DBA ENGINEERING LTD.

DHILLON BURLEIGH & ASSOCIATES
Civil, Pavement, Geo, Environmental & Materials Engineers

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Kingston, Ontario K7P 2E4
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Toll Free: 1-888-256-8833
Fax: (613) 389-4204

Public Works and Government Services Canada
294 King Street East
2nd Floor
Kingston, ON
K7L 5P1

Attention: Mr. Bob Todd, Project Manager

Re: Additional Boreholes,
New Housing Units and Associated Service Trench

Further to your request, we have completed the additional Twenty Six (26) boreholes in and around the site of the proposed new medium security housing units BB36 and BB37 and along the line of the proposed service trench associated with these units.

The purpose of the assignment was to provide additional subsoil/bedrock/groundwater information that was not included in the original geotechnical investigation, conducted by DBA Engineering Ltd. for this project.

Site Information

A detailed site description is given in the original geotechnical report issued by DBA for the project. A site map indicating the borehole locations is attached to this report.

Field Investigation

The additional field investigation was completed by DBA Engineering Ltd. geotechnical staff on March 23, and 24, 2010. Twenty six (26) boreholes (23 for the housing units and 3 for the service trench) were advanced to practical auger refusal. Within two of these boreholes (B06-9 and B09-11) bedrock cores were taken by NQ rock coring techniques to a depth of 3.0 m within the bedrock structure. Sampling of the bedrock was by diamond core drilling, using a 1.5m long NQ double tube wireline core barrel providing 47.6 mm diameter rock core samples. The recovered rock cores were visually examined and described in the field. In addition, the following index properties were noted and recorded:

- Total Core Recovery (TCR)
- Rock Quality Designation (RQD)

Upon completion of boreholes, subsoil/groundwater conditions were measured and recorded.

Ground surface elevations at the borehole locations were surveyed by others and the related information was provided to DBA Engineering Ltd. by the Client.

Results of the Field Investigation

In the area of the housing unit construction, subsoil conditions encountered are consistent with those found in the original geotechnical investigation.

In general, soil conditions encountered within these borehole locations consisted of surficial topsoil, overlying a thin layer of heterogeneous fill/native material, overlying limestone bedrock. Refusal to augering on the shallow limestone bedrock surface was encountered underlying the overburden material, at depths ranging between 0.1 m to 2.0 m below existing site grades.

Upon meeting auger refusal, 3.0 m of bedrock core was extracted from B06-9 and B09-11 and returned to DBA's laboratory for further analysis. Upon inspection the bedrock was found to be grey medium bedded

limestone with moderate shale partings. Rock Quality Designation (RQD) was calculated for the 1.5 m core runs and used for rock description. RQD represents the quantity of rock present with an unfractured length of greater than 100mm as a percentage of the core run. It can be related to the strength of a rock formation. Evaluation of the retrieved rock core samples revealed an average RQD value of 28 % for the upper 1.5 m run and 88 % for the lower 1.5 m run. This indicates that the bedrock changes from poor to good quality with depth.

Standpipe type piezometers were installed in boreholes B06-9 and B09-11 to get a more accurate measure of stabilized groundwater levels in the area. Groundwater measurements were taken four (4) days after drilling. Groundwater was encountered in both locations within the limestone bedrock surface at depths of 3.8 m and 2.9 m below existing site grades (Elev. 95.5 to 95.6m).

The information related to subsurface soil/groundwater conditions encountered during field investigation, are described in the individual borehole logs attached to this report.

Three additional boreholes were also advanced for the proposed service trench associated with the new housing units (Boreholes Trench BH-1 to BH3). The subsurface conditions encountered in these boreholes were generally consistent with the boreholes drilled for the housing units. In the boreholes drilled in the lower area (Trench BH1 and Trench BH2), fill material was not encountered. Subsoil conditions in this area consisted of topsoil, overlying native silty clay, overlying the limestone bedrock. A standard penetration test was carried out in Trench BH1 and the obtained 'N' value of 14 attests the stiff condition of the fine grained material.

Discussion and Recommendations

The results of this field investigation are consistent with those of the previous geotechnical investigation completed for this area. As such, the recommendations outlined in the original report should generally be used for design. However, DBA Engineering Ltd. makes the following clarifications or additions to the original report:

Foundations

It is recommended that footings be installed directly on the sound limestone bedrock surface. Sound bedrock is defined as bedrock that is not loose, fractured, weathered and cannot be easily excavated.

Poor quality bedrock which is fractured and unsuitable was encountered overlying the sound bedrock surface. This layer is of an approximate thickness of 1.0 m to 1.2 m and should be excavated to expose the sound limestone bedrock surface.

Foundations designed to bear directly on the sound limestone bedrock formation may be designed for the following factored capacities:

In SLS	1000 kPa
In ULS	3000 kPa

Total and differential settlements for foundations placed directly on the sound, clean bedrock surface should be negligible.

Service Trenching

The construction of the proposed services should consist of the removal of the existing overburden soils to achieve the required grades. Based on the borehole information the utility pipes will likely be installed on bedrock surface or on native soil.

Pipe bedding should be in accordance with the pipe design/manufacture recommendations, appropriate local municipality requirements and standards (e.g., OPS).

Bedding for the pipes should consist of a minimum of 150 mm Granular 'A' material. The bedding should be placed in lifts compatible with the compaction equipment used to achieve 95% Standard Proctor Maximum Dry Density (SPMDD). Backfill around the pipes should consist of Granular 'A' material with

a minimum cover thickness of 300 mm on the obvert of the pipes. The backfill should be compacted to 95% SPMDD.

The native soil and heterogeneous fill encountered across the site is considered suitable for reuse as subgrade material for general backfilling if unsaturated and unfrozen. The fill is reusable under similar conditions. However, it may require some conditioning first. It is recommended that moisture contents in the native soil be closely monitored when it is to be used as select subgrade fill soils during construction.

Wet soils should not be placed as subgrade fill under any circumstances. The soil should be placed in lifts compatible with the compaction equipment used to obtain a minimum compaction of 95% SPMDD. It is recommended that the minimum level of compaction of trench backfill be increased to 98% SPMDD within 0.6 m of pavement subbase.

All trenching should be carried out in accordance with the local municipality's current standards.

Groundwater Control/Subsurface Drainage

The groundwater level was encountered below the limestone bedrock surface. However, it is to be noted that, groundwater level do fluctuate seasonally and may be present at higher elevations during spring months or in response to major weather events. Based on the conditions encountered during the field investigation, measures to control groundwater may be required for bedrock excavations during the construction of the housing units and will likely be required during the installation of utility services.

Groundwater/surface water infiltration into excavations should be managed by the use of normal sumps and pumps. If excessive water infiltration is encountered within excavations, DBA should be contacted to provide further guidance.

Closure

We trust that the information contained in this report is satisfactory. Should you have any questions, please do not hesitate to contact this office.

