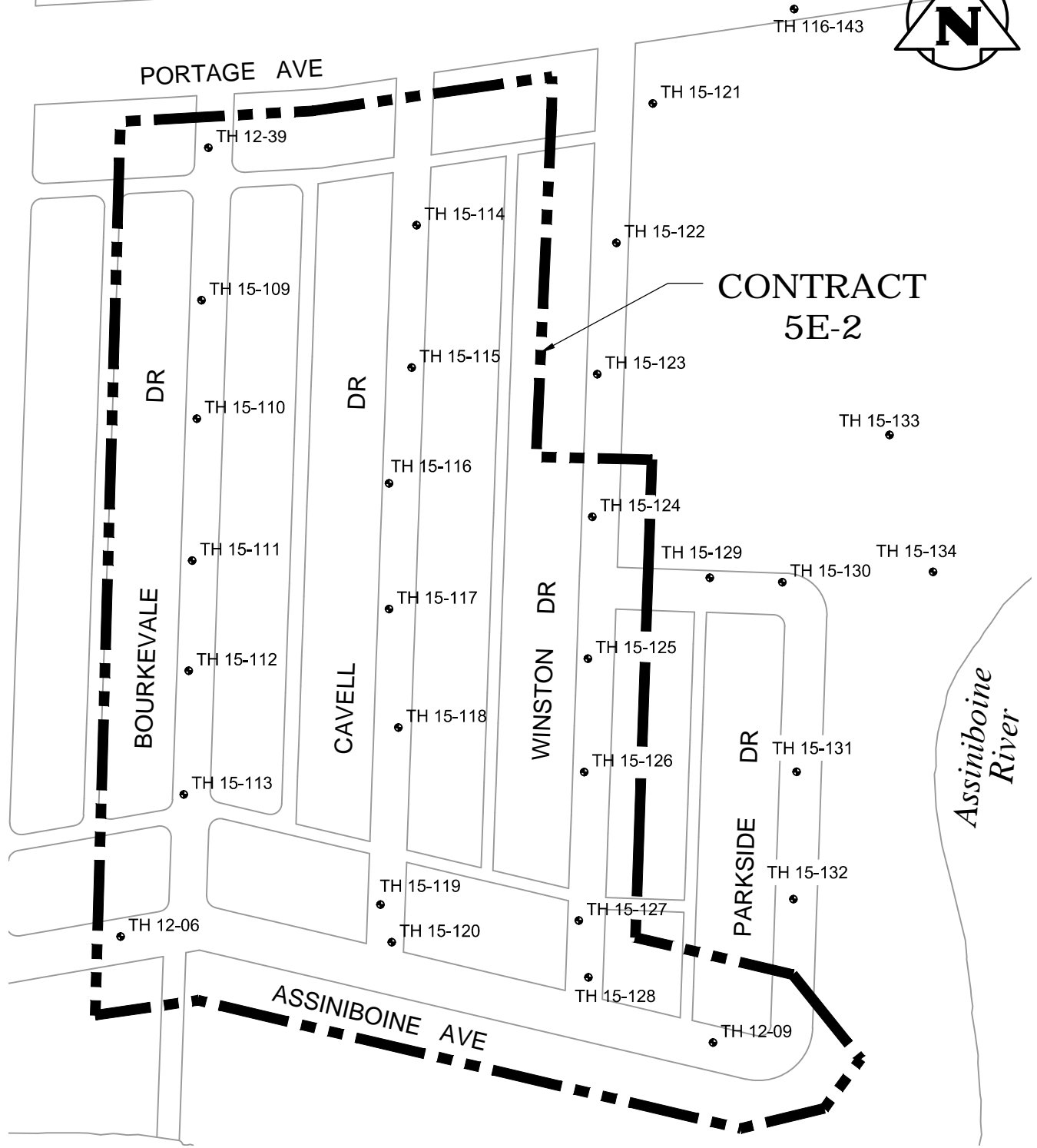


# APPENDIX A - TEST HOLE LOGS



X:\A-G\CITY OF WINNIPEG - WATER & WASTE DEPARTMENT - 0012\10001203.00 - FERRY ROAD\CONTRACT 5E-2\CAD\SKETCHES\5E-2 THS APPENDIX A.DWG 17.03.24 10:56 AM

**DYREGROV ROBINSON INC.**

CONSULTING GEOTECHNICAL ENGINEERS

CLIENT



**TETRA TECH**

Complex World  
Clear Solutions

AUTHORIZED BY: AUTHORIZED  
DATE: 26/10/16

CLIENT DRAWING NO.

DRAWING DESCRIPTION

**TEST HOLE LOCATION FOR FERRY ROAD  
CSR WORKS CONTRACT 5E-2**

DESIGNED BY:  
REVIEWED BY:

DRAWN BY: NL  
SCALE: NTS

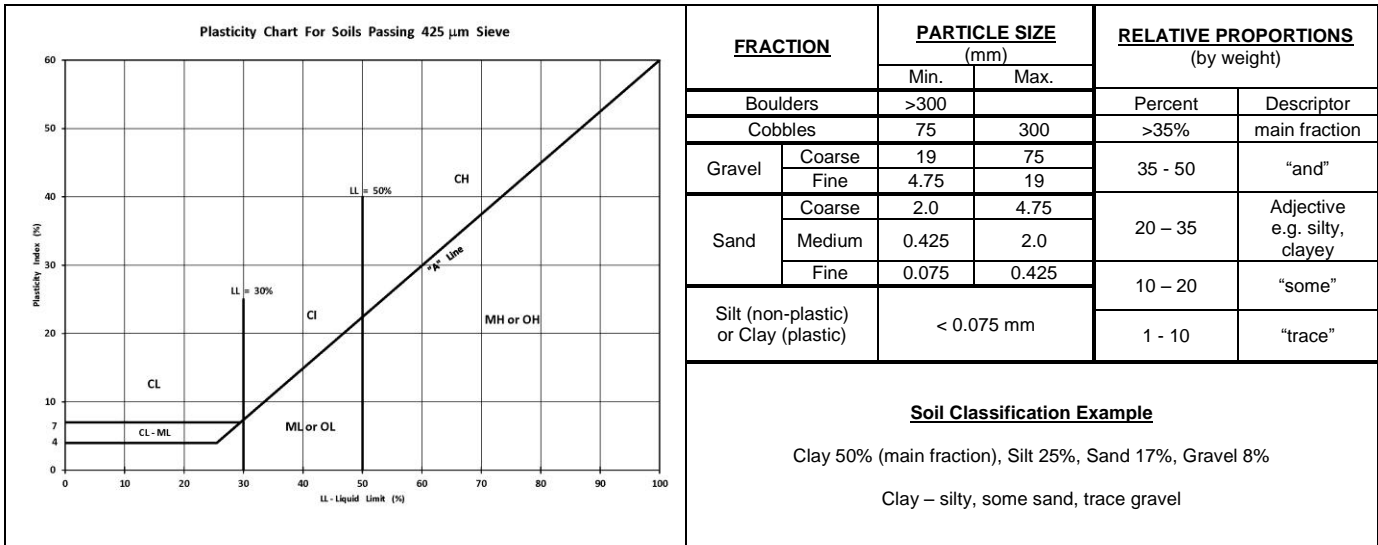
DRAWING NO.

FIGURE\_1

REV.  
00

## EXPLANATION OF TERMS & SYMBOLS

Description			TH Log Symbols	USCS Classification	Laboratory Classification Criteria				
					Fines (%)	Grading	Plasticity	Notes	
<b>COARSE GRAINED SOILS</b>	GRAVELS (More than 50% of coarse fraction of gravel size)	CLEAN GRAVELS (Little or no fines)	Well graded gravels, sandy gravels, with little or no fines		GW	0-5	$C_u > 4$ $1 < C_c < 3$	Dual symbols if 5-12% fines. Dual symbols if above "A" line and $4 < W_p < 7$  $C_u = \frac{D_{60}}{D_{10}}$ $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$	
			Poorly graded gravels, sandy gravels, with little or no fines		GP	0-5	Not satisfying GW requirements		
		DIRTY GRAVELS (With some fines)	Silty gravels, silty sandy gravels		GM	> 12			Atterberg limits below "A" line or $W_p < 4$
			Clayey gravels, clayey sandy gravels		GC	> 12			Atterberg limits above "A" line or $W_p < 7$
	SANDS (More than 50% of coarse fraction of sand size)	CLEAN SANDS (Little or no fines)	Well graded sands, gravelly sands, with little or no fines		SW	0-5	$C_u > 6$ $1 < C_c < 3$		
			Poorly graded sands, gravelly sands, with little or no fines		SP	0-5	Not satisfying SW requirements		
		DIRTY SANDS (With some fines)	Silty sands, sand-silt mixtures		SM	> 12			Atterberg limits below "A" line or $W_p < 4$
			Clayey sands, sand-clay mixtures		SC	> 12			Atterberg limits above "A" line or $W_p < 7$
<b>FINE GRAINED SOILS</b>	SILTS (Below 'A' line negligible organic content)	$W_L < 50$	Inorganic silts, silty or clayey fine sands, with slight plasticity		ML		Classification is Based upon Plasticity Chart		
		$W_L > 50$	Inorganic silts of high plasticity		MH				
	CLAYS (Above 'A' line negligible organic content)	$W_L < 30$	Inorganic clays, silty clays, sandy clays of low plasticity, lean clays		CL				
		$30 < W_L < 50$	Inorganic clays and silty clays of medium plasticity		CI				
		$W_L > 50$	Inorganic clays of high plasticity, fat clays		CH				
	ORGANIC SILTS & CLAYS (Below 'A' line)	$W_L < 50$	Organic silts and organic silty clays of low plasticity		OL				
		$W_L > 50$	Organic clays of high plasticity		OH				
	<b>HIGHLY ORGANIC SOILS</b>		Peat and other highly organic soils		Pt	Von Post Classification Limit		Strong colour or odour, and often fibrous texture	
	Asphalt		Glacial Till		Bedrock (Igneous)	<b>DYREGROV ROBINSON INC.</b> CONSULTING GEOTECHNICAL ENGINEERS			
	Concrete		Clay Shale		Bedrock (Limestone)				
	Fill				Bedrock (Undifferentiated)				



**TERMS and SYMBOLS**

Laboratory and field tests are identified as follows:

**Unconfined Comp.:** undrained shear strength (kPa or psf) derived from unconfined compression testing.

**Torvane:** undrained shear strength (kPa or psf) measured using a Torvane

**Pocket Pen.:** undrained shear strength (kPa or psf) measured using a pocket penetrometer.

**Unit Weight** bulk unit weight of soil or rock (kN/m<sup>3</sup> or pcf).

**SPT – N** Standard Penetration Test: The number of blows (N) required to drive a 51 mm O.D. split barrel sampler 300 mm into the soil using a 63.5 kg hammer with a free fall drop height of 760 mm.

**DCPT** Dynamic Cone Penetration Test. The number of blows (N) required to drive a 50 mm diameter cone 300 mm into the soil using a 63.5 kg hammer with a free fall drop height of 760 mm.

**M/C** insitu soil moisture content in percent

**PL** Plastic limit, moisture content in percent

**LL** Liquid limit, moisture content in percent

The undrained shear strength (Su) of cohesive soil is related to its consistency as follows:

Su (kPa)	Su (psf)	CONSISTENCY
<12	250	very soft
12 – 25	250 – 525	soft
25 – 50	525 – 1050	firm
50 – 100	1050 – 2100	stiff
100 – 200	2100 – 4200	very stiff
200	4200	hard

The SPT - N of non-cohesive soil is related to compactness condition as follows:

N – Blows / 300 mm	COMPACTNESS
0 - 4	very loose
4 - 10	loose
10 - 30	compact
30 - 50	dense
50 +	very dense

**References:**

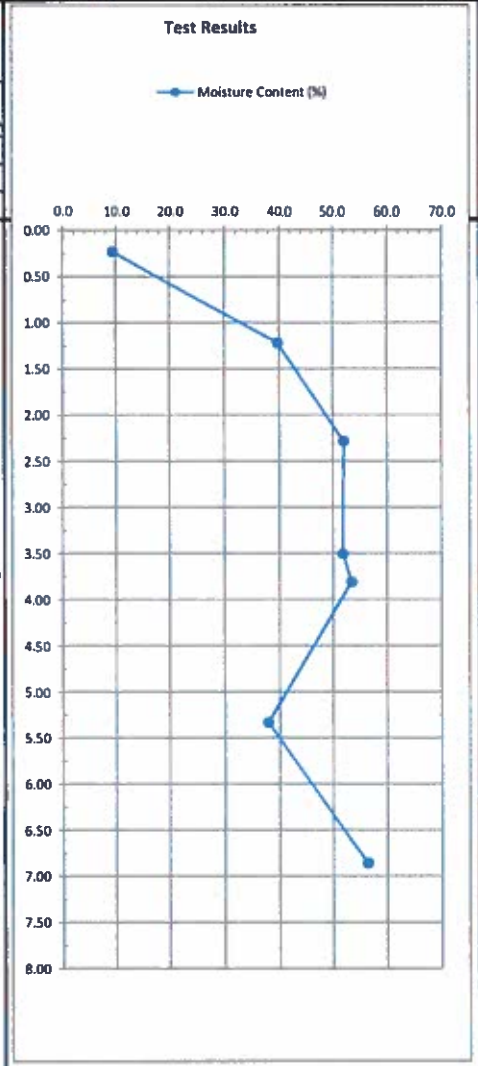
ASTM D2487 – Classification of Soils For Engineering Purposes (Unified Soil Classification System)

Canadian Foundation Engineering Manual, 4<sup>th</sup> Edition, Canadian Geotechnical Society, 2006

