THURBER ENGINEERING LTD.

August 16, 2012 File: 14-188-10

Greater Victoria School District #61
Facilities Department
491 Cecelia Street
Victoria, BC V8T 4T4

Attention: Jim Soles

OAK BAY HIGH SCHOOL REPLACEMENT
GEOTECHNICAL INVESTIGATION FOR
DESIGN-BUILD PROPONENTS

Dear Jim:

This report presents the results of the geotechnical investigations conducted to date at the site of the proposed Oak Bay High School Replacement in Oak Bay, BC. The recent investigation was completed for the Greater Victoria School District (GVSD) #61 to supplement the earlier preliminary investigation in order to provide the Design Build (D-B) proponents with geotechnical data across the property to assist in preparation of their bids.

The scope of work was outlined in our proposal letter to the GVSD dated April 23, 2012, and authorization to proceed with the investigation was given in an e-mail from the GVSD dated May 4, 2012.

The results of the preliminary geotechnical investigation completed in January 2011 are incorporated into this report. Consequently, the earlier report dated February 7, 2011 is superseded by this report and is no longer valid.

Use of this report is subject to the attached Statement of Limitations and Conditions. The reader's attention is specifically drawn to these conditions as it is considered essential that they be followed for the proper use and interpretation of this report.

1. PROJECT AND SITE DESCRIPTION

The existing Oak Bay High School (see Figure 1-1) will be replaced with a new school building to be located at the present north soccer field. The remaining structures will be removed and redeveloped into soccer and rugby pitches and parking areas.

The present site is a mix of grassed and paved areas located around the existing west and east school buildings. The elevation ranges from 13.19 m near TH12-2 to 16.53 m at TH12-24 and -26.

The new school is mandated by the Provincial Government to achieve LEED Gold status.

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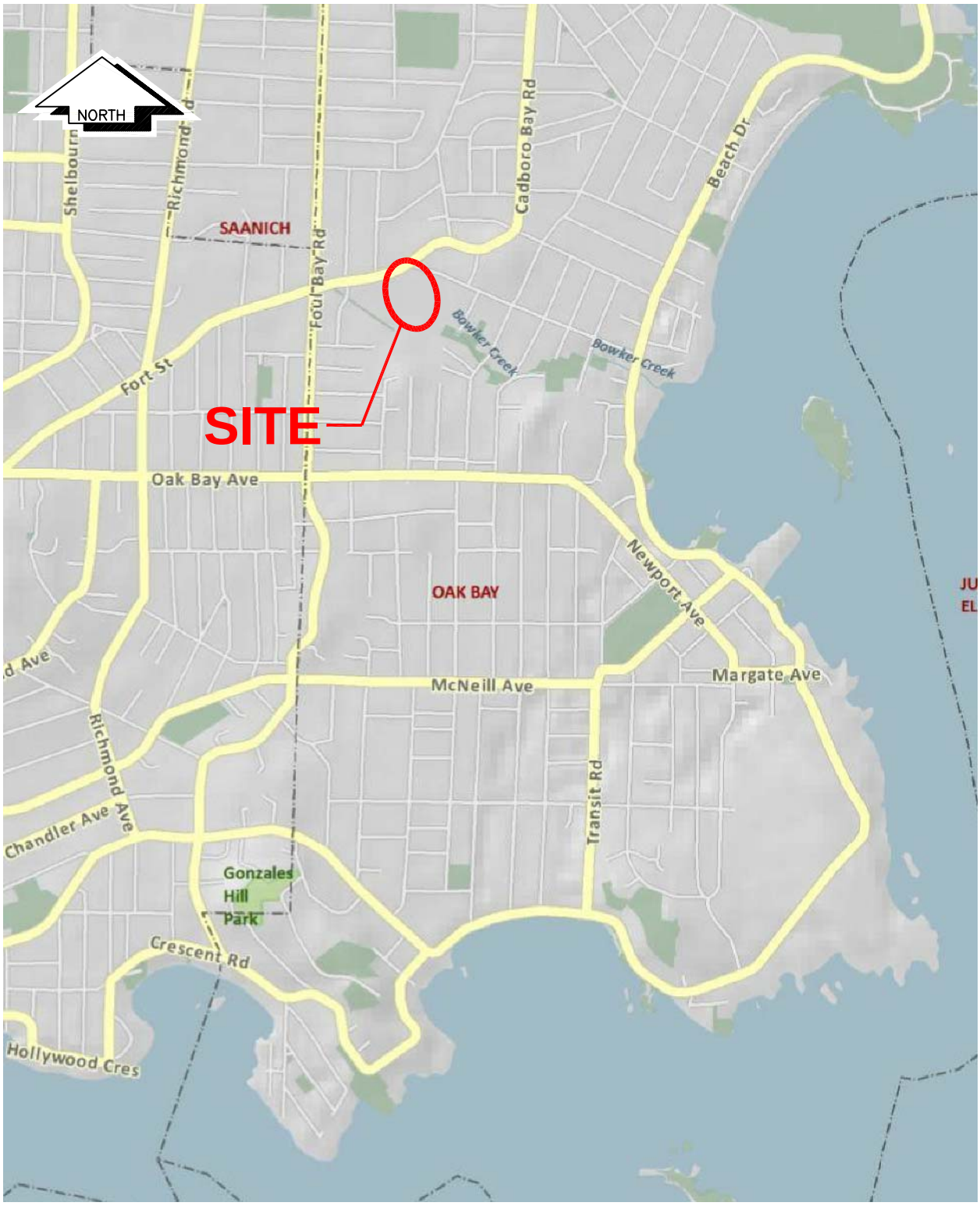
OAK BAY HIGH SCHOOL REPLACEMENT
SITE LOCATION

SCALE 1:20,000 Approx.



Digital base from C.R.D. Natural Areas Atlas.

FIGURE 1-1

Client: Greater Victoria School District #61
File No.: 14-188-10
E-File: TED04076.dwg

Date: August 14, 2012

2. SUBSURFACE INVESTIGATIONS

2.1 Background Information

Thurber Engineering Ltd. (Thurber) has previously conducted several geotechnical investigations in the general area of the school site including the Marrion Gardens/Shannon Oaks development on Oak Street and at the Oak Bay Recreation Centre. Thurber also carried out an environmental assessment for a leaking oil tank at the Oak Bay High School in 2000.

Soil conditions in this general area are variable and complex. At the Marrion Gardens/Shannon Oaks site, a marine clay deposit overlies a thick deposit of compact to dense sand (Quadra Sand). The marine clay deposit is very stiff at the surface but becomes soft with depth. The Quadra Sand deposit can be quite dense and earlier investigations at the Marrion Garden/Shannon Oaks site with an auger drill were not successful in drilling through the sand deposit. A raft foundation was used for the 4-storey wood frame structure which has a full basement, and driven piles were used to support the 7-storey tower structure.

2.2 2011 Investigations

Prior to undertaking the fieldwork, BC One Call was notified to identify nearby buried and/or overhead utilities located in the vicinity of the drill holes. Western Utilities Services Ltd. of Victoria, BC was contacted to scan each test hole area for underground utilities prior to drilling.

Five test holes (TH11-1 to -5) were drilled within or adjacent to the proposed building footprint on January 8 and 15, 2011 using a GP1300 truck mounted auger drill rig operated by Drillwell Enterprises Ltd. of Duncan, BC. The test holes were advanced to refusal at depths ranging from 8.8 m at TH11-1 to 14.7 m at TH11-3. All test holes were terminated in a dense to very dense till-like deposit of gravelly silty sand.

The test holes were logged in the field by a senior Thurber technologist and were located relative to existing site features. The approximate locations of the test holes are shown on Drawing No. 14-188-10-3 in Appendix C.

Standard Penetration Tests (SPTs) were conducted at TH11-1 at approximate 1.5 m intervals below 7.3 m depth to assess the soil density within the lower granular soils. This test involves driving a 50 mm diameter thick-walled sampler into the soil under the energy of a 63.5 kg weight falling 760 mm. The number of blows required to drive the sampler 300 mm is known as the standard penetration blow count (N).

All soil samples were returned to our Victoria laboratory for visual identification (ASTM D2488) and moisture content determination (ASTM D4959). Undisturbed Shelby tube samples were obtained from TH11-4 for consolidation testing (ASTM D2435). The results of the consolidation tests are given in Appendix B.

A 25 mm PVC standpipe piezometer was installed at TH11-4 to permit subsequent groundwater monitoring and was capped with a road box. All tests holes were backfilled in accordance with

BC Groundwater protection hole closure procedures and topped with the existing sod, except TH11-4. Excess drill cuttings were removed from the site for subsequent disposal.

The results of the drilling and laboratory testing are summarized on the test hole logs in Appendix A.

2.3 2012 Investigations

Prior to undertaking the fieldwork, BC One Call was notified to identify nearby buried and/or overhead utilities located in the vicinity of the drill holes. Western Utilities Services Ltd. of Victoria, BC was contacted to scan each test hole area for underground utilities prior to drilling. All test holes locations and elevations were surveyed by J.E. Anderson and Associates on July 17, 2012. All test holes were logged by a senior Thurber technologist.

The locations of the test holes are shown on Drawing No. 14-188-10-3 in Appendix C. Illustrative cross sections through the school building site showing the generalized subsurface stratigraphy are shown on Drawing Nos. 14-188-10-4 and -5 in Appendix C.

Environmental assessment was not undertaken as part of this investigation, however all soil samples were visually screened for obvious signs of potential contamination.

2.3.1 Auger Drilling

A total of 29 shallow test holes (TH12-1 to -29) were drilled across the west and south portions of the property on July 3 and 4, 2012 using a GP1300 truck mounted auger drill rig operated by Drillwell Enterprises Ltd. of Duncan, BC. The test holes were generally drilled to a depth of 3.1 m to assess the depths of stripping and sub-excavation that may be required. All test holes were terminated in a very stiff to hard, native brown silty clay. TH12-7 was drilled slightly deeper and terminated at a depth of 4.6 m in firm to stiff, sandy silty clay.

Disturbed samples were obtained at selected depths in each auger test hole and returned to our laboratory for routine geotechnical analysis. All test holes were backfilled with drill cuttings and capped with a bentonite seal in accordance with BC Groundwater hole closure procedures. An asphalt patch was placed at the surface, where applicable.

All soil samples were returned to our Victoria laboratory for visual identification and moisture content determination.

The results of the auger drilling and laboratory testing are summarized on the test hole logs in Appendix A.

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2.3.2 Mud Rotary Drilling

Sea to Sky Drilling of Coquitlam, BC was retained to drill 8 mud rotary test holes (TH12-30 to TH12-37) generally within or adjacent to the proposed new school building footprint. The primary purpose of these holes was to determine if Quadra Sand underlies the site and to determine the depth to bedrock at these locations.

Standard Penetration Tests (SPTs) were conducted at all test hole locations. The tests were conducted at approximately 1.5 m intervals in the upper 7 m to 8 m, and then at selected intervals below this depth. Disturbed samples of the overburden were recovered from the split spoon, and six undisturbed Shelby tube samples were obtained at selected depths within the clay deposit from 5 of the 8 test holes for possible laboratory consolidation testing. A field vane shear test was carried out in general accordance with ASTM D 2573 at selected depths within the grey clay deposit in all test holes except TH12-34, -35, and -37.

The test holes were advanced approximately 1 m into bedrock to confirm its presence, except for test holes TH12-30 and -33 which were cored a minimum of 8 m into bedrock.

Standpipe piezometers were installed in TH12-31 and -33 at the completion of drilling to monitor groundwater levels. All other test holes were backfilled with drill cuttings and capped with a bentonite seal in accordance with BC Groundwater hole closure procedures. An asphalt patch was placed at the surface where applicable.

All soil samples were returned to our Victoria laboratory for visual identification and moisture content determination. Atterberg Limit tests were also conducted on six selected samples to determine the plasticity of the clay.

Two specimens from the undisturbed Shelby tube samples were selected for laboratory consolidation testing. The results of the consolidation tests are provided in Appendix B.

The rock core from TH12-30 and TH12-33 was returned to our laboratory and visually logged. The rock type, core recovery and condition, rock quality designation (RQD), degree of weathering, intact rock strength and a description of the structural discontinuities were recorded and are summarized on the attached core logs in Appendix A. Test holes TH12-34, -35 and -37 were probe holes only. These holes were advanced 1 m into bedrock without sampling or testing.

The results of the overburden drilling and laboratory testing are summarized on the test hole logs in Appendix A.

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3. SUBSURFACE CONDITIONS

3.1 Soil and Bedrock Conditions

A generalized description of the soil and groundwater conditions encountered during the investigations is described below. The reader should, however, refer to the test hole logs in Appendix A for a more detailed description of conditions at each test hole location.

Based on the results of the drilling investigations, subsurface conditions at this site are fairly typical of the conditions found in the Victoria area. A thin surficial layer consisting of asphalt, topsoil and fill overlies a relatively thick layer of marine clay. The upper portion of the clay deposit is over-consolidated and generally stiff to hard in consistency (desiccated crust).

The lower portion of the clay is lightly to near normally consolidated and grades from firm to soft in consistency with depth. The marine clay deposit is underlain be a variable thickness of till-like material that was not encountered in all test holes. The overburden soils are underlain by bedrock which varies in depth considerably across the proposed school building site.

Table 1 following the text provides a summary of the soils encountered in the test holes. A description of the various soil units is given below.

Topsoil and Fill

A 25 mm thick layer of asphalt was encountered at the surface in six test holes drilled in the existing parking areas and access roads. Topsoil was encountered at the surface in 29 of the test holes and ranges in thickness from 0.1 m to 0.8 m.

Fill was encountered beneath the asphalt and the topsoil in 23 of the test holes and ranges in thickness from 0.1 m to 1.5 m. The fill consists of sand and gravel as well as soft silty clay, and contains some organics and debris.

The depth from the ground surface to the native clay contact ranges from 0.2 m to about 1.8 m.

Marine Clay

The deeper test holes were drilled in the area of the proposed school building. The upper desiccated brown clay crust extends to depths from about 3.8 m to 5.9 m below the ground surface. The desiccated clay is typically stiff to hard in consistency, although the lower portion at some locations is firm in consistency. The desiccated layer generally has low to high plasticity.

At several locations, the upper portion of the marine deposit is a sandy clay to silty sand. This deposit was encountered at TH12-3, -5, -10, -11, -19, -21, -24, -25 and -28, and ranges in thickness from about 0.4 m to 1.5 m. It is possible that some of this deposit is fill material.

The clay deposit below the desiccated crust is grey, firm to soft in consistency, and typically of intermediate to high plasticity. The thickness of the grey clay deposit ranges from about 1.5 m to 10.4 m. In-situ vane shear tests were conducted in the grey clay at depths of about 1 m to 2.7 m below the surface of the grey clay. At these locations and depths, the uncorrected peak field vane shear strengths range from 37 kPa to 57 kPa and indicates the clay is firm to stiff in consistency. Based on the remoulded shear strength, the grey clay generally has a sensitivity ranging from about 3.3 to 4.8. In one of the tests (TH12-32 at about 2 m below the surface of the grey clay), the sensitivity was 13.

Till-Like Deposit

A dense till-like deposit was encountered below the clay and above the bedrock in all of the mud rotary test holes. At these locations, the till-like deposit ranges in thickness from about 0.2 m to 2.0 m. The limited samples obtained indicate the till-like soil generally consists of silty sand and gravel to silty sand with trace to some clay. This deposit can contain cobbles and boulders.

Till-like soils were also encountered in two of the 2011 auger test holes (TH11-1 and TH11-4). At these two locations, the till-like soil is about 0.9 m to 1 m thick.

Auger Refusal

Auger refusal in the 2011 test holes was encountered at depths from 8.8 m to 14.7 m below the present ground surface. Auger refusal usually occurs on bedrock, or in very dense till above the bedrock.

Bedrock

The mud rotary test holes were all advanced into bedrock, and the bedrock was cored for a length of about 8 m in two of the test holes. Bedrock was encountered at depths from 7.3 m to 15.8 m below the ground surface.

The bedrock was cored at TH12-30 and TH12-33. At TH12-30, the upper 2 m of rock core was logged as quartz diorite. The rock core is solid and has a Rock Quality Designation (RQD) of about 82 to 89%. Two unconfined compression tests on samples from this rock type gave compressive strengths of 69 MPa and 125 MPa which indicates strong to very strong rock. The rock core below the quartz diorite is broken to solid gneiss that generally has an RQD of 60% to 68%. Four unconfined compression tests on samples from this rock type gave compressive strengths of 119 MPa to 251 MPa which indicates very strong to extremely strong rock. A 400 mm thick very broken zone (RQD of 0%) was encountered at the surface of the gneiss.

At TH12-33, the entire core length was logged as gneiss. The rock core is broken to solid with an RQD of 0% to 87%. Four unconfined compression tests on selected samples gave compressive strengths of 130 MPa to 206 MPa which indicates very strong rock. A 200 mm thick very broken zone was encountered at about 3.1 m below the surface of the rock.

The bedrock surface in the Greater Victoria area is known to be highly irregular and areas of steeply sloping bedrock are often encountered.

Rock core photo logs (Figures 3-1 and 3-2) are provided in Appendix A.

The boxed rock core for TH12-30 and -33 is available for viewing in our Victoria laboratory by the D-B proponents.

3.2 Groundwater

Groundwater was encountered in 7 of the test holes at the time of drilling. In the 2011 auger holes, the water level at the completion of drilling was at a depth of 0.9 m below the ground surface (TH11-1). A standpipe piezometer installed in TH11-4 had a recorded water level of 1 m below the ground surface, 3 days after drilling.

Groundwater was also encountered in 3 of the test holes drilled in 2012 at the completion of drilling (TH12-7, TH12-12 and TH12-13). The water level in the open test holes was at depths from 2.6 m to 4 m below the ground surface.

Standpipe piezometers were installed in two of the 2012 mud rotary holes (TH12-31 and TH12-33). The measured water levels seven days after drilling were at a depth of 1.8 m and 3.3 m respectively. The measured water levels in these two piezometers dropped by about 0.2 m when measured again 22 days after drilling.

Long term monitoring of the water levels at the site has not been conducted to date. It is anticipated that the water levels will vary seasonally.

4. GEOLOGY AND SEISMICITY

4.1 Geology

The bedrock geology of the site (Figure 4-1) is comprised of lower Paleozoic (408 million years old and older) metamorphosed igneous rock, consisting of massive and gneissic metadiortite, metagabbro and amphibolite of the Wark Gneiss Formation as mapped by J.E. Mueller, 1980 (Geological Survey of Canada Map 1553A).

The general quaternary surficial geology in this area has been mapped as thick soft clay (unit C2) on the Quaternary Geology Map of Greater Victoria (Geoscience Map 2000-2). The C2 unit is assigned to areas with more than 3 m of the grey silty clay of the Victoria Clay Formation which is generally overlain by 2 m to 5 m of brown silty clay of the same formation and underlain by less than 10 m of older Pleistocene deposits.

4.2 Seismicity

The BC Building Code design level earthquake is the 1:2,475 year event. The peak ground acceleration (PGA) at this site for this event is 0.61 g.

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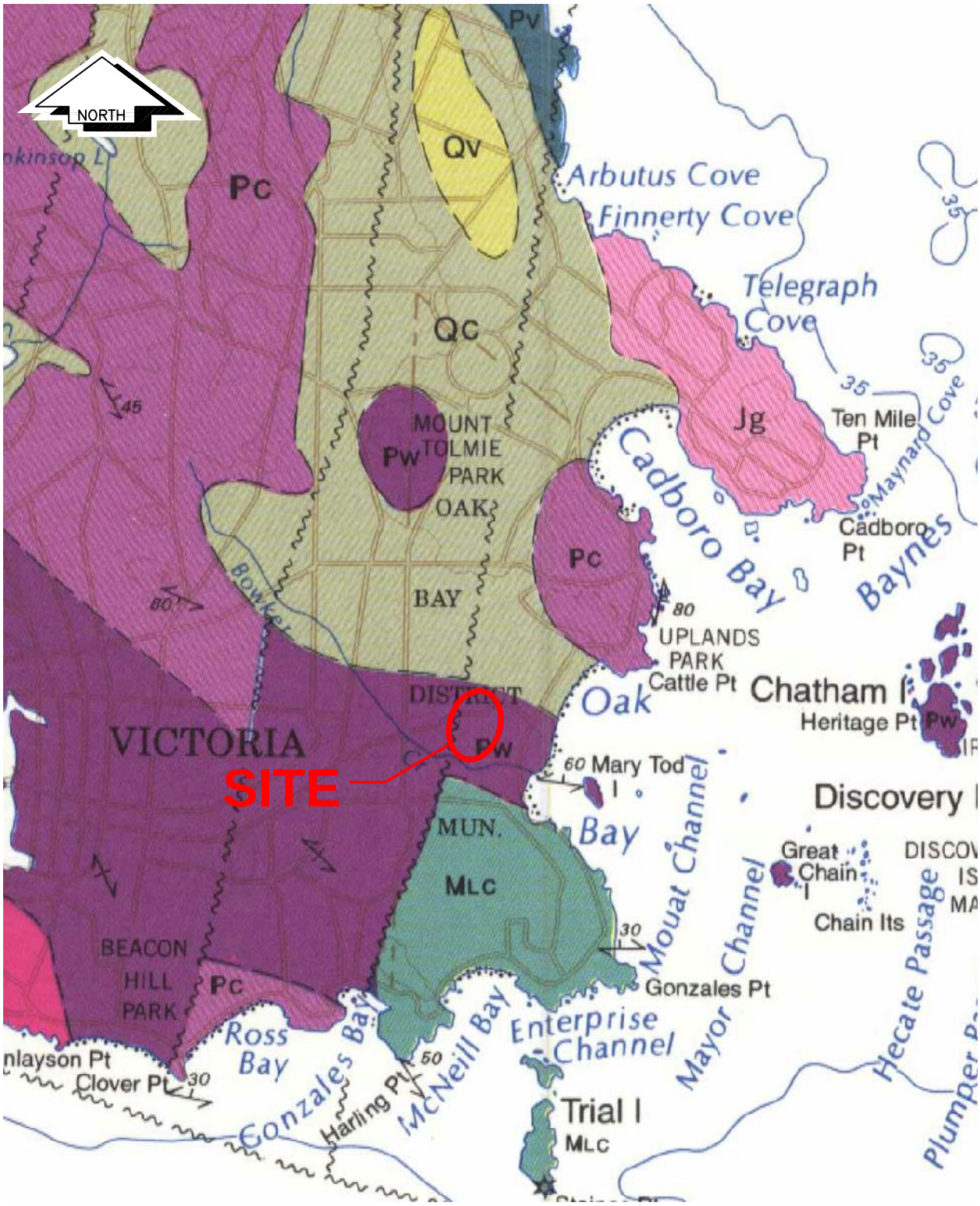
OAK BAY HIGH SCHOOL REPLACEMENT
BEDROCK GEOLOGY MAP

Not to Scale



Portion of G.S.C. Map 1553A.