Sincerely,

DBA ENGINEERING LTD

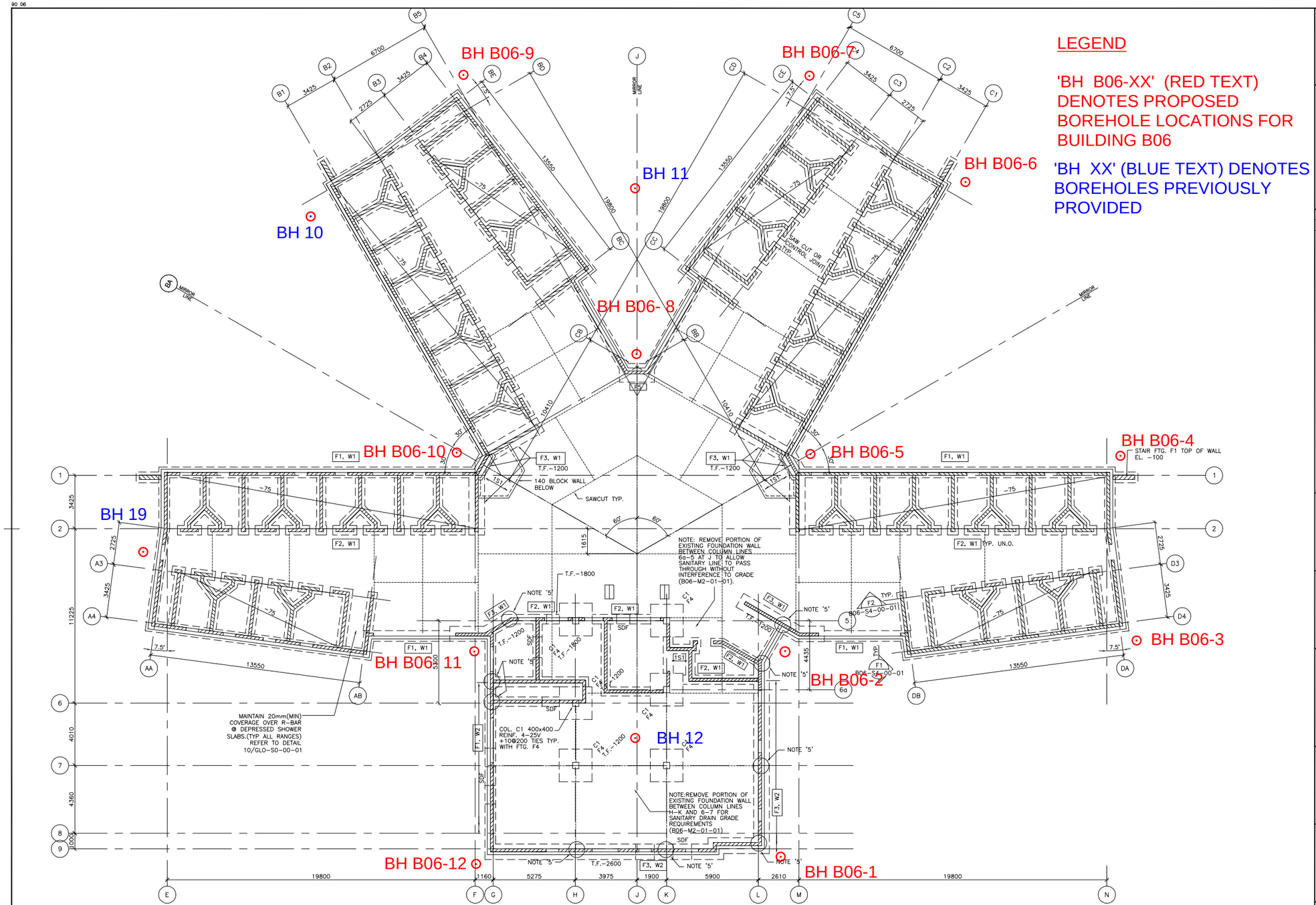
Murray McClelland

Geotechnical Manager

Reviewed by:

Shahkar Shahangian ~~Ph.D., CHEBAP~~, P. Eng.
Manager, Geotechnical Division

90 06



LEGEND

'BH B06-XX' (RED TEXT) DENOTES PROPOSED BOREHOLE LOCATIONS FOR BUILDING B06

'BH XX' (BLUE TEXT) DENOTES BOREHOLES PREVIOUSLY PROVIDED

Public Works
Government Services Canada
Architectural and Engineering Services
Ontario Region

Travaux publics
Services gouvernementaux Canada
Services d'architecture et de génie
Région de l'Ontario

Rev. No.	Description	Date

consultant

project title
titre du projet

Correctional Service Canada

CELL UNIT B06

drawing title
titre du dessin

PROPOSED BOREHOLE LOCATIONS

designed by
conc par

drawn by
dessine par

reviewed by
examine par

approved by
approuve par

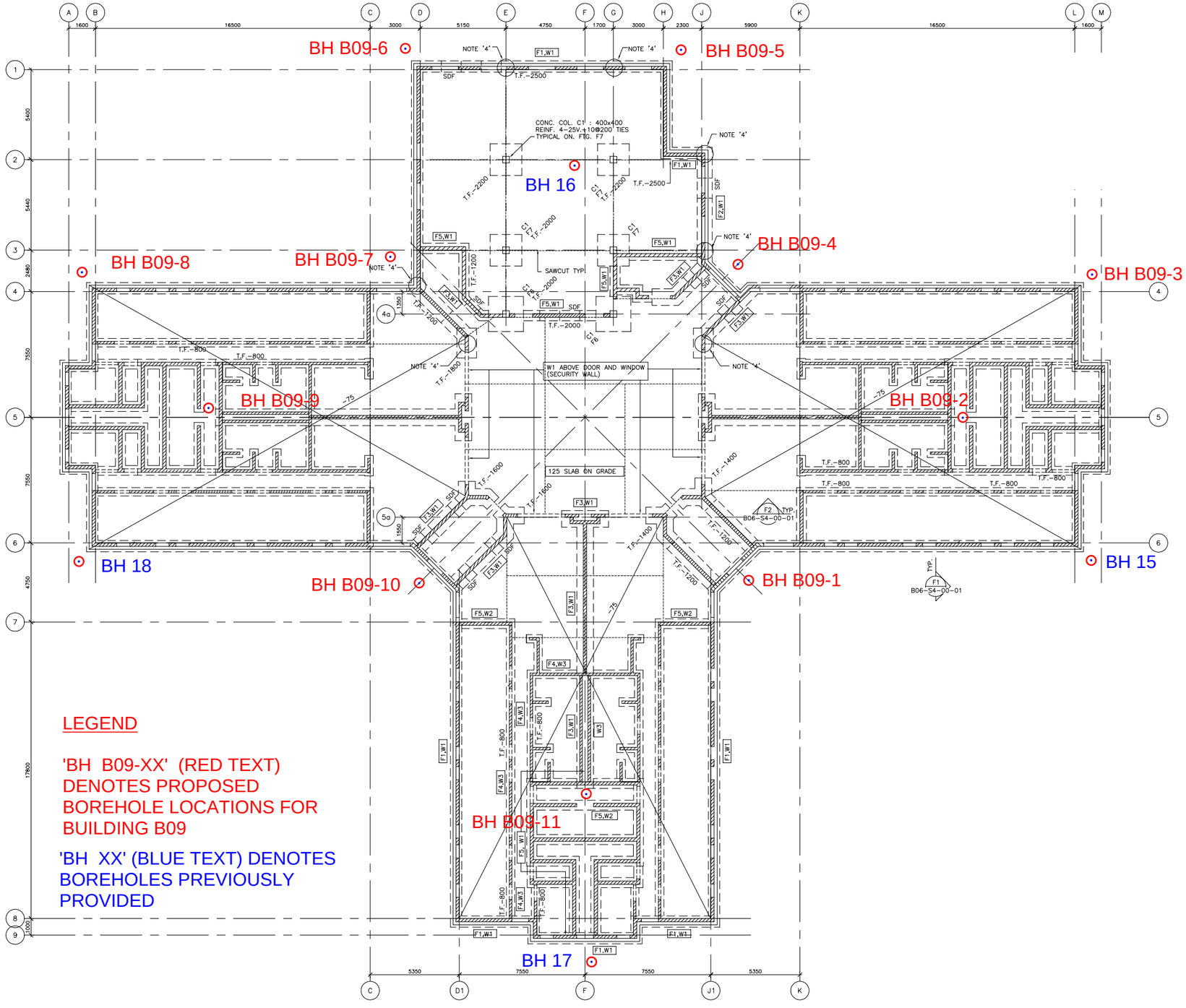
project date
date du projet JAN 31, 2011

project no.
no. du projet R.043794.001

drawing no.
dessine no.

