



Westbank Projects Corp.
501 - 1067 West Cordova Street
Vancouver, B.C.
V6C 1C7

May 12th, 2020
File: 14469

Attention: Spencer Goodman

**Re: Preliminary Hydrogeological Report: Proposed Mixed Use Development
1780 East Broadway, Vancouver, BC**

1.0 INTRODUCTION

We understand that it is proposed to construct a new mixed-use development at the above referenced site. Preliminary design drawings prepared by Perkin and Wills Architects (dated May 1st, 2020) shows three residential towers up to 32 storeys in height over commercial units over up to three levels of below grade parking. The underground parkade is to be constructed to within close proximity to the property lines on all sides and will likely extend to a maximum depth of about 12.5 m below ground surface (bgs).

The following desktop study summarizes our preliminary findings from a hydrogeological perspective and outlines an approach for further investigation into groundwater conditions at the site prior to development. This report has been prepared exclusively for Westbank Project Corp., for their use, and the use of others on their design team as well as to satisfy the *City of Vancouver's Groundwater Management Bulletin* (released March 2019 and amended April 2020).

The requirement for this preliminary hydrogeological study is triggered by the *City of Vancouver's Rezoning Policy for Sustainable Large Developments* which defines a large development as any site that is 8,000 m² or greater is required to provide a Hydrogeological Study that evaluates the potential for the proposed building(s) and site design to intercept the yearly high water table.

2.0 SITE DESCRIPTION

The site comprises the existing Safeway building, the adjacent at grade parking area and a part of the railway embankment (in the northeast corner of the site). The lot is rectangular and has an area of approximately 10,200 m².

The lot gently slopes from the east to the west with an approximate 2 m grade difference across the length of the site. The north-east corner of the site (the railway embankment) slopes steeply downwards from approximately 37 m to 24 m geodetic.

The site is bounded by East Broadway to the north, a multifamily residential property to the east, 10th Ave to the south and the Commercial-Broadway Skytrain station to the west.

The location of the site is shown on our Drawing No. 14469-01, following the text of this report.

3.0 GROUND INVESTIGATION

3.1. Phase 1

To-date there has been a number of phases of sub-surface ground investigation carried out at the site. The first phase of ground investigation was carried out on between April 30th and May 2nd, 2013 by others and comprised the following:

- 9 No. Sonic Drilled Test Holes (to depths of between 6.1 and 15.2 m below ground surface (bgs));
- 9 No. Dynamic Cone Penetration Tests (DCPT); and
- 5 No. Groundwater Monitoring Well Installations.

The truck mounted sonic rig was provided and operated by Downrite Drilling Ltd. Of Chilliwack, BC.

3.2. Phase 2

A second phase of ground investigation was carried out by GeoPacific Consultants on August 17th 2018, the purpose of which was to investigate ground conditions in the vicinity of the north-east embankment slope. This work comprised the following:

- 2 No. Auger Drill Holes (7.3 m to 8.2 m below ground surface (bgs)); and
- Soil Sampling.

The track mounted auger drill rig was provided by Ontrack Drilling of Coquitlam, BC.

The geotechnical field investigation was supervised by a member of our geotechnical team who logged and sampled the soils and noted existing groundwater conditions. Upon completion, all test holes were backfilled and sealed in accordance with provincial abandonment requirements.

Due to the slope of the bank of the “Grandview Cut”, the test hole locations had to be set on the adjacent parking lot of 1780 East Broadway. The approximate test hole locations are shown on our Drawing No. 14469-02, following the text of this report.

4.0 SUBSURFACE CONDITIONS

Subsurface conditions have been sourced from a combination of readily available online sources and from site-specific investigation data.

4.1. General Soil and Rock Conditions

According to the Geological Survey of Canada Surficial Geology Map 1486A the site is mapped as being underlain by Capilano Sediments and Vashon Drift deposits (*i.e.* Glacial Till). At the area of the site, Tertiary bedrock is likely to be present within 10 m of the surface.

4.2. Encountered Soil Profile

The 2018 sub-surface ground investigation recorded the following soil profile at the site:

Table 1 – Soil Profile

Formation	Type	Description
FILL	Fill	Underlying asphalt surfacing was sand and gravel fill with trace to some silt. The fill material was observed to be dense and extended to 0.15 m to 2.4 m below the existing surface.
VASHON DRIFT	Glacial Till	Dense to very dense glacial till was observed in both test holes ranging from 2.7 to 4.9 m in thickness. Till was light brown to grey and was comprised of primarily silt with varying sand and gravel constituents or silt with varying sand, clay and gravel constituents.
KITSILANO FORMATION	Bedrock	Bedrock is encountered at the base of 10 of the 11 test holes and ranged in thickness from 2.7 m to 4.9 m. Bedrock was generally weathered, generally soft, and consisted of either sandstone, siltstone or shale.

For specific subsurface soil descriptions at the test hole locations refer to the test hole logs provided in Appendix 'A', following this report.

5.0 GROUNDWATER CONDITIONS

5.1. Mapped Aquifers

The south-west half of the site is within the mapped extent of the Quadra Sands Formation (BC Water Atlas, 2020). The Quadra Sands (Aquifer #49) is a regionally important and commonly confined aquifer comprising clean well sorted pre-glacial sands and gravels. The quadra sands are known to experience artesian pressures along the southern slopes of Vancouver, however these artesian pressures are not anticipated in the locale of the site.

The Quadra Sands were not encountered on the borehole logs from either of the two phases of ground investigation and therefore will not be considered further in this report.

5.2. Encountered Groundwater

Five groundwater monitoring wells were installed as part of the 2013 investigation. Groundwater levels were recorded on the 13th June, 2013. A summary of the response zones and recorded water levels are shown on the following table:

Table 2 – Groundwater Level Summary

Well No.	Response Zone (m bgs)	Water Level (m bgs)	Response Zone (Geology)
BH13-1	3.0 – 6.0	3.27	SAND and Gravel / Sandy Clayey SILT
BH13-2	3.0 – 6.0	3.36	SAND / SILTSTONE
BH13-3	4.5 – 7.5	3.05	Clayey SILT / SHALE
BH13-6	6.0 – 9.0	7.74	SANDSTONE
BH13-7	6.0 – 9.0	4.49	SANDSTONE

The above table shows that groundwater was recorded ranging from 3.05 to 7.74 m bgs. Based on our working knowledge of the area, this groundwater is to be seasonally variable “perched” groundwater/ Groundwater was not encountered during the 2018 ground investigation.

Seasonal perched groundwater during wetter months is typically encountered at the upper contact of the weathered till-like deposits and within sandy zones. Groundwater is also potentially present within permeable lenses within the glacial till, or, within fractures zones of the tertiary bedrock. Inflows of groundwater at this site are therefore likely to be limited. The regional groundwater flow direction is assumed to follow topography and flow towards the south-east, discharging into Trout Lake.