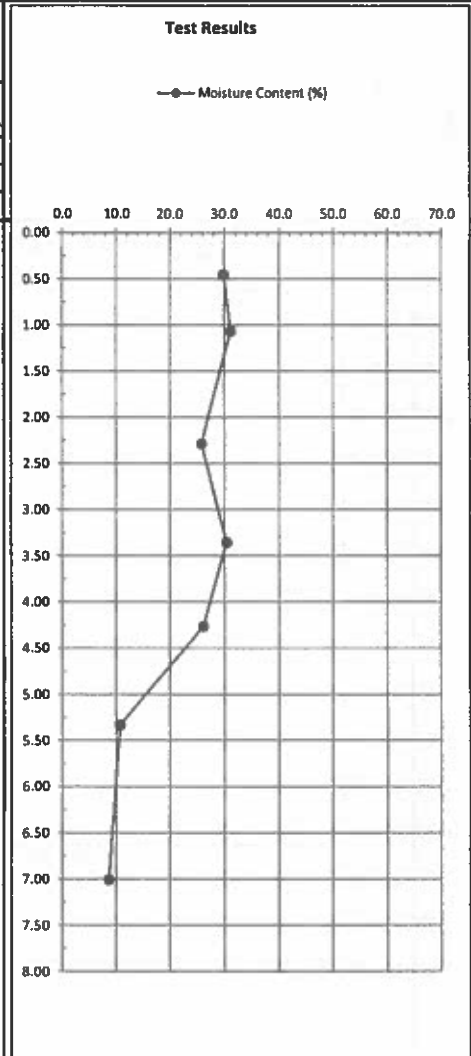
**PROJECT:** Ferry Road LDS  
**LOCATION:** Assiniboine Ave. at Bourkevale Dr.  
**CONTRACTOR:** Paddock Drilling Ltd.  
**METHOD:** Acker Soil Sentry - 125 mm SSA

**LOGGED BY:** RB  
**REVIEWED BY:** AOD  
**DRILL DATE:** April 18, 2012  
**DRILL DEPTH (m):** 7.6

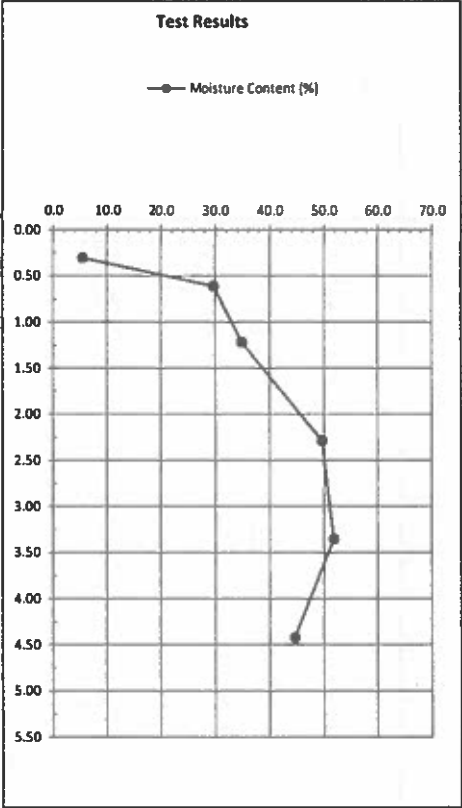
DEPTH (m)	ELEVATION (m)	SOIL SYMBOL	SOIL DESCRIPTION	UNDRAINED SHEAR STRENGTH Su								
				QU	UNCONFINED COMPRESSION	TV	TORVANE	PP	POCKET PEN	Y	UNIT WEIGHT	
0.00	233.58		0 - 0.18 m CONCRETE									
0.50	233.08		0.18 - 0.48 m SAND AND GRAVEL (Fill) - brown, moist, fine to coarse grained, well graded									
1.00	232.58		0.48 - 7.6 m CLAY - silty - mottled brown and grey - stiff, moist, high plasticity - trace silt inclusions  - firm below 2.0 m       - till inclusions, grey, soft, wet below 6.1 m									
1.50	232.08			TV = 88 kPa PP = 98 kPa								
2.00	231.58			TV = 45 kPa PP = 37 kPa								
2.50	231.08											
3.00	230.58			Qu = 23 kPa TV = 66 kPa PP = 71 kPa Y = 16.9 kN/m <sup>3</sup>								
3.50	230.08											
4.00	229.58											
4.50	229.08											
5.00	228.58											
5.50	228.08			TV = 35 kPa								
6.00	227.58											
6.50	227.08											
7.00	226.58											
7.50	226.08											
8.00	225.58	7.6 m	END OF TEST HOLE AT 7.6 m IN CLAY Notes: 1. Squeezing below 6.1 m in clay tayer. 2. Test hole backfilled with auger cuttings, capped with concrete core and cold patch.									



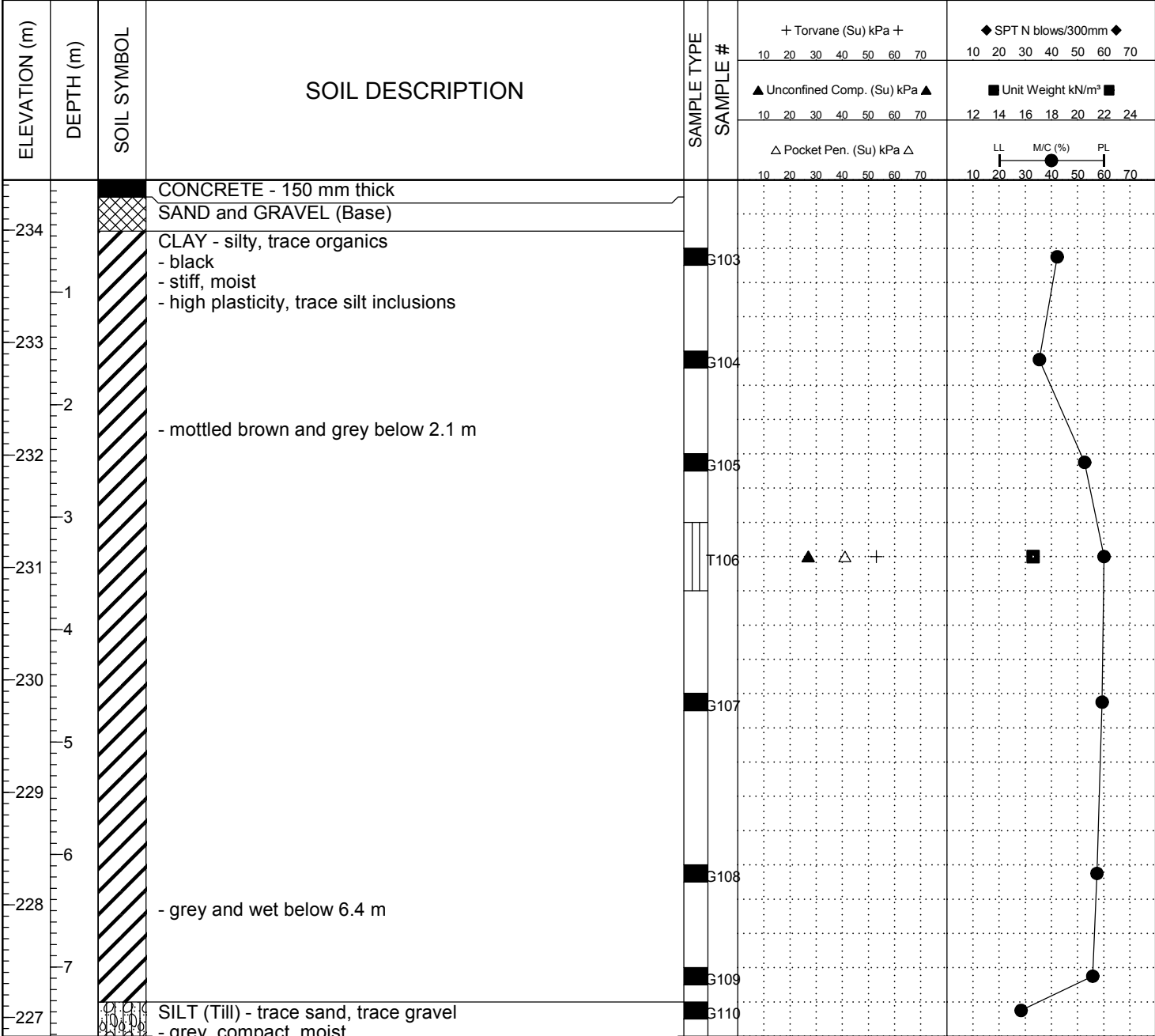
DYREGROV ROBINSON INC. CONSULTING GEOTECHNICAL ENGINEERS				PROJECT # 113324	TEST HOLE NO. 12-9
PROJECT: Ferry Road LDS			LOGGED BY: RB		
LOCATION: Assiniboine Ave. at Parkside Dr.			REVIEWED BY: AOD		
CONTRACTOR: Paddock Drilling Ltd.			DRILL DATE: April 19, 2012		
METHOD: Acker Soil Sentry - 125 mm SSA			DRILL DEPTH (m): 7.6		
DEPTH (m)	ELEVATION (m)	SOIL SYMBOL	SOIL DESCRIPTION	UNDRAINED SHEAR STRENGTH $S_u$	
				QU	UNCONFINED COMPRESSION
				TV	TORVANE
				PP	POCKET PEN.
				$\gamma$	UNIT WEIGHT
0.00	231.85		0 - 0.051 m ASPHALT		
			0.051 - 0.23 m CONCRETE		
0.50	231.35		0.23 - 1.5 m CLAY (Fill) - silty, trace sand, trace gravel - black - stiff, moist, high plasticity	PP = 61 kPa	
1.00	230.85				
1.50	230.35		1.5 - 4.6 m CLAY (Alluvial) - stratified with silt and sand - brown - firm, moist, high plasticity	PP = 37 kPa	
2.00	229.85				
2.50	229.35				
3.00	228.85				
3.50	228.35				
4.00	227.85				
4.50	227.35				
5.00	226.85		4.6 - 7.6 m SILT (Till) - some sand, trace gravel - tan - compact, dry		
5.50	226.35				
6.00	225.85		- dense below 6.0 m		
6.50	225.35				
7.00	224.85		- light grey below 6.7 m		
7.50	224.35				
8.00	223.85		7.6 m END OF TEST HOLE AT 7.6 m IN SILT TILL Notes: 1. Test hole backfilled with auger cuttings, capped with concrete core and cold patch.		



DYREGROV ROBINSON INC. CONSULTING GEOTECHNICAL ENGINEERS			PROJECT # 113324	TEST HOLE NO. 12-39	
PROJECT: Ferry Road LDS			LOGGED BY: RB		
LOCATION: Bourkevale St. at Portage Ave.			REVIEWED BY: AOD		
CONTRACTOR: Paddock Drilling Ltd.			DRILL DATE: May 25, 2012		
METHOD: Acker MP8 - 125 mm SSA			DRILL DEPTH (m): 5.0		
DEPTH (m)	ELEVATION (m)	SOIL SYMBOL	SOIL DESCRIPTION	UNDRAINED SHEAR STRENGTH Su	
				QU	UNCONFINED COMPRESSION
				TV	TORVANE
				PP	POCKET PEN.
				Y	UNIT WEIGHT
0.00	234.84		0 - 0.15 m CONCRETE		
			0.15 - 0.36 m SAND AND GRAVEL (Fill) - brown, dry, poorly graded		
0.50	234.34		0.36 - 0.9 m CLAY (Fill) - silty, trace sand, trace gravel - grey, stiff, moist, high plasticity		
1.00	233.84		0.9 - 5.0 m CLAY - silty - mottled brown and grey - stiff, moist, high plasticity - trace silt inclusions	TV = 88 kPa PP = 86 kPa	
1.50	233.34				
2.00	232.84				
2.50	232.34			TV = 52 kPa	
3.00	231.84				
3.50	231.34				
4.00	230.84		- firm below 3.7 m - trace till inclusions, trace sand, trace gravel below 4.0 m	TV = 26 kPa	
4.50	230.34				
5.00	229.84		5.0 m END OF TEST HOLE AT 5.0 m IN CLAY		
5.50	229.34		Notes: 1. Test hole backfilled with auger cuttings, capped with concrete core and cold patch.		