GSC-B1 DATE PLOTTED: PLOT SCALE: SETUP SCALE: CAD FILE:

90 06



Public Works
Government Services Canada
Architectural and Engineering Services
Ontario Region

Travaux publics
Services gouvernementaux Canada
Services d'architecture et de génie
Région de l'Ontario

Rev. No.	Description	Date

consultant

project title
titre du projet

Correctional Service Canada

LIVING UNIT B09

drawing title
titre du dessin

PROPOSED BOREHOLE LOCATIONS

designed by
conc par

drawn by
dessine par

reviewed by
examine par

approved by
approuve par

project date
date du projet JAN 31, 2011

project no.
no. du projet R.043794.001

drawing no.
dessine no. B09–S2–01–01

GSC–B1 DATE PLOTTED: PLOT SCALE: SETUP SCALE: CAD FILE:

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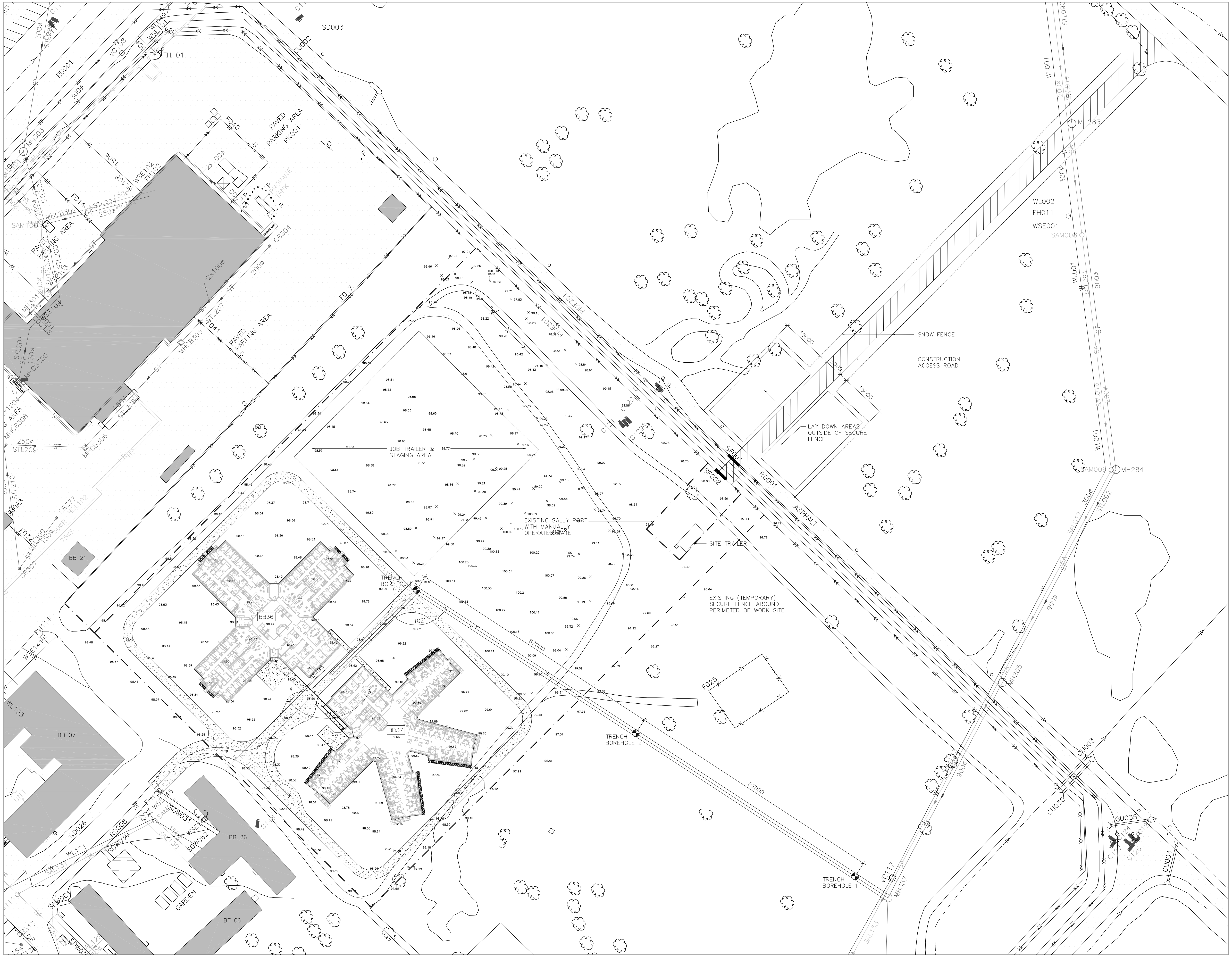

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

NORR Limited
An Ingenium Group Company
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Kingston, ON, Canada K7L 2L1
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NORR
ARCHITECTS ENGINEERS PLANNERS

KEY PLAN 1:10,000

revision		date
04		
03		
02		
01		

Do not scale drawings.
Verify all dimensions and conditions on site and immediately notify the Departmental Representative of all discrepancies.

A Detail No. / No. du détail
B drawing no. – where detailed / dessin no. – où détaillé

project title / titre du projet
BATH Ontario
PWGSC
HWY 33
BATH INSTITUTION
BB36 & BB37
SITE WORKS

drawing title / titre du dessin
OVERALL SITE PLAN

drawn by / dessine par: XX

designed by / conc par

approved by / approuve par

bid / offre — project manager / administrateur de projets

project date / date du projet: 2011-03-15

project no. / no. du projet: R.043794.001

drawing no. / dessine no.: C-300

GSC-B1 DATE PLOTTED: PLOT SCALE: CAD FILE:

RECORD OF BOREHOLE No. B06-1

Project Number:	**10-1539-08**	Drilling Location:	**B06-1**	Logged by:	**MM**
Project Client:	**PWGSC**	Drilling Method:	**100 mm Solid Stem Augers**	Compiled by:	**MM**
Project Name:	**Housing Units - Secondary Investigation**	Drilling Machine:	**Track Mounted Drill**	Reviewed by:	**RC**
Project Location:	**Bath Institute**	Date Started:	**Mar 23, 11** Date Completed:	Revision No.:	**0**

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		
Lithology Plot	DESCRIPTION **Local Ground Surface Elevation: 98.6 m**	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing ○ SPT ● DCPT MTO Vane* Nilcon Vane* △ Intact ◇ Intact ▲ Remould ◆ Remould * Undrained Shear Strength (kPa) 20 40 60 80	★ Rinse pH Values Atterberg Limits Soil Vapour Reading parts per million (ppm) Plastic 200 300 Liquid ▲ Lower Explosive Limit (LEL) ✱ Passing 75 um (%) W_L ● Moisture Content (%) Plastic Liquid 20 40 60 80	INSTRUMENTATION INSTALLATION	COMMENTS
	dark brown topsoil - silty clay with roots and organics frozen 98.4										
	brown 0.2 fill - silty clay some gravel firm 98.2 0.4										
	refusal on inferred bedrock						98				

DBA Engineering Limited
370 Steelcase Road East
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Fax: 905-940-8508

▽ No freestanding groundwater measured in open borehole on completion of drilling.

