry soil+tare, g	20.96	21.82		Nb Blows
Mass of water, g	1.41	1.56		Soil Plasticity Chart
Tare, g	13.57	13.53		
Mass of soil, g	7.39	8.29		Low plasticity Dirganic clay
Water content %	19.1%	18.8%		Inorganic clay     Inorganic clay       Inorganic clay     Inorganic clay       Inorganic clay     Inorganic clay       Inorganic clay     Inorganic clay       Inorganic clay     Inorganic clay
Average water content %		9%		
	r Content ( W <sup>n</sup>	):		30 CL Wether and CH and CH
Tare no.	A3		-	20 Inorganic silt High compressibility
Wet soil+tare, g	320.80		-	10
Dry soil+tare, g	271.90			Milliand Q Organic blay
Mass of water, g	48.90		-	0 10 20 30 40 50 60 70 80 90 100 Liquid Limit LL
Tare, g	4.40		-	Liquid Limit Plastic Limit
Mass of soil, g	267.50			(LL) (PL) Plasticity index (PI) Natural Water Content W
Water content %	18.3%			34         19         15         18
Remarks:	The material	meets the pro	oject specificatio	8
Performed by:		Gre	g Peters	Date: 12/6/2017
Verified by:	Abdul Ha	feez Khan, P	Eng.; Laboratory	Manager Date: 12/11/2017



Client:		Te	errapure Environ	mental		WLB 1367-3	
Project/Site:	Stoney Cree	k Landfill, 65	Green Mountain	Road West, H	lamilton, Ontario	Project no.:	11103232
Borehole no.:			Sample no.:		6A	Depth:	
Soil description:		Lean	clay with sand (CL	_)		Date sampled:	
Apparatus:	Hand	Crank	Balance no.:	V	/LG-3	Porcelain bowl no.:	JK
Liquid limit device no.:		A-3B	Oven no.:	V	/LG-2	Spatula no.:	2
Sieve no.:		S-47	Glass plate no.:	·	1	-	
	Liquid Limit			Soil Preparati			
	Test No. 1	Test No. 2	Test No. 3	1	Cohesive <425 µn		Dry preparation
Number of blows	32	25	17		Cohesive >425 µn	n 🗌	Wet preparation
-	Water Conte				Non-cohesive		
Tare no.	W1	114	A3	35.0		Results	
Wet soil+tare, g	25.34	23.69	25.16	- 35.0			
Dry soil+tare, g	22.84	21.22	22.44	_			
Mass of water, g	2.50	2.47	2.72	(%) t 33.0			
Tare, g Mass of soil, g	14.66	13.53	14.44	Water Content (%)			
Water content %	8.18	7.69	8.00	/ater (			
Plastic Limit (P	30.6%	32.1%	34.0%	≤ 31.0			
Tare no.	101	134	-				<b>→</b>
Wet soil+tare, g	21.36	23.67	-				
Dry soil+tare, g	20.21	23.07	-	29.0	15 17 19	21 23 25 27 Nb Blows	29 31 33 35
Mass of water, g	1.15	1.48	-		Soil	Plasticity Chart	
Tare, g	13.64	13.55	-	70			
Mass of soil, g	6.57	8.64	-	60 —	Low plasticity	High plastic Inorganic c	zity
Water content %	17.5%	17.1%	-	료 - 50 -	Inorganic clay		
Average water content %		3%	-				
Natural Wate	er Content (W <sup>n</sup>	):	-				
Tare no.	SL49		-	– 06 – D	Low compressibility		(MH) and (CH)
Wet soil+tare, g	230.50		-	20 -	Inorganic silt	◆ - High	a compressibility ganic şilt ganic qlay
Dry soil+tare, g	196.70		-	10		- Medium co inorganiq si	mpres\$ibility ilt
Mass of water, g	33.80		-	0	·····	<sup>ML</sup> <sub>and</sub> <sup>OL</sup> - Organic cla 0 40 50 60	70 80 90 100
Tare, g	4.40		-	Ũ	.0 20 0	Liquid Limit LL	
Mass of soil, g	192.30			Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)	Natural Water Content W <sup>n</sup>
Water content %	17.6%		1	32	17	15	18
Remarks:	The material	meets the pro	pject specification	ns	·		·
Performed by:		Gree	g Peters		Date:		12/6/2017
Verified by:	Abdul Ha		Eng.; Laboratory	/ Manager	Date:		12/11/2017