FIGURE 4-1

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The design level earthquake for buildings at this site has a 2% probability of exceedance in 50 years (1 in 2,475 year return period) based on the 2010 National Building Code (NBC).

There is a mapped fault line that runs generally north-east to south-west along the west-side of the property.

5. PRELIMINARY GEOTECHNICAL ASSESSMENT

5.1 General

The preliminary geotechnical assessment given in this section of the report is based on the conceptual design drawings that were provided to us in 2011 and on discussions at that time with Genivar (structural engineers) during the preliminary design stage. The assessment is provided as a general guideline to identify the geotechnical issues at the site and to suggest possible foundation support systems for the buildings. The design-build team is solely responsible for the layout of the facility and the detailed design of the structures and fields. The proponents must therefore make their own assessment of the data and select appropriate geotechnical parameters for foundation design.

5.2 Site Seismicity

Firm to soft, native grey silty clay was encountered across the building site below the upper very stiff, silty clay crust. Due to the relatively thick layer of soft clay, the site is classified as Site Class E for seismic design. A Site Class D classification may be possible if in-situ seismic shear tests are conducted.

A copy of the 2010 NBC Seismic Hazard Calculation is attached at the end of Appendix A.

5.3 Preliminary Site Assessment

Soft, compressible clays of variable thickness were encountered at all of the deeper test holes drilled at this site. Based on discussions with the structural engineer during the preliminary design stage, we understand that the structure may have up to three storeys with high anticipated foundation loads in the 3-storey area. The high foundation loads will likely result in large total settlements and long term differential settlements.

5.3.1 Consolidation Testing

Undisturbed Shelby tube samples of the upper grey-brown, silty clay and the lower firm to soft, grey clay were collected to permit the completion of one dimensional consolidation tests. Two tests were carried out in 2011, and an additional two tests were completed for the 2012 investigation. Test results are included in Appendix B.

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5.3.2 Preliminary Foundation Assessment

The parameters obtained from the consolidation testing were used in conjunction with the preliminary unfactored column loads provided by the structural engineer to estimate the range of potential footing settlements due to consolidation of the underlying grey clay deposit, which varies in thickness across the site. This preliminary analysis indicated that differential settlements of conventional shallow foundations for a 3-storey structure will be of concern.

It may be possible to utilize shallow foundations in some areas; however, a detailed settlement analysis will have to be conducted by the proponents to determine if foundation settlements are within acceptable limits, and if the differential settlement between pile supported structures and structures on shallow foundations can be accommodated. It may be possible to reduce foundation settlements to acceptable limits by using a crawl space beneath the building or removing some of the clay and replacing with light weight fill such as expanded polystyrene (EPS).

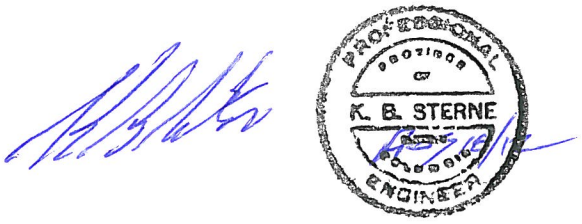
5.3.3 Site Grading

Due to the underlying firm to soft compressible grey clay deposit at this site, any raising of the present site grade may lead to significant settlement. Settlement analyses will be required to determine the actual amount of grade raising that can be used without excessive settlement.

6. CLOSURE

If you have any questions concerning this investigation or the preliminary assessment, please contact us.

Yours truly,
Thurber Engineering Ltd.
Kevin Sterne, M.Sc., P.Eng.
Review Principal



Brian Webster, B.Eng., EIT.
Project Engineer

Attachments

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TABLE 1

SUMMARY OF SUBSURFACE CONDITIONS

Test Hole No.	Surficial Soils				Native Soils				Auger Refusal Depth (m)	Depth to Bedrock (m)
	Asphalt (mm)	Topsoil (mm)	Fill (mm)	Total Thickness (m)	Brown Clay [(b)] (m)	Grey Clay (m)	Till-Like (m)	Depth to Grey Clay (m)		
12-1	25		475	0.5	2.6					
12-2	25		775	0.8	2.2					
12-3			500	0.5	2.6					
12-4			400	0.4	2.7					
12-5			1200	1.2	1.9					
12-6		200		0.2	2.9					
12-7			700	0.7	3.9					
12-8			200	0.2	2.9					
12-9			300	0.3	2.8					
12-10			400	0.4	2.7[(a)]					
12-11	25		475	0.5	2.6					
12-12	25		475	0.5	2.6					
12-13		600		0.6	2.5					
12-14		700		0.7	2.4					
12-15		400	1200	1.6	1.5					
12-16		300		0.3	2.8					
12-17		600		0.6	2.5					
12-18		300	1300	1.6	1.5					
12-19		400	900	1.3	1.8[(a)]					
12-20		500		0.5	2.6					
12-21		300	1500	1.8	1.3					
12-22		600		0.6	2.5					
12-23		200		0.2	2.9					

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TABLE 1

SUMMARY OF SUBSURFACE CONDITIONS

Test Hole No.	Surficial Soils				Native Soils				Auger Refusal Depth (m)	Depth to Bedrock (m)
	Asphalt (mm)	Topsoil (mm)	Fill (mm)	Total Thickness (m)	Brown Clay [(b)] (m)	Grey Clay (m)	Till-Like (m)	Depth to Grey Clay (m)		
12-24		400		0.4	2.7					
12-25		800		0.8	2.3					
12-26		400		0.4	2.7					
12-27		600		0.6	2.5					
12-28		500		0.5	2.6					
12-29		500		0.5	2.6					
12-30		300		0.3	5.3	1.5	0.2	5.6		7.3
12-31		300		0.3	3.5	4.1	0.2	3.8		8.1
12-32		300		0.3	4.9	8.6	2.0	5.2		15.8
12-33		200	1400	1.6	3.7	8.3	0.3	5.3		13.9
12-34 [(c)]		300		0.3	5.3	5.2	0.5	5.6		11.3
12-35 [(c)]		300		0.3	4.5	3.3	0.2	4.8		8.3
12-36	25		275	0.3	4.9	3.35	0.65	5.2		9.2
12-37 [(c)]	25		275	0.3	4.5	4.8	0.8	4.8		10.4
11-1		100	1100	1.2	2.8	3.85	1.0	4.0	8.8	
11-2		150	450	0.6	4.0	6.8		4.6	11.4	
11-3		150	950	1.1	3.2	10.4		4.3	14.7	
11-4		200	900	1.1	4.8	6.6	0.9	5.9	13.4	
11-5		400	100	0.5	3.6	7.4		4.1	11.5	

Notes:

(a) The brown clay thickness in the table includes the thickness of silty sand or clayey sand found at the surface of the silty clay deposit.
(b) For TH12-1 to 12-29: Brown clay not fully penetrated. Therefore, actual thickness greater than shown.
(c) For TH12-34, -35, -37: Overburden stratigraphy inferred from drill action and cuttings.

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STATEMENT OF LIMITATIONS AND CONDITIONS

1. STANDARD OF CARE

This study and Report have been prepared in accordance with generally accepted engineering or environmental consulting practices in this area. No other warranty, expressed or implied, is made.

2. COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment are a part of the Report which is of a summary nature and is not intended to stand alone without reference to the instructions given to us by the Client, communications between us and the Client, and to any other reports, writings, proposals or documents prepared by us for the Client relative to the specific site described herein, all of which constitute the Report.

IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT. WE CANNOT BE RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE REPORT.

3. BASIS OF REPORT

The Report has been prepared for the specific site, development, design objectives and purposes that were described to us by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the document, subject to the limitations provided herein, are only valid to the extent that this Report expressly addresses proposed development, design objectives and purposes, and then only to the extent there has been no material alteration to or variation from any of the said descriptions provided to us unless we are specifically requested by the Client to review and revise the Report in light of such alteration or variation or to consider such representations, information and instructions.

4. USE OF THE REPORT

The information and opinions expressed in the Report, or any document forming part of the Report, are for the sole benefit of the Client. NO OTHER PARTY MAY USE OR RELY UPON THE REPORT OR ANY PORTION THEREOF WITHOUT OUR WRITTEN CONSENT AND SUCH USE SHALL BE ON SUCH TERMS AND CONDITIONS AS WE MAY EXPRESSLY APPROVE. The contents of the Report remain our copyright property. The Client may not give, lend or, sell the Report, or otherwise make the Report, or any portion thereof, available to any person without our prior written permission. Any use which a third party makes of the Report, are the sole responsibility of such third parties. Unless expressly permitted by us, no person other than the Client is entitled to rely on this Report. We accept no responsibility whatsoever for damages suffered by any third party resulting from use of the Report without our express written permission.

5. INTERPRETATION OF THE REPORT

a) Nature and Exactness of Soil and Contaminant Description: Classification and identification of soils, rocks, geological units, contaminant materials and quantities have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors are judgmental in nature. Comprehensive sampling and testing programs implemented with the appropriate equipment by experienced personnel, may fail to locate some conditions. All investigations utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarizing such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and the Client and all other persons making use of such documents or records with our express written consent should be aware of this risk and this report is delivered on the express condition that such risk is accepted by the Client and such other persons. Some conditions are subject to change over time and those making use of the Report should be aware of this possibility and understand that the Report only presents the conditions at the sampled points at the time of sampling. Where special concerns exist, or the Client has special considerations or requirements, the Client should disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.

b) Reliance on Provided Information: The evaluation and conclusions contained in the Report have been prepared on the basis of conditions in evidence at the time of site inspections and on the basis of information provided to us. We have relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, we cannot accept responsibility for any deficiency, misstatement or inaccuracy contained in the Report as a result of misstatements, omissions, misrepresentations, or fraudulent acts of the Client or other persons providing information relied on by us. We are entitled to rely on such representations, information and instructions and are not required to carry out investigations to determine the truth or accuracy of such representations, information and instructions.

(see over …)

INTERPRETATION OF THE REPORT *(continued. . .)*

c) Design Services: The Report may form part of the design and construction documents for information purposes even though it may have been issued prior to the final design being completed. We should be retained to review the final design, project plans and documents prior to construction to confirm that they are consistent with the intent of the Report. Any differences that may exist between the report recommendations and the final design detailed in the contract documents should be reported to us immediately so that we can address potential conflicts.

d) Construction Services: During construction we must be retained to provide field reviews. Field reviews consist of performing sufficient and timely observations of encountered conditions to confirm and document that the site conditions do not materially differ from those interpreted conditions considered in the preparation of the report. Adequate field reviews are necessary for Thurber to provide letters of assurance, in accordance with the requirements of many regulatory authorities.

6. RISK LIMITATION

Geotechnical engineering and environmental consulting projects often have the potential to encounter pollutants or hazardous substances and the potential to cause an accidental release of those substances. In consideration of the provision of the services by us, which are for the Client's benefit, the Client agrees to hold harmless and to indemnify and defend us and our directors, officers, servants, agents, employees, workmen and contractors (hereinafter referred to as the "Company") from and against any and all claims, losses, damages, demands, disputes, liability and legal investigative costs of defence, whether for personal injury including death, or any other loss whatsoever, regardless of any action or omission on the part of the Company, that result from an accidental release of pollutants or hazardous substances occurring as a result of carrying out this Project. This indemnification shall extend to all Claims brought or threatened against the Company under any federal or provincial statute as a result of conducting work on this Project. In addition to the above indemnification, the Client further agrees not to bring any claims against the Company in connection with any of the aforementioned causes.

7. SERVICES OF SUBCONSULTANTS AND CONTRACTORS

The conduct of engineering and environmental studies frequently requires hiring the services of individuals and companies with special expertise and/or services which we do not provide. We may arrange the hiring of these services as a convenience to our Clients. As these services are for the Client's benefit, the Client agrees to hold the Company harmless and to indemnify and defend us from and against all claims arising through such hirings to the extent that the Client would incur had he hired those services directly. This includes responsibility for payment for services rendered and pursuit of damages for errors, omissions or negligence by those parties in carrying out their work. In particular, these conditions apply to the use of drilling, excavation and laboratory testing services.

8. CONTROL OF WORK AND JOBSITE SAFETY

We are responsible only for the activities of our employees on the jobsite. The presence of our personnel on the site shall not be construed in any way to relieve the Client or any contractors on site from their responsibilities for site safety. The Client acknowledges that he, his representatives, contractors or others retain control of the site and that we never occupy a position of control of the site. The Client undertakes to inform us of all hazardous conditions, or other relevant conditions of which the Client is aware. The Client also recognizes that our activities may uncover previously unknown hazardous conditions or materials and that such a discovery may result in the necessity to undertake emergency procedures to protect our employees as well as the public at large and the environment in general. These procedures may well involve additional costs outside of any budgets previously agreed to. The Client agrees to pay us for any expenses incurred as the result of such discoveries and to compensate us through payment of additional fees and expenses for time spent by us to deal with the consequences of such discoveries. The Client also acknowledges that in some cases the discovery of hazardous conditions and materials will require that certain regulatory bodies be informed and the Client agrees that notification to such bodies by us will not be a cause of action or dispute.

9. INDEPENDENT JUDGEMENTS OF CLIENT

The information, interpretations and conclusions in the Report are based on our interpretation of conditions revealed through limited investigation conducted within a defined scope of services. We cannot accept responsibility for independent conclusions, interpretations, interpolations and/or decisions of the Client, or others who may come into possession of the Report, or any part thereof, which may be based on information contained in the Report. This restriction of liability includes but is not limited to decisions made to develop, purchase or sell land.

THURBER

Sheet 1 of 1

LOG OF TEST HOLE

TEST HOLE NO. TH12-1

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 13.61 m

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 3, 2012

FILE NO.: 14-188-10

ELEVATION (m) | DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading | DEPTH (m)

5 10 15 20 25 30 35 40 45 50

COMMENTS		SOILS DESCRIPTION
	SM	25 mm ASPHALT over dark brown, moist, silty, gravelly SAND (FILL); trace organics; gravel to 40 mm diameter; asphalt and brick debris
Cpen = 180 kPa	CL	Very stiff to hard, moist, brown, silty CLAY; trace gravel to 25 mm diameter; trace sand
Cpen = 185 kPa	CL-CH	
		End of Hole at 3.1 m depth. Upon completion of drilling: No free water encountered. Hole backfilled with cuttings. Bentonite seal installed near surface; asphalt patch installed at surface.

13 12 11 10 9 8 7 6 5 4

0 1 2 3 4 5 6 7 8 9 10

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_ OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 1 of 1

LOG OF TEST HOLE

TEST HOLE NO. **TH12-2**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 13.19 m

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 3, 2012

FILE NO.: 14-188-10

ELEVATION (m) | DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: ◧ Disturbed ■ Undisturbed ☒ No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): ❋ GASTECH reading ⊠ PID reading | DEPTH (m)

5 10 15 20 25 30 35 40 45 50

ELEVATION (m)	COMMENTS		SOILS DESCRIPTION	DEPTH (m)
13			25 mm ASPHALT over brown to black, moist, silty SAND and GRAVEL (FILL); organics present; gravel to 50 mm diameter; asphalt, brick and concrete debris	0
12	Cpen = 185 kPa	CL	Very stiff to hard, moist, brown, silty CLAY; trace to some gravel to 30 mm diameter; trace to some sand	1
11				2
	Cpen > 200 kPa	CH		3
10			End of Hole at 3.0 m depth. Upon completion of drilling: No free water encountered. Hole backfilled with cuttings. Bentonite seal installed near surface; asphalt patch installed at surface.	4
9				5
8				6
7				7
6				8
5				9
4				10

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 1 of 1

LOG OF TEST HOLE

TEST HOLE NO. **TH12-3**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 13.87 m

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 3, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m) | DEPTH (m)

5 10 15 20 25 30 35 40 45 50

COMMENTS

SOILS DESCRIPTION

ELEVATION (m)	DEPTH (m)	COMMENTS		SOILS DESCRIPTION
13	0			Moist, brown to black, silty SAND and GRAVEL (FILL); organics present; gravel to 40 mm diameter; asphalt, brick and concrete debris
	1	Cpen = 160 kPa	SM	Dense, moist, brown, gravelly, silty SAND; trace to some silt
12	2			Very stiff, moist, brown, silty CLAY; trace gravel; trace sand
11	3	Cpen = 140 kPa	CL	
10	4			End of Hole at 3.1 m depth. Upon completion of drilling: No free water encountered. Hole backfilled with cuttings. Bentonite surface seal installed.
9	5			
8	6			
7	7			
6	8			
5	9			
4	10			

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_ OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 1 of 1

LOG OF TEST HOLE

TEST HOLE NO. **TH12-4**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 15.54 m

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 3, 2012

FILE NO.: 14-188-10

ELEVATION (m) | DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading | DEPTH (m)

5 10 15 20 25 30 35 40 45 50

COMMENTS

SOILS DESCRIPTION

Elevation (m)	Depth (m)	Comments		Soils Description
15	0			Moist, brown to black, silty SAND and GRAVEL (FILL); trace organics; gravel to 40 mm diameter; asphalt and concrete debris
	1	Cpen = 125 kPa	CL	Very stiff, moist, mottled brown to brown, silty CLAY; trace to some gravel to 40 mm diameter; trace sand
14	2	Cpen = 185 kPa	CL	
13	3			End of Hole at 3.1 m depth. Upon completion of drilling: No free water encountered. Hole backfilled with cuttings. Bentonite surface seal installed.
12	4			
11	5			
10	6			
9	7			
8	8			
7	9			
6	10			

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_ OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 1 of 1

LOG OF TEST HOLE

TEST HOLE NO. **TH12-5**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 15.94 m

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 3, 2012

FILE NO.: 14-188-10

ELEVATION (m) | DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading | DEPTH (m)

5 10 15 20 25 30 35 40 45 50

COMMENTS

SOILS DESCRIPTION

Compact to dense, moist, brown, gravelly SAND (possible FILL); gravel to 40 mm diameter; trace silt

SP-SM

Very stiff to hard, moist, brown, silty CLAY; trace gravel to 20 mm diameter; trace sand

Cpen = 150 kPa

CL

End of Hole at 3.1 m depth.
Upon completion of drilling:
No free water encountered.
Hole backfilled with cuttings.
Bentonite surface seal installed.