Scale: 1 : 26

RECORD OF BOREHOLE No. B06-2

Project Number:	**10-1539-08**	Drilling Location:	**B06-2**	Logged by:	**MM**
Project Client:	**PWGSC**	Drilling Method:	**100 mm Solid Stem Augers**	Compiled by:	**MM**
Project Name:	**Housing Units - Secondary Investigation**	Drilling Machine:	**Track Mounted Drill**	Reviewed by:	**RC**
Project Location:	**Bath Institute**	Date Started:	**Mar 23, 11** Date Completed:	Revision No.:	**0**

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		COMMENTS
Lithology Plot	DESCRIPTION Local Ground Surface Elevation: 99.1 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing: SPT ○ DCPT ●; MTO Vane* △ Intact ▲ Remould; Nilcon Vane* ◇ Intact ◆ Remould; * Undrained Shear Strength (kPa) 20 40 60 80	★ Rinse pH Values 2 4 6 8 10 12; Soil Vapour Reading parts per million (ppm) Plastic 200 300 Liquid 400; ▲ Lower Explosive Limit (LEL); ✱ Passing 75 um (%) W_L; ◑ Moisture Content (%) ●; Plastic Liquid 20 40 60 80	INSTRUMENTATION INSTALLATION	
	dark brown topsoil - silty clay with roots and organics frozen 98.9						99				
	brown 0.2 fill - silty clay some gravel 98.7										
	refusal on inferred bedrock 0.4										

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▽ No freestanding groundwater measured in open borehole on completion of drilling.

Scale: 1 : 26

RECORD OF BOREHOLE No. B06-3

Project Number:	**10-1539-08**	Drilling Location:	**B06-3**	Logged by:	**MM**
Project Client:	**PWGSC**	Drilling Method:	**100 mm Solid Stem Augers**	Compiled by:	**MM**
Project Name:	**Housing Units - Secondary Investigation**	Drilling Machine:	**Track Mounted Drill**	Reviewed by:	**RC**
Project Location:	**Bath Institute**	Date Started:	**Mar 23, 11** Date Completed:	Revision No.:	**0**

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		COMMENTS
Lithology Plot	DESCRIPTION **Local Ground Surface Elevation: 98.5 m**	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing: ○ SPT ● DCPT; MTO Vane* △ Intact ▲ Remould; Nilcon Vane* ◇ Intact ◆ Remould; * Undrained Shear Strength (kPa) 20 40 60 80	★ Rinse pH Values 2 4 6 8 10 12; Atterberg Limits; Soil Vapour Reading △ parts per million (ppm) Plastic 200 300 Liquid 400; ▲ Lower Explosive Limit (LEL); ✱ Passing 75 um (%) W_L; ◑ Moisture Content (%) ●; Plastic 20 40 60 80 Liquid	INSTRUMENTATION INSTALLATION	
	dark brown topsoil - silty clay with roots and organics frozen 98.3										
	brown 0.2 fill - silty clay some gravel						98				
	97.9 refusal on inferred bedrock 0.6										

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▽ No freestanding groundwater measured in open borehole on completion of drilling.

RECORD OF BOREHOLE No. B06-4

Project Number:	**10-1539-08**	Drilling Location:	**B06-4**	Logged by:	**MM**
Project Client:	**PWGSC**	Drilling Method:	**100 mm Solid Stem Augers**	Compiled by:	**MM**
Project Name:	**Housing Units - Secondary Investigation**	Drilling Machine:	**Track Mounted Drill**	Reviewed by:	**RC**
Project Location:	**Bath Institute**	Date Started:	**Mar 23, 11** Date Completed:	Revision No.:	**0**

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		COMMENTS
Lithology Plot	DESCRIPTION Local Ground Surface Elevation: 98.8 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing: SPT ○ DCPT ●; MTO Vane* △ Intact ▲ Remould; Nilcon Vane* ◇ Intact ◆ Remould; * Undrained Shear Strength (kPa) 20 40 60 80	★ Rinse pH Values 2 4 6 8 10 12; Soil Vapour Reading parts per million (ppm) Plastic 200 300 Liquid 400; ▲ Lower Explosive Limit (LEL); ✱ Passing 75 um (%) W_L; ◑ Moisture Content (%) ●; Plastic 20 40 60 80 Liquid	INSTRUMENTATION INSTALLATION	
	dark brown topsoil - silty clay with roots and organics frozen 98.6										
	brown 0.2 fill - silty clay some gravel 98.2										
	refusal on inferred bedrock 0.6						98				

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▽ No freestanding groundwater measured in open borehole on completion of drilling.

Borehole details as presented, do not constitute a thorough understanding of all potential conditions present and requires interpretative assistance from a qualified Geotechnical Engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commisioned and the accompanying'Notes to Record of Boreholes'.

Scale: 1 : 26

RECORD OF BOREHOLE No. B06-5

Project Number:	**10-1539-08**	Drilling Location:	**B06-5**	Logged by:	**MM**
Project Client:	**PWGSC**	Drilling Method:	**100 mm Solid Stem Augers**	Compiled by:	**MM**
Project Name:	**Housing Units - Secondary Investigation**	Drilling Machine:	**Track Mounted Drill**	Reviewed by:	**RC**
Project Location:	**Bath Institute**	Date Started:	**Mar 23, 11** Date Completed:	Revision No.:	**0**

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		COMMENTS
Lithology Plot	DESCRIPTION Local Ground Surface Elevation: 99.2 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing: SPT ○ DCPT ●; MTO Vane* △ Intact ▲ Remould; Nilcon Vane* ◇ Intact ◆ Remould; * Undrained Shear Strength (kPa) 20 40 60 80	Rinse pH Values 2 4 6 8 10 12; Soil Vapour Reading parts per million (ppm) Plastic 200 300 Liquid 400; Lower Explosive Limit (LEL) Passing 75 um (%) W_L; Moisture Content (%); Plastic Liquid 20 40 60 80	INSTRUMENTATION INSTALLATION	
	dark brown topsoil - silty clay with roots and organics frozen 99.0										
	brown 0.2 fill - silty clay some gravel						99				
	98.7 refusal on inferred bedrock 0.6										

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▽ No freestanding groundwater measured in open borehole on completion of drilling.

RECORD OF BOREHOLE No. B06-6

DBA

Project Number:	**10-1539-08**	Drilling Location:	**B06-6**	Logged by:	**MM**
Project Client:	**PWGSC**	Drilling Method:	**100 mm Solid Stem Augers**	Compiled by:	**MM**
Project Name:	**Housing Units - Secondary Investigation**	Drilling Machine:	**Track Mounted Drill**	Reviewed by:	**RC**
Project Location:	**Bath Institute**	Date Started:	**Mar 23, 11** Date Completed:	Revision No.:	**0**

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		
Lithology Plot	DESCRIPTION Local Ground Surface Elevation: 99.0 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing: ○ SPT ● DCPT; MTO Vane*: △ Intact ▲ Remould; Nilcon Vane*: ◇ Intact ◆ Remould; * Undrained Shear Strength (kPa) 20 40 60 80	★ Rinse pH Values 2 4 6 8 10 12; Atterberg Limits; Soil Vapour Reading △ parts per million (ppm) 100 200 300 400; ▲ Lower Explosive Limit (LEL); ✱ Passing 75 um (%); ● Moisture Content (%); W_P Plastic, W_L Liquid 20 40 60 80	INSTRUMENTATION INSTALLATION	COMMENTS
	dark brown topsoil - silty clay with roots and organics frozen — 98.8 / 0.2										
	brown fill - silty clay some gravel — 98.7 / 0.3										
	refusal on inferred bedrock										

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No freestanding groundwater measured in open borehole on completion of drilling.