PROJECT: Ferry Road & Riverbend CSR Works		CLIENT: Tetra Tech WEI		TESTHOLE NO: 15-109		
LOCATION: Bourkevale Drive - UTM 5526577 N, 628391 E				PROJECT NO.: 143691		
CONTRACTOR: Paddock Drilling Ltd.		METHOD: BRAT 22R - 125 mm SSA diameter auger		ELEVATION (m): 234.602		
SAMPLE TYPE	GRAB	SHELBY TUBE	SPLIT SPOON	BULK	NO RECOVERY	CORE
BACKFILL TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT	CUTTINGS	SAND



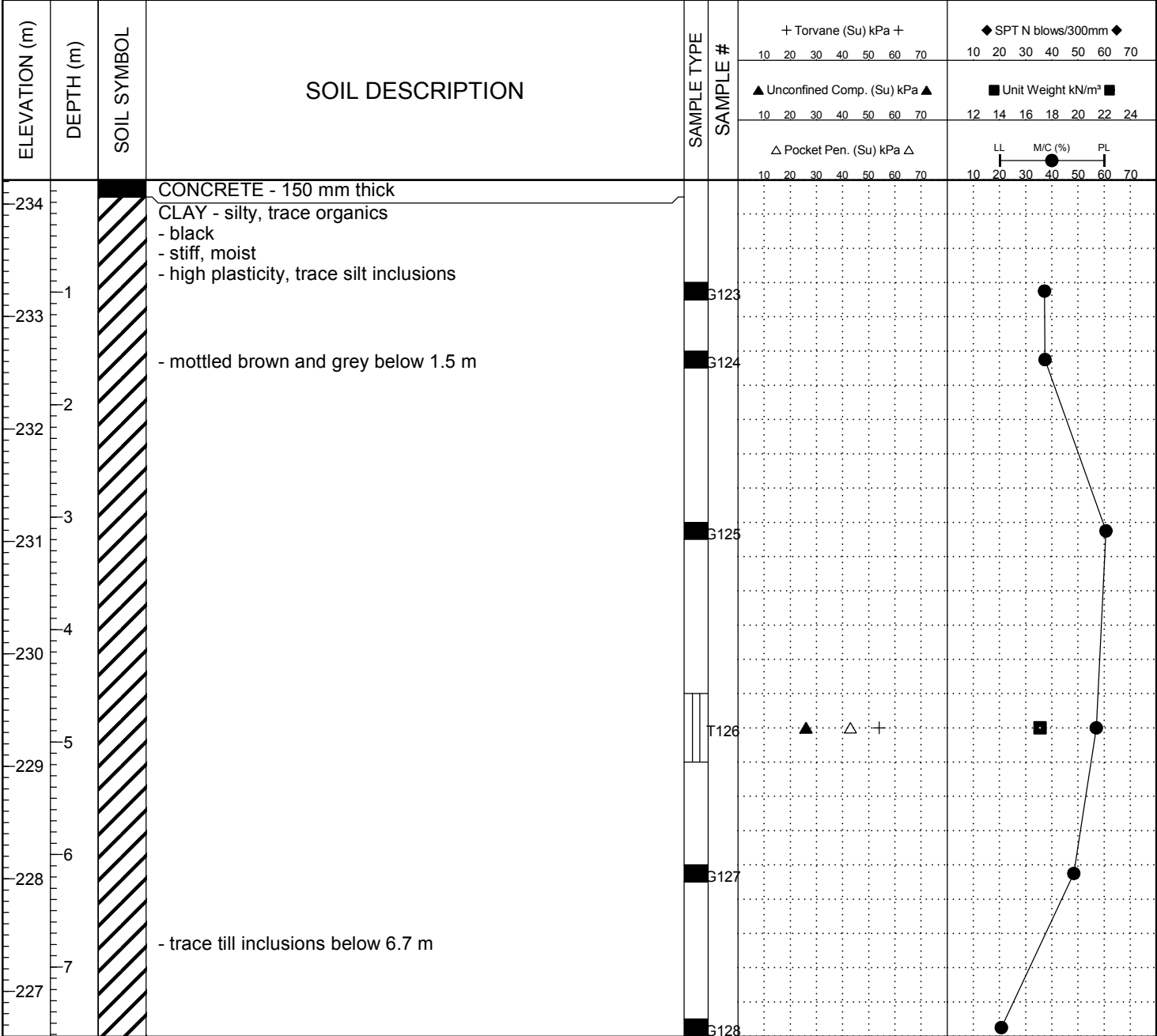
END OF TEST HOLE AT 7.6 m IN SILT (TILL)  
Notes:  
1. Frost to 1.5 m.  
2. No sloughing or seepage observed.  
3. Test hole backfilled with auger cuttings and bentonite chips.  
4. Cold patch placed over core.

BH GEOTECH PLOTS - NEW ALT.1 143691 5A\_WINSTON AND AREA.GPJ DATA TEMPLATE - AUGUST 2, 2013.GDT 28/11/15

**DYREGROV ROBINSON INC.**  
Consulting Geotechnical Engineers

LOGGED BY: CR	COMPLETION DEPTH: 7.62 m
REVIEWED BY: GR	COMPLETION DATE: 17/2/15
PROJECT ENGINEER: Gil Robinson	

PROJECT: Ferry Road & Riverbend CSR Works		CLIENT: Tetra Tech WEI		TESTHOLE NO: 15-110		
LOCATION: Bourkevale Drive - UTM 5526529 N, 628389 E				PROJECT NO.: 143691		
CONTRACTOR: Paddock Drilling Ltd.		METHOD: BRAT 22R - 125 mm SSA diameter auger		ELEVATION (m): 234.37		
SAMPLE TYPE	GRAB	SHELBY TUBE	SPLIT SPOON	BULK	NO RECOVERY	CORE
BACKFILL TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT	CUTTINGS	SAND



END OF TEST HOLE AT 7.6 m IN CLAY

Notes:

1. Frost to 1.5 m.
2. No sloughing or seepage observed.
3. Test hole backfilled with auger cuttings and bentonite chips.
4. Cold patch placed over core.

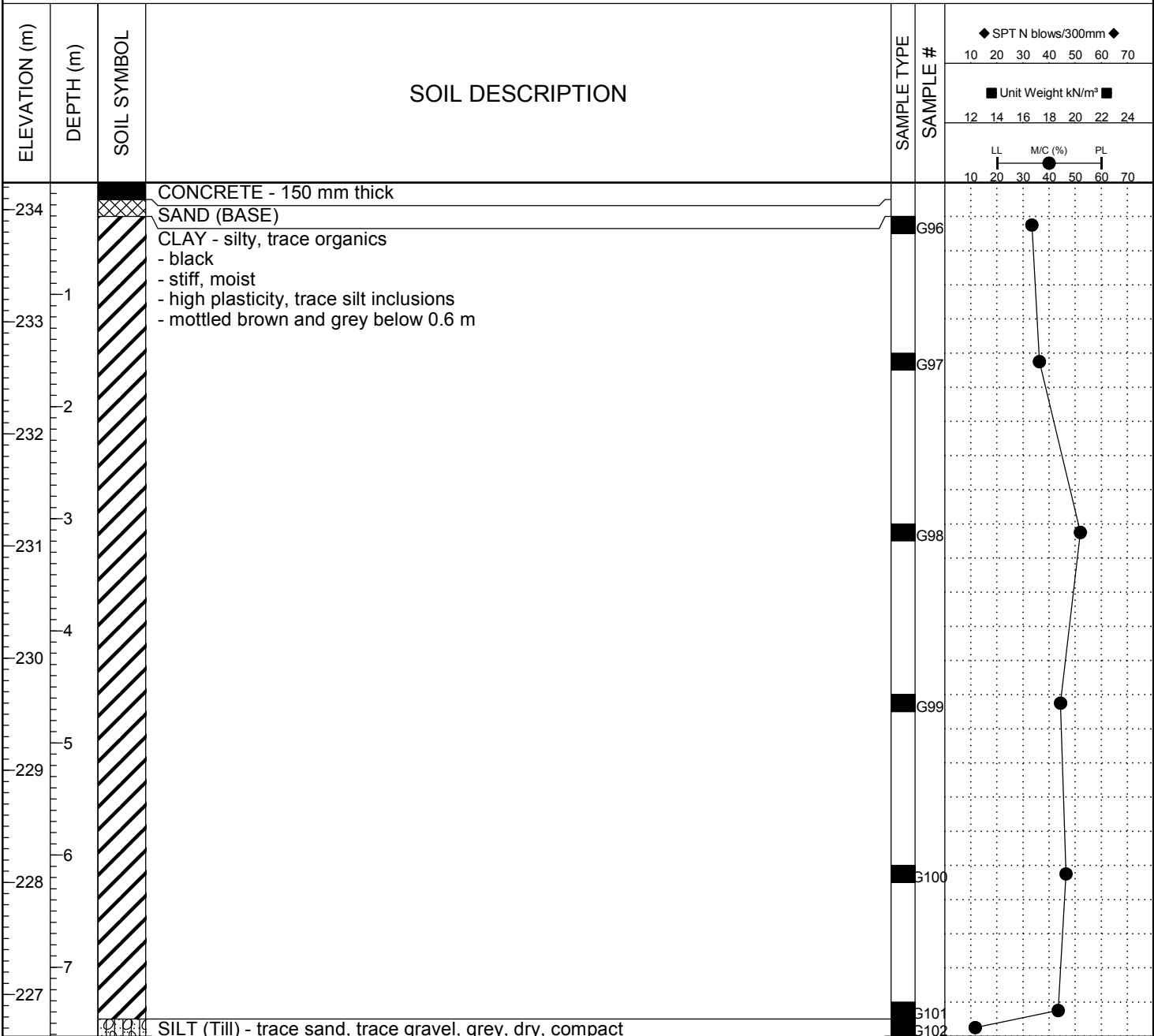
BH GEOTECH PLOTS - NEW ALT.1 143691 5A\_WINSTON AND AREA.GPJ DATA TEMPLATE - AUGUST 2, 2013.GDT 28/11/15

**DYREGROV ROBINSON INC.**  
Consulting Geotechnical Engineers

LOGGED BY: CR	COMPLETION DEPTH: 7.62 m
REVIEWED BY: GR	COMPLETION DATE: 17/2/15
PROJECT ENGINEER: Gil Robinson	



PROJECT: Ferry Road & Riverbend CSR Works		CLIENT: Tetra Tech WEI		TESTHOLE NO: 15-111		
LOCATION: Bourkevale Drive - UTM 5526472 N, 628387 E				PROJECT NO.: 143691		
CONTRACTOR: Paddock Drilling Ltd.		METHOD: BRAT 22R - 125 mm SSA diameter auger		ELEVATION (m): 234.398		
SAMPLE TYPE	GRAB	SHELBY TUBE	SPLIT SPOON	BULK	NO RECOVERY	CORE
BACKFILL TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT	CUTTINGS	SAND



END OF TEST HOLE AT 7.6 m IN SILT (TILL)

Notes:

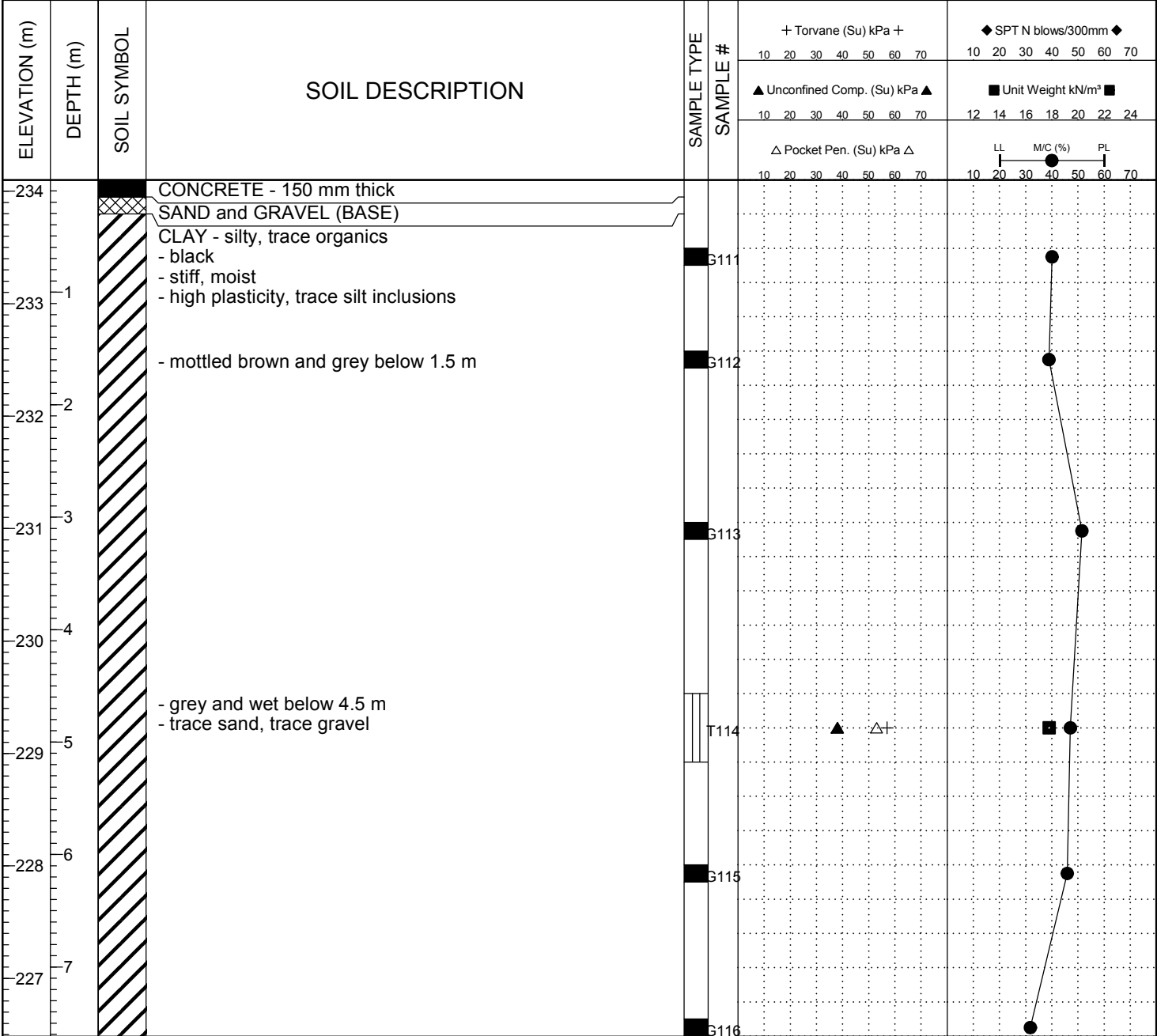
1. Frost to 1.5 m.
2. No sloughing or seepage observed.
3. Test hole backfilled with auger cuttings and bentonite chips.
4. Cold patch placed over core.