ELEVATION (m): 15, 14, 13, 12, 11, 10, 9, 8, 7, 6

DEPTH (m): 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_ OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 1 of 1

LOG OF TEST HOLE

TEST HOLE NO. **TH12-6**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 15.57 m

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 3, 2012

FILE NO.: 14-188-10

ELEVATION (m) | DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading | DEPTH (m)

5 10 15 20 25 30 35 40 45 50

COMMENTS

SOILS DESCRIPTION

Elevation (m)	Depth (m)	Comments		Soils Description
15	0			Moist, organic, silty SAND and GRAVEL (TOPSOIL)
14	1	Cpen = 150 kPa	CL	Very stiff to hard, moist, brown, silty CLAY; trace to some gravel to 50 mm diameter; trace sand
13	2			
12	3	Cpen = 185 kPa	CL	
11	4			End of Hole at 3.1 m depth. Upon completion of drilling: No free water encountered. Hole backfilled with cuttings. Bentonite surface seal installed.
10	5			
9	6			
8	7			
7	8			
6	9			
	10			

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 1 of 1

LOG OF TEST HOLE

TEST HOLE NO. TH12-7

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 14.45 m

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 3, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL | Plastic Limit | Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m) | 5 10 15 20 25 30 35 40 45 50 | DEPTH (m)

COMMENTS		SOILS DESCRIPTION
	CL	Moist, dark brown, silty, sandy CLAY (FILL); trace organics; trace to some gravel to 60 mm diameter; asphalt, concrete and metal debris
Cpen = 200 kPa	CL	Very stiff to hard, moist, mottled brown, silty CLAY; trace to some gravel to 40 mm diameter
Cpen = 135 kPa	CL	
Water Level (July 3, 2012)		Firm to stiff, moist, brown, sandy, silty CLAY; trace gravel to 30 mm diameter
Cpen = 75 kPa	CL	
		End of Hole at 4.6 m depth. Upon completion of drilling: Free water encountered at 4.0 m depth. Hole backfilled with cuttings. Bentonite surface seal installed.

ELEVATION: 14, 13, 12, 11, 10, 9, 8, 7, 6, 5

DEPTH: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_ OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 1 of 1

LOG OF TEST HOLE

TEST HOLE NO. **TH12-8**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 15.64 m

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 3, 2012

FILE NO.: 14-188-10

ELEVATION (m) | DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading | DEPTH (m)

5 10 15 20 25 30 35 40 45 50

COMMENTS

SOILS DESCRIPTION

Elevation (m)	Depth (m)	Comments		Soils Description
15	0			Dense, moist, brown to black, silty, clayey SAND and GRAVEL (FILL); trace organics; gravel to 40 mm diameter
	1			Hard, moist, mottled brown, silty CLAY; trace to some gravel to 40 mm diameter; trace sand
14		Cpen = 200 kPa	CL	
	2			Stiff, moist, brown, silty CLAY; trace gravel; trace sand
13		Cpen = 60 kPa	CL	
	3			End of Hole at 3.1 m depth. Upon completion of drilling: No free water encountered. Hole backfilled with cuttings. Bentonite surface seal installed.
12	4			
11	5			
10	6			
9	7			
8	8			
7	9			
6	10			

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

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LOG OF TEST HOLE

TEST HOLE NO. TH12-9

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 14.43 m

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 3, 2012

FILE NO.: 14-188-10

ELEVATION (m) | DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading | DEPTH (m)

5 10 15 20 25 30 35 40 45 50

COMMENTS

SOILS DESCRIPTION

Elevation (m)	Depth (m)	Comments		Soils Description
14	0			Moist, brown SAND and GRAVEL (FILL); gravel to 20 mm diameter; trace to some silt
13	1	Cpen > 200 kPa	CL	Very stiff to hard, moist, brown, sandy CLAY (till-like); trace to some silt; trace gravel to 20 mm diameter
12	2		CL	Soft to firm, moist to wet, grey-brown, silty, sandy CLAY; trace gravel
11	3		CL	End of Hole at 3.1 m depth. Upon completion of drilling: No free water encountered. Hole backfilled with cuttings. Bentonite surface seal installed.
10	4			
9	5			
8	6			
7	7			
6	8			
5	9			
	10			

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_ OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 1 of 1

LOG OF TEST HOLE

TEST HOLE NO. **TH12-10**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 14.87 m

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 3, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m)	DEPTH (m)	COMMENTS		SOILS DESCRIPTION
	0			Moist, brown SAND and GRAVEL (FILL); organics present; gravel to 30 mm diameter; trace to some silt; brick debris
14	1		SM	Compact to dense, moist, brown, silty SAND; trace gravel
			SC	Dense, moist, brown, silty, clayey, gravelly SAND; some silt; gravel to 40 mm diameter
13	2			
				Hard, moist, brown, silty CLAY; trace gravel to 20 mm diameter; trace sand
12	3	Cpen > 200 kPa	CL-CH	
				End of Hole at 3.1 m depth. Upon completion of drilling: No free water encountered. Hole backfilled with cuttings. Bentonite surface seal installed.
11	4			
10	5			
9	6			
8	7			
7	8			
6	9			
5	10			

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_ OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 1 of 1

LOG OF TEST HOLE

TEST HOLE NO. **TH12-11**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 16.11 m

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 3, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m)	DEPTH (m)	COMMENTS		SOILS DESCRIPTION
16	0			25 mm ASPHALT over moist, brown, sandy GRAVEL (FILL); gravel to 20 mm diameter; trace silt; trace organics
		Cpen = 60 kPa	CL	Stiff, moist, mottled brown, sandy CLAY; trace gravel
15	1	Cpen = 180 kPa	CL	Very stiff to hard, moist, brown, silty, sandy CLAY (till-like); trace to some gravel to 40 mm diameter; trace sand
14	2			
13	3	Cpen = 200 kPa	CL	End of Hole at 3.1 m depth. Upon completion of drilling: No free water encountered. Hole backfilled with cuttings. Bentonite seal installed near surface; asphalt patch installed at surface.
12	4			
11	5			
10	6			
9	7			
8	8			
7	9			
	10			

5 10 15 20 25 30 35 40 45 50

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_ OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

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LOG OF TEST HOLE

TEST HOLE NO. TH12-12

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 14.58 m

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 3, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m)	DEPTH (m)	COMMENTS		SOILS DESCRIPTION
	0			25 mm ASPHALT over moist, dark brown, sandy GRAVEL (FILL); gravel to 50 mm diameter
14	1	Cpen = 200 kPa	CL	Hard, moist, mottled brown, silty CLAY; trace to some sand; trace gravel to 20 mm diamter
13	2		CL	
12	3	Water Level (July 3, 2012)		Firm to stiff, moist to wet, brown, silty CLAY; trace to some sand; trace gravel
		Cpen = 50 kPa	CL	
11	4			End of Hole at 3.1 m depth. Upon completion of drilling: Free water encountered at 2.6 m depth. Hole backfilled with cuttings. Bentonite seal installed near surface; asphalt patch installed at surface.
10	5			
9	6			
8	7			
7	8			
6	9			
5	10			

5 10 15 20 25 30 35 40 45 50

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_ OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 1 of 1

LOG OF TEST HOLE

TEST HOLE NO. **TH12-13**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 15.32 m

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 4, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m)	COMMENTS		SOILS DESCRIPTION	DEPTH (m)
15			Loose, moist, black, organic, silty, SAND and GRAVEL (TOPSOIL)	0
14	Cpen = 200 kPa	CL	Very stiff to hard, moist, brown, silty CLAY; trace to some gravel to 40 mm diameter; trace to some sand	1
13	Water Level (July 4, 2012)			2
	Cpen = 150 kPa	CL		3
12			End of Hole at 3.1 m depth. Upon completion of drilling: Free water encountered at 2.6 m depth. Hole backfilled with cuttings. Bentonite surface seal installed.	4
11				5
10				6
9				7
8				8
7				9
6				10

Sheet 1 of 1

LOG OF TEST HOLE

TEST HOLE NO. **TH12-14**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 15.23 m

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 4, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m)	5 10 15 20 25 30 35 40 45 50	COMMENTS		SOILS DESCRIPTION	DEPTH (m)
15				Loose, moist, black, organic, silty, SAND and GRAVEL (TOPSOIL)	0
14		Cpen = 170 kPa	CL	Very stiff to hard, moist, mottled brown, silty CLAY; trace gravel to 30 mm diameter; trace sand	1
13					2
		Cpen = 185 kPa	CH		3
12				End of Hole at 3.1 m depth. Upon completion of drilling: No free water encountered. Hole backfilled with cuttings. Bentonite surface seal installed.	4
11					5
10					6
9					7
8					8
7					9
6					10

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_ OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 1 of 1

LOG OF TEST HOLE

TEST HOLE NO. **TH12-15**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 15.12 m

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 4, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m)	DEPTH (m)	COMMENTS		SOILS DESCRIPTION
15	0			Loose, moist, black, organic, silty, SAND and GRAVEL (TOPSOIL)
14	1		ML	Compact, dark brown to black, moist, gravelly, sandy SILT (FILL); trace organics; gravel to 30 mm diameter
13	2	Cpen = 200 kPa		Very stiff to hard, moist, brown, silty CLAY; trace gravel to 40 mm diameter; trace sand
12	3		CL-CH	
11	4			End of Hole at 3.1 m depth. Upon completion of drilling: No free water encountered. Hole backfilled with cuttings. Bentonite surface seal installed.
10	5			
9	6			
8	7			
7	8			
6	9			
	10			

5 10 15 20 25 30 35 40 45 50

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_ OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 1 of 1

LOG OF TEST HOLE

TEST HOLE NO. **TH12-16**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 15.37 m

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 4, 2012

FILE NO.: 14-188-10

ELEVATION (m) | DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): Disturbed / Undisturbed | WATER LEVEL: Plastic Limit – Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): Passing #200 sieve, Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading | DEPTH (m)

5 10 15 20 25 30 35 40 45 50

COMMENTS

SOILS DESCRIPTION

Loose, moist, black, organic, silty, SAND and GRAVEL (TOPSOIL)

Very stiff to hard, moist, mottled brown, silty CLAY; trace gravel; trace sand

Cpen = 200 kPa

CL

Cpen > 200 kPa

CH

End of Hole at 3.1 m depth.
Upon completion of drilling:
No free water encountered.
Hole backfilled with cuttings.
Bentonite surface seal installed.

15 14 13 12 11 10 9 8 7 6

0 1 2 3 4 5 6 7 8 9 10

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_ OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 1 of 1

LOG OF TEST HOLE

TEST HOLE NO. **TH12-17**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 14.89 m

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 4, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m)	DEPTH (m)	COMMENTS		SOILS DESCRIPTION
14	0			Loose, moist, black, organic, silty, SAND and GRAVEL (TOPSOIL)
13	1	Cpen = 135 kPa	CL	Very stiff, moist, brown, silty CLAY; trace to some sand; trace gravel
12	2	Cpen = 160 kPa	CL-CH	
11	3			End of Hole at 3.1 m depth. Upon completion of drilling: No free water encountered. Hole backfilled with cuttings. Bentonite surface seal installed.
10	4			
9	5			
8	6			
7	7			
6	8			
5	9			
	10			

5 10 15 20 25 30 35 40 45 50

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_ OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 1 of 1

LOG OF TEST HOLE

TEST HOLE NO. **TH12-18**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 14.51 m

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 4, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m)	DEPTH (m)	COMMENTS		SOILS DESCRIPTION
14	0			Loose, moist, black, organic, silty SAND and GRAVEL (TOPSOIL)
	1			Mottled dark brown to black, moist, silty CLAY (FILL); some gravel; trace to some sand; trace organics; brick debris
13			CL	
	2			Very stiff, moist, mottled brown, silty CLAY; trace to some gravel; trace to some sand
12	3	Cpen = 170 kPa	CL	
11				End of Hole at 3.1 m depth. Upon completion of drilling: No free water encountered. Hole backfilled with cuttings. Bentonite surface seal installed.
	4			
10	5			
9	6			
8	7			
7	8			
6	9			
5	10			

5 10 15 20 25 30 35 40 45 50

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_ OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

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LOG OF TEST HOLE

TEST HOLE NO. TH12-19

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 14.37 m

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 4, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m)	DEPTH (m)	COMMENTS		SOILS DESCRIPTION
14	0			Moist, black, organic, silty SAND and GRAVEL (TOPSOIL)
	1		CL/OL	Moist, dark brown to black, organic, silty CLAY (FILL); some sand; trace to some gravel to 40 mm diameter
13			SC	Moist, brown, clayey SAND; trace to some gravel
	2			Very stiff to hard, moist, brown, silty CLAY; trace gravel to 30 mm diameter; trace sand
12		Cpen = 200 kPa	CH	
	3			End of Hole at 3.1 m depth. Upon completion of drilling: No free water encountered. Hole backfilled with cuttings. Bentonite surface seal installed.
11	4			
10	5			
9	6			
8	7			
7	8			
6	9			
5	10			

5 10 15 20 25 30 35 40 45 50

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_ OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

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LOG OF TEST HOLE

TEST HOLE NO. **TH12-20**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 14.95 m

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 4, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m) | DEPTH (m)

5 10 15 20 25 30 35 40 45 50

COMMENTS		SOILS DESCRIPTION
		Moist, black, organic, silty SAND and GRAVEL (TOPSOIL)
Cpen = 175 kPa	CL	Very stiff, moist, mottled brown, silty CLAY; trace to some gravel to 25 mm diameter; trace to some sand
Cpen >200 kPa	CL	
		End of Hole at 3.1 m depth. Upon completion of drilling: No free water encountered. Hole backfilled with cuttings. Bentonite surface seal installed.

ELEVATION (m): 14, 13, 12, 11, 10, 9, 8, 7, 6

DEPTH (m): 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_ OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 1 of 1

LOG OF TEST HOLE

TEST HOLE NO. **TH12-21**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 15.23 m

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 4, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m)	DEPTH (m)	COMMENTS		SOILS DESCRIPTION
15	0			Moist, black, organic, silty SAND and GRAVEL (TOPSOIL)
	1		SC	Moist, brown, clayey SAND (FILL); trace to some gravel to 40 mm diameter
14				
13	2	Cpen = 190 kPa	CL	Very stifft to hard, moist, brown, silty CLAY; trace to some sand; trace gravel to 10 mm diameter
	3			
12				End of Hole at 3.1 m depth. Upon completion of drilling: No free water encountered. Hole backfilled with cuttings. Bentonite surface seal installed.
11	4			
10	5			
9	6			
8	7			
7	8			
6	9			
	10			

5 10 15 20 25 30 35 40 45 50

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

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LOG OF TEST HOLE

TEST HOLE NO. **TH12-22**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 15.69 m

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 4, 2012

FILE NO.: 14-188-10

ELEVATION (m) | DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading | DEPTH (m)

5 10 15 20 25 30 35 40 45 50

COMMENTS

SOILS DESCRIPTION

Elevation (m)	Depth (m)	Sample	Soils Description
	0		Moist, black, organic, silty SAND and GRAVEL (TOPSOIL)
15	1		Very stiff to hard, moist, brown, silty CLAY; trace to some sand; trace gravel to 40 mm diameter
14	2	CL	
13	3	CL-CH	
12	4		End of Hole at 3.1 m depth. Upon completion of drilling: No free water encountered. Hole backfilled with cuttings. Bentonite surface seal installed.
11	5		
10	6		
9	7		
8	8		
7	9		
6	10		

Sheet 1 of 1

LOG OF TEST HOLE

TEST HOLE NO. **TH12-23**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 16.41 m

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 4, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m)	DEPTH (m)	COMMENTS		SOILS DESCRIPTION
16	0			Moist, black, organic, silty SAND and GRAVEL (TOPSOIL)
	1			Very stiff to hard, moist, mottled brown, silty CLAY; trace to some sand; trace gravel to 30 mm diameter
15		Cpen = 200 kPa	CL	
	2			
14		Cpen > 180 kPa	CL	
	3			
13				End of Hole at 3.1 m depth. Upon completion of drilling: No free water encountered. Hole backfilled with cuttings. Bentonite surface seal installed.
	4			
12				
	5			
11				
	6			
10				
	7			
9				
	8			
8				
	9			
7				
	10			

5 10 15 20 25 30 35 40 45 50

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_ OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 1 of 1

LOG OF TEST HOLE

TEST HOLE NO. **TH12-24**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 16.53 m

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 4, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m)	DEPTH (m)	COMMENTS		SOILS DESCRIPTION
	0			Moist, black, organic, silty SAND and GRAVEL (TOPSOIL)
16	1			Very stiff, moist, mottled brown, sandy CLAY; trace gravel to 20 mm diameter
15			SC/CL	
14	2	Cpen > 175 kPa		Very stiff to hard, moist, brown, silty CLAY; trace gravel to 20 mm diameter; trace sand
	3		CL-CH	
13				End of Hole at 3.1 m depth. Upon completion of drilling: No free water encountered. Hole backfilled with cuttings. Bentonite surface seal installed.
12	4			
11	5			
10	6			
9	7			
8	8			
7	9			
	10			

5 10 15 20 25 30 35 40 45 50

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_ OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

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LOG OF TEST HOLE

TEST HOLE NO. **TH12-25**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 16.52 m

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 4, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m)	DEPTH (m)	COMMENTS		SOILS DESCRIPTION
16	0			Moist, black, organic, silty SAND and GRAVEL (TOPSOIL)
	1	Cpen = 150 kPa	SC/CL	Very stiff, moist, brown, sandy CLAY; some silt; trace gravel to 20 mm diameter
15				
14	2	Cpen = 170 kPa	CL-CH	Very stiff to hard, moist, brown, silty CLAY; trace sand; trace gravel
	3			End of Hole at 3.1 m depth. Upon completion of drilling: No free water encountered. Hole backfilled with cuttings. Bentonite surface seal installed.
13	4			
12	5			
11	6			
10	7			
9	8			
8	9			
7	10			

5 10 15 20 25 30 35 40 45 50

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_ OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 1 of 1

LOG OF TEST HOLE

TEST HOLE NO. **TH12-26**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 16.53 m

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 4, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m)	DEPTH (m)	COMMENTS	SOILS DESCRIPTION
16	0		Moist, black, organic, silty SAND and GRAVEL (TOPSOIL)
	1		Very stiff to hard, moist, brown, silty CLAY; trace to some sand; trace gravel
15		CL	
	2		
14		CL-CH	
	3		End of Hole at 3.1 m depth. Upon completion of drilling: No free water encountered. Hole backfilled with cuttings. Bentonite surface seal installed.
13	4		
12	5		
11	6		
10	7		
9	8		
8	9		
7	10		

5 10 15 20 25 30 35 40 45 50

Sheet 1 of 1

LOG OF TEST HOLE

TEST HOLE NO. **TH12-27**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 16.44 m

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 4, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m)	DEPTH (m)	COMMENTS		SOILS DESCRIPTION
16	0			Moist, black, organic, silty SAND and GRAVEL (TOPSOIL)
15	1	Cpen = 185 kPa	CL	Very stiff to hard, moist, mottled brown, silty CLAY; trace to some sand; trace gravel to 25 mm diameter
14	2			
13	3	Cpen > 200 kPa	CL	End of Hole at 3.1 m depth. Upon completion of drilling: No free water encountered. Hole backfilled with cuttings. Bentonite surface seal installed.
12	4			
11	5			
10	6			
9	7			
8	8			
7	9			
	10			

5 10 15 20 25 30 35 40 45 50

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_ OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

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LOG OF TEST HOLE

TEST HOLE NO. TH12-28

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 16.32 m

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 4, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m)	DEPTH (m)	COMMENTS		SOILS DESCRIPTION
16	0			Moist, black, organic, silty SAND and GRAVEL (TOPSOIL)
	1			Stiff, moist, mottled brown, sandy CLAY; trace to some sand; trace gravel to 20 mm diameter
15		Cpen = 85 kPa	CL	
14	2			Very stiff to hard, moist, brown, silty CLAY; trace sand; trace gravel to 25 mm diameter
	3	Cpen > 200 kPa	CL	
13				End of Hole at 3.1 m depth. Upon completion of drilling: No free water encountered. Hole backfilled with cuttings. Bentonite surface seal installed.
12	4			
11	5			
10	6			
9	7			
8	8			
7	9			
	10			

5 10 15 20 25 30 35 40 45 50

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_ OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 1 of 1

LOG OF TEST HOLE

TEST HOLE NO. **TH12-29**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 16.20 m

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 4, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): ⊠ GASTECH reading, ⊡ PID reading

ELEVATION (m)	DEPTH (m)	COMMENTS		SOILS DESCRIPTION
16	0			Moist, black, organic, silty SAND and GRAVEL (TOPSOIL)
15	1	Cpen = 160 kPa	CL	Very stiff, moist, mottled brown, silty CLAY; trace to some sand; trace gravel to 30 mm diameter
14	2			
13	3	Cpen = 150 kPa	CL	End of Hole at 3.1 m depth. Upon completion of drilling: No free water encountered. Hole backfilled with cuttings. Bentonite surface seal installed.
12	4			
11	5			
10	6			
9	7			
8	8			
7	9			
	10			

5 10 15 20 25 30 35 40 45 50

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_ OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 1 of 2

LOG OF TEST HOLE

TEST HOLE NO. **TH12-30**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 15.81 m
METHOD: Mud Rotary
DRILLING CO.: Sea to Sky
INSPECTOR: BRW/JH

THURBER

CLIENT: GVSD #61
PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 9, 2012
FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m) | DEPTH (m)

5 10 15 20 25 30 35 40 45 50

COMMENTS

Cpen = 70 kPa
52
Cvane (lab) = 64 kPa

Cvane (field) = 37 kPa
Peak Strength
Cvane (field) = 8 kPa
Remoulded
60 blows / 25 mm penetration