Scale: 1 : 26

RECORD OF BOREHOLE No. B06-7

Project Number:	**10-1539-08**	Drilling Location:	**B06-7**	Logged by:	**MM**
Project Client:	**PWGSC**	Drilling Method:	**100 mm Solid Stem Augers**	Compiled by:	**MM**
Project Name:	**Housing Units - Secondary Investigation**	Drilling Machine:	**Track Mounted Drill**	Reviewed by:	**RC**
Project Location:	**Bath Institute**	Date Started:	**Mar 23, 11** Date Completed:	Revision No.:	**0**

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING	INSTRUMENTATION INSTALLATION	COMMENTS
Lithology Plot	DESCRIPTION **Local Ground Surface Elevation: 99.1 m**	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing: ○ SPT ● DCPT; MTO Vane* △ Intact ▲ Remould; Nilcon Vane* ◇ Intact ◆ Remould; * Undrained Shear Strength (kPa) 20 40 60 80	★ Rinse pH Values 2 4 6 8 10 12; Atterberg Limits; Soil Vapour Reading △ parts per million (ppm) 100 200 300 400; ▲ Lower Explosive Limit (LEL); * Passing 75 um (%) W_L; ● Moisture Content (%); Plastic Liquid 20 40 60 80		
	dark brown topsoil - silty clay with roots and organics frozen 98.9						99				
	brown 0.2 fill - silty clay some gravel										
	98.1 refusal on inferred bedrock 1.0					1					

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▽ No freestanding groundwater measured in open borehole on completion of drilling.

Scale: 1 : 26

RECORD OF BOREHOLE No. B06-8

Project Number:	**10-1539-08**	Drilling Location:	**B06-8**	Logged by:	**MM**
Project Client:	**PWGSC**	Drilling Method:	**100 mm Solid Stem Augers**	Compiled by:	**MM**
Project Name:	**Housing Units - Secondary Investigation**	Drilling Machine:	**Track Mounted Drill**	Reviewed by:	**RC**
Project Location:	**Bath Institute**	Date Started:	**Mar 23, 11** Date Completed:	Revision No.:	**0**

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		COMMENTS
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing: ○ SPT ● DCPT; MTO Vane* △ Intact ▲ Remould; Nilcon Vane* ◇ Intact ◆ Remould; * Undrained Shear Strength (kPa) 20 40 60 80	★ Rinse pH Values 2 4 6 8 10 12; Atterberg Limits; Soil Vapour Reading △ parts per million (ppm) 100 200 300 400; Plastic Liquid; ▲ Lower Explosive Limit (LEL); * Passing 75 um (%) W_L; ● Moisture Content (%); Plastic Liquid 20 40 60 80	INSTRUMENTATION INSTALLATION	
	Local Ground Surface Elevation: 99.7 m										
	dark brown topsoil - silty clay with roots and organics 99.6 / frozen 0.1										
	refusal on inferred bedrock						99				

DBA Engineering Limited
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Markham, Ontario L3R 1G2
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Fax: 905-940-8508

▽ No freestanding groundwater measured in open borehole on completion of drilling.

Borehole details as presented, do not constitute a thorough understanding of all potential conditions present and requires interpretative assistance from a qualified Geotechnical Engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commisioned and the accompanying'Notes to Record of Boreholes'.

Scale: 1 : 26

RECORD OF BOREHOLE No. B06-9

Project Number:	10-1539-08	Drilling Location:	B06-9	Logged by:	MM
Project Client:	PWGSC	Drilling Method:	100 mm Solid Stem Augers	Compiled by:	MM
Project Name:	Housing Units - Secondary Investigation	Drilling Machine:	Track Mounted Drill	Reviewed by:	RC
Project Location:	Bath Institute	Date Started:	Mar 23, 11	Date Completed:	Revision No.: 0

Local Ground Surface Elevation: 99.4 m

Depth (m)	Description	Elevation (m)	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value
	dark brown topsoil - silty clay with roots and organics	99.2				
	frozen	0.2				
	brown fill - silty clay some gravel					
		97.7				
	grey limestone shale fractured	1.7				
		97.4				
	grey **LIMESTONE BEDROCK** medium bedded with few shale partings poor to good quality	2.0				
	RX1 RQD = 38% REC = 70%		RX	1	70	
	RX2 RQD = 88% REC = 100%		RX	2	100	
		94.4				
		5.0				

FIELD TESTING: Penetration Testing (○ SPT ● DCPT); MTO Vane* (△ Intact ▲ Remould); Nilcon Vane* (◇ Intact ◆ Remould); * Undrained Shear Strength (kPa) 20 40 60 80

LAB TESTING: ★ Rinse pH Values 2 4 6 8 10 12; Atterberg Limits; △ Soil Vapour Reading parts per million (ppm) Plastic 200 300 Liquid 400; ▲ Lower Explosive Limit (LEL); ✱ Passing 75 um (%) W_L; ◑ Moisture Content (%); Plastic 20 40 60 80 Liquid

INSTRUMENTATION INSTALLATION

COMMENTS

DBA Engineering Limited
370 Steelcase Road East
Markham, Ontario L3R 1G2
Tel: 1-800-819-8833
Fax: 905-940-8508

▽ Groundwater depth on completion of drilling: 3.8 m.

Scale: 1 : 37

RECORD OF BOREHOLE No. B06-10

Project Number:	**10-1539-08**	Drilling Location:	**B06-10**	Logged by:	**MM**
Project Client:	**PWGSC**	Drilling Method:	**100 mm Solid Stem Augers**	Compiled by:	**MM**
Project Name:	**Housing Units - Secondary Investigation**	Drilling Machine:	**Track Mounted Drill**	Reviewed by:	**RC**
Project Location:	**Bath Institute**	Date Started:	**Mar 23, 11** Date Completed:	Revision No.:	**0**

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		COMMENTS
Lithology Plot	DESCRIPTION Local Ground Surface Elevation: 99.9 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing: ○ SPT ● DCPT; MTO Vane* △ Intact ▲ Remould; Nilcon Vane* ◇ Intact ◆ Remould; * Undrained Shear Strength (kPa) 20 40 60 80	★ Rinse pH Values 2 4 6 8 10 12; Atterberg Limits; Soil Vapour Reading parts per million (ppm) Plastic 200 300 Liquid 400; ▲ Lower Explosive Limit (LEL); ✱ Passing 75 um (%) W_L; ◑ Moisture Content (%) ●; Plastic 20 40 60 80 Liquid	INSTRUMENTATION INSTALLATION	
	dark brown topsoil - silty clay with roots and organics frozen 99.7										
	refusal on inferred bedrock 0.2						99				

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▽ No freestanding groundwater measured in open borehole on completion of drilling.

Borehole details as presented, do not constitute a thorough understanding of all potential conditions present and requires interpretative assistance from a qualified Geotechnical Engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commisioned and the accompanying'Notes to Record of Boreholes'.

Scale: 1 : 26

RECORD OF BOREHOLE No. B06-11

Project Number:	**10-1539-08**	Drilling Location:	**B06-11**	Logged by:	**MM**
Project Client:	**PWGSC**	Drilling Method:	**100 mm Solid Stem Augers**	Compiled by:	**MM**
Project Name:	**Housing Units - Secondary Investigation**	Drilling Machine:	**Track Mounted Drill**	Reviewed by:	**RC**
Project Location:	**Bath Institute**	Date Started:	**Mar 23, 11** Date Completed:	Revision No.:	**0**

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		
Lithology Plot	DESCRIPTION Local Ground Surface Elevation:	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing: ○ SPT ● DCPT; MTO Vane* △ Intact ▲ Remould; Nilcon Vane* ◇ Intact ◆ Remould; * Undrained Shear Strength (kPa) 20 40 60 80	★ Rinse pH Values 2 4 6 8 10 12; Atterberg Limits W_P W W_L; △ Soil Vapour Reading parts per million (ppm) Plastic 200 300 Liquid 400; ▲ Lower Explosive Limit (LEL); * Passing 75 um (%); ● Moisture Content (%); Plastic Liquid 20 40 60 80	INSTRUMENTATION INSTALLATION	COMMENTS
	dark brown topsoil - silty clay with roots and organics frozen										
	brown 0.2 fill - silty clay some gravel										
	refusal on inferred bedrock 0.4										

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▽ No freestanding groundwater measured in open borehole on completion of drilling.