The single round of groundwater monitoring is insufficient to provide meaningful commentary on the presence of static water level at the site.

5.3. BC Water Atlas Search

A search on the BC Water Atlas Website conducted on April 29th, 2020 (BC Gov, 2020) found that the site is not located within the provincial well drilling advisory area for flowing artesian conditions.

Additionally, there are no registered groundwater wells located within 150 m of the site.

5.4. Summary of Groundwater Information

The ground investigations recorded perched groundwater during drilling within permeable zones in the till, at the contact between the glacial till and weathered bedrock and within the sandstone bedrock. Groundwater was observed at depths of between 3.1 m and 7.8 m bgs. Quadra Sands were not observed at the site and hence groundwater inflows at the site are anticipated to be limited to inflows of perched groundwater and fracture flows from the bedrock.

Only a single round of groundwater monitoring was undertaken at the site, and therefore we are unable to provide full commentary on the static water table at the site. However, given the proximity of the site to the Grandview Cut (located north-east) and the presence of an associated 15 m embankment, significant groundwater is considered highly unlikely.

Further monitoring should be undertaken to better understand the groundwater regime at the site.

6.0 WATERCOURSES

There are no watercourses mapped on or within 500 m of the site.

The site is not located in the footprint of any known channels or waterways.

7.0 DISCUSSION AND RECOMMENDATIONS

We understand that the site will be re-developed with three residential towers up to 32 storeys high over commercial units over three levels of underground parking. The P3 slab depth is likely to extend to 12.5 m below existing grades (approximately 22.5 to 24.5 m geodetic).

Groundwater was observed in the five existing monitoring wells on one occasion (June 2013) with water levels recorded between 3.05 and 7.74 m bgs. The groundwater monitoring wells are installed to a maximum of 9 m bgs, these are therefore they are positioned above the proposed P3 slab depth of approximately 12.5m bgs. Deeper wells would therefore need to be installed at the site to understand the long-term groundwater levels at the site, however, we anticipate this groundwater to be perched.

The single round of groundwater level monitoring undertaken in June 2013 is insufficient to understand the static water levels at the site and further work is required.

We anticipate that there will be groundwater inflows to the proposed excavation from permeable lenses in the till and from discrete fracture zones in the bedrock, however further work is required to determine inflow rates. In order to meet the requirements of the *City of Vancouver's Groundwater Bulletin* (Dated April 2020) and the requirements for the *City of Vancouver's Rezoning Policy for Sustainable Large Developments* we recommend the following further work be undertaken at the site:

Existing Groundwater Monitoring Infrastructure:

- Installation of 5 automated groundwater monitoring piezometers within the existing groundwater monitoring wells to determine perched groundwater variation over time;
- Development of the existing groundwater monitoring wells and monitoring of the subsequent groundwater response; and
- Hydraulic conductivity testing of BH13-6 and BH13-7 using slug testing methods;

Further intrusive works:

- Drilling and subsequent installation of 2-3 No. groundwater monitoring wells to at least 2 m below the final excavation depth (as per City of Vancouver requirements);
- Development of the groundwater monitoring wells;
- Installation of automated groundwater monitoring piezometers in the wells;
- Hydraulic conductivity testing (if required);
- Undertake seepage modelling (if required); and
- Provide a final hydrogeological report with impact assessment, findings and design recommendations.

8.0 CLOSURE

This study is prepared exclusively for Westbank Project Corp. and the City of Vancouver for the purposes of providing hydrogeological recommendations for the City of Vancouver's Groundwater Management Bulletin. The report remains the property of GeoPacific Consultants Ltd. and unauthorized use of, or duplication of, this report is prohibited.

We are pleased to be of assistance to you on this project and we trust that our comments and recommendations are both helpful and sufficient for your current purposes. If you would like further details or would like clarification of any of the above, please do not hesitate to contact the undersigned.

For:

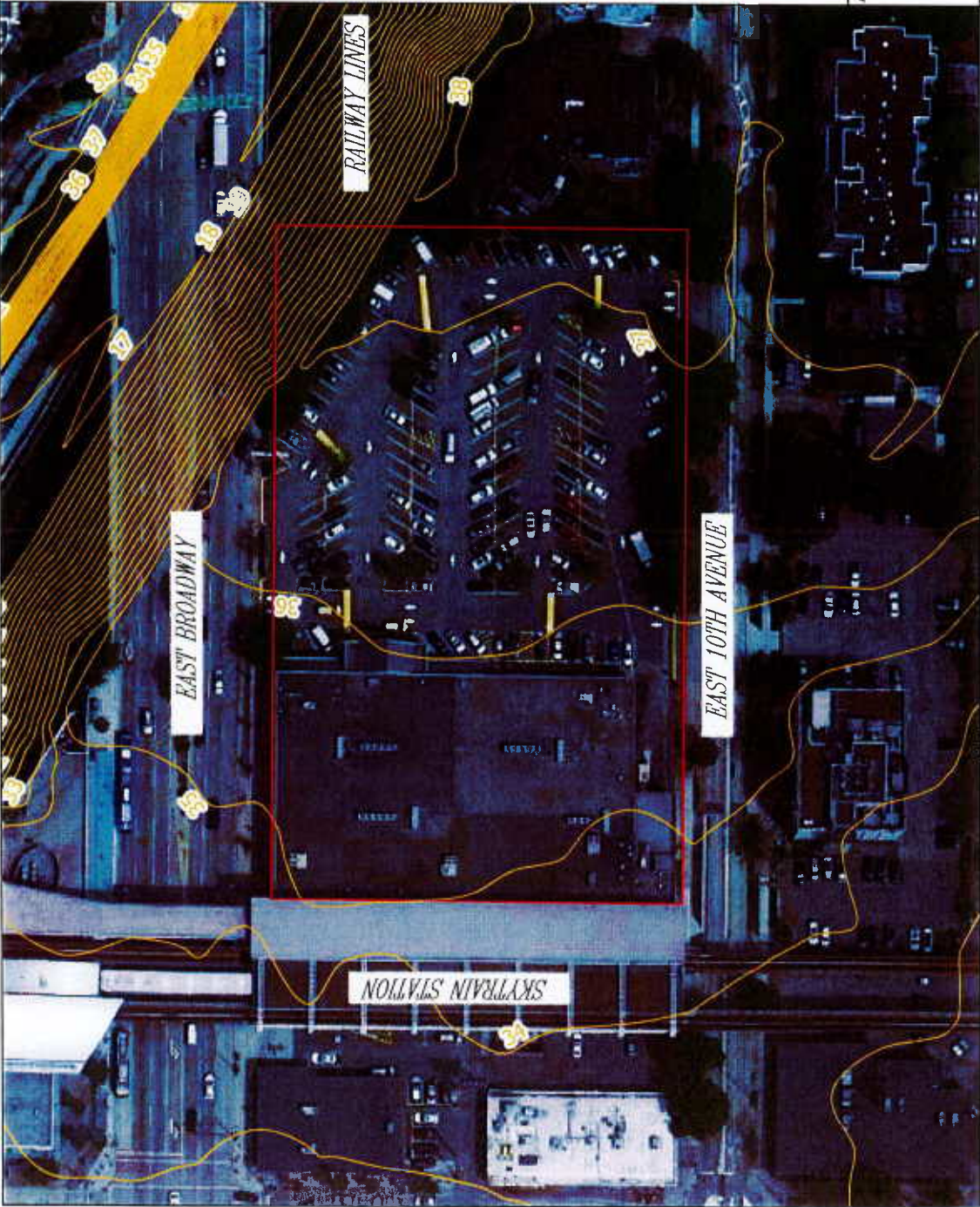
GeoPacific Consultants Ltd.