BH GEOTECH PLOTS - NEW ALT1 143691 5A\_WINSTON AND AREA.GPJ DATA TEMPLATE - AUGUST 2, 2013.GDT 28/11/15

**DYREGROV ROBINSON INC.**  
Consulting Geotechnical Engineers

LOGGED BY: CR	COMPLETION DEPTH: 7.62 m
REVIEWED BY: GR	COMPLETION DATE: 17/2/15
PROJECT ENGINEER: Gil Robinson	

PROJECT: Ferry Road & Riverbend CSR Works	CLIENT: Tetra Tech WEI	TESTHOLE NO: 15-112
LOCATION: Bourkevale Drive - UTM 5526427 N, 628386 E		PROJECT NO.: 143691
CONTRACTOR: Paddock Drilling Ltd.	METHOD: BRAT 22R - 125 mm SSA diameter auger	ELEVATION (m): 234.256
SAMPLE TYPE	<input type="checkbox"/> GRAB <input type="checkbox"/> SHELBY TUBE <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> BULK <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> CORE	
BACKFILL TYPE	<input type="checkbox"/> BENTONITE <input type="checkbox"/> GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> CUTTINGS <input type="checkbox"/> SAND	



END OF TEST HOLE AT 7.6 m IN CLAY

Notes:

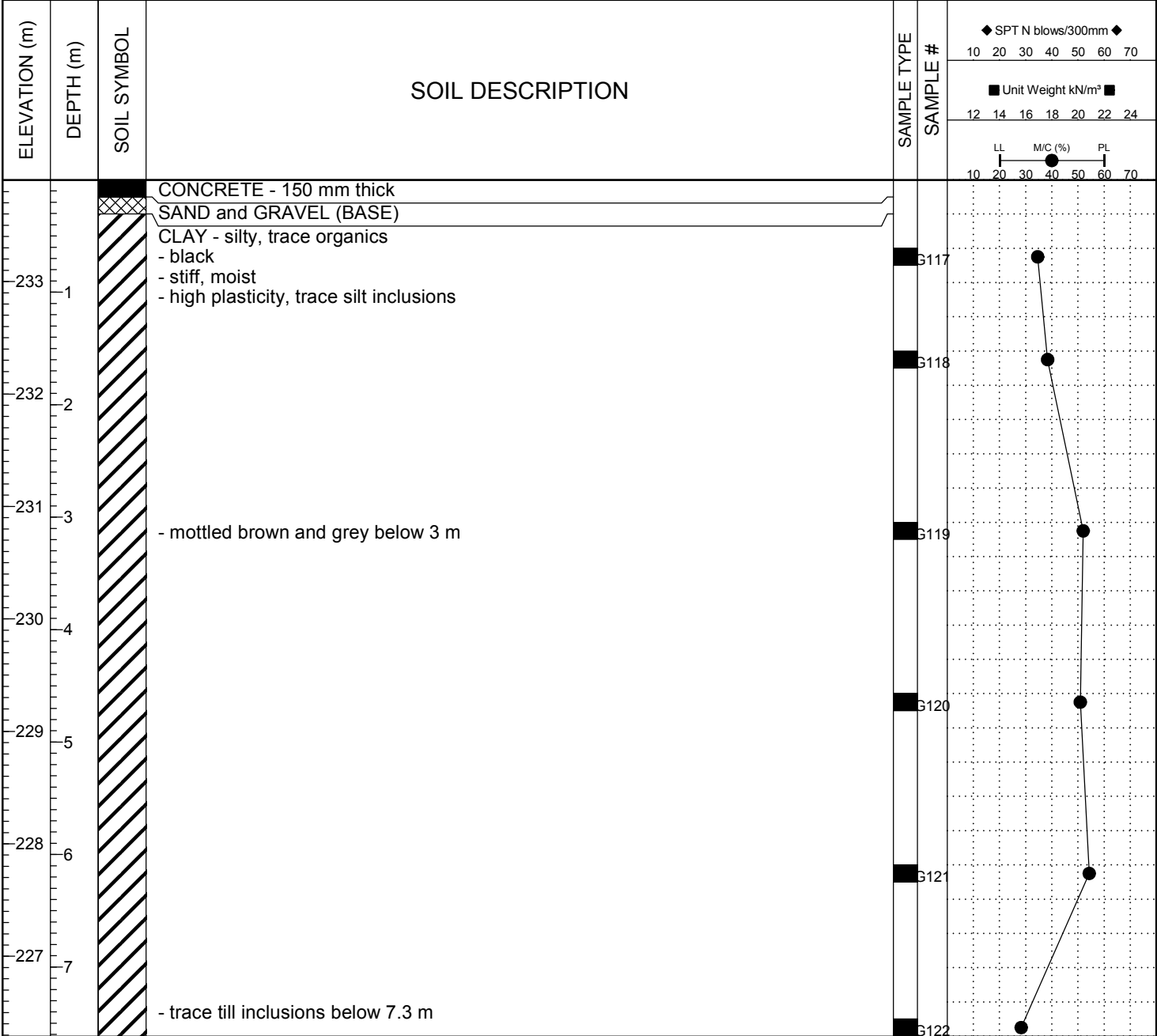
1. Frost to 1.5 m.
2. No sloughing or seepage observed.
3. Test hole backfilled with auger cuttings and bentonite chips.
4. Cold patch placed over core.

BH GEOTECH PLOTS - NEW ALT.1 143691 SA\_WINSTON AND AREA.GPJ DATA TEMPLATE - AUGUST 2, 2013.GDT 28/11/15

**DYREGROV ROBINSON INC.**  
Consulting Geotechnical Engineers

LOGGED BY: CR	COMPLETION DEPTH: 7.62 m
REVIEWED BY: GR	COMPLETION DATE: 17/2/15
PROJECT ENGINEER: Gil Robinson	

PROJECT: Ferry Road & Riverbend CSR Works		CLIENT: Tetra Tech WEI		TESTHOLE NO: 15-113		
LOCATION: Bourkevale Drive - UTM 5526376 N, 628384 E				PROJECT NO.: 143691		
CONTRACTOR: Paddock Drilling Ltd.		METHOD: BRAT 22R - 125 mm SSA diameter auger		ELEVATION (m): 234.059		
SAMPLE TYPE	GRAB	SHELBY TUBE	SPLIT SPOON	BULK	NO RECOVERY	CORE
BACKFILL TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT	CUTTINGS	SAND



END OF TEST HOLE AT 7.6 m IN CLAY

Notes:

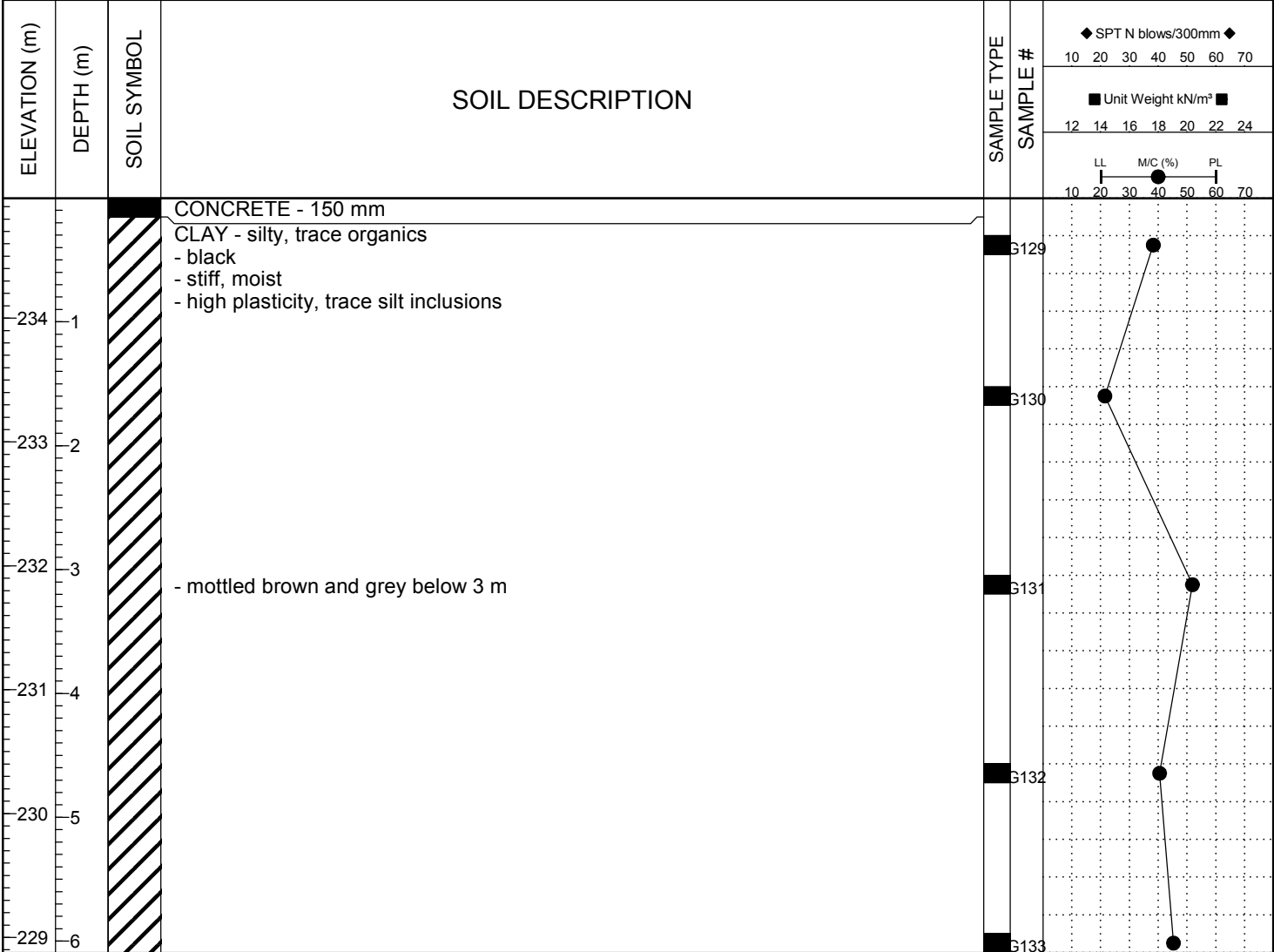
1. Frost to 1.5 m.
2. No sloughing or seepage observed.
3. Test hole backfilled with auger cuttings and bentonite chips.
4. Cold patch placed over core.

BH GEOTECH PLOTS - NEW ALT.1 143691 5A\_WINSTON AND AREA.GPJ DATA TEMPLATE - AUGUST 2, 2013.GDT 28/11/15

**DYREGROV ROBINSON INC.**  
Consulting Geotechnical Engineers

LOGGED BY: CR	COMPLETION DEPTH: 7.62 m
REVIEWED BY: GR	COMPLETION DATE: 17/2/15
PROJECT ENGINEER: Gil Robinson	

PROJECT: Ferry Road & Riverbend CSR Works		CLIENT: Tetra Tech WEI		TESTHOLE NO: 15-114		
LOCATION: Cavell Drive - UTM 5526608 N, 628479 E				PROJECT NO.: 143691		
CONTRACTOR: Paddock Drilling Ltd.		METHOD: BRAT 22R - 125 mm SSA diameter auger		ELEVATION (m): 235.125		
SAMPLE TYPE	GRAB	SHELBY TUBE	SPLIT SPOON	BULK	NO RECOVERY	CORE
BACKFILL TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT	CUTTINGS	SAND



END OF TEST HOLE AT 6.1 m IN CLAY

Notes:

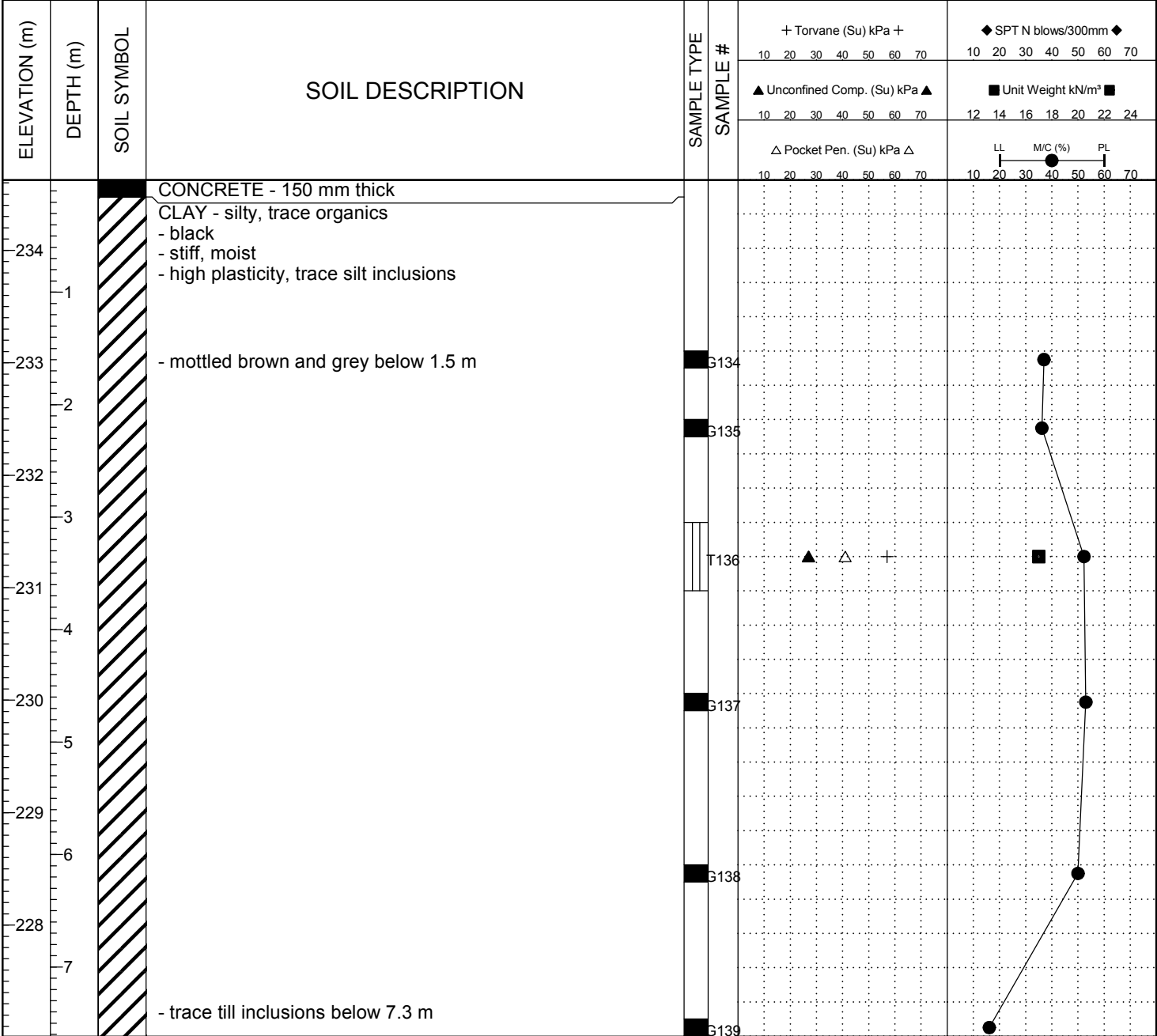
1. Frost to 1.5 m.
2. No sloughing or seepage observed.
3. Test hole backfilled with auger cuttings and bentonite chips.
4. Cold patch placed over core.