Client:		Te	errapure Environ	ental	Lab no.:	WLB 1367-4
Project/Site:	Stoney Cree	k Landfill, 65	Green Mountain	oad West, Hamilton, Ontario	Project no.:	11103232
Borehole no.:			Sample no.:	7A	Depth:	
Soil description:			Lean clay (CL)		Date sampled:	
Apparatus:	Hand	Crank	Balance no.:	WLG-3	Porcelain bowl no .:	44
Liquid limit device no.:	WLS		Oven no.:		Spatula no.:	2
Sieve no.:	WL	S-47	Glass plate no.:	1		
	Liquid Limit (	LL):	1	Soil Preparation:		
	Test No. 1	Test No. 2	Test No. 3	Cohesive <425 µm	$\checkmark$	Dry preparation
Number of blows	30	20	16	Cohesive >425 µm		Wet preparation
	Water Conte	ent:	1	Non-cohesive		
Tare no.	127	Q5	W1		Results	
Wet soil+tare, g	24.10	23.15	25.74	36.0		
Dry soil+tare, g	21.48	21.02	22.86			
Mass of water, g	2.62	2.13	2.88	8		
Tare, g	13.57	14.82	14.68	autent autent	$\sim$	
Mass of soil, g	7.91	6.20	8.18	0.45	$\rightarrow$	
Water content %	33.1%	34.4%	35.2%	Š		
Plastic Limit (P	L) - Water Cont	ent:				
Tare no.	Q2	135				
Wet soil+tare, g	24.40	20.41		32.0		
Dry soil+tare, g	22.89	19.34		15 17 19	21 23 2 Nb Blows	5 27 29 31
Mass of water, g	1.51	1.07			Plasticity Chart	
Tare, g	14.75	13.63		70	LL 50	
Mass of soil, g	8.14	5.71		60 Low plasticity Inorganic clay	High plastic Inorganic cl	ity ay
Water content %	18.6%	18.7%		년 Inorganic clay - 1 50	C+	
Average water content %	18.	6%	-	<u>ă</u> 40 <b>−</b> − − − −		
Natural Wate	er Content ( W <sup>n</sup>	):		2 2 30 Low compressibility		
Tare no.	HA20			Low compressibility		(MH) and (CH)
Wet soil+tare, g	233.70				in org	compressibility ganic silt janic day
Dry soil+tare, g	198.70				- Medium cor inorganic si	mpressibility It
Mass of water, g	35.00			0 10 20 30	) 40 50 60	70 80 90 100
Tare, g	4.30				Liquid Limit LL	
Mass of soil, g	194.40			Liquid Limit Plastic Limit (LL) (PL)	Plasticity Index (PI)	Natural Water Content W <sup>n</sup>
Water content %	18.0%			34 19	15	18
Remarks:	The material	meets the pro	ject specificatio			
Performed by:		Gree	g Peters	Date:		12/6/2017
Verified by:	Abdul Ha		Eng.; Laboratory	Manager Date:		12/11/2017