Sean Heffernan, B.Sc., M.Sc.
Hydrogeologist

Reviewed By:



Matt Kokan, M.Sc., P.Eng.
Principal



LEGEND:

- SITE BOUNDARY
- 1 M ELEVATION CONTOURS

NOTES

1) CONTOUR LAYER SOURCED FROM CITY OF VANCOUVER OPEN DATA PORTAL

REFERENCE

FILE NO.: 14469	REVISIONS:	
	A.	
DWG. NO.: 14469-01	B.	
	C.	

PRELIMINARY HYDROGEOLOGICAL REPORT
WEST 18TH AND 19TH AVENUE
SITE LOCATION PLAN

1779 W. 75th Avenue
Vancouver, B.C. V6P 6P2
P: 604-439-0122
F: 604-439-0159

GEOPACIFIC
VANCOUVER



DATE: 30TH APRIL 2020	DRAWN BY: SRI	APPROVED BY: MJK	DATE: 30TH APRIL 2020	APPROVED BY: MJK
SCALE: NTS				



LEGEND:

- SITE BOUNDARY
- + GROUNDWATER MONITORING WELL

NOTES

MONITORING WELL LOCATIONS ARE APPROXIMATE.

APPENDIX

DATE: 11TH MAY 2020			
DRAWN BY: SHH	APPROVED BY: MJK	REVIEWED BY: MJK	
SCALE:	NTS		

1775 W. 75th Avenue
Vancouver, B.C. V6P 4G2
P 604-421-0022
F 604-420-0800



FILE NO.: 14469	REVISIONS:
DWG. NO.: 14469-02-CW	
	A.
	B.
	C.

HYDROGEOLOGICAL REPORT
1700 EAST BROADWAY, VANCOUVER
GROUNDWATER MONITORING WELLS

APPENDIX A

Test Hole Log: TH18-01

File: 14469

Project: Proposed Mixed Use Development

Client: Westbank

Site Location: Broadway and Commercial Drive



GEO PACIFIC

1779 West 75th Avenue, Vancouver, BC, V6P 6P2
Tel: 604-439-9822 Fax: 604-439-9189

INFERRED PROFILE				Moisture Content (%)	DCPT (blows per foot) 10 20 30 40	Groundwater / Well	Remarks
Depth	Symbol	SOIL DESCRIPTION	Depth (m)/Elev (m)				
0		Ground Surface	0.0				
0.0		Asphalt [76.2 mm]	0.0				
0.0		Sand and Gravel [Fill] brown Sand and Gravel, trace silt		7.1	25		
0.0		Silty Sand and Sandy Silt [Till] Light brown silty Sand and sandy Silt, some gravel, subangular, dry, dense to very dense		8.1	>50		Fines Content 16.3 %
0.0		from 0.6 m to 1.5 m: silty Sand and Gravel, subangular and rounded					
0.0		at 1.8 m and 2.7 m: cobbles		7.7			
0.0		from 2.7 m: trace gravel, moist					
0.0		from 3.7 m: grey					
0.0				12.4			Fines Content 43.8 %
0.0				17.3			
0.0			-4.7				
0.0		Sandstone Grey Sandstone, trace rounded clasts, soft, weathered, wet	-4.7	13.3			Fines Content 34.2 %
0.0		from 6.4 m: very dense, hardly no drilling progress, slightly weathered					
0.0			-7.3				
0.0		End of Borehole	-7.3				refusal @ 7.3 m

Logged: CA

Method: Solid Stem Auger

Date: 2018-07-08

Datum: Ground elevation

Figure Number: A.01

Page: 1 of 1

Site Location: Broadway and Commercial Drive



GEOPACIFIC

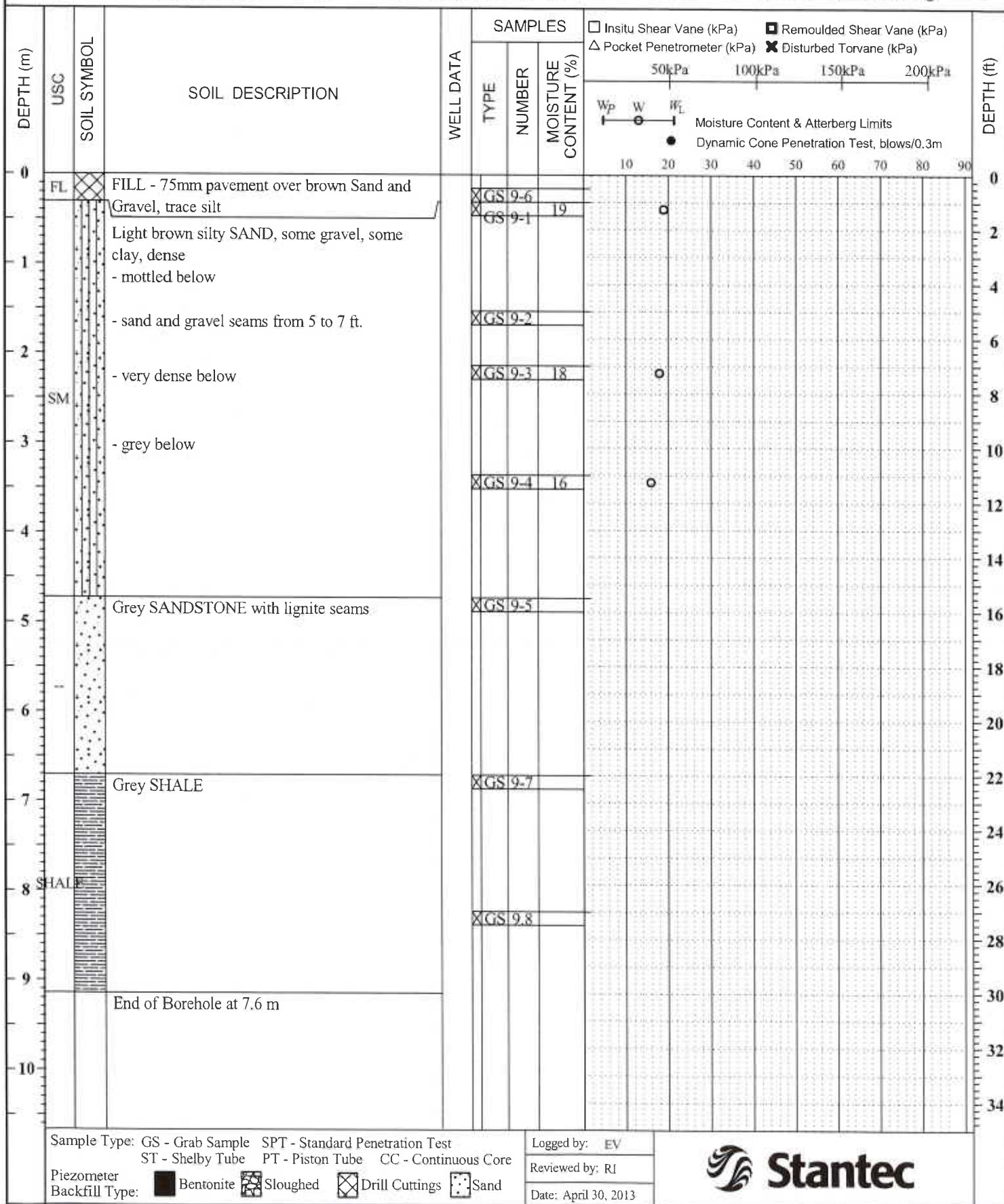
1779 West 75th Avenue, Vancouver, BC, V6P 6P2
Tel: 604-439-0922 Fax: 604-439-9189