Scale: 1 : 26

RECORD OF BOREHOLE No. B06-12

DBA

Project Number:	10-1539-08	Drilling Location:	B06-12	Logged by:	MM
Project Client:	PWGSC	Drilling Method:	100 mm Solid Stem Augers	Compiled by:	MM
Project Name:	Housing Units - Secondary Investigation	Drilling Machine:	Track Mounted Drill	Reviewed by:	RC
Project Location:	Bath Institute	Date Started:	Mar 23, 11 Date Completed:	Revision No.:	0

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		
Lithology Plot	DESCRIPTION Local Ground Surface Elevation: 98.8 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing: ○ SPT ● DCPT; MTO Vane*: △ Intact ▲ Remould; Nilcon Vane*: ◇ Intact ◆ Remould; * Undrained Shear Strength (kPa) 20 40 60 80	★ Rinse pH Values 2 4 6 8 10 12; Atterberg Limits; Soil Vapour Reading parts per million (ppm) 100 200 300 400; ▲ Lower Explosive Limit (LEL); % Passing 75 um (%); Moisture Content (%); Plastic / Liquid 20 40 60 80	INSTRUMENTATION INSTALLATION	COMMENTS
	dark brown topsoil - silty clay with roots and organics frozen — 98.6 / 0.2										
	brown fill - silty clay some gravel — 98.5 / 0.3										
	refusal on inferred bedrock										
							98				

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No freestanding groundwater measured in open borehole on completion of drilling.

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Scale: 1 : 26

RECORD OF BOREHOLE No. B09-1

Project Number:	**10-1539-08**	Drilling Location:	**B09-1**	Logged by:	**MM**
Project Client:	**PWGSC**	Drilling Method:	**100 mm Solid Stem Augers**	Compiled by:	**MM**
Project Name:	**Housing Units - Secondary Investigation**	Drilling Machine:	**Track Mounted Drill**	Reviewed by:	**RC**
Project Location:	**Bath Institute**	Date Started:	**Mar 24, 11** Date Completed:	Revision No.:	**0**

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		COMMENTS
Lithology Plot	DESCRIPTION **Local Ground Surface Elevation: 98.5 m**	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing: ○ SPT ● DCPT; MTO Vane* △ Intact ▲ Remould; Nilcon Vane* ◇ Intact ◆ Remould; * Undrained Shear Strength (kPa) 20 40 60 80	★ Rinse pH Values 2 4 6 8 10 12; Atterberg Limits W_P W W_L; △ Soil Vapour Reading parts per million (ppm) Plastic 200 300 Liquid 400; ▲ Lower Explosive Limit (LEL); * Passing 75 um (%); ● Moisture Content (%); Plastic Liquid 20 40 60 80	INSTRUMENTATION INSTALLATION	
	dark brown topsoil - silty clay with roots and organics frozen 98.3										
	brown 0.2 fill - silty clay some gravel						98				
	97.7 refusal on inferred bedrock 0.8										

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▽ No freestanding groundwater measured in open borehole on completion of drilling.

Scale: 1 : 26

RECORD OF BOREHOLE No. B09-2

Project Number:	**10-1539-08**	Drilling Location:	**B09-2**	Logged by:	**MM**
Project Client:	**PWGSC**	Drilling Method:	**100 mm Solid Stem Augers**	Compiled by:	**MM**
Project Name:	**Housing Units - Secondary Investigation**	Drilling Machine:	**Track Mounted Drill**	Reviewed by:	**RC**
Project Location:	**Bath Institute**	Date Started:	**Mar 24, 11** Date Completed:	Revision No.:	**0**

LITHOLOGY PROFILE			SOIL SAMPLING						FIELD TESTING	LAB TESTING		
Lithology Plot	DESCRIPTION Local Ground Surface Elevation: 98.5 m		Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing ○ SPT ● DCPT MTO Vane* Nilcon Vane* △ Intact ◇ Intact ▲ Remould ◆ Remould * Undrained Shear Strength (kPa) 20 40 60 80	★ Rinse pH Values Atterberg Limits Soil Vapour Reading parts per million (ppm) Plastic 200 300 Liquid ▲ Lower Explosive Limit (LEL) Passing 75 um (%) W_L Moisture Content (%) Plastic Liquid 20 40 60 80	INSTRUMENTATION INSTALLATION	COMMENTS
	dark brown topsoil - silty clay with roots and organics	98.3										
	frozen brown fill - silty clay some gravel	0.2						98				
		97.9										
	refusal on inferred bedrock	0.6										

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▽ No freestanding groundwater measured in open borehole on completion of drilling.

Scale: 1 : 26

RECORD OF BOREHOLE No. B09-3

Project Number:	**10-1539-08**	Drilling Location:	**B09-3**	Logged by:	**MM**
Project Client:	**PWGSC**	Drilling Method:	**100 mm Solid Stem Augers**	Compiled by:	**MM**
Project Name:	**Housing Units - Secondary Investigation**	Drilling Machine:	**Track Mounted Drill**	Reviewed by:	**RC**
Project Location:	**Bath Institute**	Date Started:	**Mar 24, 11** Date Completed:	Revision No.:	**0**

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		COMMENTS
Lithology Plot	DESCRIPTION Local Ground Surface Elevation: 98.3 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing: ○ SPT ● DCPT; MTO Vane* △ Intact ▲ Remould; Nilcon Vane* ◇ Intact ◆ Remould; * Undrained Shear Strength (kPa) 20 40 60 80	★ Rinse pH Values 2 4 6 8 10 12; Atterberg Limits W_P W W_L; △ Soil Vapour Reading parts per million (ppm) Plastic 200 300 Liquid 400; ▲ Lower Explosive Limit (LEL); * Passing 75 um (%); ● Moisture Content (%); Plastic Liquid 20 40 60 80	INSTRUMENTATION INSTALLATION	
	dark brown topsoil - silty clay with roots and organics frozen 98.1										
	refusal on inferred bedrock 0.3						98				

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▽ No freestanding groundwater measured in open borehole on completion of drilling.

Scale: 1 : 26

RECORD OF BOREHOLE No. B09-4

Project Number:	**10-1539-08**	Drilling Location:	**B09-4**	Logged by:	**MM**
Project Client:	**PWGSC**	Drilling Method:	**100 mm Solid Stem Augers**	Compiled by:	**MM**
Project Name:	**Housing Units - Secondary Investigation**	Drilling Machine:	**Track Mounted Drill**	Reviewed by:	**RC**
Project Location:	**Bath Institute**	Date Started:	**Mar 24, 11** Date Completed:	Revision No.:	**0**

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		
Lithology Plot	DESCRIPTION **Local Ground Surface Elevation: 98.4 m**	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing ○ SPT ● DCPT MTO Vane* Nilcon Vane* △ Intact ◇ Intact ▲ Remould ◆ Remould * Undrained Shear Strength (kPa) 20 40 60 80	★ Rinse pH Values Atterberg Limits Soil Vapour Reading parts per million (ppm) Plastic 200 300 Liquid ▲ Lower Explosive Limit (LEL) ✱ Passing 75 um (%) W_L ● Moisture Content (%) Plastic Liquid 20 40 60 80	INSTRUMENTATION INSTALLATION	COMMENTS
	dark brown topsoil - silty clay with roots and organics frozen 98.2										
	brown 0.2 fill - silty clay some gravel 98.0						98				
	refusal on inferred bedrock 0.5										

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▽ No freestanding groundwater measured in open borehole on completion of drilling.