BH GEOTECH PLOTS - NEW ALT1 143691 5A - WINSTON AND AREA.GPJ DATA TEMPLATE - AUGUST 2, 2013.GDT 28/11/15

**DYREGROV ROBINSON INC.**  
Consulting Geotechnical Engineers

LOGGED BY: CR	COMPLETION DEPTH: 6.10 m
REVIEWED BY: GR	COMPLETION DATE: 17/2/15
PROJECT ENGINEER: Gil Robinson	

PROJECT: Ferry Road & Riverbend CSR Works		CLIENT: Tetra Tech WEI		TESTHOLE NO: 15-115		
LOCATION: Cavell Drive - UTM 5526550 N, 628477 E				PROJECT NO.: 143691		
CONTRACTOR: Paddock Drilling Ltd.		METHOD: BRAT 22R - 125 mm SSA diameter auger		ELEVATION (m): 234.782		
SAMPLE TYPE	GRAB	SHELBY TUBE	SPLIT SPOON	BULK	NO RECOVERY	CORE
BACKFILL TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT	CUTTINGS	SAND



END OF TEST HOLE AT 7.6 m IN CLAY

Notes:

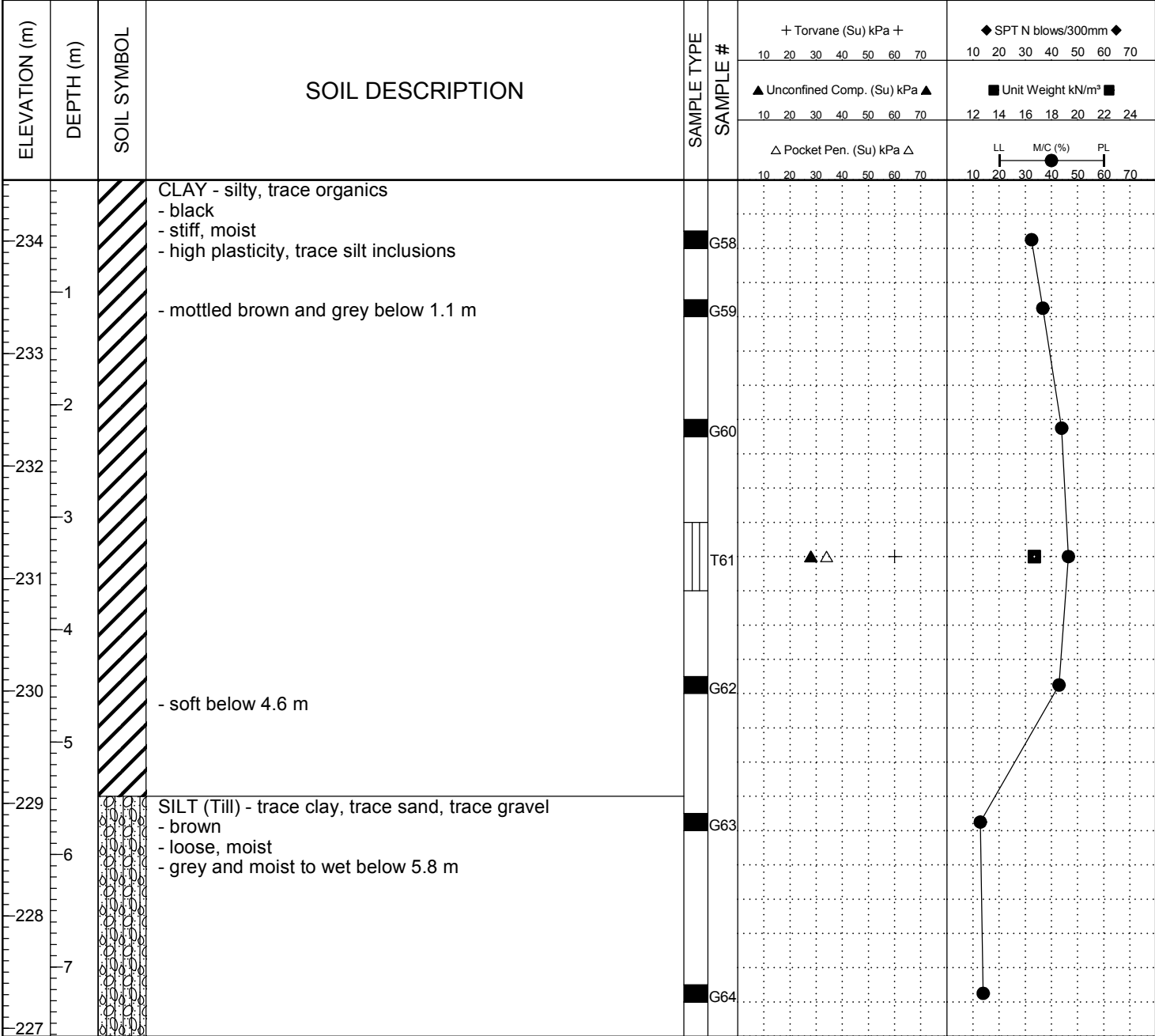
1. Frost to 1.5 m.
2. No sloughing or seepage observed.
3. Test hole backfilled with auger cuttings and bentonite chips.
4. Cold patch placed over core.

BH GEOTECH PLOTS - NEW ALT.1 143691 5A\_WINSTON AND AREA.GPJ DATA TEMPLATE - AUGUST 2, 2013.GDT 28/11/15

**DYREGROV ROBINSON INC.**  
Consulting Geotechnical Engineers

LOGGED BY: CR	COMPLETION DEPTH: 7.62 m
REVIEWED BY: GR	COMPLETION DATE: 17/2/15
PROJECT ENGINEER: Gil Robinson	

PROJECT: Ferry Road & Riverbend CSR Works		CLIENT: Tetra Tech WEI		TESTHOLE NO: 15-116		
LOCATION: Cavell Drive - UTM 5526503 N, 628468 E				PROJECT NO.: 143691		
CONTRACTOR: Maple Leaf Drilling Ltd.		METHOD: Acker Renegade- 125mm SS augers		ELEVATION (m): 234.7		
SAMPLE TYPE	GRAB	SHELBY TUBE	SPLIT SPOON	BULK	NO RECOVERY	CORE
BACKFILL TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT	CUTTINGS	SAND



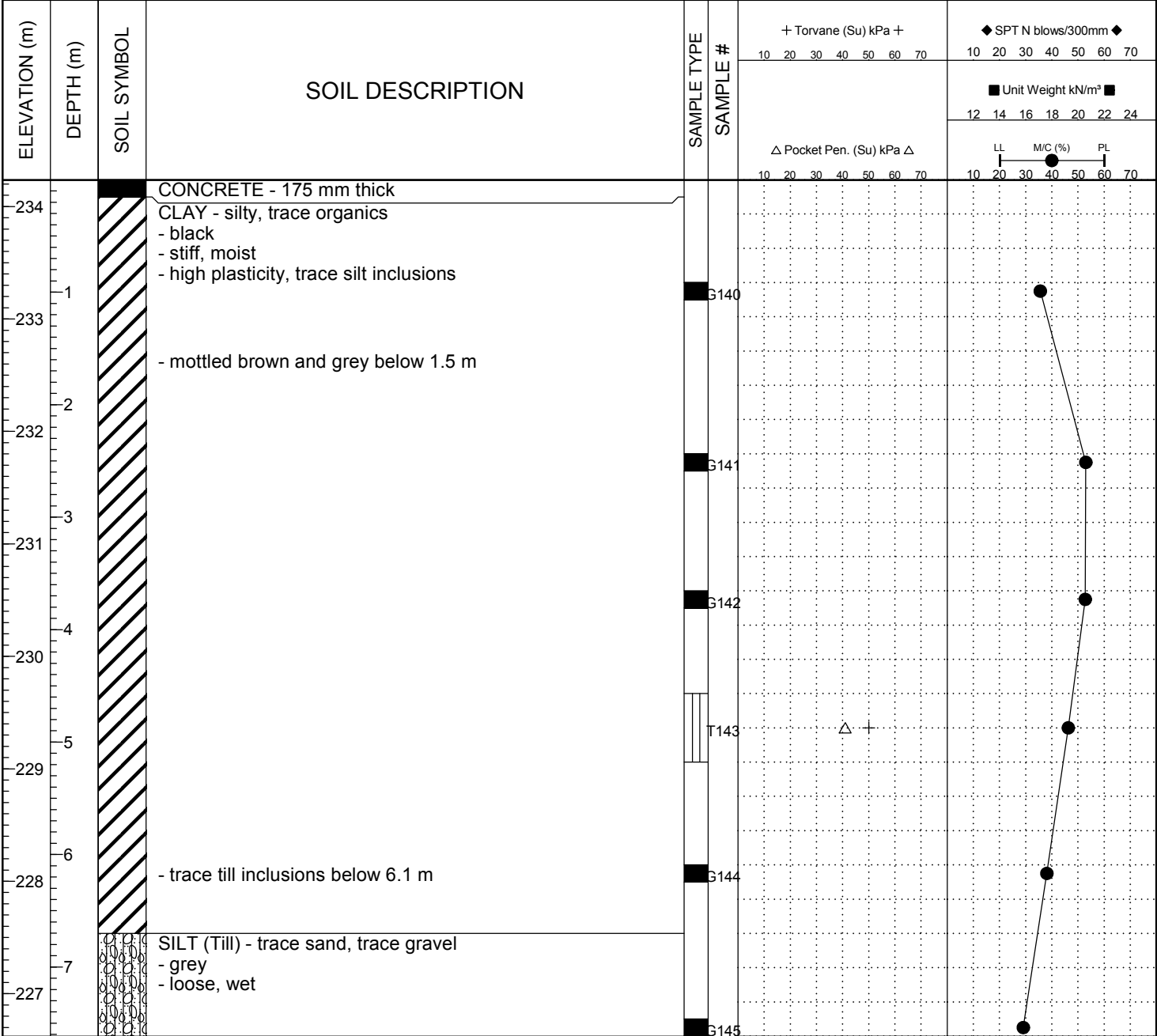
END OF TEST HOLE AT 7.6 m IN SILT (TILL)  
 Notes:  
 1. No sloughing or seepage observed.  
 2. Test hole backfilled with auger cuttings and bentonite chips.