Client:		Te	errapure Environi	mental		Lab no.:	WLB 1367-5	
Project/Site:	Stoney Creel	k Landfill, 65	Green Mountain	Road West, H	amilton, Ontario	Project no.:	11103232	
Borehole no.:			Sample no.:		8A	Depth:		
Soil description:		Lean	clay with gravel (Cl	L)		Date sampled:		
Apparatus:	Hand	Crank	Balance no.:	W	′LG-3	Porcelain bowl no.:	13	
Liquid limit device no.:	WLS		Oven no.:	W	'LG-2	Spatula no.:	2	
Sieve no.:	WLS	5-47	Glass plate no.:		1	-		
	Liquid Limit (	LL):	1	Soil Preparati	on:			
	Test No. 1	Test No. 2	Test No. 3	$\checkmark$	Cohesive <425 µm	n 🗸	Dry preparation	
Number of blows	31	26	20		Cohesive >425 µm		Wet preparation	
	Water Conte	ent:	1		Non-cohesive			
Tare no.	133	124	105	_		Results		
Wet soil+tare, g	23.35	24.61	22.62	36.0				
Dry soil+tare, g	20.91	21.85	20.32					
Mass of water, g	2.44	2.76	2.30	(%) ± 34.0				
Tare, g	13.41	13.62	13.63	tuent 34.0				
Mass of soil, g	7.50	8.23	6.69	Water Content (%)				
Water content %	32.5%	33.5%	34.4%	≥ 32.0				
Plastic Limit (P	L) - Water Cont	ent:						
Tare no.	126	148						
Wet soil+tare, g	22.68	24.64		30.0				
Dry soil+tare, g	21.26	22.88			15 17 19	21 23 25 27 Nb Blows	29 31 33 35	
Mass of water, g	1.42	1.76			Soil	Plasticity Chart		
Tare, g	13.55	13.65		70		LL 50		
Mass of soil, g	7.71	9.23		60 -	Low plasticity Inorganic clay	High plastic Inorganic cl	ity ay	
Water content %	18.4%	19.1%		ال - 50 ال - 50 ال - 50 ال - 50 ال - 50		C+		
Average water content %	18.	7%	-					
Natural Wate	er Content ( W <sup>n</sup> )	):		Blasticity	CL			
Tare no.	10X			Data Data Data Data Data Data Data Data	Low compressibility		(MH) and (CH)	
Wet soil+tare, g	286.50					<ul> <li>→ High inorg</li> <li>- Inorg</li> </ul>	compressibility ganic silt janic olay	
Dry soil+tare, g	249.20			10		- Medium coi inorganic si	npressibility It	
Mass of water, g	37.30				10 20 3	0 40 50 60	70 80 90 100	
Tare, g	4.30					Liquid Limit LL		
Mass of soil, g	244.90			Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)	Natural Water Content W <sup>n</sup>	
Water content %	15.2%			34	19	15	15	
Remarks:	The material	meets the pro	pject specification	ns				
Performed by:		0-	n Dotoro		Date:		10/7/0017	
			g Peters	/ Managor			12/7/2017	
Verified by:	ADUUI Hat	eez knan, P.	Eng.; Laboratory	vivianager	Date:		12/11/2017	



Client:		Те	errapure Environ	mental		WLB 1367-6		
Project/Site:	Stoney Creel	k Landfill, 65 (	Green Mountain	Road West, Ha	amilton, Ontario	Project no.:	11103232	
Borehole no.:			Sample no.:	<u> </u>	ЭA	Depth:		
Soil description:		l	Lean clay (CL)			Date sampled:		
Apparatus:	Hand	Crank	Balance no.:	WL	_G-3	Porcelain bowl no .:	44	
Liquid limit device no.:	WLS		Oven no.:		_G-2	Spatula no.:	2	
Sieve no.:	WL	8-47	Glass plate no.:		1			
r	Liquid Limit (	LL):		Soil Preparatio				
	Test No. 1	Test No. 2	Test No. 3		Cohesive <425 µm		Dry preparation	
Number of blows	33	25	17		Cohesive >425 µm		Wet preparation	
	Water Conte	nt:			Non-cohesive			
Tare no.	123	Q6	Q1			Results		
Wet soil+tare, g	24.40	26.50	29.08	34.0 -				
Dry soil+tare, g	21.87	23.64	25.49					
Mass of water, g	2.53	2.86	3.59	t (%)		$\searrow$		
Tare, g	13.54	14.80	14.80	Water Content (%)				
Mass of soil, g	8.33	8.84	10.69	O 32.0 -				
Water content %	30.4%	32.4%	33.6%	Wa				
Plastic Limit (P	L) - Water Cont	ent:	-					
Tare no.	127	148						
Wet soil+tare, g	20.50	23.70	-	30.0 - 1	5 17 19	21 23 25 27	29 31 33 35	
Dry soil+tare, g	19.40	22.14				Nb Blows	20 01 00 00	
Mass of water, g	1.10	1.56	-	70	Soil	Plasticity Chart		
Tare, g	13.57	13.65	-			LL 50		
Mass of soil, g	5.83	8.49			_ow plasticity norganic clay	High plastic Inorganic cl	sity lay	
Water content %	18.9%	18.4%	-	H- 50		CH		
Average water content %		6%	-					
Natural Wate	r Content ( W <sup>n</sup>	):	-	- 05 Licity Inc	CL		(MH) and (CH)	
Tare no.	Q5		-	20 - <sup>L</sup>	ow compressibility	- High		
Wet soil+tare, g	522.40			10		inorg     - Inorg	compressibility ganic silt janic day	
Dry soil+tare, g	474.00					- Medium cor inorganic si M∟ and OL - Organic cla	mpressibility It Iy	
Mass of water, g	48.40			0 + 0	10 20 3	0 40 50 60 Liquid Limit LL	70 80 90 100	
Tare, g	221.00			Liquid Limit	Plastic Limit	-	I	
Mass of soil, g	253.00			Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)	Natural Water Content W <sup>n</sup>	
Water content %	19.1%			32	19	13	19	
Remarks:	The material	meets the pro	ject specification	ns				
Desformed by:					Detai			
Performed by:			g Peters		Date:		1/3/2018	
Verified by:	Abdul Ha	feez Khan, P.	Eng.; Laboratory	/ Manager	Date:	1/5/2018		