Page 1 of 1

BOREHOLE RECORD

BH13-9

CLIENT Canada Safeway Limited PROJECT No. 123110609
 PROJECT Safeway Store #189, 1780 East Broadway DATUM NORTHING
 LOCATION Vancouver, BC ELEVATION EASTING
 DRILLING DATE April 30, 2013 DRILLING CO. Downrite Drilling DRILLING METHOD Sonic Drilling

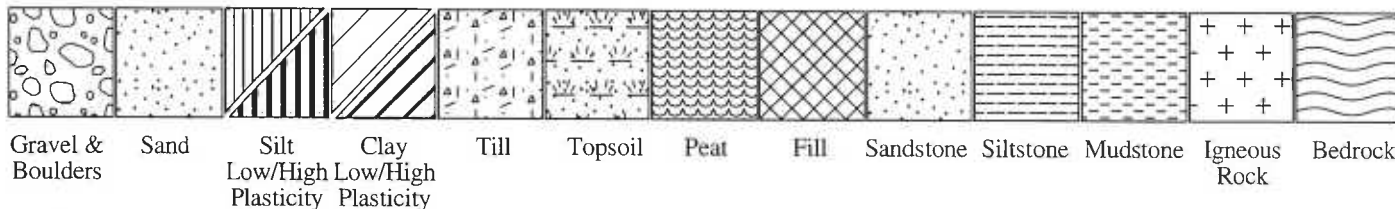




Stantec

SYMBOLS AND TERMS USED ON BOREHOLE AND TEST PIT RECORDS

STRATA PLOT



Initial water level reading



Long term water level reading

SOIL DESCRIPTION

Terminology used for describing soil strata based upon the proportion of individual particle sizes present:

less than 10%	Trace	20-35%	Adjective (e.g. silty or sandy)
10-20%	Some	35-50%	And (e.g. silt and sand)

The standard terminology to describe cohesionless soils includes the state of packing, as determined by laboratory test or by the Standard Penetration Test 'N' -value: the number of blows of 140 pound (64kg) hammer falling 30 inches (760 mm), required to drive a 2 inch (50.8mm) O.D. split spoon sampler one foot (305 mm) into the soil. The state of packing approximately relates to the SPT 'N' value as follows:

State of Packing	'N' Value	Relative Density %	State of Packing	'N' Value	Relative Density %
Very Loose	<4	<15	Dense	30-50	65-85
Loose	4-10	15-35	Very Dense	>50	>85
Medium Dense	10-30	35-65			

The standard terminology to describe cohesive soils includes the consistency, which is based on undrained shear strength as measured by insitu vane tests, penetrometer test, unconfined compression tests, or occasionally by standard penetration tests.

Consistency	Undrained Shear Strength kips/sq.ft.	kPa	'N' Value	Consistency	Undrained Shear Strength kips/sq.ft.	kPa	'N' Value
Very Soft	<0.25	<12.5	<2	Stiff	1.0-2.0	50-100	8-15
Soft	0.25-0.5	12.5-25	2-4	Very Stiff	2.0-4.0	100-200	15-30
Firm	0.5-1.0	25-50	4-8	Hard	>4.0	>200	>30

SAMPLES



GS... Grab Sample



RC... Rock Core



NR... No Recovery



AS... Auger Sample



ST... Shelby tube or thin wall tube



UNDIST .. Undisturbed Sample



SS... Split spoon sample
(Obtained by performing the Standard Penetration Test)