BH GEOTECH PLOTS - NEW ALT1 143691 5A\_WINSTON AND AREA.GPJ DATA TEMPLATE - AUGUST 2, 2013.GDT 28/11/15

**DYREGROV ROBINSON INC.**  
 Consulting Geotechnical Engineers

LOGGED BY: CR	COMPLETION DEPTH: 7.62 m
REVIEWED BY: GR	COMPLETION DATE: 26/6/15
PROJECT ENGINEER: Gil Robinson	

PROJECT: Ferry Road & Riverbend CSR Works		CLIENT: Tetra Tech WEI		TESTHOLE NO: 15-117	
LOCATION: Cavell Drive - UTM 5526452 N, 628468 E				PROJECT NO.: 143691	
CONTRACTOR: Paddock Drilling Ltd.		METHOD: BRAT 22R - 125 mm SSA diameter auger		ELEVATION (m): 234.392	
SAMPLE TYPE	<input checked="" type="checkbox"/> GRAB	<input type="checkbox"/> SHELBY TUBE	<input type="checkbox"/> SPLIT SPOON	<input type="checkbox"/> BULK	<input type="checkbox"/> NO RECOVERY
BACKFILL TYPE	<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> CUTTINGS
					<input type="checkbox"/> CORE
					<input type="checkbox"/> SAND



END OF TEST HOLE AT 7.6 m IN SILT (TILL)

Notes:

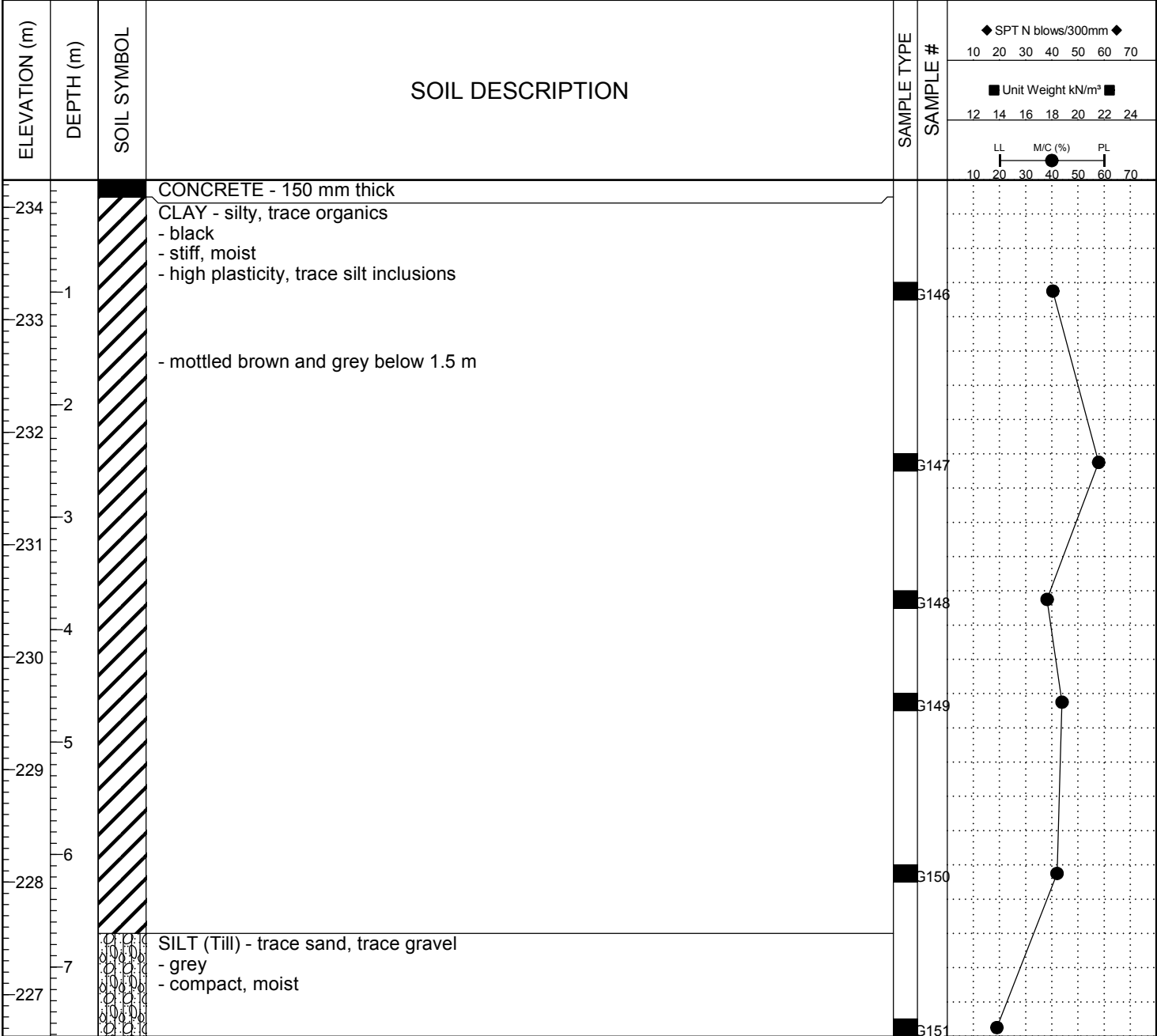
1. Frost to 1.5 m.
2. No sloughing or seepage observed.
3. Test hole backfilled with auger cuttings and bentonite chips.
4. Cold patch placed over core.

BH GEOTECH PLOTS - NEW ALT.1 143691 5A\_WINSTON AND AREA.GPJ DATA TEMPLATE - AUGUST 2, 2013.GDT 28/11/15

**DYREGROV ROBINSON INC.**  
Consulting Geotechnical Engineers

LOGGED BY: CR	COMPLETION DEPTH: 7.62 m
REVIEWED BY: GR	COMPLETION DATE: 17/2/15
PROJECT ENGINEER: Gil Robinson	

PROJECT: Ferry Road & Riverbend CSR Works		CLIENT: Tetra Tech WEI		TESTHOLE NO: 15-118		
LOCATION: Cavell Drive - UTM 5526404 N, 628471 E				PROJECT NO.: 143691		
CONTRACTOR: Paddock Drilling Ltd.		METHOD: BRAT 22R - 125 mm SSA diameter auger		ELEVATION (m): 234.399		
SAMPLE TYPE	GRAB	SHELBY TUBE	SPLIT SPOON	BULK	NO RECOVERY	CORE
BACKFILL TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT	CUTTINGS	SAND



END OF TEST HOLE AT 7.6 m IN SILT (TILL)  
Notes:  
1. Frost to 1.5 m.  
2. No sloughing or seepage observed.  
3. Test hole backfilled with auger cuttings and bentonite chips.  
4. Cold patch placed over core.

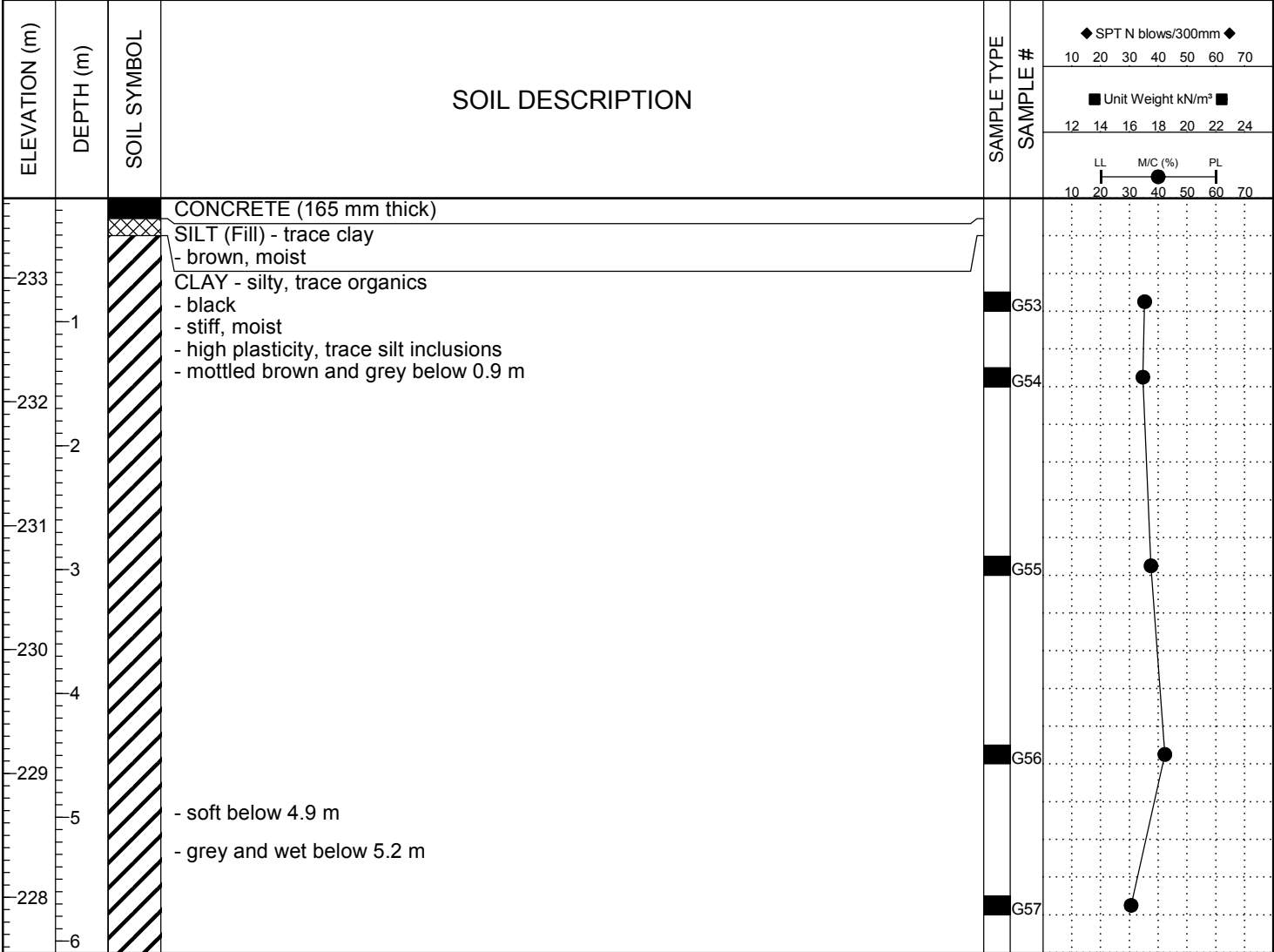
BH GEOTECH PLOTS - NEW ALT1 143691 5A\_WINSTON AND AREA.GPJ DATA TEMPLATE - AUGUST 2, 2013.GDT 28/11/15

**DYREGROV ROBINSON INC.**  
Consulting Geotechnical Engineers

LOGGED BY: CR	COMPLETION DEPTH: 7.62 m
REVIEWED BY: GR	COMPLETION DATE: 17/2/15
PROJECT ENGINEER: Gil Robinson	



PROJECT: Ferry Road & Riverbend CSR Works	CLIENT: Tetra Tech WEI	TESTHOLE NO: 15-119
LOCATION: Cavell Drive - UTM 5526332 N, 628464 E		PROJECT NO.: 143691
CONTRACTOR: Maple Leaf Drilling Ltd.	METHOD: Acker Renegade- 125mm SS augers	ELEVATION (m): 233.8
SAMPLE TYPE	<input type="checkbox"/> GRAB <input type="checkbox"/> SHELBY TUBE <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> BULK <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> CORE	
BACKFILL TYPE	<input type="checkbox"/> BENTONITE <input type="checkbox"/> GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> CUTTINGS <input type="checkbox"/> SAND	



END OF TEST HOLE AT 6.1 m IN CLAY

Notes:

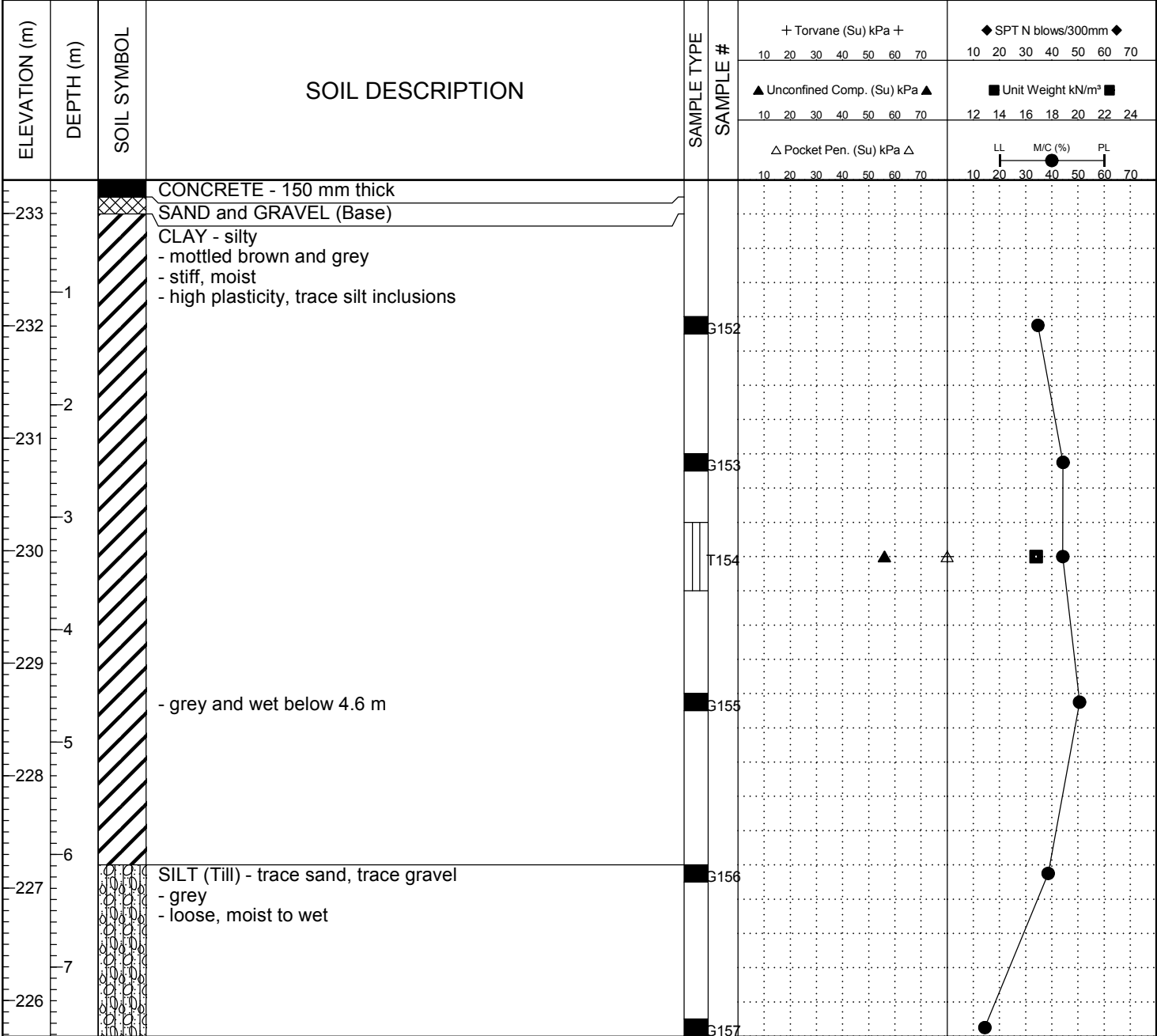
1. No seepage or sloughing observed.
2. Test hole backfilled with auger cuttings and bentonite chips.