ELEVATION (m)	DEPTH (m)		SOILS DESCRIPTION
15	0		Moist, organic, silty SAND (TOPSOIL)
	1	CL	Very stiff, moist, brown, silty CLAY; trace sand; trace gravel to 20 mm diameter
14	2		
13	3	CL-CH	
12	4	CL-CH	Firm to stiff, moist, grey-brown, silty CLAY; trace sand
11	5	CH	
10	6	CH	Firm, wet, grey, silty CLAY
9	7	CH	
		GM/SM	Very dense, wet, grey, silty SAND and GRAVEL (till-like); gravel to 20 mm diameter; trace to some clay
8	8		BEDROCK (see Rock Core Log)
7	9		
6	10		

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 2 of 2

LOG OF TEST HOLE

TEST HOLE NO. **TH12-30**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 15.81 m

METHOD: Mud Rotary

DRILLING CO.: Sea to Sky

INSPECTOR: BRW/JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 9, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m)	5 10 15 20 25 30 35 40 45 50	COMMENTS	SOILS DESCRIPTION	DEPTH (m)
5			BEDROCK (see Rock Core Log)	10
4				11
3				12
2				13
1				14
0				15
-1			End of Hole at 15.7 m depth. Upon completion of drilling: No free water encountered. Hole grouted with bentonite slurry to surface.	16
-2				17
-3				18
-4				19
				20

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_ OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

CORE LOG

TEST HOLE No. TH12-30

Project OAK BAY HIGH SCHOOL
Location SEE DRAWING No. 14-188-10-3
Driller SEA TO SKY
Hole Orientation VERTICAL
Method DIAMOND DRILL - NQ
Logged By TJS
Elevation 15.81 m
Dates 2012-Jul-9
Date 2012-Jul-30

Drilling Details	Depth (m)	Core Recovery (%)	Core Condition	Discontinuity Spacing	R.Q.D. (%)	Intact Rock Strength	Weathering	Structural Discontinuity Description	Rock Mass Description	Strength (MPa)
									Bedrock at 7.3m depth	
	8								Start coring at 8.03m depth	
	9	100	Solid	1	82	R4-R5		- 70°; stepped; rough	QUARTZ DIORITE light greenish-grey; strong; medium to coarse grained; crystalline; plagioclase-phyric quartz diorite; none to weakly foliated	U=125 U=69
		118			89			- 48°; planar; rough - 35°; planar; rough; calcite infilled (x5 @ 100 mm)		
	10	79	V.Broken	24	0				GNEISS dark greenish-grey; very strong; crystalline; weakly foliated; plagioclase-hornblende gneiss; patchy argillic alteration	
		107	Broken	4	64			- 50°; planar; smooth; calcite infilled (x3 @ 50-140 mm) - 80°; undulating; rough		U=251 U=212
	11		Solid					- 40°; undulating; smooth; calcite infilled		
		99			60	R5	SW	- 60°; planar; smooth (x2 @ 210 mm)		
	12							- 8°; undulating; rough; calcite infilled		
			Broken	8				- 70°; undulating; smooth Fault breccia - 45°; planar; rough (x4 @ 120 mm)		
	13	97			63					

CORE RECOVERY
$\frac{\text{Length of core}}{\text{core run}} \times 100$

R.Q.D.
$\frac{\text{Sum core lengths} > 100\text{mm}}{\text{length of core run}} \times 100$

DISCONTINUITY SPACING
No. of fractures/m

STRENGTH (MPa)
U = Unconfined Comp. Strength
A = Axial Point Load $I_{S(50)}$
D = Diametral Point Load $I_{S(50)}$
L = Irregular Lump Point Load $I_{S(50)}$

ROCK STRENGTH (MPa)

R0	Extremely weak	<1
R1	Very weak	1-5
R2	Weak	5-25
R3	Medium strong	25-50
R4	Strong	50-100
R5	Very strong	100-250
R6	Extremely strong	>250

WEATHERING

F	Fresh
SW	Slightly
MW	Moderately
HW	Highly
CW	Completely
RS	Residual Soil

FILE No. 14-188-10
PREPARED BY: THURBER
SHEET 01 of 02

CORE LOG

TEST HOLE No. TH12-30

Project OAK BAY HIGH SCHOOL
Location SEE DRAWING No. 14-188-10-3
Driller SEA TO SKY
Method DIAMOND DRILL - NQ
Hole Orientation VERTICAL
Logged By TJS
Elevation 15.81 m
Dates 2012-Jul-9
Date 2012-Jul-30

Drilling Details	Depth (m)	Core Recovery (%)	Core Condition	Discontinuity Spacing	R.Q.D. (%)	Intact Rock Strength	Weathering	Structural Discontinuity Description	Rock Mass Description	Strength (MPa)
	15	106	Solid	2	68	R5	SW	- 50°; undulating; smooth - 50°; planar; rough; calcite infilled - 55°; undulating; rough; calcite infilled	GNEISS dark greenish-grey; very strong; crystalline; weakly foliated; plagioclase-hornblende gneiss; patchy argillic alteration	U=119 U=193
			Broken	4				8°; undulating; smooth; - calcite infilled		
	16								15.6m END OF HOLE	
	17									
	18									
	19									
	20									

CORE RECOVERY
$\frac{\text{Length of core}}{\text{core run}} \times 100$

R.Q.D.
$\frac{\text{Sum core lengths} > 100\text{mm}}{\text{length of core run}} \times 100$

DISCONTINUITY SPACING
No. of fractures/m

STRENGTH (MPa)
U = Unconfined Comp. Strength
A = Axial Point Load $I_{S(50)}$
D = Diametral Point Load $I_{S(50)}$
L = Irregular Lump Point Load $I_{S(50)}$

ROCK STRENGTH (MPa)

R0	Extremely weak	<1
R1	Very weak	1-5
R2	Weak	5-25
R3	Medium strong	25-50
R4	Strong	50-100
R5	Very strong	100-250
R6	Extremely strong	>250

WEATHERING

F	Fresh
SW	Slightly
MW	Moderately
HW	Highly
CW	Completely
RS	Residual Soil

FILE No. 14-188-10

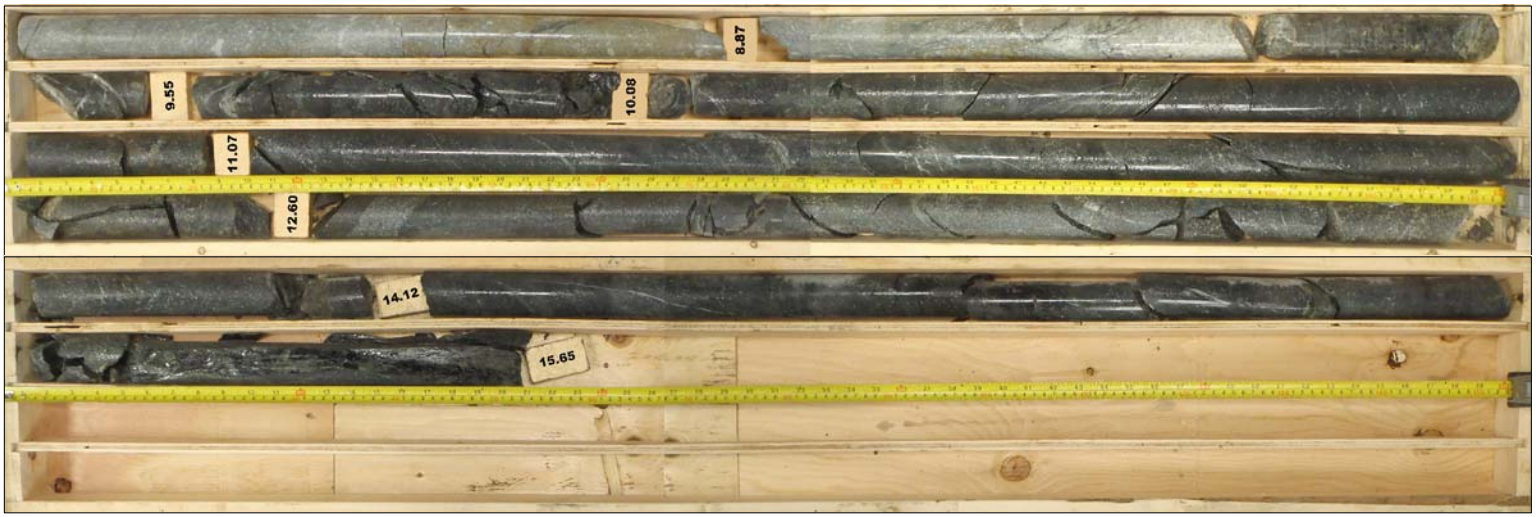
PREPARED BY: THURBER

SHEET 02 of 02

THURBER

OAK BAY HIGH SCHOOL REPLACEMENT
TEST HOLE 12-30; CORE PHOTOS

Not to Scale



Box #1
8.03 - 13.82 m

Box #2
13.82 - 15.65 m

FIGURE 3-1

Client: Greater Victoria School District #61
File No.: 14-188-10
E-File: TED04075.dwg

Date: August 14, 2012

Sheet 1 of 1

LOG OF TEST HOLE

TEST HOLE NO. **TH12-31**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 15.95 m
METHOD: Mud Rotary
DRILLING CO.: Sea to Sky
INSPECTOR: JH

THURBER

CLIENT: GVSD #61
PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 10, 2012
FILE NO.: 14-188-10

ELEVATION (m) | DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%) Disturbed / Undisturbed | WATER LEVEL Plastic Limit / Liquid Limit | SAMPLES Disturbed / Undisturbed / No Recovery | GRAIN SIZE (%) Passing #200 sieve / Passing #4 sieve | SOIL HEADSPACE READING (ppm) GASTECH reading / PID reading | DEPTH (m)

5 10 15 20 25 30 35 40 45 50

ELEVATION (m)	COMMENTS		SOILS DESCRIPTION	DEPTH (m)
			Moist, organic, silty SAND (TOPSOIL)	0
15	Cpen = 160 kPa	CL	Very stiff, moist, brown, silty CLAY; trace gravel to 15 mm diameter; trace sand	1
14	Water Level (17-Jul-2012) Water Level (1-Aug-2012)			2
	Cpen = 175 kPa	CH	61	
13				3
12		CL-CH	Firm, wet, grey, silty CLAY	4
11				5
	Cvane (lab) = 36 kPa	CL		
10				6
	Cvane (field) = 48 kPa Peak Strength Cvane (field) = 10 kPa Remoulded			
9		CL-CH		7
8	Switched to Tri-cone bit.		Dense, moist, grey, silty SAND and GRAVEL (till-like)	8
			BEDROCK	
7				9
			End of Hole at 9.0 m depth. Upon completion of drilling: No free water encountered. 25 mm diameter Monitoring Well installed.	
				10

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 14/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 1 of 2

LOG OF TEST HOLE

TEST HOLE NO. **TH12-32**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 16.32 m

METHOD: Mud Rotary

DRILLING CO.: Sea to Sky

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 10, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m)	COMMENTS		SOILS DESCRIPTION	DEPTH (m)
16			Moist, organic, silty SAND (TOPSOIL)	0
	Cpen = 190 kPa	CL	Stiff to very stiff, moist, brown, silty CLAY; trace gravel; trace sand	1
15				2
14	Cpen = 150 kPa	CL		3
13				4
	Cpen = 95 kPa	CL	Stiff, moist, grey-brown, silty CLAY; trace sand	5
12				
11	Cpen = 40 kPa	CL-CH	Firm to soft, wet, grey, silty CLAY; trace gravel; trace sand	6
	Cpen = 20 kPa			
10	59	CH		7
	Cvane (field) = 39 kPa Peak Strength Cvane (field) = 3 kPa Remoulded			8
9				9
8		CH		10
7				

5 10 15 20 25 30 35 40 45 50

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 14/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 2 of 2

LOG OF TEST HOLE

TEST HOLE NO. **TH12-32**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 16.32 m

METHOD: Mud Rotary

DRILLING CO.: Sea to Sky

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 10, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m)	DEPTH (m)	COMMENTS	SOILS DESCRIPTION
6	10		Firm to soft, wet, grey, silty CLAY; trace gravel; trace sand
5	11		
4	12		
3	13		
2	14		SM — Dense, moist, grey, silty SAND (till-like); trace to some gravel
1	15		
0	16	Switched to Tri-cone bit.	BEDROCK
-1	17		End of Hole at 16.8 m depth. Upon completion of drilling: No free water encountered. Hole grouted with bentonite slurry to surface.
-2	18		
-3	19		
	20		

5 10 15 20 25 30 35 40 45 50

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 14/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 1 of 3

LOG OF TEST HOLE

TEST HOLE NO. **TH12-33**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 15.77 m

METHOD: Mud Rotary

DRILLING CO.: Sea to Sky

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 11/12, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m) | DEPTH (m) | 5 10 15 20 25 30 35 40 45 50

COMMENTS

SOILS DESCRIPTION

ELEVATION (m)	DEPTH (m)		COMMENTS	SOILS DESCRIPTION
15	0			Moist, organic, silty SAND (TOPSOIL)
	1	SM/CL		Compact, moist, brown, silty SAND and GRAVEL (FILL); trace to some clay; gravel to 20 mm diameter
14	2			Stiff to very stiff, moist, brown, silty CLAY; trace sand
13	3	CL		
			Water Level (17-Jul-2012)	
12	4		Water Level (1-Aug-2012)	
		CL-CH		
11	5			
			Cpen = 60 kPa	
10	6	CH		Firm to soft, moist to wet, grey, silty CLAY; trace fine sand; trace gravel
9	7		Cvane (lab) = 29 kPa	
		CH	60	
8	8		Cvane (field) = 50 kPa Peak Strength Cvane (field) = 15 kPa Remoulded	
7	9			
6	10			

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 2 of 3

LOG OF TEST HOLE

TEST HOLE NO. **TH12-33**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 15.77 m

METHOD: Mud Rotary

DRILLING CO.: Sea to Sky

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 11/12, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m)	DEPTH (m)	COMMENTS	SOILS DESCRIPTION
5	10		Firm to soft, moist to wet, grey, silty CLAY; trace fine sand; trace gravel
4	11	CH	
3	12		
2	13		
1	14		Dense, moist, grey, silty SAND and GRAVEL (till-like)
0	15		BEDROCK
-1	16		(see Rock Core Logs)
-2	17		
-3	18		
-4	19		
	20		

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_ OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 3 of 3

LOG OF TEST HOLE

TEST HOLE NO. **TH12-33**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 15.77 m

METHOD: Mud Rotary

DRILLING CO.: Sea to Sky

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 11/12, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m)	DEPTH (m)	COMMENTS	SOILS DESCRIPTION
-5	20		BEDROCK (see Rock Core Logs)
-6	21		
-7	22		End of Hole at 21.6 m depth. Upon completion of drilling: No free water encountered. 25 mm diameter Monitoring Well installed.
-8	23		
-9	24		
-10	25		
-11	26		
-12	27		
-13	28		
-14	29		
	30		

5 10 15 20 25 30 35 40 45 50

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_ OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 10/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

CORE LOG

TEST HOLE No. TH12-33

Project OAK BAY HIGH SCHOOL
Location SEE DRAWING No. 14-188-10-3
Driller SEA TO SKY
Method DIAMOND DRILL - NQ
Hole Orientation VERTICAL
Logged By TJS
Elevation 15.77 m
Dates 2012-Jul-11/12
Date 2012-Jul-30

Drilling Details	Depth (m)	Core Recovery (%)	Core Condition	Discontinuity Spacing	R.Q.D. (%)	Intact Rock Strength	Weathering	Structural Discontinuity Description	Rock Mass Description	Strength (MPa)
									Start coring at 13.8m depth	
	14	99	Solid	3	86	R5	SW	- 50°; planar; rough - 50°; curved; rough - 15°; undulating; rough	GNEISS dark greenish-grey; very strong; crystalline; weakly foliated; plagioclase-hornblende gneiss; patchy argillic alteration; medium grained	U=135 U=206
	15	65		12	0			- 20 mm broken core - 55°; undulating; rough - 60°; planar; rough - 45°; planar; rough; jointed vein		
				5				- 40°; stepped; rough		
	16	101	Broken	15	40			- 70°; undulating; slickensided; calcite infilled (x4 @ 100 mm) - 45°; planar; slickensided; calcite infilled		
	17		V.Broken	>30		-	MW	Fault gouge; calcite veins < 20 mm thick		
		97	Solid	5	69	R5	SW	- 90°; planar; rough		U=151 U=130
	18							- 10-40°; curved; rough - 48°; planar; smooth; calcite infilled		
	19	101			87			- 61°; stepped; rough; calcite infilled - 55°; planar; rough; calcite infilled (x2 @ 10 mm) - 60°; planar; rough		

CORE RECOVERY
$\frac{\text{Length of core}}{\text{core run}} \times 100$

R.Q.D.
$\frac{\text{Sum core lengths} > 100\text{mm}}{\text{length of core run}} \times 100$

DISCONTINUITY SPACING
No. of fractures/m

STRENGTH (MPa)
U = Unconfined Comp. Strength
A = Axial Point Load $I_{S(50)}$
D = Diametral Point Load $I_{S(50)}$
L = Irregular Lump Point Load $I_{S(50)}$

ROCK STRENGTH (MPa)

R0	Extremely weak	<1
R1	Very weak	1-5
R2	Weak	5-25
R3	Medium strong	25-50
R4	Strong	50-100
R5	Very strong	100-250
R6	Extremely strong	>250

WEATHERING

F	Fresh
SW	Slightly
MW	Moderately
HW	Highly
CW	Completely
RS	Residual Soil

FILE No. 14-188-10

PREPARED BY: THURBER

SHEET 01 of 02

CORE LOG

TEST HOLE No. TH12-33

Project OAK BAY HIGH SCHOOL
Location SEE DRAWING No. 14-188-10-3
Driller SEA TO SKY
Hole Orientation VERTICAL
Method DIAMOND DRILL - NQ
Logged By TJS
Elevation 15.77 m
Dates 2012-Jul-11/12
Date 2012-Jul-30

Drilling Details	Depth (m)	Core Recovery (%)	Core Condition	Discontinuity Spacing	R.Q.D. (%)	Intact Rock Strength	Weathering	Structural Discontinuity Description	Rock Mass Description	Strength (MPa)
	21	93	Broken	8	29	R5	SW	- 70°; planar; rough Fault gouge; slickensides - 30°; undulating; slickensided shear; gouge infilled - 48°; undulating; smooth (x3 @ 150 mm) Fault gouge; slickensides	GNEISS dark greenish-grey; very strong; crystalline; weakly foliated; plagioclase-hornblende gneiss; patchy argillic alteration; medium grained	
	22								21.3m END OF HOLE	
	23									
	24									
	25									
	26									

CORE RECOVERY
$\frac{\text{Length of core}}{\text{core run}} \times 100$

R.Q.D.
$\frac{\text{Sum core lengths} > 100\text{mm}}{\text{length of core run}} \times 100$

DISCONTINUITY SPACING
No. of fractures/m

STRENGTH (MPa)
U = Unconfined Comp. Strength
A = Axial Point Load $I_{S(50)}$
D = Diametral Point Load $I_{S(50)}$
L = Irregular Lump Point Load $I_{S(50)}$

ROCK STRENGTH (MPa)

R0	Extremely weak	<1
R1	Very weak	1-5
R2	Weak	5-25
R3	Medium strong	25-50
R4	Strong	50-100
R5	Very strong	100-250
R6	Extremely strong	>250

WEATHERING

F	Fresh
SW	Slightly
MW	Moderately
HW	Highly
CW	Completely
RS	Residual Soil

FILE No. 14-188-10

PREPARED BY: THURBER

SHEET 02 of 02

THURBER

OAK BAY HIGH SCHOOL REPLACEMENT
TEST HOLE 12-33; CORE PHOTOS

Not to Scale

Box #1
13.79 - 19.53 m

Box #2
19.53 - 21.34 m

FIGURE 3-2

Client: Greater Victoria School District #61
File No.: 14-188-10
E-File: TED04075.dwg

Date: August 14, 2012

Sheet 1 of 2

LOG OF TEST HOLE

TEST HOLE NO. **TH12-34**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 16.10 m

METHOD: Mud Rotary

DRILLING CO.: Sea to Sky

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 12, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m)	DEPTH (m)	COMMENTS	SOILS DESCRIPTION
16	0	Bedrock probe hole only; no samples were recovered; stratigaphy is approximate only based on drill action and cuttings.	Moist, organic, silty SAND (TOPSOIL)
			Very stiff, moist, brown, silty CLAY
15	1		
14	2		
13	3		
12	4		
11	5		
			Firm to soft, moist, grey, silty CLAY
10	6		
9	7		
8	8		
7	9		
	10		

5 10 15 20 25 30 35 40 45 50

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 14/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

LOG OF TEST HOLE

TEST HOLE NO. **TH12-34**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 16.10 m
METHOD: Mud Rotary
DRILLING CO.: Sea to Sky
INSPECTOR: JH

THURBER

CLIENT: GVSD #61
PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 12, 2012
FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m)	DEPTH (m)	COMMENTS	SOILS DESCRIPTION
6	10		Firm to soft, moist, grey, silty CLAY
5	11	Switched to Tri-cone bit.	Dense, moist, grey SAND and GRAVEL (till-like)
			BEDROCK
4	12		
3	13		End of Hole at 12.3 m depth. Upon completion of drilling: No free water encountered. Hole grouted with bentonite slurry to surface.
2	14		
1	15		
0	16		
-1	17		
-2	18		
-3	19		
	20		

5 10 15 20 25 30 35 40 45 50

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 14/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 1 of 1

LOG OF TEST HOLE

TEST HOLE NO. **TH12-35**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 15.82 m

METHOD: Mud Rotary

DRILLING CO.: Sea to Sky

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 12, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m)	COMMENTS	SOILS DESCRIPTION	DEPTH (m)
15	Bedrock probe hole only; no samples were recovered; stratigaphy is approximate only based on drill action and cuttings.	Moist, organic, silty SAND (TOPSOIL)	0
		Very stiff, moist, brown, silty CLAY	1
14			2
13			3
12			4
11		Firm to soft, moist, grey, silty CLAY	5
10			6
9			7
8	Switched to Tri-cone bit.	Dense, moist to wet, grey SAND and GRAVEL (till-like)	8
7		BEDROCK	9
6		End of Hole at 9.3 m depth. Upon completion of drilling: No free water encountered. Hole grouted with bentonite slurry to surface.	10

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 14/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 1 of 2

LOG OF TEST HOLE

TEST HOLE NO. **TH12-36**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 15.83 m
METHOD: Mud Rotary
DRILLING CO.: Sea to Sky
INSPECTOR: JH

THURBER

CLIENT: GVSD #61
PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 13, 2012
FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m)	COMMENTS		SOILS DESCRIPTION	DEPTH (m)
		GP-GM	25 mm ASPHALT over moist, brown, sandy GRAVEL (FILL); gravel to 30 mm diameter; trace to some silt; brick and concrete debris	0
15			Very stiff, moist, brown, silty CLAY; trace gravel; trace sand	1
14	Cpen = 160 kPa	CH		2
13		CH		3
12		CH		4
11				5
10	Cpen = 70 kPa Cvane (lab) = 48 kPa	CL	Stiff to firm, moist, grey, silty CLAY; trace gravel; trace sand	6
9	Cvane (field) = 57 kPa Peak Strength Cvane (field) = 13 kPa Remoulded			7
8				8
7	*76*	SM	Very dense, moist to wet, grey, silty SAND and GRAVEL (till-like)	9
6	Switched to Tri-cone bit.		BEDROCK	10

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 14/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 2 of 2

LOG OF TEST HOLE

TEST HOLE NO. **TH12-36**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 15.83 m

METHOD: Mud Rotary

DRILLING CO.: Sea to Sky

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 13, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: ◧ Disturbed ■ Undisturbed ⊠ No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): ❋ GASTECH reading ⊠ PID reading

ELEVATION (m)	DEPTH (m)	COMMENTS	SOILS DESCRIPTION
5	10		
4	11		
3	12		
2	13		
1	14		
0	15		
-1	16		
-2	17		
-3	18		
-4	19		
	20		

End of Hole at 10.2 m depth.
Upon completion of drilling:
No free water encountered.
Hole grouted with bentonite slurry to surface.