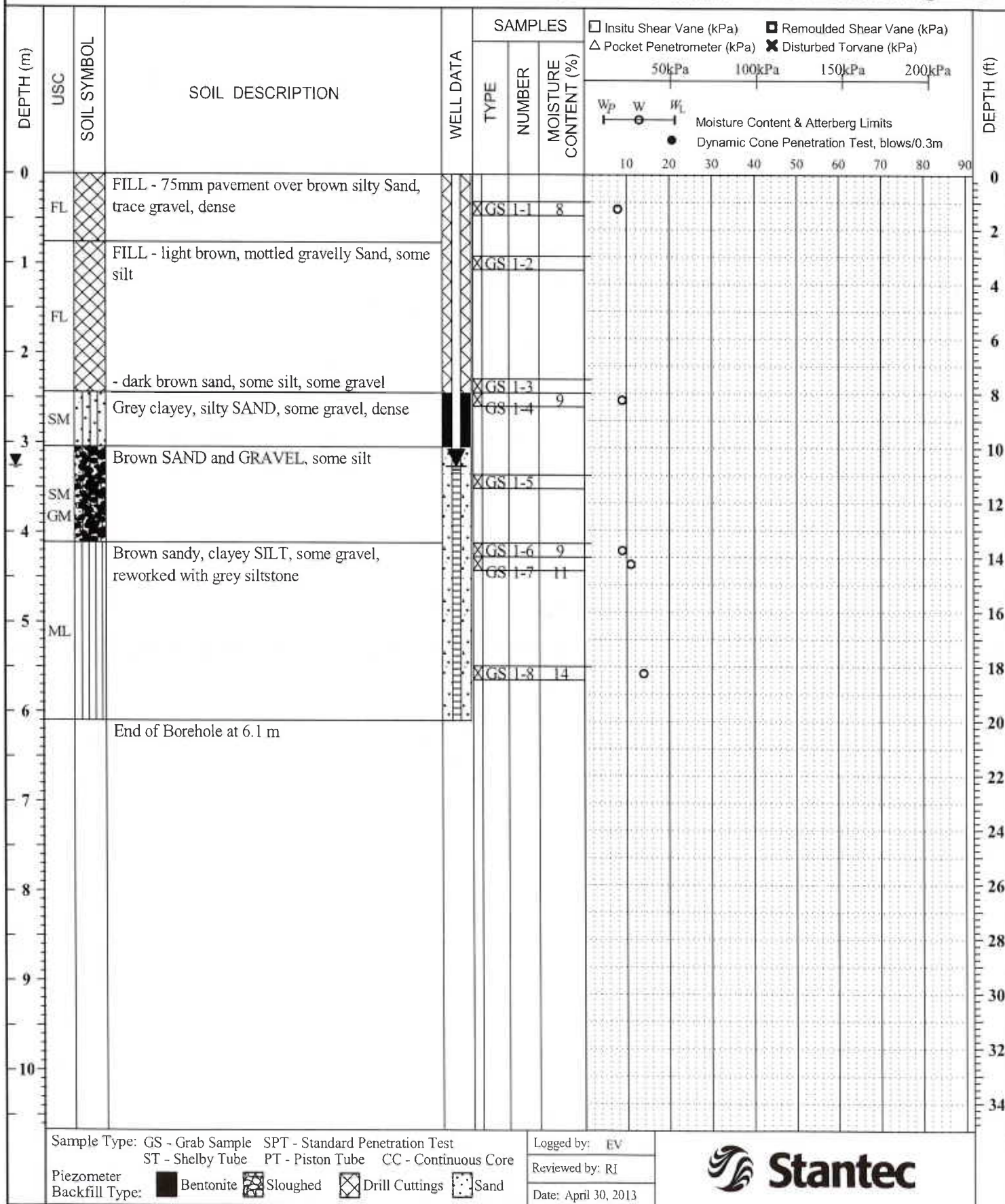


Ps... Piston Sample

BOREHOLE RECORD

BH13-1

CLIENT Canada Safeway Limited PROJECT No. 123110609
 PROJECT Safeway Store #189, 1780 East Broadway DATUM NORTHING
 LOCATION Vancouver, BC ELEVATION EASTING
 DRILLING DATE May 1, 2013 DRILLING CO. Downrite Drilling DRILLING METHOD Sonic Drilling



BOREHOLE RECORD

BH13-2

CLIENT Canada Safeway Limited PROJECT No. 123110609
 PROJECT Safeway Store #189, 1780 East Broadway DATUM NORTHING
 LOCATION Vancouver, BC ELEVATION EASTING
 DRILLING DATE May 1, 2013 DRILLING CO. Downrite Drilling DRILLING METHOD Sonic Drilling

DEPTH (m)	USC	SOIL SYMBOL	SOIL DESCRIPTION	WELL DATA	SAMPLES			Moisture Content & Atterberg Limits				DEPTH (ft)
					TYPE	NUMBER	MOISTURE CONTENT (%)	50kPa	100kPa	150kPa	200kPa	
0	FL		FILL - 90mm pavement over 3/4 inch minus base fill									0
1	FL		FILL - light brown Sand, some gravel, some silt, dense									2
2												4
3	SP		Light brown SAND, trace silt, trace organics, dense - silty seam from 9.5 to 10 ft. - gravelly below									6
4			- silt and sand, some organics seam									8
5			Grey SILTSTONE									10
6			End of Borehole at 6.1 m									12
7												14
8												16
9												18
10												20
												22
												24
												26
												28
												30
												32
												34

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
 ST - Shelby Tube PT - Piston Tube CC - Continuous Core

Piezometer Backfill Type: ☐ Bentonite ☒ Sloughed ☒ Drill Cuttings ☐ Sand

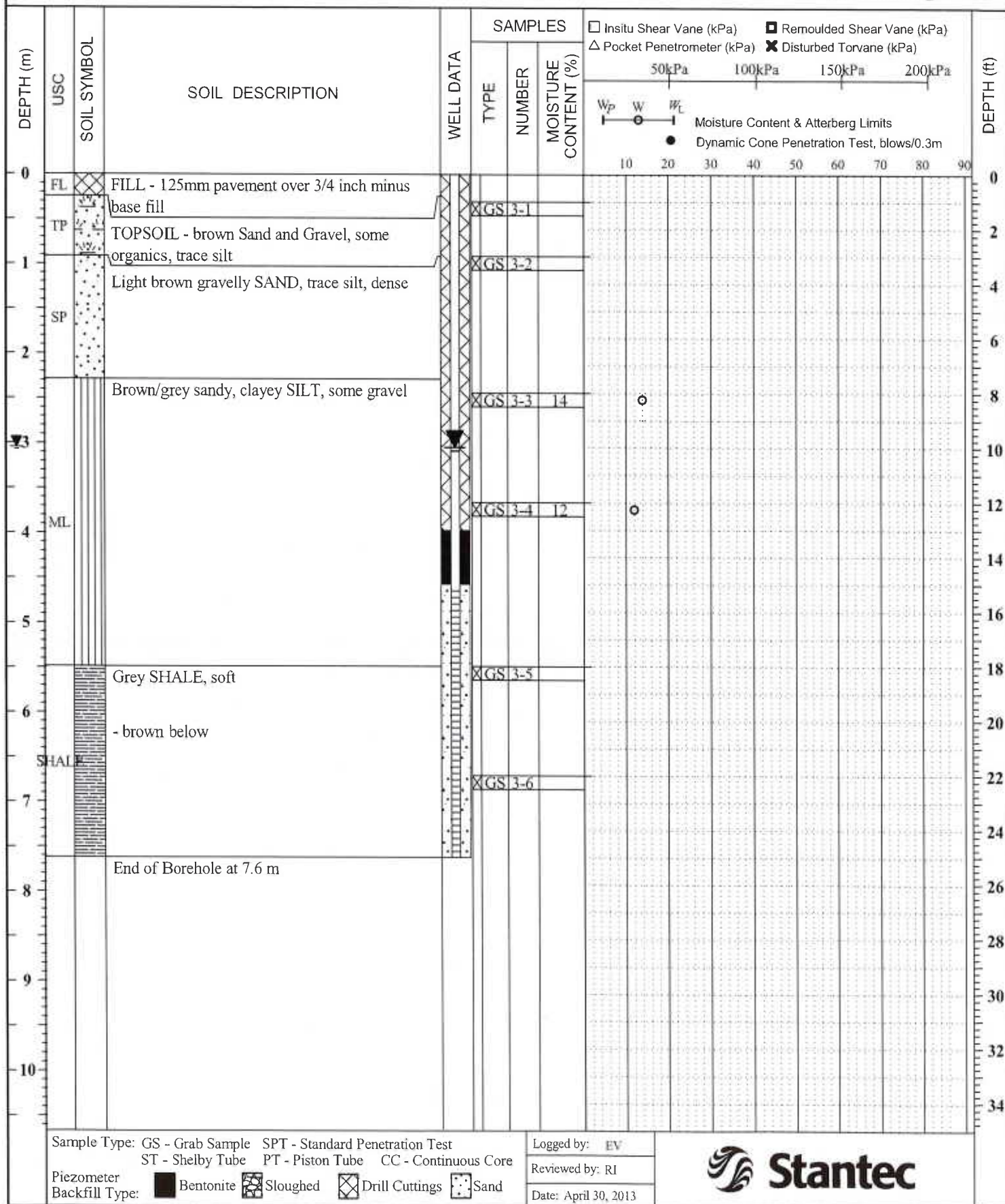
Logged by: EV
 Reviewed by: RI
 Date: April 30, 2013