## Particle-Size Analysis of Soils

MTO LS-702 (Geotechnical)

Client	:	Terrapure Environmental		Lab No.:	WLB 1329-1		
Proje	ct, Site:	Stoney Creek Landfill 65 Green Mountain Road West, Ha	milton, Ontario	Project No.:	11103232		
	orehole No.: epth:			Sample No.: Enclosure:	1A -		
101 90 93 93 93 94 94 94 94 94 94 94 94 94 94 94 94 94						- 0 - 10 - 20 - 30 - 40 - 30 - 50 - 50 - 60 - 70 - 80 - 90	
	0.001	0.01 0.1 Dia	1 Imeter (mm)		10 10		
			Sand ine Mediu s as per USCS (ASTM		Gravel Fine Coarse		
		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 specifica						_	
Perfo	rmed by:	Muhammad Rauf		Date:	October 13, 2017		
Verifie	ed by:	Abdul Hafeez Khan, P.Eng.; Labor	ratory Manager	Date:	October 13, 2017		



## Particle-Size Analysis of Soils

MTO LS-702 (Geotechnical)

Clien	t:	Terrapure Environmental		Lab No.:	WLB 1329-2		
Proje	ct, Site:	Stoney Creek Landfill 65 Green Mountain Road West, Ha	amilton, Ontario	Project No.:	11103232		
	orehole No.: Depth:			Sample No.: Enclosure:	2A -		
Percent Passing			ameter (mm)			0 10 20 30 40 50 50 60 60 70 80 90 100	
			Sand		Gravel		
			ine Mediu s as per USCS (ASTM		Fine Coarse		
		Soil Description	Gravel (%)	Sand (%)	Clay & Silt (%)		
		Lean clay with sand (CL)	1	15	84		
		Clay-size particles (<0.002 mm):			37 %		
Rem	arks: <u>The</u>	material meets the project specifications					
Perfo	ormed by:	Muhammad Rauf		Date:	October 13, 2017		
Verif	ed by:	Abdul Hafeez Khan, P.Eng.; Labo	ratory Manager	Date:	October 13, 2017		



## Particle-Size Analysis of Soils

MTO LS-702 (Geotechnical)