Scale: 1 : 26

RECORD OF BOREHOLE No. B09-5

DBA

Project Number:	10-1539-08	Drilling Location:	B09-5	Logged by:	MM
Project Client:	PWGSC	Drilling Method:	100 mm Solid Stem Augers	Compiled by:	MM
Project Name:	Housing Units - Secondary Investigation	Drilling Machine:	Track Mounted Drill	Reviewed by:	RC
Project Location:	Bath Institute	Date Started:	Mar 24, 11 Date Completed:	Revision No.:	0

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		
Lithology Plot	DESCRIPTION Local Ground Surface Elevation: 98.5 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing: ○ SPT ● DCPT MTO Vane*: △ Intact ▲ Remould Nilcon Vane*: ◇ Intact ◆ Remould * Undrained Shear Strength (kPa) 20 40 60 80	★ Rinse pH Values 2 4 6 8 10 12 Atterberg Limits △ Soil Vapour Reading parts per million (ppm) 100 200 300 400 ▲ Lower Explosive Limit (LEL) ✕ Passing 75 um (%) ● Moisture Content (%) W_P Plastic W_L Liquid 20 40 60 80	INSTRUMENTATION INSTALLATION	COMMENTS
	dark brown topsoil - silty clay with roots and organics frozen 98.3										
	refusal on inferred bedrock 0.2						98				

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No freestanding groundwater measured in open borehole on completion of drilling.

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Scale: 1 : 26

RECORD OF BOREHOLE No. B09-6

Project Number:	10-1539-08	Drilling Location:	B09-6	Logged by:	MM
Project Client:	PWGSC	Drilling Method:	100 mm Solid Stem Augers	Compiled by:	MM
Project Name:	Housing Units - Secondary Investigation	Drilling Machine:	Track Mounted Drill	Reviewed by:	RC
Project Location:	Bath Institute	Date Started:	Mar 24, 11	Date Completed:	Revision No.: 0

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		COMMENTS
Lithology Plot	DESCRIPTION Local Ground Surface Elevation: 98.5 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing: SPT, DCPT; MTO Vane* Intact/Remould; Nilcon Vane* Intact/Remould; * Undrained Shear Strength (kPa) 20 40 60 80	Rinse pH Values 2 4 6 8 10 12; Atterberg Limits; Soil Vapour Reading parts per million (ppm) Plastic 200 300 Liquid 400; Lower Explosive Limit (LEL); Passing 75 um (%) W_L; Moisture Content (%); Plastic Liquid 20 40 60 80	INSTRUMENTATION INSTALLATION	
	dark brown topsoil - silty clay with roots and organics frozen 98.2										
	refusal on inferred bedrock 0.3						98				

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▽ No freestanding groundwater measured in open borehole on completion of drilling.

Borehole details as presented, do not constitute a thorough understanding of all potential conditions present and requires interpretative assistance from a qualified Geotechnical Engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commisioned and the accompanying'Notes to Record of Boreholes'.

Scale: 1 : 26

RECORD OF BOREHOLE No. B09-7

Project Number:	**10-1539-08**	Drilling Location:	**B09-7**	Logged by:	**MM**
Project Client:	**PWGSC**	Drilling Method:	**100 mm Solid Stem Augers**	Compiled by:	**MM**
Project Name:	**Housing Units - Secondary Investigation**	Drilling Machine:	**Track Mounted Drill**	Reviewed by:	**RC**
Project Location:	**Bath Institute**	Date Started:	**Mar 24, 11** Date Completed:	Revision No.:	**0**

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		COMMENTS
Lithology Plot	DESCRIPTION Local Ground Surface Elevation: 98.5 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing: ○ SPT ● DCPT; MTO Vane* △ Intact ▲ Remould; Nilcon Vane* ◇ Intact ◆ Remould; * Undrained Shear Strength (kPa) 20 40 60 80	★ Rinse pH Values 2 4 6 8 10 12; Atterberg Limits W_P W W_L; △ Soil Vapour Reading parts per million (ppm) Plastic 200 300 Liquid 400; ▲ Lower Explosive Limit (LEL); * Passing 75 um (%); ◑ Moisture Content (%); Plastic Liquid 20 40 60 80	INSTRUMENTATION INSTALLATION	
	dark brown topsoil - silty clay with roots and organics frozen 98.2 refusal on inferred bedrock 0.3						98				

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▽ No freestanding groundwater measured in open borehole on completion of drilling.

Scale: 1 : 26

RECORD OF BOREHOLE No. B09-8

Project Number:	**10-1539-08**	Drilling Location:	**B09-8**	Logged by:	**MM**
Project Client:	**PWGSC**	Drilling Method:	**100 mm Solid Stem Augers**	Compiled by:	**MM**
Project Name:	**Housing Units - Secondary Investigation**	Drilling Machine:	**Track Mounted Drill**	Reviewed by:	**RC**
Project Location:	**Bath Institute**	Date Started:	**Mar 24, 11** Date Completed:	Revision No.:	**0**

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		COMMENTS
Lithology Plot	DESCRIPTION Local Ground Surface Elevation: 99.0 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing: ○ SPT ● DCPT; MTO Vane* △ Intact ▲ Remould; Nilcon Vane* ◇ Intact ◆ Remould; * Undrained Shear Strength (kPa) 20 40 60 80	★ Rinse pH Values 2 4 6 8 10 12; Atterberg Limits; Soil Vapour Reading △ parts per million (ppm) 100 200 300 400; ▲ Lower Explosive Limit (LEL); ✱ Passing 75 um (%) W_L; ◑ Moisture Content (%) ●; Plastic Liquid 20 40 60 80	INSTRUMENTATION INSTALLATION	
	dark brown topsoil - silty clay with roots and organics frozen 98.7										
	refusal on inferred bedrock 0.3						98				

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▽ No freestanding groundwater measured in open borehole on completion of drilling.

Scale: 1 : 26

RECORD OF BOREHOLE No. B09-9

Project Number:	10-1539-08	Drilling Location:	B09-9	Logged by:	MM
Project Client:	PWGSC	Drilling Method:	100 mm Solid Stem Augers	Compiled by:	MM
Project Name:	Housing Units - Secondary Investigation	Drilling Machine:	Track Mounted Drill	Reviewed by:	RC
Project Location:	Bath Institute	Date Started:	Mar 24, 11	Date Completed:	Revision No.: 0

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		COMMENTS
Lithology Plot	DESCRIPTION Local Ground Surface Elevation: 99.0 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing: ○ SPT ● DCPT; MTO Vane* △ Intact ▲ Remould; Nilcon Vane* ◇ Intact ◆ Remould; * Undrained Shear Strength (kPa) 20 40 60 80	★ Rinse pH Values 2 4 6 8 10 12; Atterberg Limits; Soil Vapour Reading △ parts per million (ppm) 100 200 300 400; ▲ Lower Explosive Limit (LEL); * Passing 75 um (%) W_L; ◑ Moisture Content (%) ●; Plastic Liquid 20 40 60 80	INSTRUMENTATION INSTALLATION	
	dark brown topsoil - silty clay with roots and organics frozen 98.7 refusal on inferred bedrock 0.3						98				

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▽ No freestanding groundwater measured in open borehole on completion of drilling.