BOREHOLE RECORD

BH13-3

CLIENT Canada Safeway Limited PROJECT No. 123110609
 PROJECT Safeway Store #189, 1780 East Broadway DATUM _____ NORTHING _____
 LOCATION Vancouver, BC ELEVATION _____ EASTING _____
 DRILLING DATE May 1, 2013 DRILLING CO. Downrite Drilling DRILLING METHOD Sonic Drilling



BOREHOLE RECORD

BH13-4

CLIENT Canada Safeway Limited PROJECT No. 123110609
 PROJECT Safeway Store #189, 1780 East Broadway DATUM NORTHING
 LOCATION Vancouver, BC ELEVATION EASTING
 DRILLING DATE May 2, 2013 DRILLING CO. Downrite Drilling DRILLING METHOD Sonic Drilling

DEPTH (m)	USC	SOIL SYMBOL	SOIL DESCRIPTION	WELL DATA			SAMPLES		TESTS		DEPTH (ft)
				TYPE	NUMBER	MOISTURE CONTENT (%)	TYPE	VALUE			
0	FL		FILL - 125mm pavement over 3/4 inch minus base fill								0
1	FL		FILL - brown gravelly Sand, some silt								2
2			Light brown, mottled silty SAND, trace gravel, dense								4
3	SM		- some gravel below								6
4			Light brown to grey reworked SILTSTONE and SHALE, very soft								8
5											10
6											12
7											14
8											16
9			Light brown to grey SANDSTONE, some lignite seams								18
10			Grey SHALE								20
											22
											24
											26
											28
											30
											32
											34

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
 ST - Shelby Tube PT - Piston Tube CC - Continuous Core
 Piezometer Backfill Type: ☐ Bentonite ☒ Sloughed ☒ Drill Cuttings ☐ Sand

Logged by: EV
 Reviewed by: RI
 Date: April 30, 2013



BOREHOLE RECORD

BH13-4 cont'd

CLIENT Canada Safeway Limited PROJECT No. 123110609
 PROJECT Safeway Store #189, 1780 East Broadway DATUM NORTHING
 LOCATION Vancouver, BC ELEVATION EASTING
 DRILLING DATE May 2, 2013 DRILLING CO. Downrite Drilling DRILLING METHOD Sonic Drilling

DEPTH (m)	USC	SOIL SYMBOL	SOIL DESCRIPTION	WELL DATA			SAMPLES		Moisture Content & Atterberg Limits Dynamic Cone Penetration Test, blows/0.3m	DEPTH (ft)
				TYPE	NUMBER	MOISTURE CONTENT (%)	TYPE	NUMBER		
11										36
12		SHALE								38
13										40
14										42
14.5			End of Borehole at 14.5 m							44
15										46
16										48
17										50
18										52
19										54
20										56
21										58
										60
										62
										64
										66
										68
										70

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
 ST - Shelby Tube PT - Piston Tube CC - Continuous Core

Piezometer Backfill Type: ☐ Bentonite ☒ Sloughed ☒ Drill Cuttings ☐ Sand

Logged by: EV
 Reviewed by: RI
 Date: April 30, 2013



BOREHOLE RECORD

BH13-5

CLIENT Canada Safeway Limited PROJECT No. 123110609
 PROJECT Safeway Store #189, 1780 East Broadway DATUM NORTHING
 LOCATION Vancouver, BC ELEVATION EASTING
 DRILLING DATE May 2, 2013 DRILLING CO. Downrite Drilling DRILLING METHOD Sonic Drilling

DEPTH (m)	USC	SOIL SYMBOL	SOIL DESCRIPTION	WELL DATA			SAMPLES		TESTS		DEPTH (ft)
				TYPE	NUMBER	MOISTURE CONTENT (%)	TYPE	NUMBER	TESTS	TESTS	
0	FL	⊗	FILL - 75mm pavement over brown Sand and Gravel, trace silt	GS	5-1	9					0
1	SM	⊙	Light brown, mottled silty SAND, trace gravel, trace clay, dense - sand and gravel seams from 2.5 to 5 ft.	GS	5-2	8					2
2			Light brown, mottled sandy, clayey SILT, some gravel, very stiff	GS	5-3	8					4
3	ML	⊙	- light brown gravelly sand seam from 10 to 11 ft.	GS	5-4	18					6
4											8
5			Grey SANDSTONE, soft	GS	5-5						10
6											12
7			- siltstone intrusions, some lignite seams	GS	5-6						14
8											16
9				GS	5-7						18
9.1			End of Borehole at 9.1 m								20