Clie	nt:	Terrapure Environmental		Lab No.:	WLB 1329-3	
Pro	ject, Site:	Stoney Creek Landfill 65 Green Mountain Road West, Ha	milton, Ontario	Project No.:	11103232	
	Borehole No.: Depth:			Sample No.: Enclosure:	3A -	_
Percent Passing	100 90 80 70 60 50 40 30 20 10					- 10 - 20 - 30 - 30 - 50 - 50 - 50 - 50 - 50 - 50 - 70 - 80
	0.001	0.01 0.1 Dia	1 ameter (mm)		10 10	- 100 00
			Sand ine Medii s as per USCS (ASTI		Gravel Fine Coarse	
		Soil Description	Gravel (%)	Sand (%)	Clay & Silt (%)	
		Lean clay (CL)	2	12	86	
Ron	narks: The	Clay-size particles (<0.002 mm):			38 %	
	The	material meets the project specifications				_
Per	formed by:	Muhammad Rauf		Date:	October 13, 2017	
Veri	fied by:	Abdul Hafeez Khan, P.Eng.; Labor	ratory Manager	Date:	October 13, 2017	



Client:		Terrapure Environment	tal			Lab No.:	WLB 1	367-1		
Projec	t, Site:	Stoney 65 Green Mountain Ro	Creek Landfill bad West, Han	nilton, Ontario		Project No.:	11103	232		
Bo De	ehole No.: oth:					Sample No.: Enclosure:	4A -			
100 90 80 70 60 50 40 30 20 10									0 10 20 30 40 50 60 70 80 90	Percent Retained
0 C	.001	0.01	0.1 Dia	ameter (mm)	1		10		100 100	
		Clay & Silt P	Fine article-Size Limit	Sand M Sasper USCS (/	ledium	-2487)	Gr Fine	avel Coarse		
		Soil Description		Gravel (%	<b>b</b> )	Sand (%)	С	lay & Silt (%)		
		Lean clay with sand (CL)		3		14		83		
		Clay-size particles (<0.002	mm):					34 %		
Remar	ks: <u>The r</u>	naterial meets the project spe	ecifications							
Perfor	ned by:	BI	layne Stanic			Date:	Dec	ember 7, 201	7	_
Verifie	d by:	Abdul Hafeez Khan	, P.Eng.; Labo	oratory Manage	r	Date:	Dece	ember 11, 201	7	



Client:		Terrapure Environmental		Lab No.:	WLB 1367-2		
Project	, Site:	Stoney Creek Land 65 Green Mountain Road West, I		Project No.:	11103232		
Bor Dep	ehole No.: oth:			Sample No.: Enclosure:	5A -		
100 90 80 70 60 50 50 40 30 20 10 0 0			1			0 10 20 30 40 50 60 70 80 90 10	Percent Retained
			Sand		Gravel		
			ine Medium nits as per USCS (ASTM I			arse	
		Soil Description	Gravel (%)	Sand (%)	Clay & Si	lt (%)	
		Lean clay with sand (CL)	6	10	84		
		Clay-size particles (<0.002 mm):			35 %	)	
Remar	ks: The r	naterial does not meet the project specifi	ations ( 94.4% on 4.75 m	m)			
Perforr	ned by:	Blayne Stani		Date:	December	7, 2017	
Verified	d by:	Abdul Hafeez Khan, P.Eng.; L	boratory Manager	Date:	December 1	1, 2017	



Clie	nt:		Те	rrap	ure E	nviro	nmen	tal									La	b No	o.:			WL	B 13	367-3	3			_
Project, Site:		: _	65	5 Gre	een N		oney ain R					niltor	n, Or	ntari	0		_Pro	oject	t No	.:	_	111	032	32				-
	Borehole Depth:	No.:														_		mple closu			-	6A -						-
Percent Passing	100 90 80 70 60 50 40 30 20 10 0.001				0.01					0.																	0 1 1 2 3 4 5 6 7 7 8 9 9 1 100	0 0 0 0 0 0 Percent Retained
	0.001				0.01					0.	<sup>1</sup> Dia	ameter	(mm	)		1						10					100	
			c	Clay &	& Silt						Fine	•		Sa		diur	n	C	oars	e		Fine	Gra		oars	e		
							F	Partic	cle-S	Size	Limit	ts as	per l	JSCS	i (AS	бтм	D-248											
				Soi	l Desc	criptio	on						Gra	avel	(%)			Sar	nd (%	6)			Cla	iy & S	Silt (	%)		
			Lea	an cl	ay witl	h sano	d (CL)							11					11					78	8			
			Clay-	size	partic	les (<	0.002	mm	):															35	%			]
Ren	narks:	The m	ateria	I doe	es not	meet	the p	rojec	ct sp	oeci	ficatio	ons (7	77.99	% on	0.0	75 r	mm. a	and 8	8.9%	o on	4.7	5 mm	ı.)					-
Per	ormed b	by:					В	layr	ne S	Star	nic							Da	ite:			Γ	Dece	mbe	r 7, 2	2017	7	_
Verified by:		-		Abo	dul Ha	afeez	Khar	ו, P.	.En	<u>g.;</u> [	Labo	orator	y Ma	ana	ger		_	Da	te:		_	D	ecer	nber	· 11,	201	7	-