Sheet 1 of 2

LOG OF TEST HOLE

TEST HOLE NO. **TH12-37**

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 15.09 m

METHOD: Mud Rotary

DRILLING CO.: Sea to Sky

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 13/14, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m)	COMMENTS	SOILS DESCRIPTION	DEPTH (m)
15	Bedrock probe hole only; no samples were recovered; stratigaphy is approximate only based on drill action and cuttings.	25 mm ASPHALT over SAND and GRAVEL (FILL)	0
		Very stiff, moist, brown, silty CLAY	
14			1
13			2
12			3
11			4
10		Firm to soft, moist, grey, silty CLAY	5
9			6
8			7
7			8
6			9
		Dense, moist, grey SAND and GRAVEL (till-like)	10

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 14/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 2 of 2

LOG OF TEST HOLE

TEST HOLE NO. TH12-37

LOCATION: See Drawing No. 14-188-10-3

TOP OF HOLE ELEV: 15.09 m

METHOD: Mud Rotary

DRILLING CO.: Sea to Sky

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: Oak Bay High School Replacement Geotechnical Investigation

DATE: July 13/14, 2012

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

ELEVATION (m)	DEPTH (m)	COMMENTS	SOILS DESCRIPTION
5	10	Switched to Tri-cone bit.	Dense, moist, grey SAND and GRAVEL (till-like)
			BEDROCK
4	11		
			End of Hole at 11.4 m depth. Upon completion of drilling: No free water encountered. Hole grouted with bentonite slurry to surface.
3	12		
2	13		
1	14		
0	15		
-1	16		
-2	17		
-3	18		
-4	19		
	20		

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_OBHS_2012 TEST HOLE LOGS.GPJ THURBER BC.GDT 14/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 1 of 1

LOG OF TEST HOLE

TEST HOLE NO. **TH11-1**

REVISED

LOCATION: See Drawing No. 14-188-10-1

TOP OF HOLE ELEV:

METHOD: Solid / Hollow Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: RDM

THURBER

CLIENT: GVSD #61

PROJECT: c/o CEI Architecture
Oak Bay High School
Geotechnical Investigation

DATE: January 8, 2011

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL | Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

DEPTH (m) | 5 10 15 20 25 30 35 40 45 50 | COMMENTS | SOILS DESCRIPTION | DEPTH (m)

Depth (m)	COMMENTS		SOILS DESCRIPTION
0			Moist, organic SILT (TOPSOIL)
0.3		SC	Wet, brown, clayey, silty SAND (FILL); trace organics
0.8		CL	Soft, moist, mottled brown, sandy, silty CLAY (FILL); trace gravel; trace organics; low plasticity
1	Cpen = 140 kPa	CL	Very stiff to hard, moist, brown, silty CLAY; medium plasticity; trace gravel to 20 mm diameter
1.5		CL	
3	Cpen = 125 kPa	CL	
4	Cpen = 50 kPa	CL	
4.2			Firm to stiff, moist, grey-brown, silty CLAY
5.5		CL	Firm to soft, moist, grey, silty CLAY; medium plasticity; trace sand; trace gravel to 30 mm diameter
7	Cvane (lab) = 29 kPa	CL	
7.6		SC/CL	
8.2			Dense to very dense, wet, grey, gravelly SAND (till-like); trace to some silt
8.8	60 blows/ 0.1m penetration	SP-SM	
9			End of Hole at 8.8 m depth. Upon completion of drilling: Backfilled with cuttings to 1.5 m depth. Bentonite from 0.6 to 1.5 m depth. Sod replaced at surface.
10			

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_2011 TEST HOLE LOGS.GPJ THURBER BC.GDT 14/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE GLB

Sheet 1 of 2

LOG OF TEST HOLE

TEST HOLE NO. **TH11-2**

REVISED

LOCATION: See Drawing No. 14-188-10-1

TOP OF HOLE ELEV:

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: RDM

THURBER

CLIENT: GVSD #61

PROJECT: c/o CEI Architecture
Oak Bay High School
Geotechnical Investigation

DATE: January 8, 2011

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

DEPTH (m) | 5 10 15 20 25 30 35 40 45 50 | COMMENTS | SOILS DESCRIPTION

DEPTH (m)	COMMENTS		SOILS DESCRIPTION
0		CL	Moist, organic SILT (TOPSOIL)
			Soft, moist, mottled brown, silty CLAY (FILL); trace sand; low to medium plasticity
1	Cpen = 120 kPa	CL	Very stiff to hard, moist, brown, silty CLAY; medium plasticity
	Cpen = 200 kPa	CH	
2			
	Cpen = 145 kPa	CL-CH	
3			
4			
	Cpen = 50 kPa	CL	Firm to stiff, moist, brown, silty CLAY
5			Soft, moist, grey, silty CLAY; trace sand; trace gravel
		CL	
6			
		CL	
7			
8			Advance Auger to Refusal. No sampling or logging of stratigraphy after 7.6 m depth.
9			
10			

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_ 2011 TEST HOLE LOGS.GPJ THURBER BC.GDT 14/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

LOG OF TEST HOLE

TEST HOLE NO. **TH11-2**

REVISED

LOCATION: See Drawing No. 14-188-10-1

TOP OF HOLE ELEV:

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: RDM

THURBER

CLIENT: GVSD #61

PROJECT: c/o CEI Architecture
Oak Bay High School
Geotechnical Investigation

DATE: January 8, 2011

FILE NO.: 14-188-10

DEPTH (m) | DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading | DEPTH (m)

5 10 15 20 25 30 35 40 45 50

COMMENTS

SOILS DESCRIPTION

Advance Auger to Refusal.
No sampling or logging of stratigraphy after 7.6 m depth.

Auger Refusal at 11.4 m depth.
Upon completion of drilling:
No free water encountered.
Backfilled with cuttings to 0.9 m depth.
Bentonite from 0.2 to 0.9 m depth.
Sod replaced at surface.

10 11 12 13 14 15 16 17 18 19 20

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_2011 TEST HOLE LOGS.GPJ THURBER BC.GDT 14/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 1 of 2

LOG OF TEST HOLE

TEST HOLE NO.
TH11-3
REVISED

LOCATION: See Drawing No. 14-188-10-1

TOP OF HOLE ELEV:

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: RDM

THURBER

CLIENT: GVSD #61

PROJECT: c/o CEI Architecture
Oak Bay High School
Geotechnical Investigation

DATE: January 8, 2011

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL | Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

DEPTH (m) | 5 10 15 20 25 30 35 40 45 50 | COMMENTS | SOILS DESCRIPTION | DEPTH (m)

Depth (m)	Comments		Soils Description
0		CL	Moist, organic SILT (TOPSOIL)
0.5	Cpen = 170 kPa	CL	Very stiff, moist, brown, silty CLAY (FILL); trace sand; trace gravel to 40 mm diameter
1	Cpen = 220 kPa	CL	Very stiff to hard, moist, brown, silty CLAY; trace sand; trace gravel to 25 mm diameter; low plasticity
2	Cpen = 175 kPa	CL	
2.5	Cpen = 200 kPa	CL	
3.5	Cpen = 100 kPa	CL	Firm to stiff, grey-brown, silty CLAY; trace sand; low to medium plastictiy
4.5	Cpen = 60 kPa	CL	Very soft to firm, moist, grey, silty CLAY; medium to high plasticity
5		CL	
6		CL-CH	
7		CL-CH	

LOG OF TEST HOLE (NO EST.) R_RRS_14-188-10_2011 TEST HOLE LOGS.GPJ_THURBER BC.GDT_14/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 2 of 2

LOG OF TEST HOLE

TEST HOLE NO.
TH11-3
REVISED

LOCATION: See Drawing No. 14-188-10-1

TOP OF HOLE ELEV:

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: RDM

THURBER

CLIENT: GVSD #61

PROJECT: c/o CEI Architecture
Oak Bay High School
Geotechnical Investigation

DATE: January 8, 2011

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

DEPTH (m) | 5 10 15 20 25 30 35 40 45 50 | COMMENTS | SOILS DESCRIPTION | DEPTH (m)

DEPTH (m)	COMMENTS	SOILS DESCRIPTION
10		CL — Very soft to firm, moist, grey, silty CLAY; medium to high plasticity
11		Advance Auger to Refusal. No sampling or logging of stratigraphy after 10.7 m depth.
12		
13		
14		
15		Auger Refusal at 14.7 m depth. Upon completion of drilling: No free water encountered. Backfilled with cuttings to 0.9 m depth. Bentonite from 0.3 to 0.9 m depth. Sod replaced at surface.
16		
17		
18		
19		
20		

LOG OF TEST HOLE (NO EST.) R_RRS_14-188-10_2011 TEST HOLE LOGS.GPJ_THURBER BC.GDT_14/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 1 of 2

LOG OF TEST HOLE

TEST HOLE NO.
TH11-4
REVISED

LOCATION: See Drawing No. 14-188-10-1

TOP OF HOLE ELEV:

METHOD: Solid / Hollow Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: c/o CEI Architecture
Oak Bay High School
Geotechnical Investigation

DATE: January 15, 2011

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): Disturbed / Undisturbed | WATER LEVEL: Plastic Limit – Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): Passing #200 sieve, Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

DEPTH (m) | 5 10 15 20 25 30 35 40 45 50

DEPTH (m)	COMMENTS		SOILS DESCRIPTION
0			Black, organic SILT (TOPSOIL)
0.5		SW	Wet, dark brown SAND and GRAVEL (FILL); trace silt; gravel to 50 mm diameter
1	Water Level (18-Jan-2011)		
1.5	Cpen = 175 kPa	CL	Very stiff to hard, moist, brown, silty CLAY; medium plastictiy
1.5	Water Level (1-Aug-2012)		
3	Cpen = 190 kPa	CH	
4.5	Cpen = 120 kPa	CL	
5	Cpen = 80 kPa Cvane (lab) = 52 kPa	CL-CH	Stiff, moist, brown, silty CLAY; medium plastictiy
5.5	Cpen = 50 kPa Cvane (lab) = 38 kPa	CL-CH CL	Firm to stiff, moist, grey-brown, silty CLAY
6			Firm to soft, moist, grey, silty CLAY; trace sand
7	Cpen = 30 kPa Cvane (lab) = 29 kPa	CL-CH	
8			
8.5	Cpen = 25 kPa		
9			Advance Auger to Refusal. No sampling or logging of stratigraphy after 9.0 m depth.
10			

LOG OF TEST HOLE (NO EST.) R_RRS_14-188-10_2011 TEST HOLE LOGS.GPJ THURBER BC.GDT 14/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 2 of 2

LOG OF TEST HOLE

TEST HOLE NO.
TH11-4
REVISED

LOCATION: See Drawing No. 14-188-10-1

TOP OF HOLE ELEV:

METHOD: Solid / Hollow Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: c/o CEI Architecture
Oak Bay High School
Geotechnical Investigation

DATE: January 15, 2011

FILE NO.: 14-188-10

DEPTH (m) | DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading | DEPTH (m)

5 10 15 20 25 30 35 40 45 50

COMMENTS

SOILS DESCRIPTION

10

Advance Auger to Refusal.
No sampling or logging of stratigraphy after 9.0 m depth.

11

12

Possible till-like contact at 12.5 m depth

13

Auger Refusal at 13.4 m depth.
Upon completion of drilling:
No free water encountered.
Monitoring Well installed.

14

15

16

17

18

19

20

LOG OF TEST HOLE (NO EST.) R_RRS_14-188-10_2011 TEST HOLE LOGS.GPJ_THURBER BC.GDT_14/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

Sheet 1 of 2

LOG OF TEST HOLE

TEST HOLE NO. **TH11-5**

REVISED

LOCATION: See Drawing No. 14-188-10-1

TOP OF HOLE ELEV:

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: c/o CEI Architecture
Oak Bay High School
Geotechnical Investigation

DATE: January 15, 2011

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL | Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

DEPTH (m) | 5 10 15 20 25 30 35 40 45 50

DEPTH (m)	COMMENTS	SOILS DESCRIPTION
0		Moist, organic SILT (TOPSOIL)
		Moist, brown, silty SAND (FILL); trace of gravel to 40 mm diameter
1	Cpen = 175 kPa	Very stiff to hard, moist, brown, silty CLAY; trace sand; trace gravel to 40 mm gravel
2		
3	Cpen = 100 kPa	
4		
	Cpen = 25 kPa	Soft, moist, grey, silty CLAY; trace sand; trace gravel
5		Advance Auger to Refusal. No sampling or logging of stratigraphy after 4.5 m depth.
6		
7		
8		
9		
10		

CL

Sheet 2 of 2

LOG OF TEST HOLE

TEST HOLE NO.
TH11-5
REVISED

LOCATION: See Drawing No. 14-188-10-1

TOP OF HOLE ELEV:

METHOD: Solid Stem Auger

DRILLING CO.: Drillwell Enterprises Ltd.

INSPECTOR: JH

THURBER

CLIENT: GVSD #61

PROJECT: c/o CEI Architecture
Oak Bay High School
Geotechnical Investigation

DATE: January 15, 2011

FILE NO.: 14-188-10

DCPT PENETRATION (blows/300 mm) | SPT PENETRATION (blows/300 mm) | WATER CONTENT (%): ○ Disturbed ● Undisturbed | WATER LEVEL: Plastic Limit — Liquid Limit | SAMPLES: Disturbed, Undisturbed, No Recovery | GRAIN SIZE (%): ▲ Passing #200 sieve, △ Passing #4 sieve | SOIL HEADSPACE READING (ppm): GASTECH reading, PID reading

DEPTH (m) | 5 10 15 20 25 30 35 40 45 50 | COMMENTS | SOILS DESCRIPTION | DEPTH (m)

10

Advance Auger to Refusal.
No sampling or logging of stratigraphy after 4.5 m depth.

11

12

Auger Refusal at 11.5 m depth.
Upon completion of drilling:
No free water encountered.
Backfilled with cuttings to 4.0 m depth.
Bentonite from 3.5 to 4.0 m depth.
Backfilled with cuttings 0.7 to 3.5 m depth.
Bentonite from 0.3 m to 0.7 m depth.
Sod replaced at surface.

13

14

15

16

17

18

19

20

LOG OF TEST HOLE (NO EST.) R RRS_14-188-10_2011 TEST HOLE LOGS.GPJ THURBER BC.GDT 14/8/12- THURBER VICTORIA FEBRUARY 2012 REVERSE.GLB

2010 National Building Code Seismic Hazard Calculation

INFORMATION: Eastern Canada English (613) 995-5548 français (613) 995-0600 Facsimile (613) 992-8836
Western Canada English (250) 363-6500 Facsimile (250) 363-6565

Requested by: , Thurber Engineering Ltd. August 14, 2012

Site Coordinates: 48.432 North 123.317 West

User File Reference: Oak Bay High School

National Building Code ground motions:
2% probability of exceedance in 50 years (0.000404 per annum)

Sa(0.2)	Sa(0.5)	Sa(1.0)	Sa(2.0)	PGA (g)
1.229	0.824	0.383	0.185	0.614

Notes. Spectral and peak hazard values are determined for firm ground (NBCC 2010 soil class C - average shear wave velocity 360-750 m/s). Median (50th percentile) values are given in units of g. 5% damped spectral acceleration (Sa(T), where T is the period in seconds) and peak ground acceleration (PGA) values are tabulated. Only 2 significant figures are to be used. ***These values have been interpolated from a 10 km spaced grid of points. Depending on the gradient of the nearby points, values at this location calculated directly from the hazard program may vary. More than 95 percent of interpolated values are within 2 percent of the calculated values.*** Warning: You are in a region which considers the hazard from a deterministic Cascadia subduction event for the National Building Code. Values determined for high probabilities (0.01 per annum) in this region do not consider the hazard from this type of earthquake.

Ground motions for other probabilities:

Probability of exceedance per annum	0.010	0.0021	0.001
Probability of exceedance in 50 years	40%	10%	5%
Sa(0.2)	0.323	0.678	0.901
Sa(0.5)	0.209	0.448	0.601
Sa(1.0)	0.097	0.207	0.277
Sa(2.0)	0.043	0.095	0.130
PGA	0.166	0.340	0.451

References

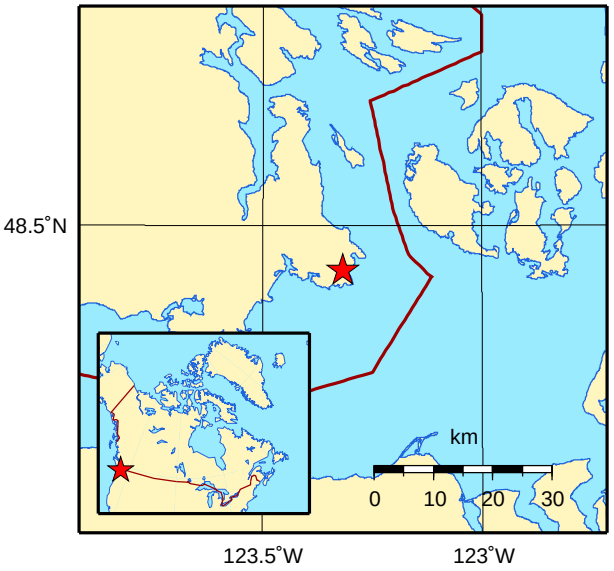
National Building Code of Canada 2010 NRCC no. 53301; sections 4.1.8, 9.20.1.2, 9.23.10.2, 9.31.6.2, and 6.2.1.3
Appendix C: Climatic Information for Building Design in Canada - table in Appendix C starting on page C-11 of Division B, volume 2

User's Guide - NBC 2010, Structural Commentaries NRCC no. 53543 (in preparation)
Commentary J: Design for Seismic Effects

Geological Survey of Canada Open File xxxx
Fourth generation seismic hazard maps of Canada: Maps and grid values to be used with the 2010 National Building Code of Canada (in preparation)

See the websites *www.EarthquakesCanada.ca* and *www.nationalcodes.ca* for more information

Aussi disponible en français



THURBER

THURBER

ONE DIMENSIONAL CONSOLIDATION TEST REPORT
SUMMARY OF TEST DATA

School District #61 (Victoria)
Oak Bay High School
File Number: 14-188-10

TH12-30, ST1, 4.6 - 5.2 m
Report Date: July 26, 2012
Test Dates: July 20 - 26, 2012

Description: CLAY (CH), greyish brown, moist, stiff

	Initial	Final		
Wet Density (kg/cu.m.):	1,867	1,895	Sand:	---
Dry Density (kg/cu.m.):	1,365	1,405	Silt:	---
Moisture Content (%):	36.8	34.9	Clay:	---
Void Ratio:	1.015	0.957		
Saturation:	99.7	100.2	Liquid Limit:	52
Specific Gravity:	2.75		Plastic Limit:	21
			Plasticity Index:	31

Test Method: ASTM D2435-03, method B, Cv calculated by root of Time method

Trimming: The specimen was trimmed with a cutting shoe to a diameter of 63.5 mm and a height of 16.4 mm and placed in a fixed ring consolidometer.