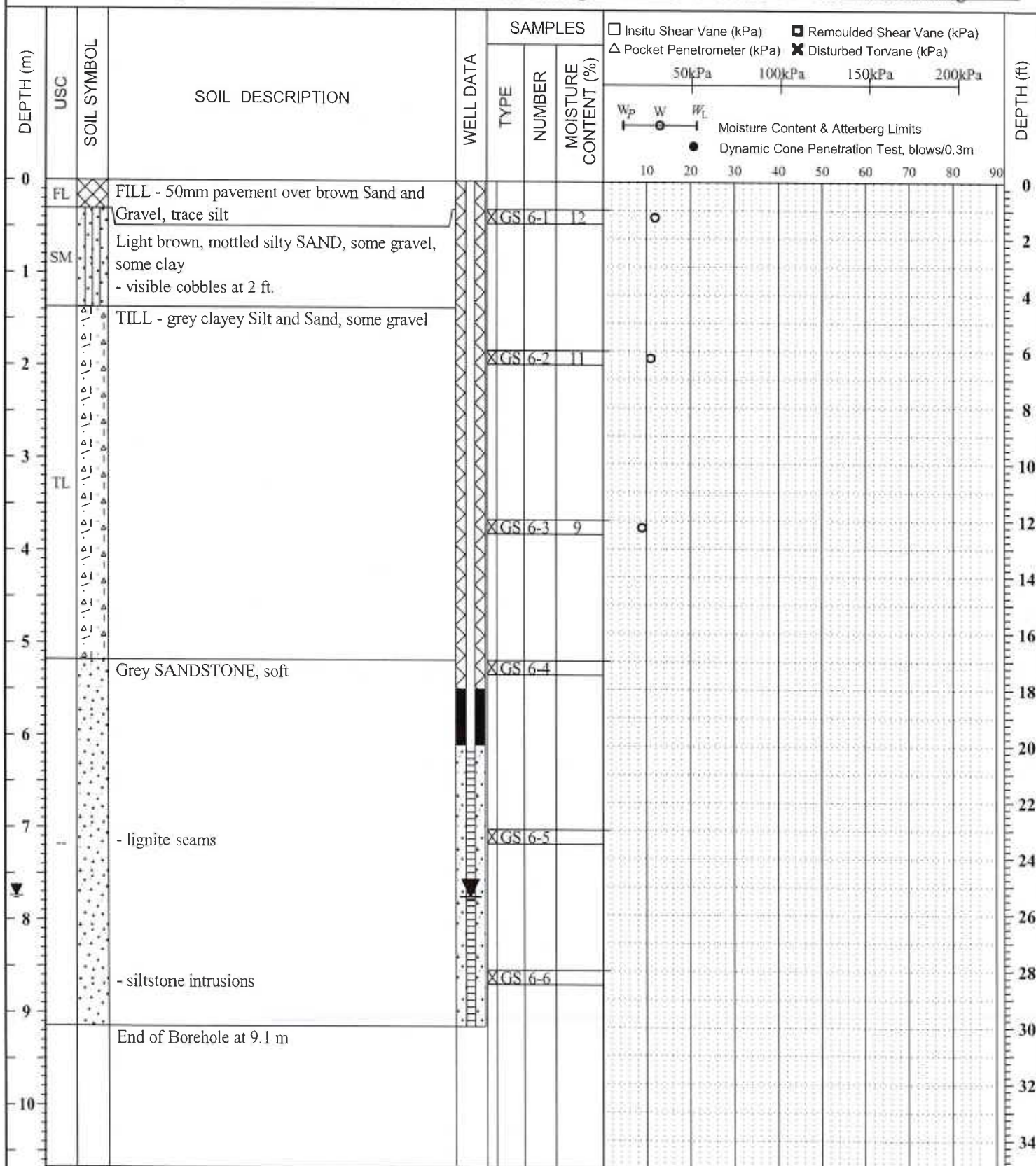
Sample Type: GS - Grab Sample SPT - Standard Penetration Test
 ST - Shelby Tube PT - Piston Tube CC - Continuous Core
 Piezometer Backfill Type: Bentonite Sloughed Drill Cuttings Sand

Logged by: EV
 Reviewed by: RI
 Date: April 30, 2013

BOREHOLE RECORD

BH13-6

CLIENT Canada Safeway Limited PROJECT No. 123110609
 PROJECT Safeway Store #189, 1780 East Broadway DATUM _____ NORTHING _____
 LOCATION Vancouver, BC ELEVATION _____ EASTING _____
 DRILLING DATE April 30, 2013 DRILLING CO. Downrite Drilling DRILLING METHOD Sonic Drilling



Sample Type: GS - Grab Sample SPT - Standard Penetration Test
 ST - Shelby Tube PT - Piston Tube CC - Continuous Core
 Piezometer Backfill Type: Bentonite Sloughed Drill Cuttings Sand

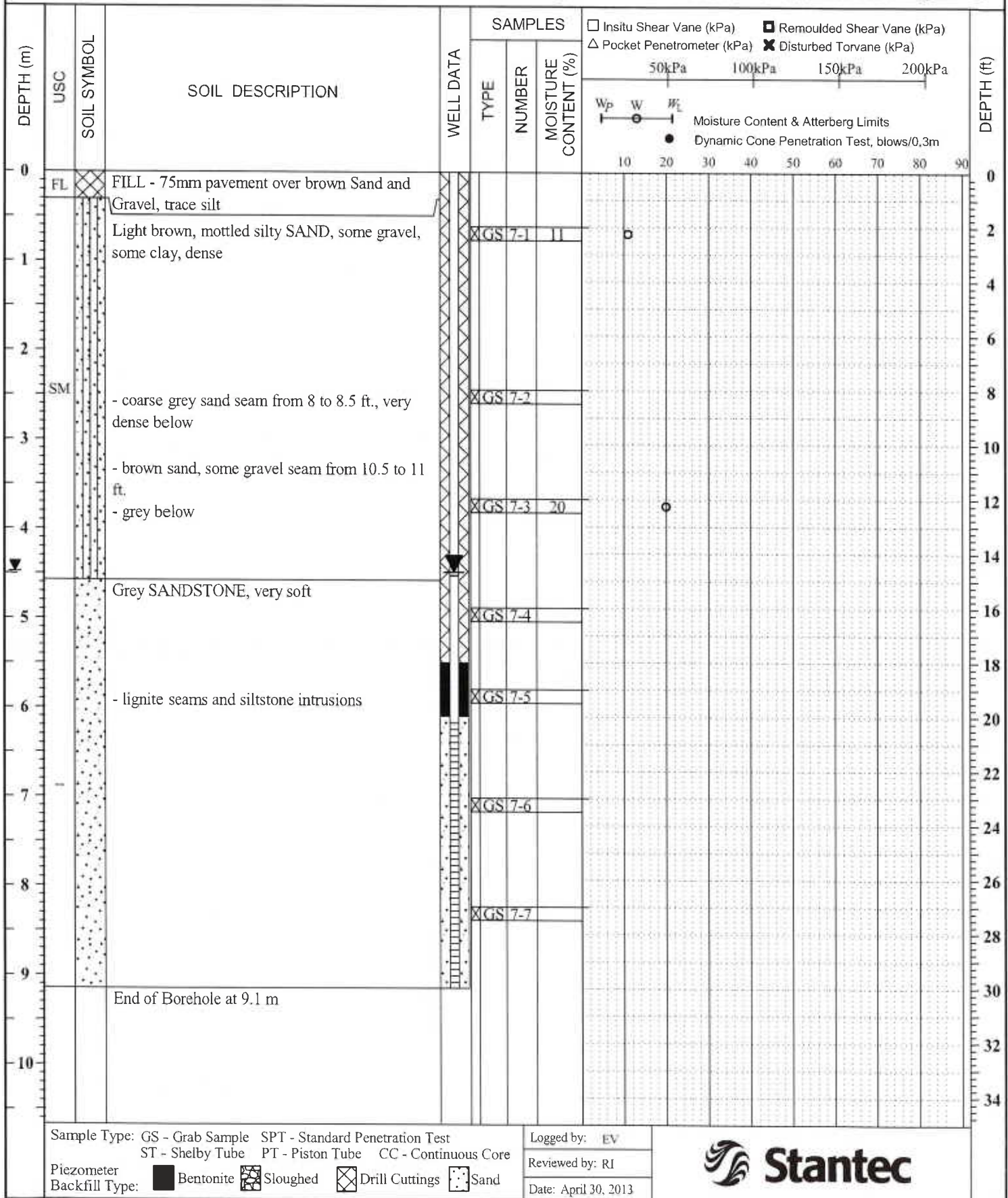
Logged by: EV
 Reviewed by: RI
 Date: April 30, 2013