Scale: 1 : 26

RECORD OF BOREHOLE No. B09-10

Project Number:	**10-1539-08**	Drilling Location:	**B09-10**	Logged by:	**MM**
Project Client:	**PWGSC**	Drilling Method:	**100 mm Solid Stem Augers**	Compiled by:	**MM**
Project Name:	**Housing Units - Secondary Investigation**	Drilling Machine:	**Track Mounted Drill**	Reviewed by:	**RC**
Project Location:	**Bath Institute**	Date Started:	**Mar 24, 11** Date Completed:	Revision No.:	**0**

Local Ground Surface Elevation: 98.5 m

Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)
	dark brown topsoil - silty clay with roots and organics						
	frozen						
	98.3 / 0.2						
	brown fill - silty clay some gravel						
	98.2 / 0.3						
	refusal on inferred bedrock						
							98

FIELD TESTING: Penetration Testing (○ SPT ● DCPT); MTO Vane* (△ Intact ▲ Remould); Nilcon Vane* (◇ Intact ◆ Remould); * Undrained Shear Strength (kPa) 20 40 60 80

LAB TESTING: ★ Rinse pH Values 2 4 6 8 10 12; Atterberg Limits; △ Soil Vapour Reading parts per million (ppm) Plastic 200 300 Liquid 400; ▲ Lower Explosive Limit (LEL); ✱ Passing 75 um (%) W_L; ◑ Moisture Content (%); Plastic 20 40 60 80 Liquid

INSTRUMENTATION INSTALLATION

COMMENTS

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▽ No freestanding groundwater measured in open borehole on completion of drilling.

Scale: 1 : 26

RECORD OF BOREHOLE No. B09-11

Project Number:	10-1539-08	Drilling Location:	B09-11	Logged by:	MM
Project Client:	PWGSC	Drilling Method:	100 mm Solid Stem Augers	Compiled by:	MM
Project Name:	Housing Units - Secondary Investigation	Drilling Machine:	Track Mounted Drill	Reviewed by:	RC
Project Location:	Bath Institute	Date Started:	Mar 23, 11	Date Completed:	Revision No.: 0

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		
Lithology Plot	DESCRIPTION Local Ground Surface Elevation: 98.4 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing ○ SPT ● DCPT MTO Vane* Nilcon Vane* △ Intact ◇ Intact ▲ Remould ◆ Remould * Undrained Shear Strength (kPa) 20 40 60 80	★ Rinse pH Values 2 4 6 8 10 12 Atterberg Limits △ Soil Vapour Reading parts per million (ppm) 100 200 300 400 ▲ Lower Explosive Limit (LEL) ✱ % Passing 75 um (%) W_L ● Moisture Content (%) Plastic Liquid 20 40 60 80	INSTRUMENTATION INSTALLATION	COMMENTS
	dark brown topsoil - silty clay with roots and organics frozen 98.2										
	brown 0.2 fill - silty clay some gravel						98				
	97.8 grey 0.7 **LIMESTONE BEDROCK** medium bedded with few shale partings poor to good quality AVG RQD=62.5% AVG REC=98.5% RX 1 RQD = 28% REC = 97%	RX	1	97		1	97				
	RX2 RQD = 97% REC = 100%	RX	2	100		2 3	96 95				
	94.6 3.8										

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▽ Groundwater depth on completion of drilling: 2.9 m.

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Scale: 1 : 26

RECORD OF BOREHOLE No. Trench BH1

Project Number:	**10-1539-08**	Drilling Location:	**Trench BH1**	Logged by:	**MM**
Project Client:	**PWGSC**	Drilling Method:	**100 mm Solid Stem Augers**	Compiled by:	**MM**
Project Name:	**Housing Units - Secondary Investigation**	Drilling Machine:	**Track Mounted Drill**	Reviewed by:	**RC**
Project Location:	**Bath Institute**	Date Started:	**Mar 24, 11** Date Completed:	Revision No.:	**0**

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		COMMENTS
Lithology Plot	DESCRIPTION Local Ground Surface Elevation: 91.3 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing: SPT ○, DCPT ●; MTO Vane* Intact △, Remould ▲; Nilcon Vane* Intact ◇, Remould ◆; * Undrained Shear Strength (kPa) 20 40 60 80	Rinse pH Values 2 4 6 8 10 12; Soil Vapour Reading parts per million (ppm) Plastic 200 300 Liquid 400; Lower Explosive Limit (LEL) ✱ Passing 75 um (%) W_L ■ Moisture Content (%) ● Plastic 20 40 60 80 Liquid	INSTRUMENTATION INSTALLATION	
	dark brown topsoil - silty clay with roots and organics frozen 91.1										
	brown SILTY CLAY stiff 0.2						91				
		SS	1	47	14	1		○			
	90.1 refusal on inferred bedrock 1.2										

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▽ No freestanding groundwater measured in open borehole on completion of drilling.

Borehole details as presented, do not constitute a thorough understanding of all potential conditions present and requires interpretative assistance from a qualified Geotechnical Engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commisioned and the accompanying'Notes to Record of Boreholes'.

Scale: 1 : 26

RECORD OF BOREHOLE No. Trench BH2

Project Number:	**10-1539-08**	Drilling Location:	**Trench BH2**	Logged by:	**MM**
Project Client:	**PWGSC**	Drilling Method:	**100 mm Solid Stem Augers**	Compiled by:	**MM**
Project Name:	**Housing Units - Secondary Investigation**	Drilling Machine:	**Track Mounted Drill**	Reviewed by:	**RC**
Project Location:	**Bath Institute**	Date Started:	**Mar 24, 11** Date Completed:	Revision No.:	**0**

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		COMMENTS
Lithology Plot	DESCRIPTION Local Ground Surface Elevation: 94.6 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing: SPT, DCPT; MTO Vane* Intact/Remould; Nilcon Vane* Intact/Remould; * Undrained Shear Strength (kPa) 20 40 60 80	Rinse pH Values 2 4 6 8 10 12; Atterberg Limits W_P Plastic 200 300 W_L Liquid 400; Soil Vapour Reading parts per million (ppm); Lower Explosive Limit (LEL); Passing 75 um (%); Moisture Content (%); Plastic 20 40 60 80 Liquid	INSTRUMENTATION INSTALLATION	
	dark brown topsoil - silty clay with roots and organics frozen — 94.4										
	brown SILTY CLAY — 0.2						94				
	— 93.7										
	refusal on inferred bedrock — 0.9										

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Fax: 905-940-8508

▽ No freestanding groundwater measured in open borehole on completion of drilling.

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RECORD OF BOREHOLE No. Trench BH3

Project Number:	10-1539-08	Drilling Location:	Trench BH3	Logged by:	MM
Project Client:	PWGSC	Drilling Method:	100 mm Solid Stem Augers	Compiled by:	MM
Project Name:	Housing Units - Secondary Investigation	Drilling Machine:	Track Mounted Drill	Reviewed by:	RC
Project Location:	Bath Institute	Date Started:	Mar 24, 11 Date Completed:	Revision No.:	0

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		
Lithology Plot	DESCRIPTION Local Ground Surface Elevation: 99.6 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	Penetration Testing: ○ SPT ● DCPT; MTO Vane* △ Intact ▲ Remould; Nilcon Vane* ◇ Intact ◆ Remould; * Undrained Shear Strength (kPa) 20 40 60 80	★ Rinse pH Values 2 4 6 8 10 12; Atterberg Limits; △ Soil Vapour Reading parts per million (ppm) 100 200 300 400; ▲ Lower Explosive Limit (LEL); ✻ Passing 75 um (%); ○ Moisture Content (%); W_P Plastic W_L Liquid 20 40 60 80	INSTRUMENTATION INSTALLATION	COMMENTS
	dark brown topsoil - silty clay with roots and organics frozen 99.3 / 0.3										
	refusal on inferred bedrock						99				

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No freestanding groundwater measured in open borehole on completion of drilling.

Borehole details as presented, do not constitute a thorough understanding of all potential conditions present and requires interpretative assistance from a qualified Geotechnical Engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commisioned and the accompanying'Notes to Record of Boreholes'.

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