Procedure: The consolidometer was flooded with distilled water immediately after the application of the first load of 13 kPa.
Subsequent loads were applied after primary consolidation was complete.

Load Increment (kPa)	Void Ratio (end of increment)	Cv (cm^2/sec)
13	1.017	
25	1.014	
50	1.002	4.84E-03
100	0.990	2.24E-03
200	0.963	2.38E-03
400	0.923	2.52E-03
800	0.826	1.39E-03
1600	0.693	8.73E-04
400	0.724	
100	0.775	
25	0.836	

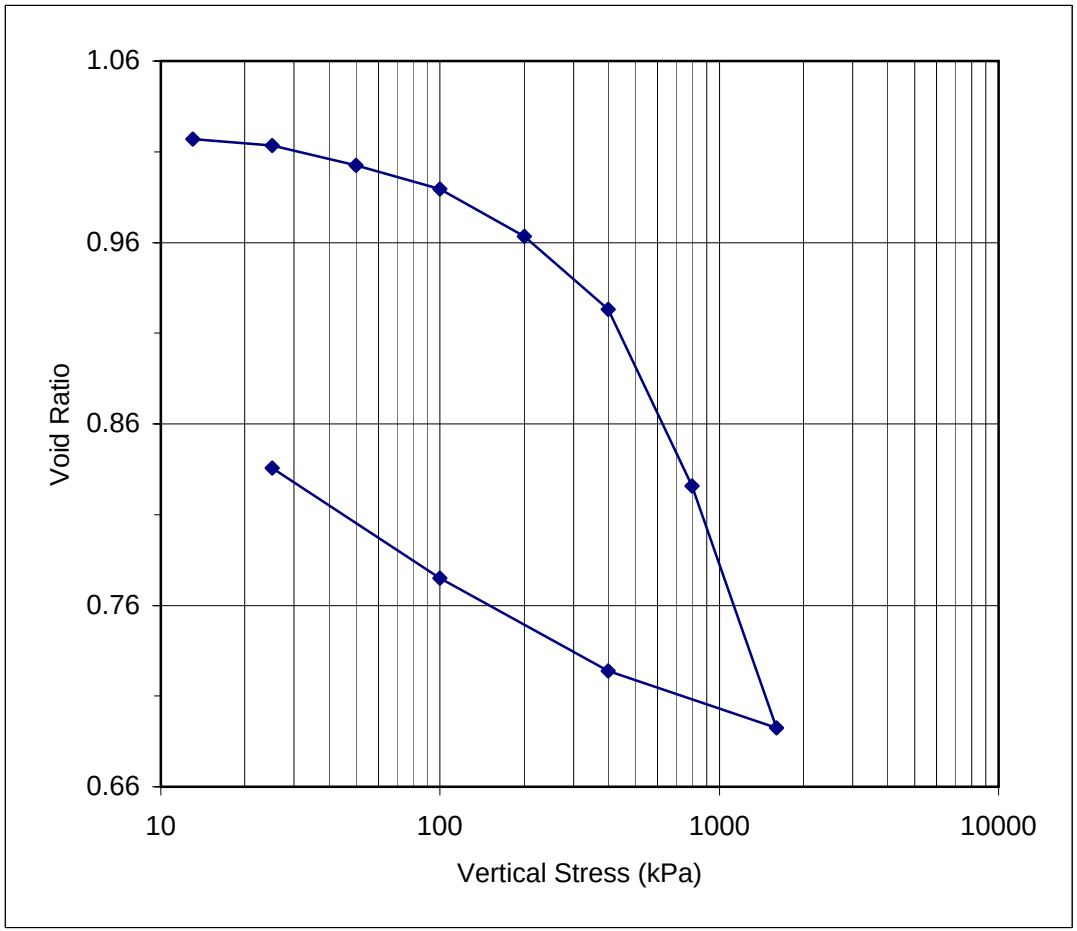
THURBER

ONE DIMENSIONAL CONSOLIDATION TEST REPORT
TEST SUMMARY PLOTS

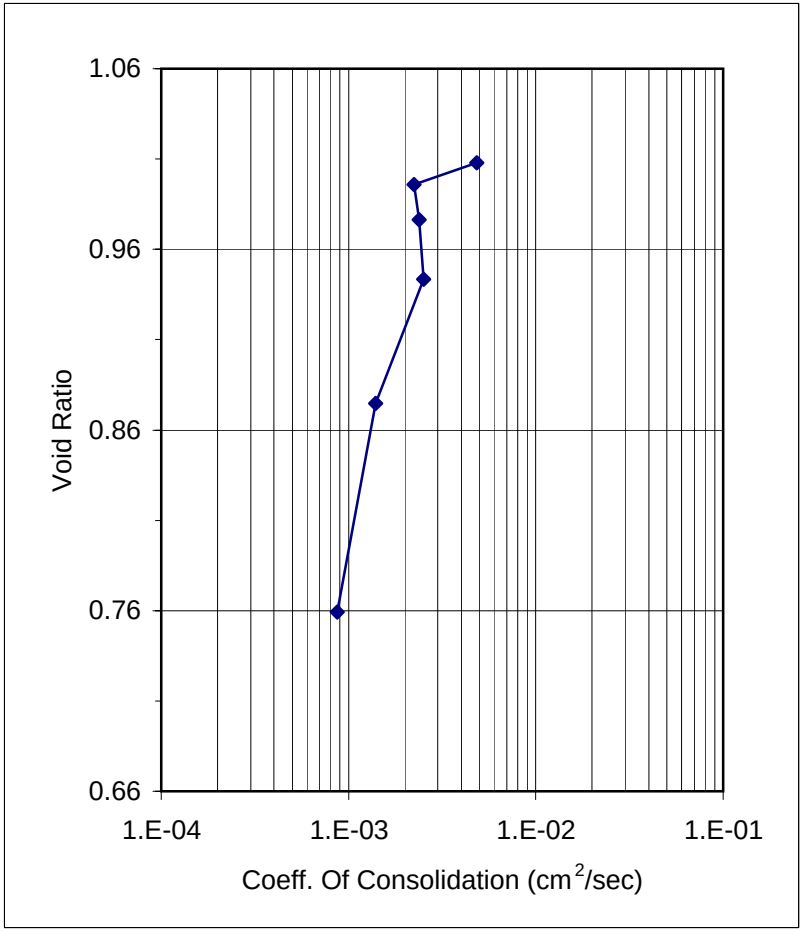
School District #61 (Victoria)
Oak Bay High School
File Number: 14-188-10

TH12-30, ST1, 4.6 - 5.2 m
Report Date: July 26, 2012
Test Dates: July 20 - 26, 2012

Void Ratio (end of load increment) Vs Log of Pressure



Average Void Ratio Vs Coefficient of Consolidation



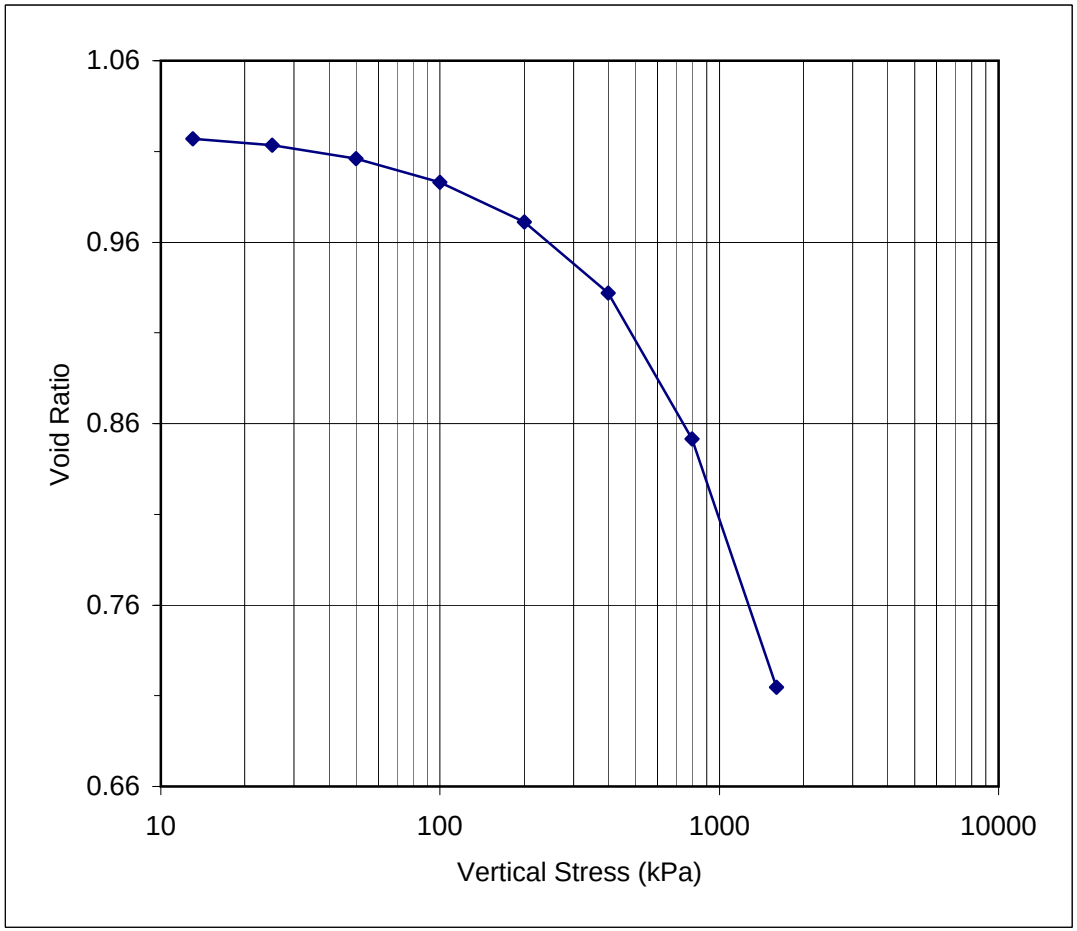
THURBER

ONE DIMENSIONAL CONSOLIDATION TEST REPORT
TEST SUMMARY PLOTS

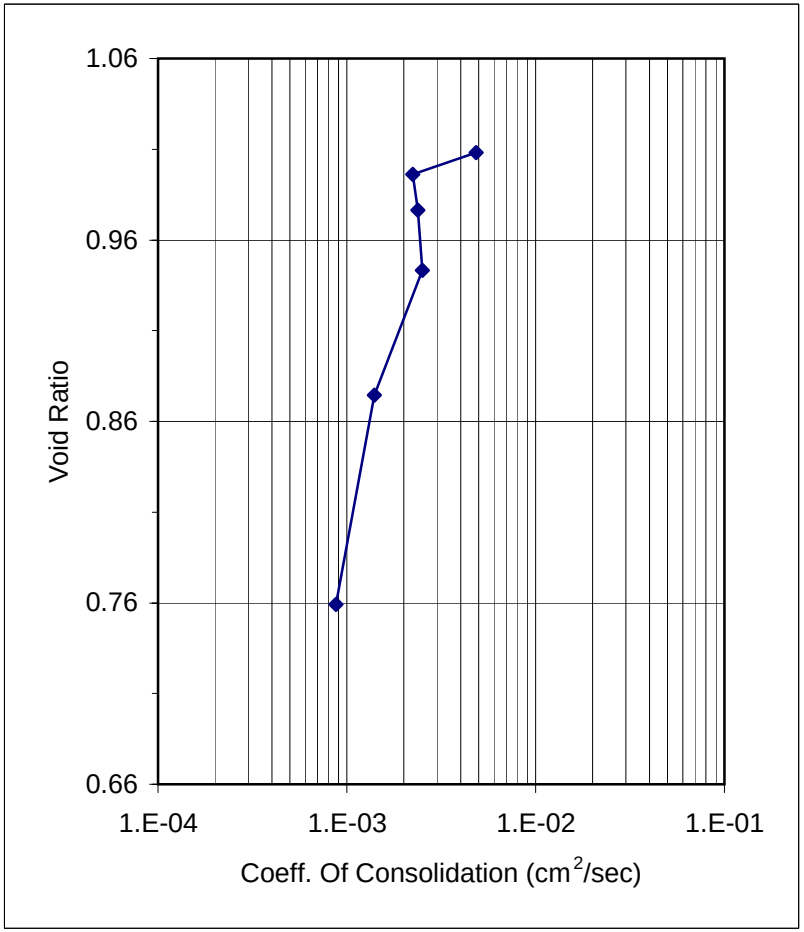
School District #61 (Victoria)
Oak Bay High School
File Number: 14-188-10

TH12-30, ST1, 4.6 - 5.2 m
Report Date: July 26, 2012
Test Dates: July 20 - 26, 2012

Void Ratio (@T_{100}) Vs Log of Pressure



Average Void Ratio Vs Coefficient of Consolidation



THURBER

ONE DIMENSIONAL CONSOLIDATION TEST REPORT
SUMMARY OF TEST DATA

School District 61 (Victoria)
Oak Bay High School
File Number: 14-188-10

TH12-32, ST1, 6.2 - 6.8 m
Report Date: July 26, 2012
Test Dates: July 20 - 26, 2012

Description: CLAY (CH), grey, wet, soft/firm

	Initial	Final		
Wet Density (kg/cu.m.):	1,755	1,861	Sand:	---
Dry Density (kg/cu.m.):	1,194	1,356	Silt:	---
Moisture Content (%):	46.9	37.2	Clay:	---
Void Ratio:	1.302	1.028	Liquid Limit:	59
Saturation:	99.1	99.6	Plastic Limit:	22
Specific Gravity:	2.75		Plasticity Index:	37

Test Method: ASTM D2435-03, method B, Cv calculated by Log of Time method

Trimming: The specimen was trimmed with a cutting shoe to a diameter of 63.5 mm and a height of 16.5 mm and placed in a fixed ring consolidometer.

Procedure: The consolidometer was flooded with distilled water immediately after the application of the first load of 13 kPa.
Subsequent loads were applied after primary consolidation was complete.

Load Increment (kPa)	Void Ratio (end of increment)	Cv (cm^2/sec)
13	1.301	
25	1.288	2.76E-03
50	1.271	2.53E-03
100	1.240	1.89E-03
200	1.172	1.59E-03
400	1.004	8.04E-04
800	0.847	8.40E-04
1600	0.706	9.91E-04
400	0.736	
100	0.792	
25	0.858	

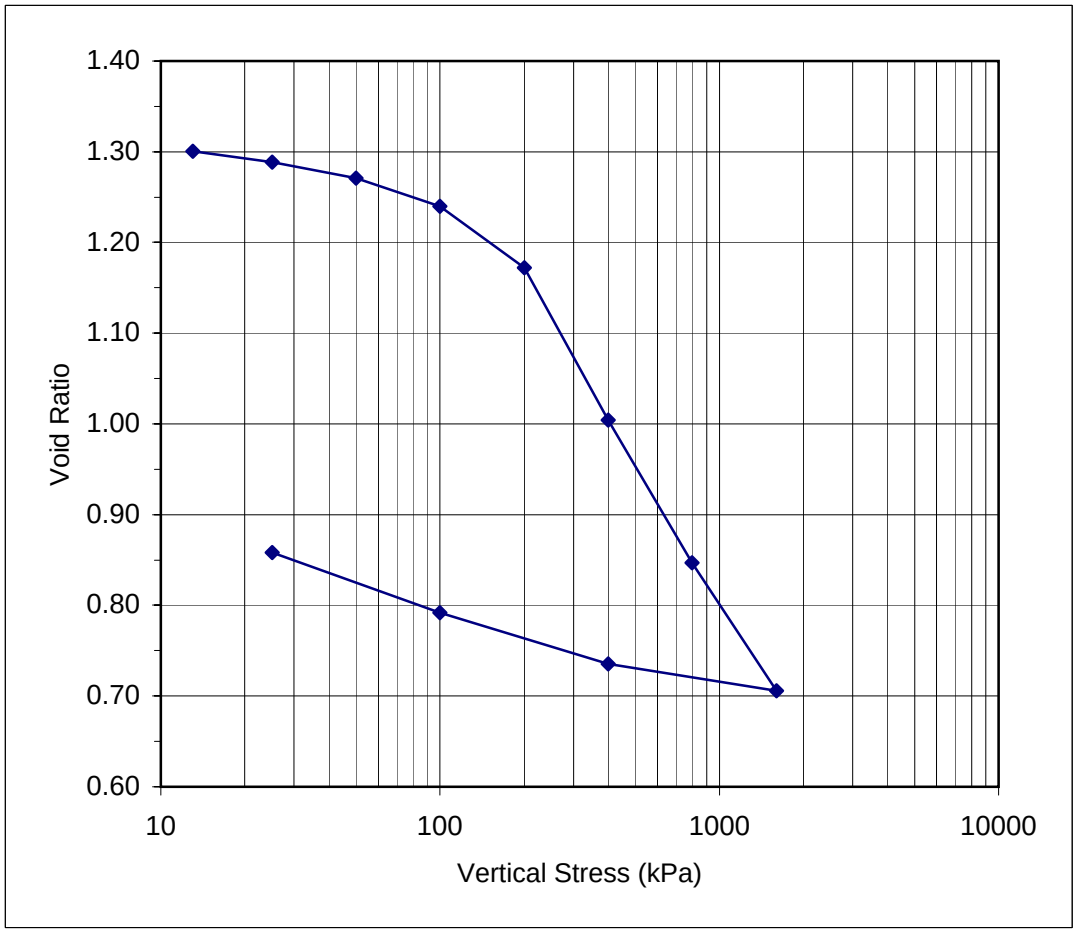
THURBER

ONE DIMENSIONAL CONSOLIDATION TEST REPORT
TEST SUMMARY PLOTS

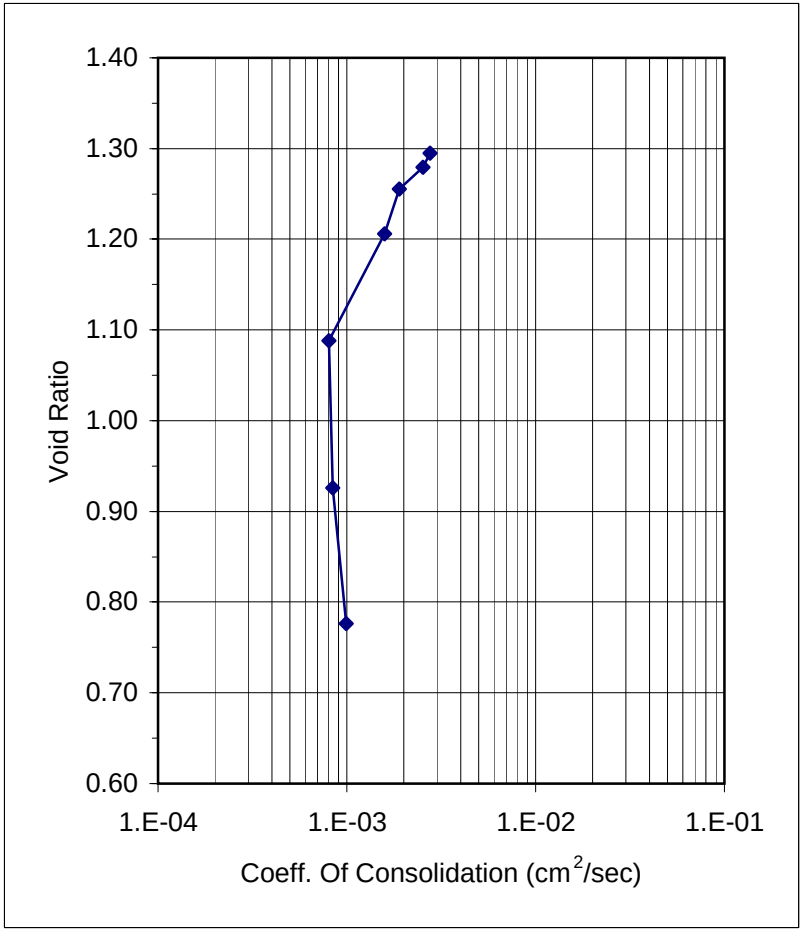
School District 61 (Victoria)
Oak Bay High School
File Number: 14-188-10