BOREHOLE RECORD

BH13-7

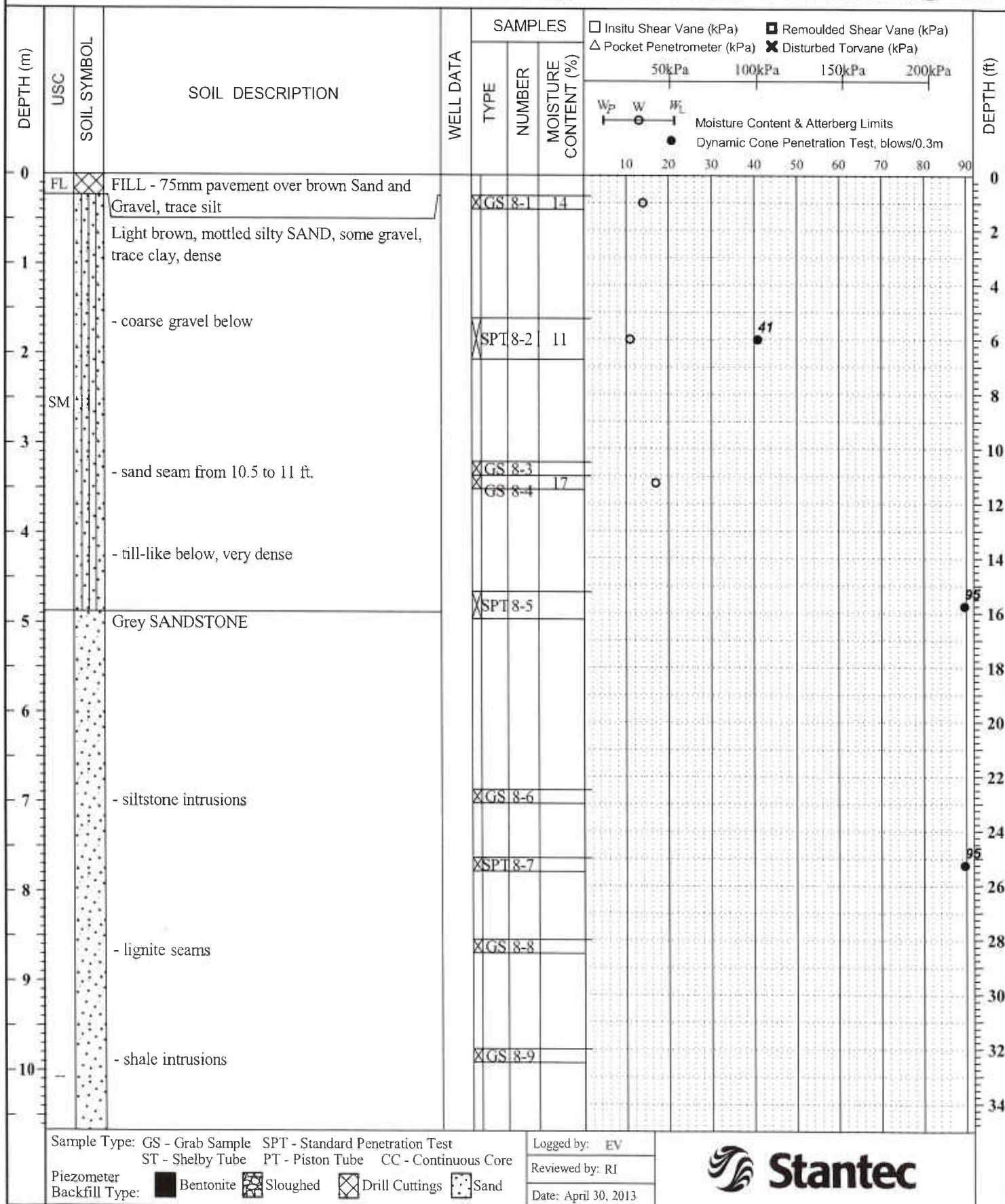
CLIENT Canada Safeway Limited PROJECT No. 123110609
 PROJECT Safeway Store #189, 1780 East Broadway DATUM NORTHING
 LOCATION Vancouver, BC ELEVATION EASTING
 DRILLING DATE May 2, 2013 DRILLING CO. Downrite Drilling DRILLING METHOD Sonic Drilling



BOREHOLE RECORD

BH13-8

CLIENT Canada Safeway Limited PROJECT No. 123110609
 PROJECT Safeway Store #189, 1780 East Broadway DATUM NORTHING
 LOCATION Vancouver, BC ELEVATION EASTING
 DRILLING DATE April 30, 2013 DRILLING CO. Downrite Drilling DRILLING METHOD Sonic Drilling



BOREHOLE RECORD

BH13-8 cont'd

CLIENT Canada Safeway Limited PROJECT No. 123110609
 PROJECT Safeway Store #189, 1780 East Broadway DATUM NORTHING
 LOCATION Vancouver, BC ELEVATION EASTING
 DRILLING DATE April 30, 2013 DRILLING CO. Downrite Drilling DRILLING METHOD Sonic Drilling

DEPTH (m)	USC	SOIL SYMBOL	SOIL DESCRIPTION	WELL DATA	SAMPLES			Moisture Content & Atterberg Limits		DEPTH (ft)
					TYPE	NUMBER	MOISTURE CONTENT (%)	W _p	W _L	
11					X	SPT-10				36
12					X	GS-11				38
13					X	GS-12				42
14										46
15					X	GS-13				48
16			End of Borehole at 15.2 m							50
17										56
18										60
19										62
20										66
21										70

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
 ST - Shelby Tube PT - Piston Tube CC - Continuous Core
 Piezometer Backfill Type: ☐ Bentonite ☒ Sloughed ☒ Drill Cuttings ☐ Sand

Logged by: EV
 Reviewed by: RJ
 Date: April 30, 2013