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**DYREGROV ROBINSON INC.**  
Consulting Geotechnical Engineers

LOGGED BY: CR	COMPLETION DEPTH: 6.10 m
REVIEWED BY: GR	COMPLETION DATE: 26/6/15
PROJECT ENGINEER: Gil Robinson	

PROJECT: Ferry Road & Riverbend CSR Works		CLIENT: Tetra Tech WEI		TESTHOLE NO: 15-120		
LOCATION: Cavell Drive - UTM 5526316 N, 628469 E				PROJECT NO.: 143691		
CONTRACTOR: Paddock Drilling Ltd.		METHOD: BRAT 22R - 125 mm SSA diameter auger		ELEVATION (m): 233.452		
SAMPLE TYPE	GRAB	SHELBY TUBE	SPLIT SPOON	BULK	NO RECOVERY	CORE
BACKFILL TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT	CUTTINGS	SAND



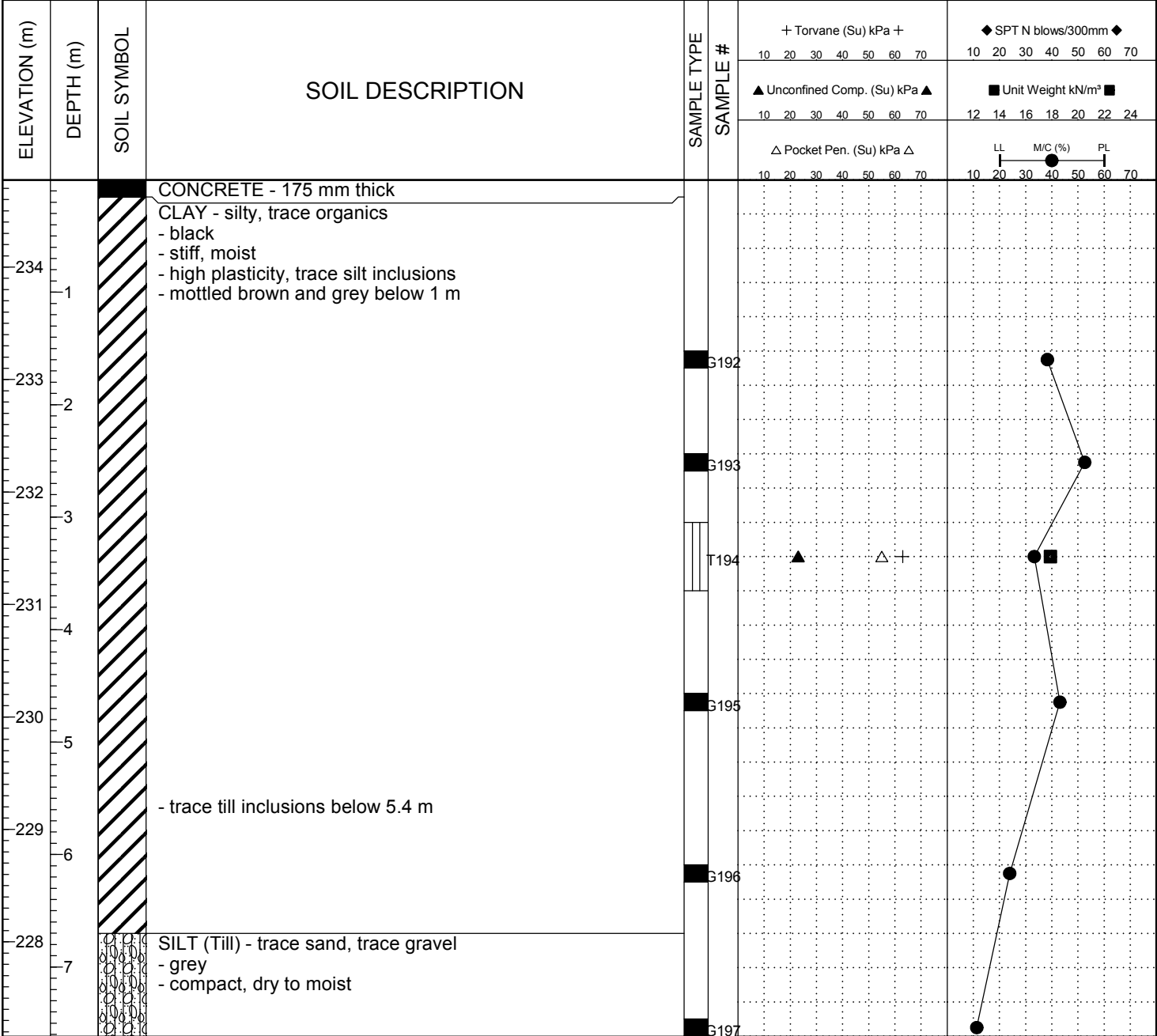
END OF TEST HOLE AT 7.6 m IN SILT (TILL)  
Notes:  
1. Frost to 1.5 m.  
2. No sloughing or seepage observed.  
3. Test hole backfilled with auger cuttings and bentonite chips.  
4. Cold patch placed over core.

BH GEOTECH PLOTS - NEW ALT.1 143691 5A\_WINSTON AND AREA.GPJ DATA TEMPLATE - AUGUST 2, 2013.GDT 28/11/15

**DYREGROV ROBINSON INC.**  
Consulting Geotechnical Engineers

LOGGED BY: CR	COMPLETION DEPTH: 7.62 m
REVIEWED BY: GR	COMPLETION DATE: 17/2/15
PROJECT ENGINEER: Gil Robinson	

PROJECT: Ferry Road & Riverbend CSR Works		CLIENT: Tetra Tech WEI		TESTHOLE NO: 15-124		
LOCATION: Winston Drive - UTM 5526489 N, 628551 E				PROJECT NO.: 143691		
CONTRACTOR: Paddock Drilling Ltd.		METHOD: BRAT 22R - drill rig, 125 mm SS Augers		ELEVATION (m): 234.931		
SAMPLE TYPE	GRAB	SHELBY TUBE	SPLIT SPOON	BULK	NO RECOVERY	CORE
BACKFILL TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT	CUTTINGS	SAND



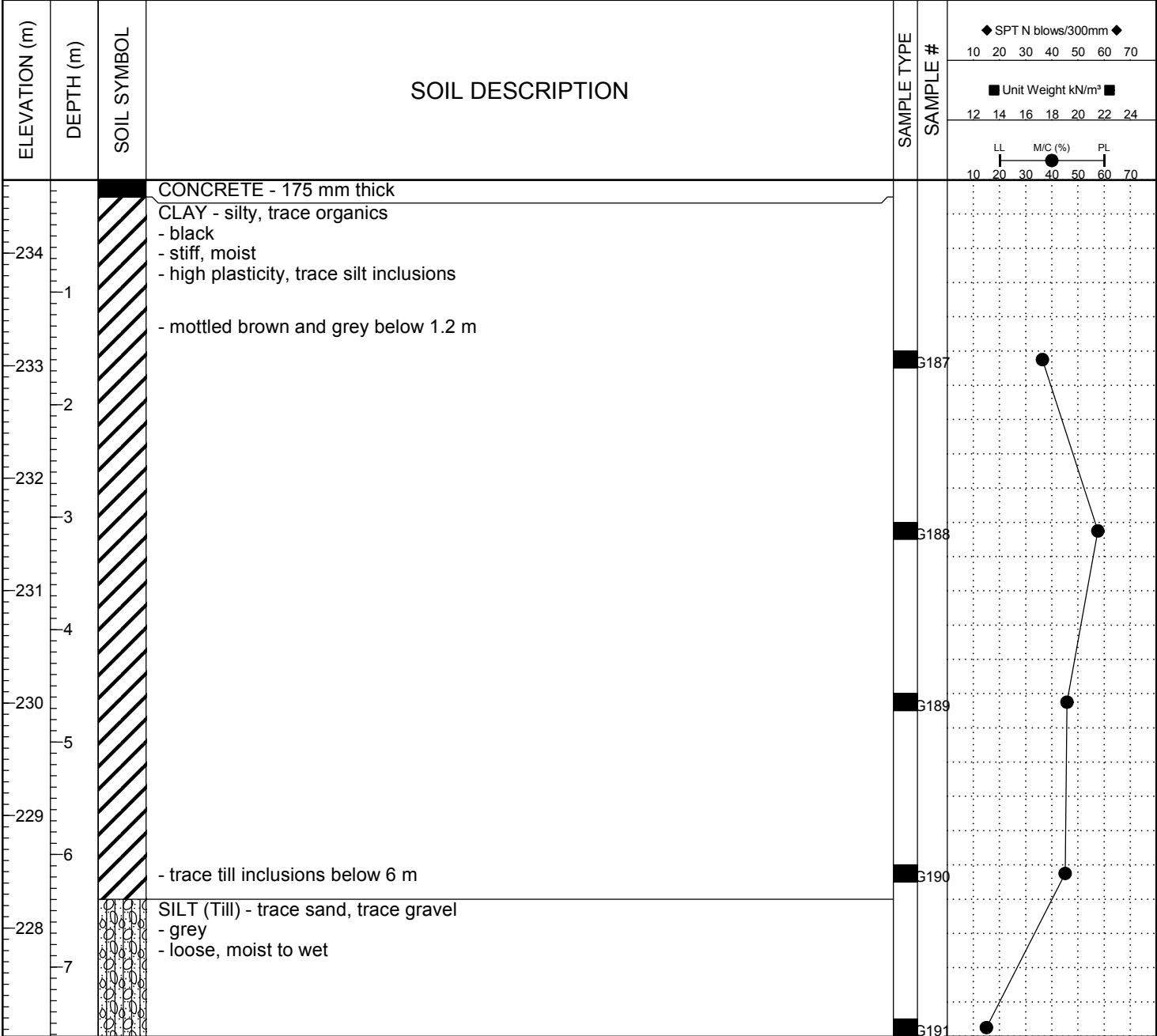
END OF TEST HOLE AT 7.6 m IN SILT (TILL)  
Notes:  
1. Frost to 1.5 m.  
2. No sloughing or seepage observed.  
3. Test hole backfilled with auger cuttings and bentonite chips.  
4. Cold patch placed over core.

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Consulting Geotechnical Engineers

LOGGED BY: CR	COMPLETION DEPTH: 7.62 m
REVIEWED BY: GR	COMPLETION DATE: 18/2/15
PROJECT ENGINEER: Gil Robinson	

PROJECT: Ferry Road & Riverbend CSR Works	CLIENT: Tetra Tech WEI	TESTHOLE NO: 15-125
LOCATION: Winston Drive - UTM 5526432 N, 628549 E		PROJECT NO.: 143691
CONTRACTOR: Paddock Drilling Ltd.	METHOD: BRAT 22R - drill rig, 125 mm SS Augers	ELEVATION (m): 234.808
SAMPLE TYPE	<input type="checkbox"/> GRAB <input type="checkbox"/> SHELBY TUBE <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> BULK <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> CORE	
BACKFILL TYPE	<input type="checkbox"/> BENTONITE <input type="checkbox"/> GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> CUTTINGS <input type="checkbox"/> SAND	



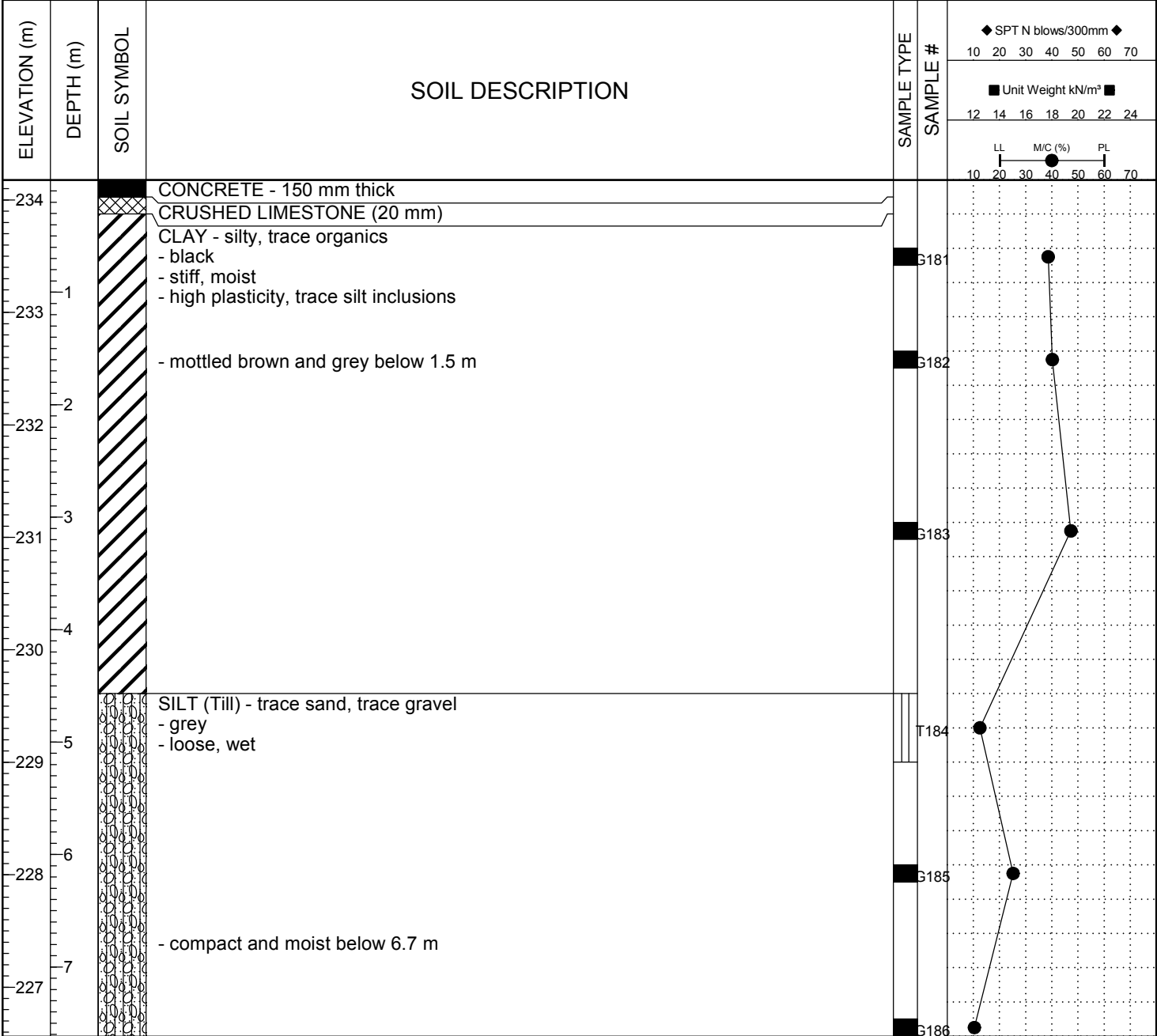
END OF TEST HOLE AT 7.6 m IN SILT (TILL)  
Notes:  
1. Frost to 1.5 m.  
2. No sloughing or seepage observed.  
3. Test hole backfilled with auger cuttings and bentonite chips.  
4. Cold patch placed over core.