TH12-32, ST1, 6.2 - 6.8 m
Report Date: July 26, 2012
Test Dates: July 20 - 26, 2012

Void Ratio (end of load increment) Vs Log of Pressure



Average Void Ratio Vs Coefficient of Consolidation



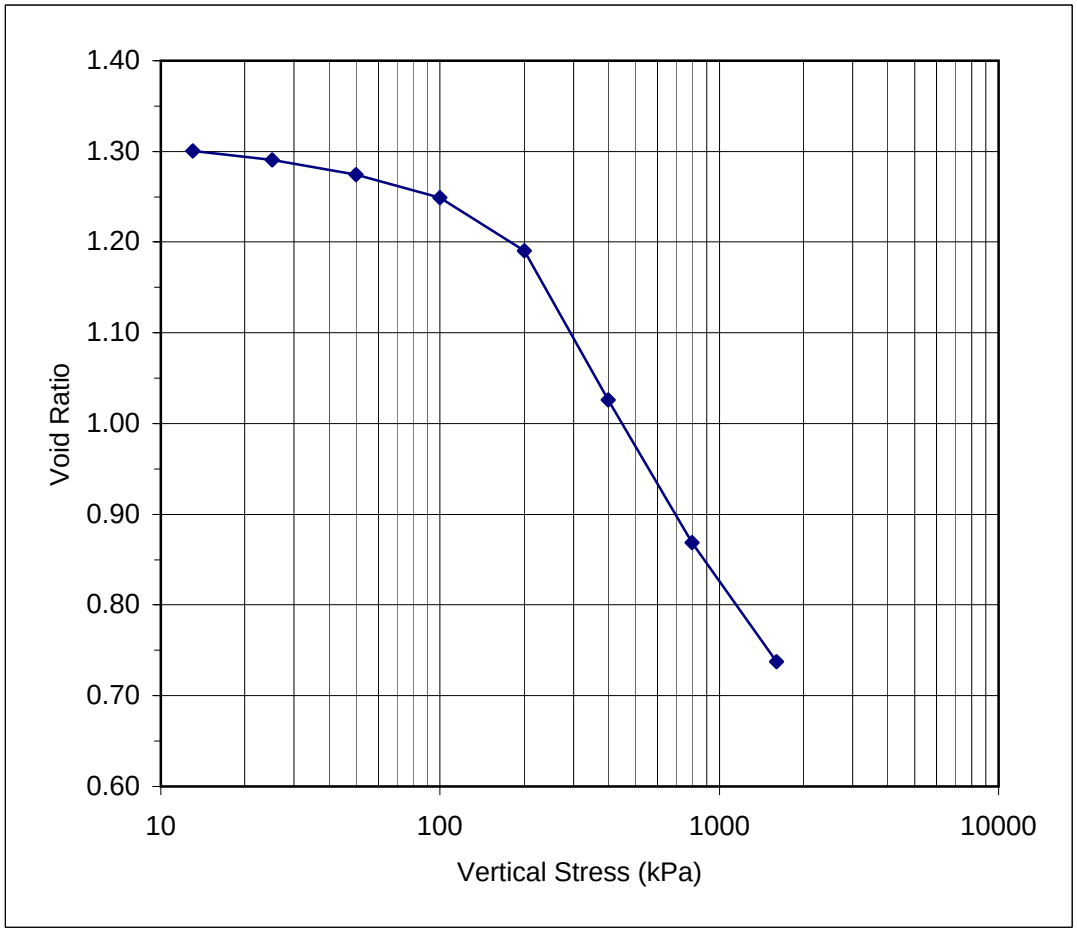
THURBER

ONE DIMENSIONAL CONSOLIDATION TEST REPORT
TEST SUMMARY PLOTS

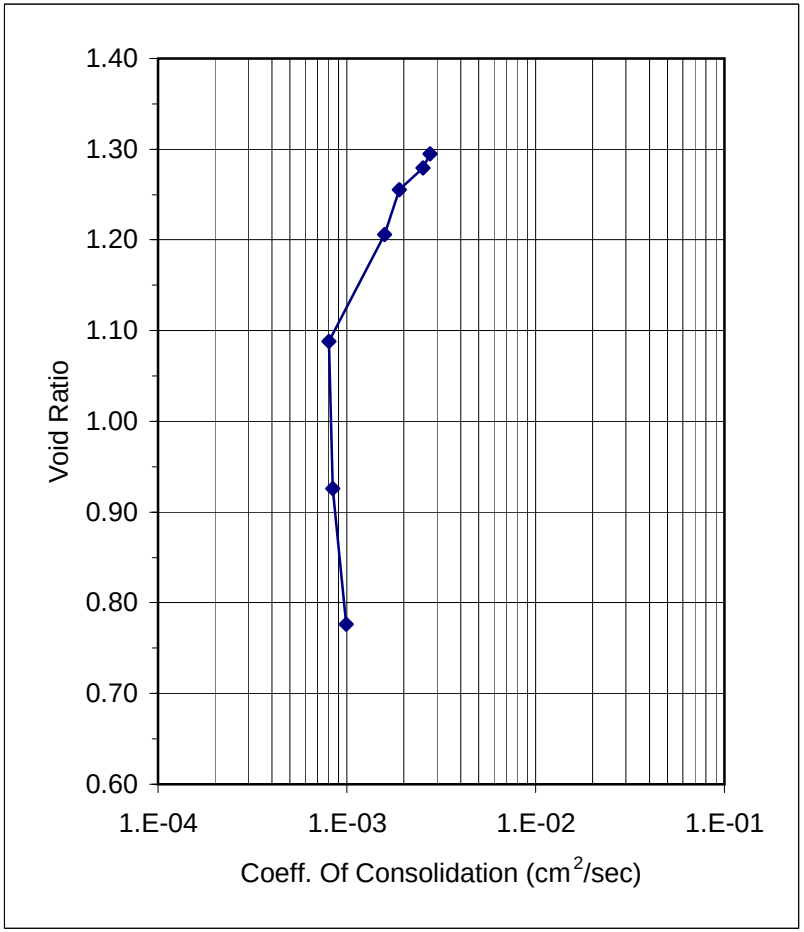
School District 61 (Victoria)
Oak Bay High School
File Number: 14-188-10

TH12-32, ST1, 6.2 - 6.8 m
Report Date: July 26, 2012
Test Dates: July 20 - 26, 2012

Void Ratio (@T_{100}) Vs Log of Pressure



Average Void Ratio Vs Coefficient of Consolidation



THURBER

ONE DIMENSIONAL CONSOLIDATION TEST REPORT
SUMMARY OF TEST DATA

GVSD61 — TH11-4, 5.4 - 5.9 m
Oak Bay High School — Report Date: Jan. 31, 2011
File Number: 14-188-10 — Test Dates: Jan. 24 - 29, 2011

Description: silty Clay (CL), grey/brown, medium plastic

	Initial	Final	
Wet Density (kg/cu.m.):	1,791	1,884	Sand:
Dry Density (kg/cu.m.):	1,251	1,353	Silt:
Moisture Content (%):	43.1	39.2	Clay:
Void Ratio:	1.302	1.128	
Saturation:	95.4	100.1	Liquid Limit:
Specific Gravity:	2.88		Plastic Limit:
			Plasticity Index:

Test Method: ASTM D2435-03, method B, Cv calculated by root of Time method

Trimming: The specimen was trimmed with a cutting shoe to a diameter of 63.5 mm and a height of 16.4 mm and placed in a fixed ring consolidometer.

Procedure: The consolidometer was flooded with distilled water immediately after the application of the first load of 13 kPa.
Subsequent loads were applied after primary consolidation was complete.

Load Increment (kPa)	Void Ratio (end of increment)	Cv (cm^2/sec)
13	1.291	
25	1.288	5.60E-03
50	1.280	4.78E-03
100	1.266	7.65E-03
200	1.242	2.29E-03
400	1.190	9.30E-04
800	1.018	6.66E-04
1600	0.831	5.54E-04
400	0.871	
100	0.941	
25	1.015	

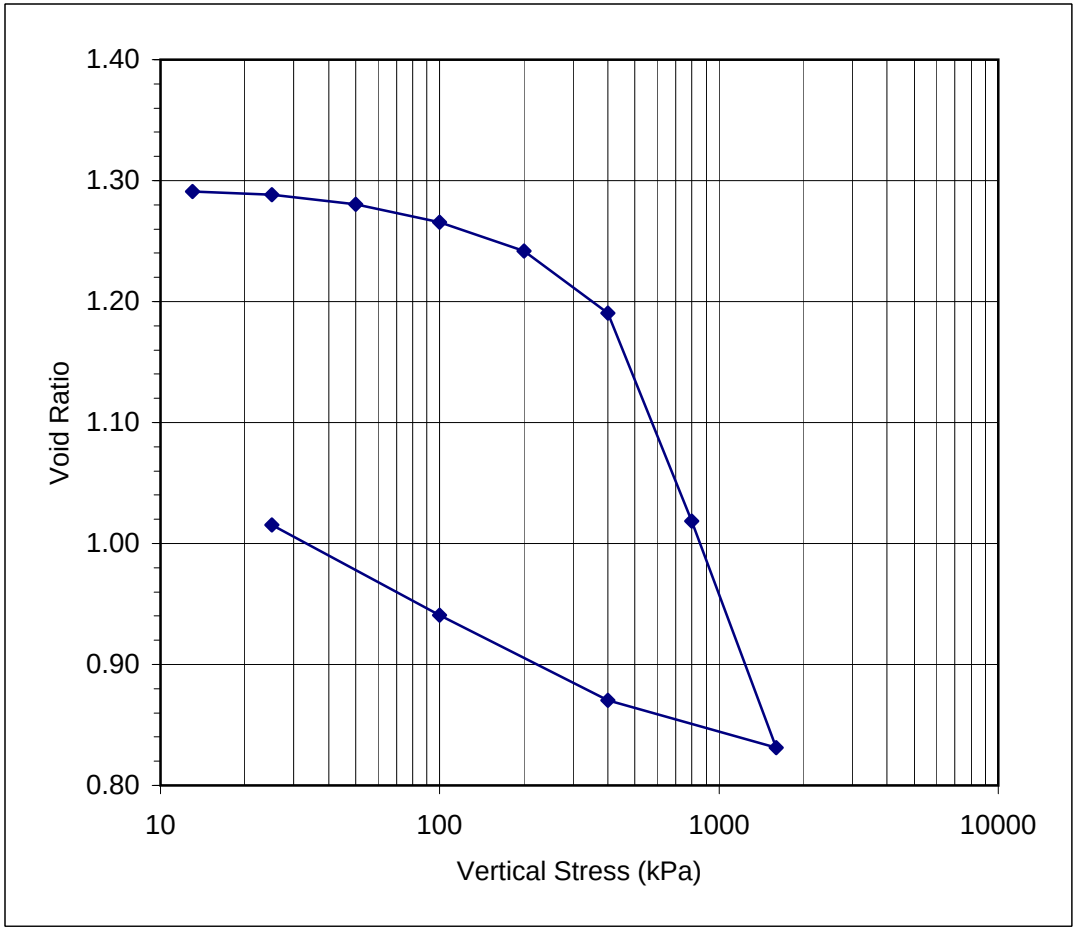
THURBER

ONE DIMENSIONAL CONSOLIDATION TEST REPORT
TEST SUMMARY PLOTS

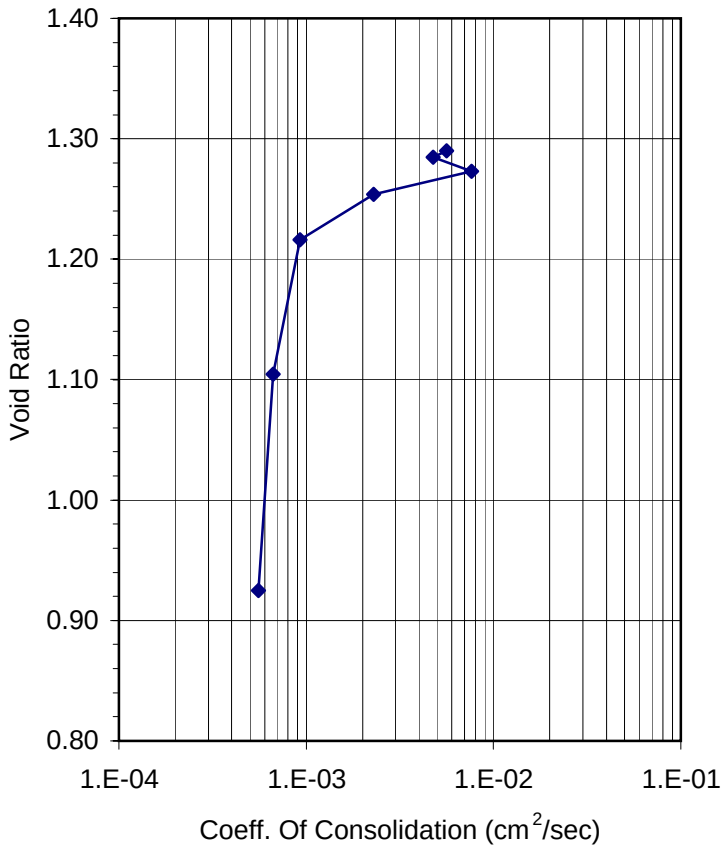
GVSD61
Oak Bay High School
File Number: 14-188-10

TH11-4, 5.4 - 5.9 m
Report Date: Jan. 31, 2011
Test Dates: Jan. 24 - 29, 2011

Void Ratio (end of load increment) Vs Log of Pressure



Average Void Ratio Vs Coefficient of Consolidation



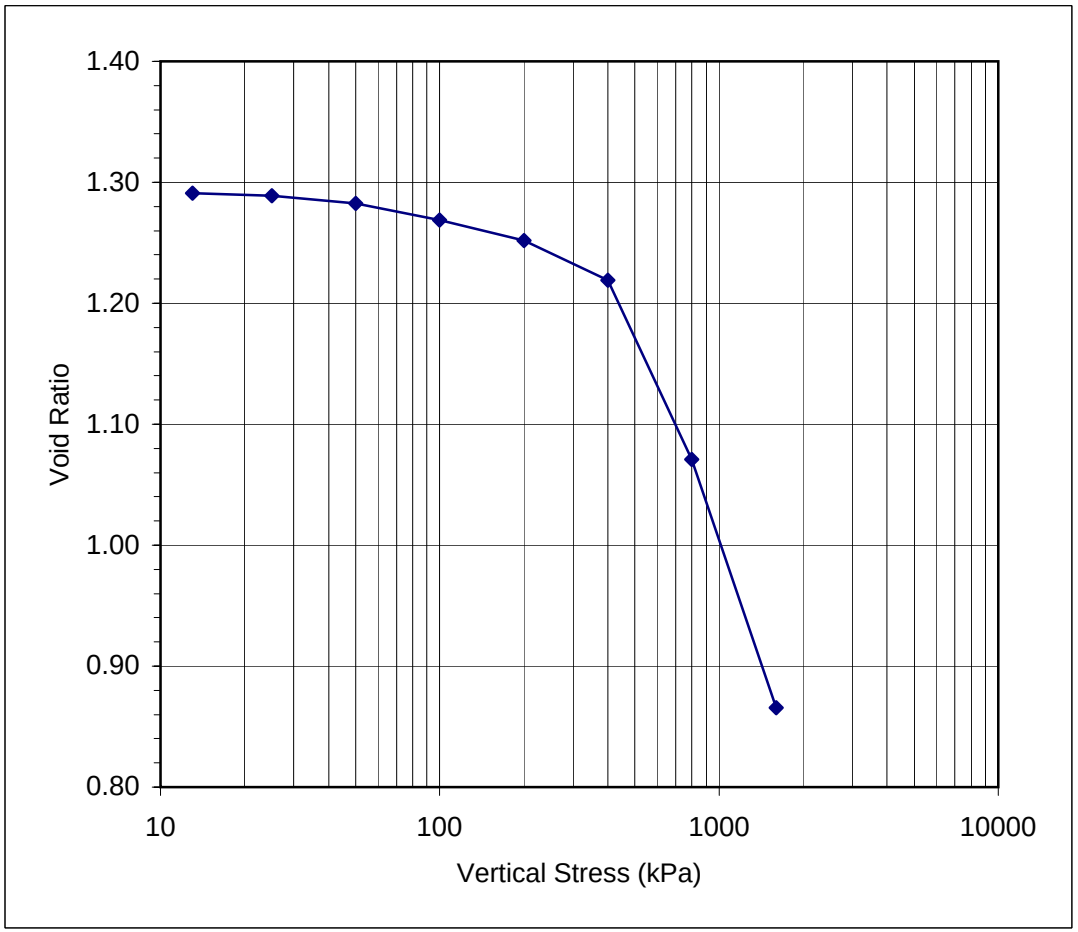
THURBER

ONE DIMENSIONAL CONSOLIDATION TEST REPORT
TEST SUMMARY PLOTS

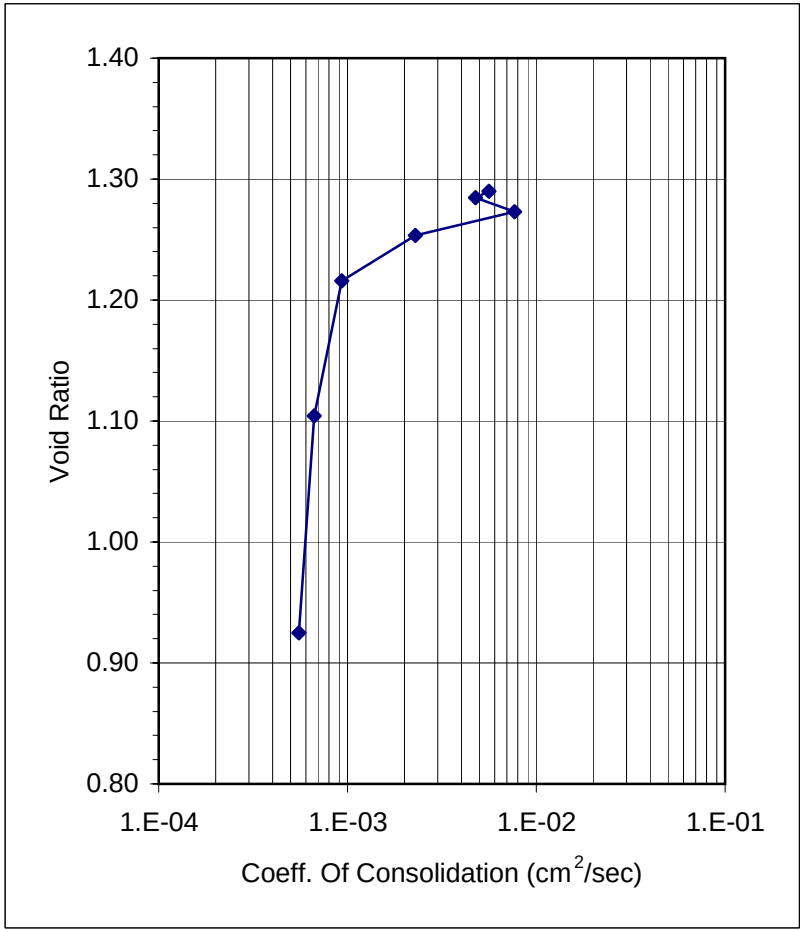
GVSD61
Oak Bay High School
File Number: 14-188-10

TH11-4, 5.4 - 5.9 m
Report Date: Jan. 31, 2011
Test Dates: Jan. 24 - 29, 2011

Void Ratio (@T_{100}) Vs Log of Pressure



Average Void Ratio Vs Coefficient of Consolidation



THURBER

ONE DIMENSIONAL CONSOLIDATION TEST REPORT
SUMMARY OF TEST DATA

GVSD61 — TH11-4, 6.9 - 7.4 m
Oak Bay High School — Report Date: Jan. 31, 2011
File Number: 14-188-10 — Test Dates: Jan. 24 - 29, 2011

Description: silty Clay (CL), grey, medium plastic

	Initial	Final	
Wet Density (kg/cu.m.):	1,771	1,947	Sand:
Dry Density (kg/cu.m.):	1,214	1,415	Silt:
Moisture Content (%):	46.0	37.6	Clay:
Void Ratio:	1.373	1.035	
Saturation:	96.4	104.6	Liquid Limit:
Specific Gravity:	2.88		Plastic Limit:
			Plasticity Index:

Test Method: ASTM D2435-03, method B, Cv calculated by Log of Time method

Trimming: The specimen was trimmed with a cutting shoe to a diameter of 63.5 mm and a height of 16.5 mm and placed in a fixed ring consolidometer.

Procedure: The consolidometer was flooded with distilled water immediately after the application of the first load of 13 kPa.
Subsequent loads were applied after primary consolidation was complete.