Client:		Terrapure Environmental				Lab No.:	WLB 1	367-4	
Projec	t, Site:	Stoney Cre 65 Green Mountain Road		nilton, Onta	rio	Project No.:	11103	232	
	rehole No.: oth:					Sample No.: Enclosure:	- -		
100 90 80 70 50 50 40 30 20 10									0 10 20 30 40 50 50 60 60 70 80 90 100
	.001	0.01	0.1 Dia	ameter (mm)	1		10		100
		Clay & Silt Partic	Fine cle-Size Limit	•	and Medium S (ASTM D		Gr Fine	avel Coarse	
		Soil Description		Grave	I (%)	Sand (%)	с	lay & Silt (%)	
		Lean clay (CL)		3		7		90	
		Clay-size particles (<0.002 mm	n):					48 %	
Remar	ks: <u>The n</u>	naterial meets the project specifi	ication						
Perfor	med by:	Blayr	ne Stanic			Date:	Dec	ember 7, 2017	,
Verifie	d by:	Abdul Hafeez Khan, P.	.Eng.; Labo	ratory Mana	ager	Date:	Dece	ember 11, 201	7



Client:	Terrapure Environmental	Lat	o No.:	WLB 1367-5			
Project, Site:	Stoney Creek Landfill 65 Green Mountain Road West, Har	lton, Ontario Pro	oject No.:	11103232			
Borehole No.: Depth:			nple No.: closure:	8A -			
100 90 80 70 60 50 40 30 20 10					• 0 10 20 30 40 50 50 50 60 70 80 90		
0.001	0.01 0.1 Di	neter (mm)		10	100 <u>100</u>		
	Clay & Silt Fin Particle-Size Limi	Sand Medium as per USCS (ASTM D-248)	Coarse 7)	Gravel Fine Coarse			
	Soil Description	Gravel (%)	Gravel (%) Sand (%) Clay & Silt (%)				
	Lean clay with gravel (CL) Clay-size particles (<0.002 mm):	13	11	76 33 %			
Remarks: <u>The n</u>	naterial does not meet the project specificati	ns (76% on 0.075 mm and	86.7% on 4.75	i mm.)			
Performed by: Verified by:	Blayne Stanic Abdul Hafeez Khan, P.Eng.; Labo	atory Manager	Date: Date:	December 7, 201 December 11, 20			



Client:		Terrapure Environmenta	al			Lab No.:	WLB <sup>2</sup>	1367-6			
Project, Site:		Stoney C 65 Green Mountain Roa	Creek Landfill ad West, Ham	nilton, Ontario		Project No.:	11103	232			
Borehole No.: Depth:						Sample No.: 9A Enclosure: -					
100 90 80 70 50 40 30 20 10 0.		0.01	0.1 Dia						0 10 20 30 40 50 60 70 80 90 100		
0.			Dia	imeter (mm)							
		Clay & Silt Pa	Fine rticle-Size Limit		Medium		Gi Fine	ravel Coarse			
		Soil Description		Gravel (	%)	Sand (%)	С	lay & Silt (%)			
		Lean clay (CL) Clay-size particles (<0.002 m	าm):	2		12		86			
Remarl	<b>(S:</b> <u>The n</u>	naterial meets the project spe									
Perforn Verified		Bla Abdul Hafeez Khan,	ayne Stanic P.Eng.; Labo	ratory Manag	er	Date:		nuary 4, 2018 nuary 5, 2018			