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**DYREGROV ROBINSON INC.**  
Consulting Geotechnical Engineers

LOGGED BY: CR	COMPLETION DEPTH: 7.62 m
REVIEWED BY: GR	COMPLETION DATE: 18/2/15
PROJECT ENGINEER: Gil Robinson	

PROJECT: Ferry Road & Riverbend CSR Works	CLIENT: Tetra Tech WEI	TESTHOLE NO: 15-126
LOCATION: Winston Drive - UTM 5526386 N, 628547 E		PROJECT NO.: 143691
CONTRACTOR: Paddock Drilling Ltd.	METHOD: BRAT 22R - drill rig, 125 mm SS Augers	ELEVATION (m): 234.334
SAMPLE TYPE	<input type="checkbox"/> GRAB <input type="checkbox"/> SHELBY TUBE <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> BULK <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> CORE	
BACKFILL TYPE	<input type="checkbox"/> BENTONITE <input type="checkbox"/> GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> CUTTINGS <input type="checkbox"/> SAND	



END OF TEST HOLE AT 7.6 m IN SILT (TILL)

Notes:

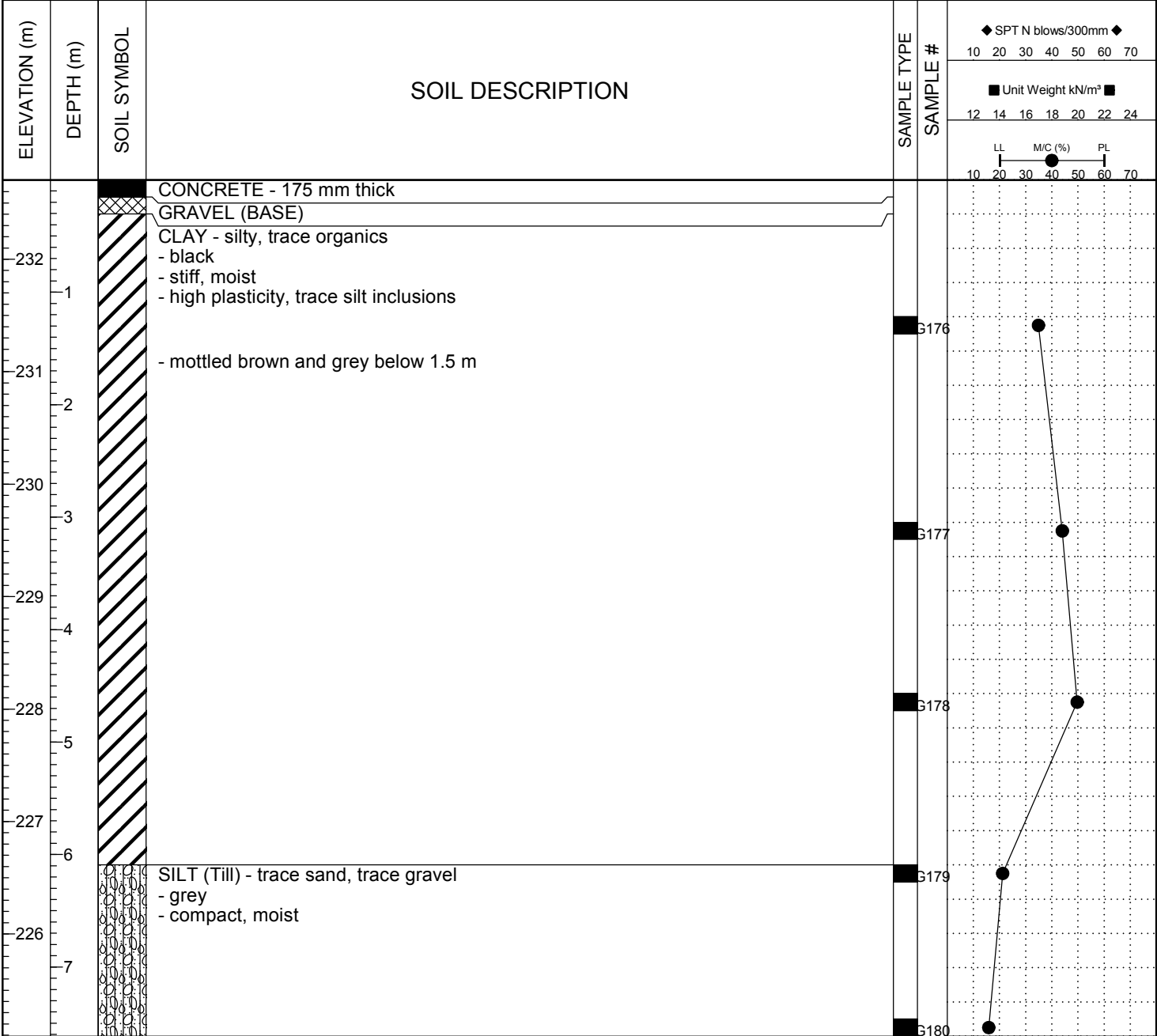
1. Frost to 1.5 m.
2. No sloughing or seepage observed.
3. Test hole backfilled with auger cuttings and bentonite chips.
4. Cold patch placed over core.

BH GEOTECH PLOTS - NEW ALT1 143691 5A\_WINSTON AND AREA.GPJ DATA TEMPLATE - AUGUST 2, 2013.GDT 28/11/15

**DYREGROV ROBINSON INC.**  
Consulting Geotechnical Engineers

LOGGED BY: CR	COMPLETION DEPTH: 7.62 m
REVIEWED BY: GR	COMPLETION DATE: 18/2/15
PROJECT ENGINEER: Gil Robinson	

PROJECT: Ferry Road & Riverbend CSR Works	CLIENT: Tetra Tech WEI	TESTHOLE NO: 15-127
LOCATION: Winston Drive - UTM 5526325 N, 628545 E		PROJECT NO.: 143691
CONTRACTOR: Paddock Drilling Ltd.	METHOD: BRAT 22R - drill rig, 125 mm SS Augers	ELEVATION (m): 232.86
SAMPLE TYPE	<input type="checkbox"/> GRAB <input type="checkbox"/> SHELBY TUBE <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> BULK <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> CORE	
BACKFILL TYPE	<input type="checkbox"/> BENTONITE <input type="checkbox"/> GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> CUTTINGS <input type="checkbox"/> SAND	



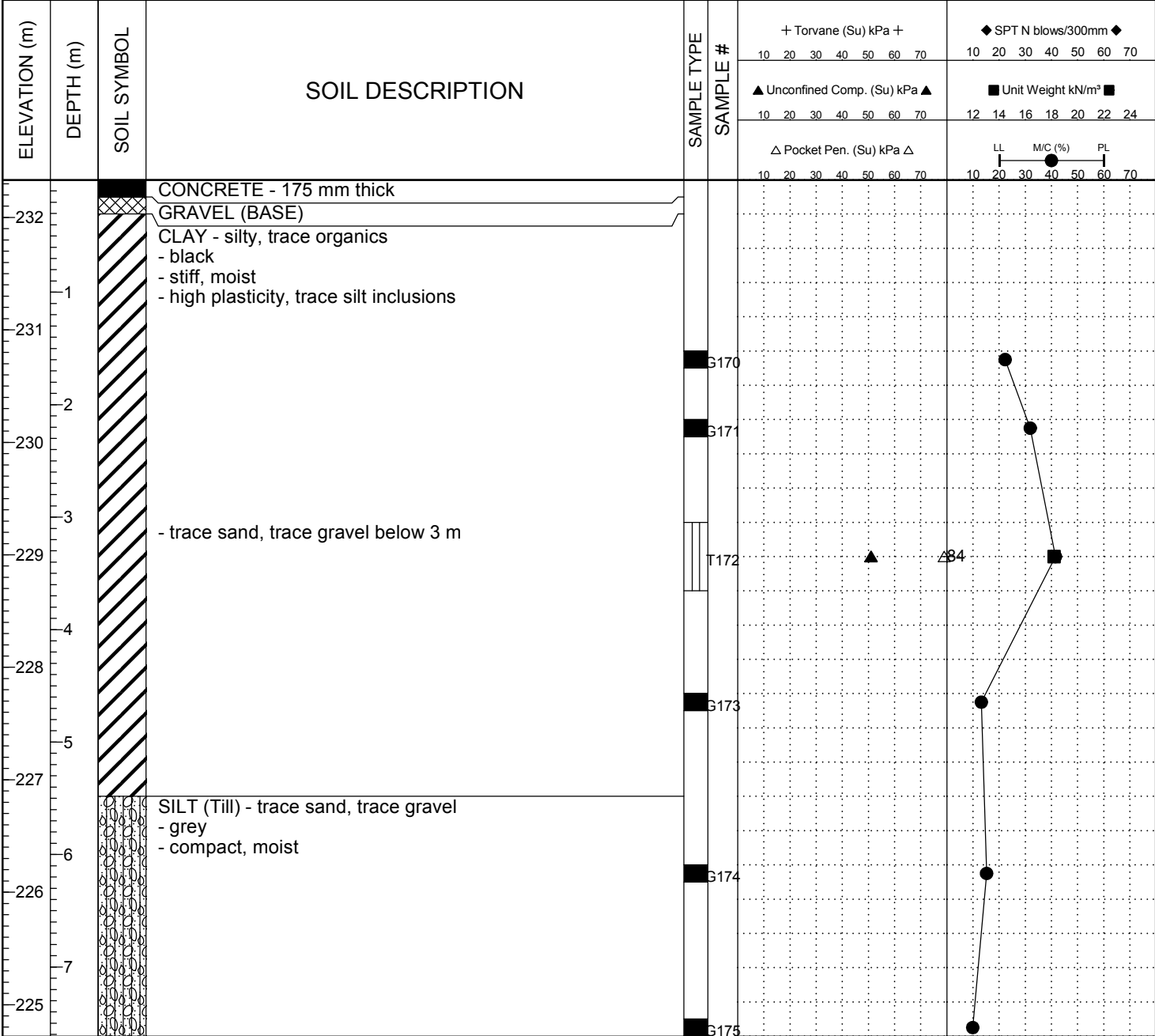
END OF TEST HOLE AT 7.6 m IN SILT (TILL)  
 Notes:  
 1. Frost to 1.5 m.  
 2. No sloughing or seepage observed.  
 3. Test hole backfilled with auger cuttings and bentonite chips.  
 4. Cold patch placed over core.

BH GEOTECH PLOTS - NEW ALT1 143691 5A\_WINSTON AND AREA.GPJ DATA TEMPLATE - AUGUST 2, 2013.GDT 28/11/15

**DYREGROV ROBINSON INC.**  
 Consulting Geotechnical Engineers

LOGGED BY: CR	COMPLETION DEPTH: 7.62 m
REVIEWED BY: GR	COMPLETION DATE: 18/2/15
PROJECT ENGINEER: Gil Robinson	

PROJECT: Ferry Road & Riverbend CSR Works		CLIENT: Tetra Tech WEI		TESTHOLE NO: 15-128		
LOCATION: Winston Drive - UTM 5526302 N, 628549 E				PROJECT NO.: 143691		
CONTRACTOR: Paddock Drilling Ltd.		METHOD: BRAT 22R - drill rig, 125 mm SS Augers		ELEVATION (m): 232.488		
SAMPLE TYPE	GRAB	SHELBY TUBE	SPLIT SPOON	BULK	NO RECOVERY	CORE
BACKFILL TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT	CUTTINGS	SAND



END OF TEST HOLE AT 7.6 m IN SILT (TILL)  
Notes:  
1. Frost to 1.5 m.  
2. No sloughing or seepage observed.  
3. Test hole backfilled with auger cuttings and bentonite chips.  
4. Cold patch placed over core.

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**DYREGROV ROBINSON INC.**  
Consulting Geotechnical Engineers

LOGGED BY: CR	COMPLETION DEPTH: 7.62 m
REVIEWED BY: GR	COMPLETION DATE: 18/2/15
PROJECT ENGINEER: Gil Robinson	