Load Increment (kPa)	Void Ratio (end of increment)	Cv (cm^2/sec)
13	1.368	
25	1.364	
50	1.354	9.35E-03
100	1.338	6.94E-03
200	1.300	9.08E-03
400	1.033	6.77E-04
800	0.866	5.98E-04
1600	0.724	7.56E-04
400	0.761	
100	0.822	
25	0.898	

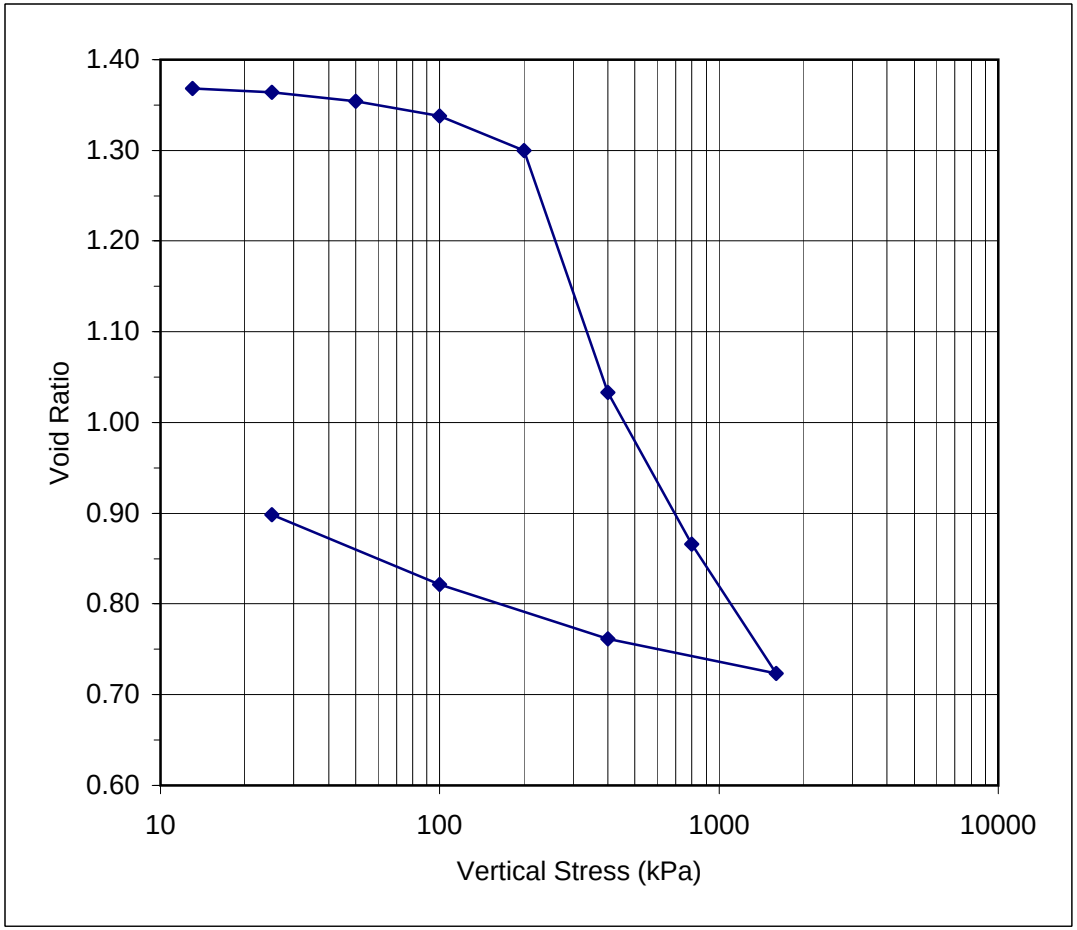
THURBER

ONE DIMENSIONAL CONSOLIDATION TEST REPORT
TEST SUMMARY PLOTS

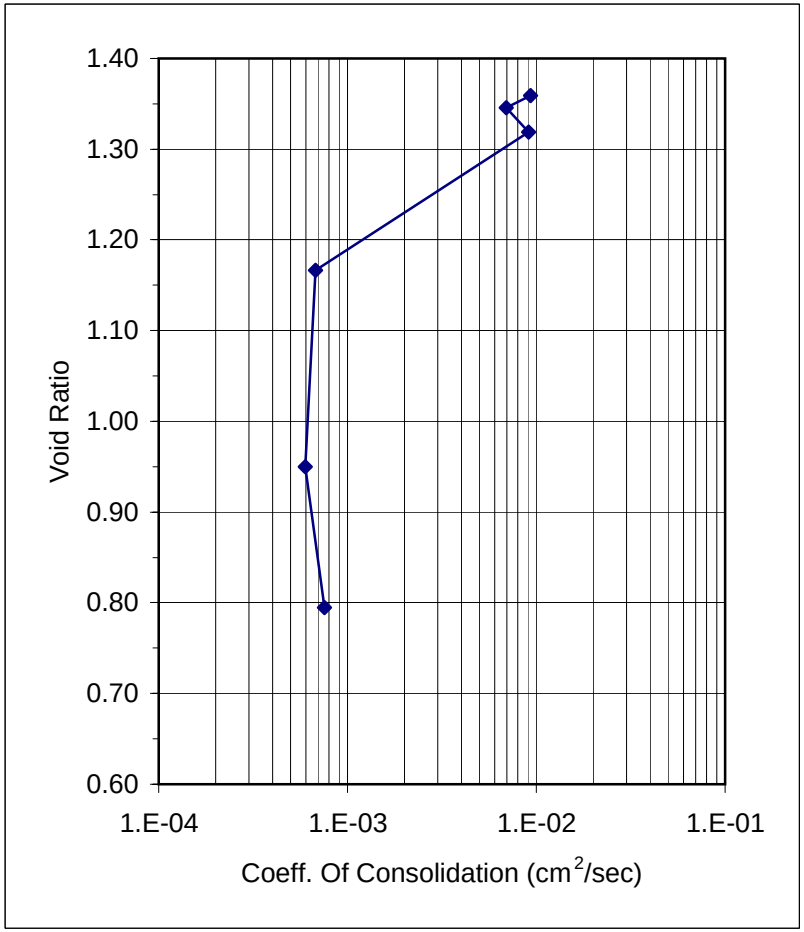
GVSD61
Oak Bay High School
File Number: 14-188-10

TH11-4, 6.9 - 7.4 m
Report Date: Jan. 31, 2011
Test Dates: Jan. 24 - 29, 2011

Void Ratio (end of load increment) Vs Log of Pressure



Average Void Ratio Vs Coefficient of Consolidation



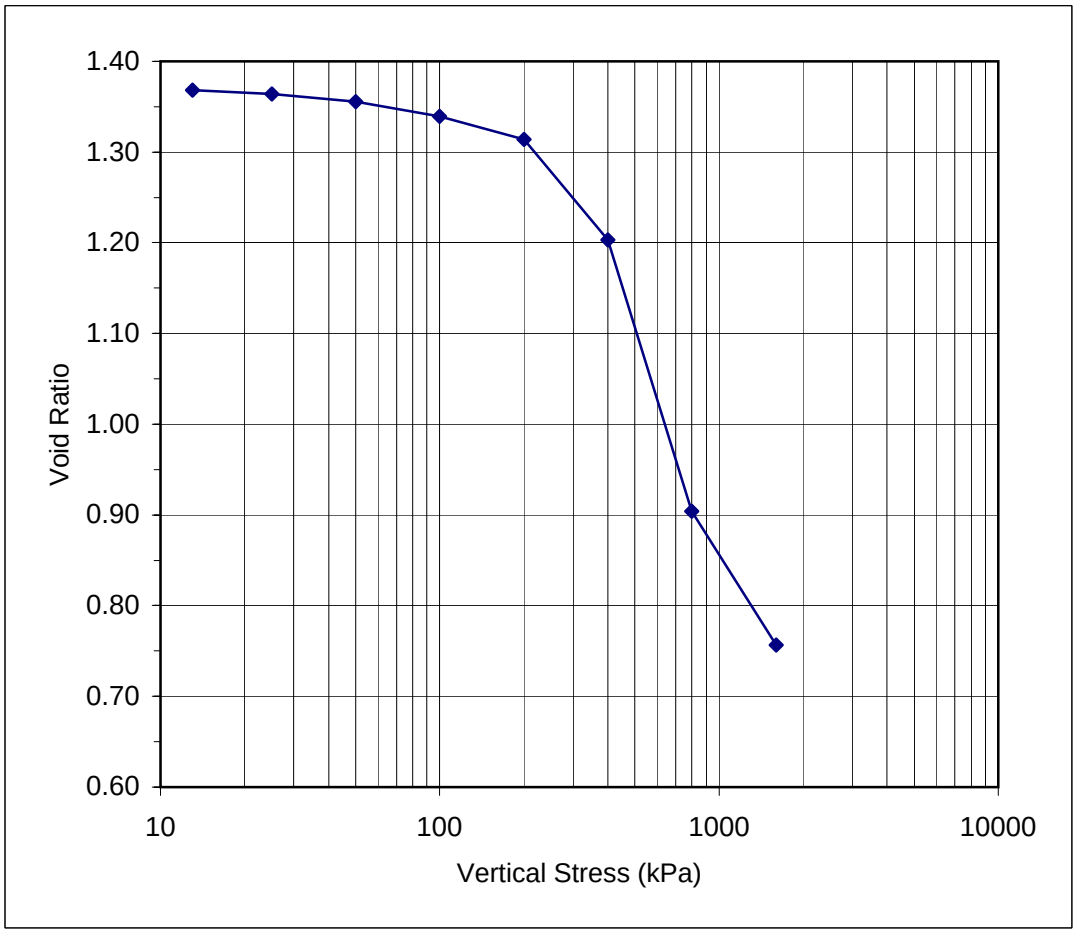
THURBER

ONE DIMENSIONAL CONSOLIDATION TEST REPORT
TEST SUMMARY PLOTS

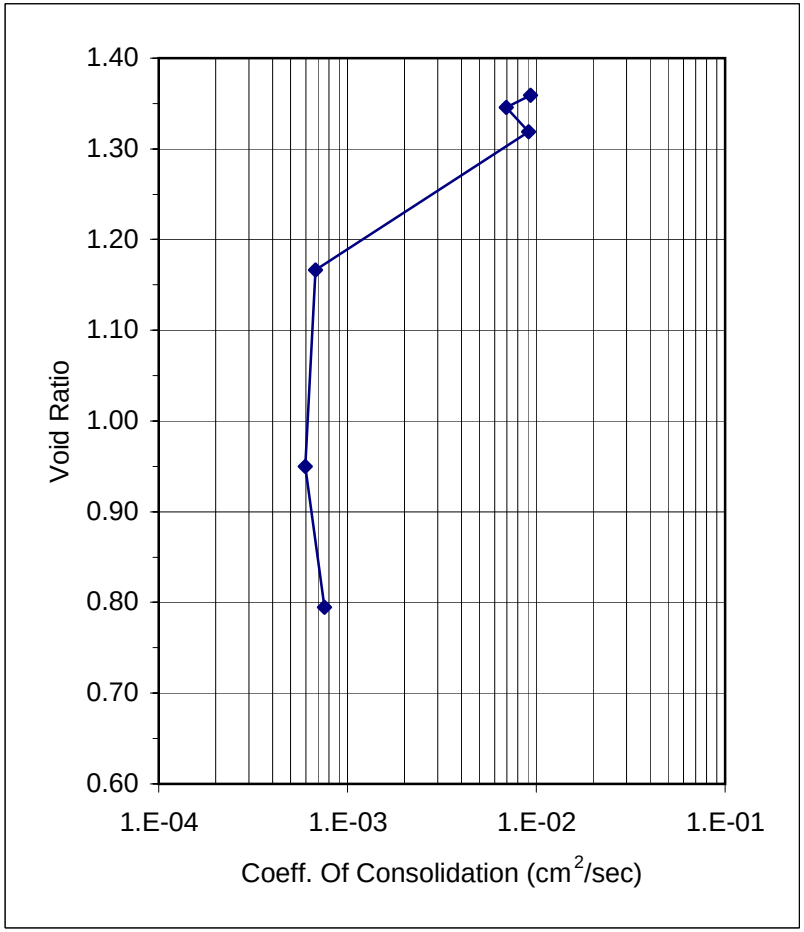
GVSD61
Oak Bay High School
File Number: 14-188-10

TH11-4, 6.9 - 7.4 m
Report Date: Jan. 31, 2011
Test Dates: Jan. 24 - 29, 2011

Void Ratio (@T_{100}) Vs Log of Pressure



Average Void Ratio Vs Coefficient of Consolidation



THURBER

TH11-1
TH11-2
TH11-3
TH11-4
TH11-5
TH12-1
TH12-2
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TH12-6
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TH12-33
TH12-34
TH12-35
TH12-36
TH12-37

2012 TEST HOLE WITH MONITORING WELL INSTALLED

2011 TEST HOLE LOCATION

2011 TEST HOLE NUMBER

2011 TEST HOLE WITH MONITORING WELL INSTALLED

2012 TEST HOLE LOCATION

2012 TEST HOLE NUMBER

NEW HIGH SCHOOL

NEW SOCCER FIELD

NEW RUGBY FIELD

NORTH

Gym Floor = 16.15m
Stage Floor = 17.37m
Top of Wall/Eaves = 23.13m
Roop peak = 25.98m

Existing Building

Existing Tennis Bubble Compound

COMP. PLAN 2376

PLAN 1678

PLAN 27193

REM. 5
COMP. PLAN 2376

Easement ROADS
RIGHT OF WAY 131018G

0 10 20 30 40 50 60m
SCALE 1:1000

NOTES:

1. Digital base plan and 2012 Test Hole locations provided by JE Anderson.
2. 2011 Test Hole locations are approximate only.
3. Building and field layouts are conceptual.

DESIGNED	BRW
DRAWN	RRS
DATE	JULY 19, 2012
APPROVED	BRW.
SCALE	1:1000

GREATER VICTORIA SCHOOL DISTRICT #61

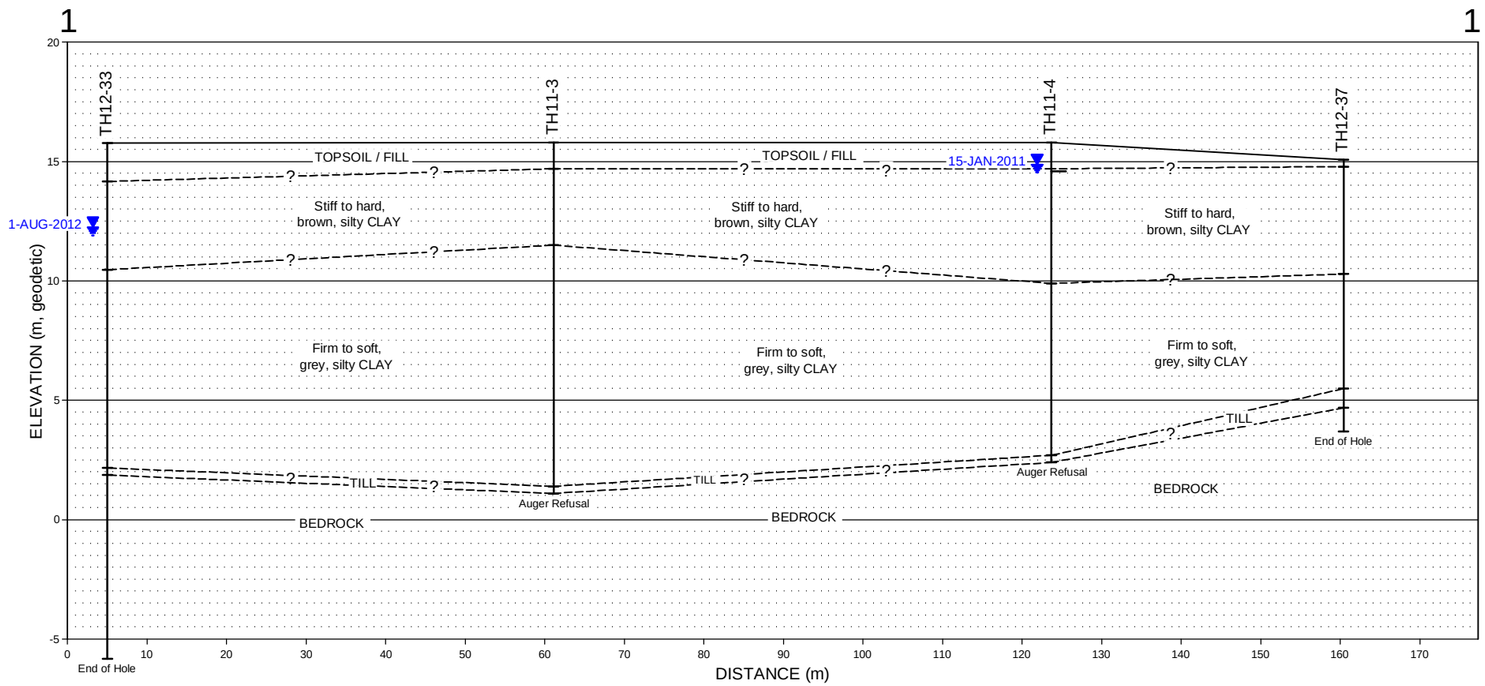
TEST HOLE LOCATION PLAN

OAK BAY HIGH SCHOOL REPLACEMENT
GEOTECHNICAL INVESTIGATION

OAK BAY, B.C.

THURBER

DWG. NO.
14-188-10-3



NORTH

SCALE:
Horizontal: 1:750
Vertical: 1:250

NOTES:

1. The soil profiles shown on this drawing are derived from data collected at discrete test locations. Actual soil conditions and stratigraphy between test holes may differ. Profile is drawn for illustrative purposes only.
2. Refusal depths shown represent dense soil conditions but do not necessarily represent the bedrock surface.

0 2.5 5 7.5 10 12.5 15 m
SCALE 1:250

0 10 20 30 40 50m
SCALE 1:750

DESIGNED	KBS
DRAWN	RRS
DATE	AUGUST 9, 2012
APPROVED	BKW.
SCALE	AS SHOWN

GREATER VICTORIA SCHOOL DISTRICT #61

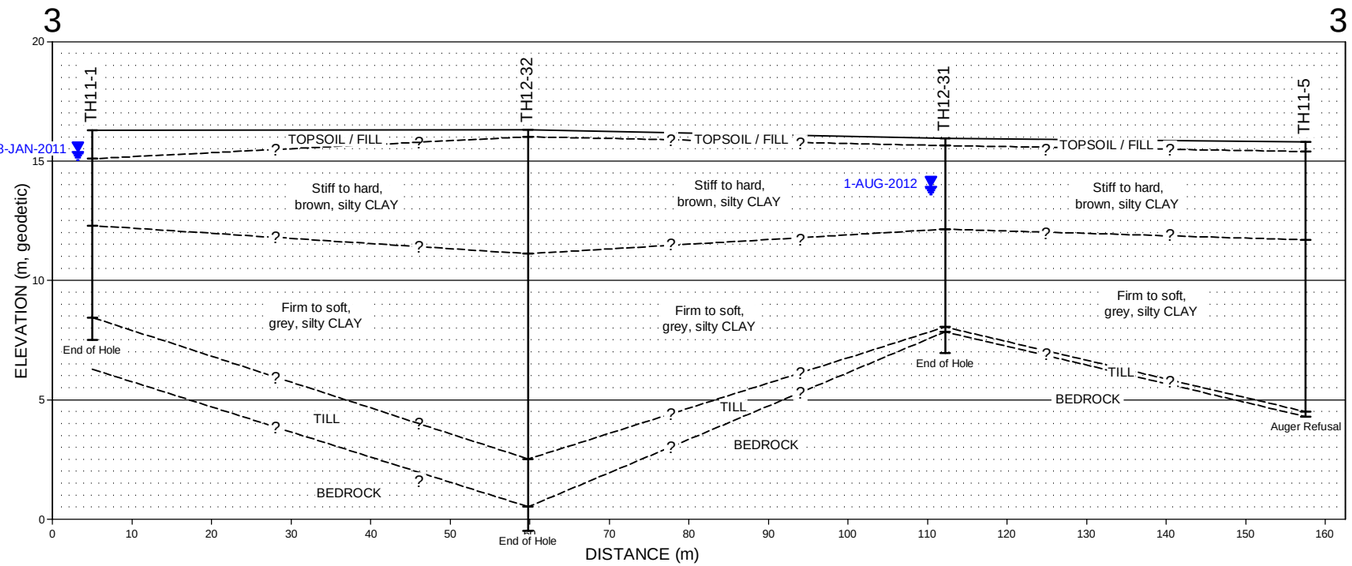
ILLUSTRATIVE PROFILES (Sheet 1 of 2)

OAK BAY HIGH SCHOOL REPLACEMENT
GEOTECHNICAL INVESTIGATION
OAK BAY, B.C.

THURBER

DWG. NO.
14-188-10-4

NORTH



SCALE:
Horizontal: 1:750
Vertical: 1:250

NOTES:

1. The soil profiles shown on this drawing are derived from data collected at discrete test locations. Actual soil conditions and stratigraphy between test holes may differ. Profile is drawn for illustrative purposes only.
2. Refusal depths shown represent dense soil conditions but do not necessarily represent the bedrock surface.

0 2.5 5 7.5 10 12.5 15 m
SCALE 1:250

0 10 20 30 40 50m
SCALE 1:750

DESIGNED KBS	GREATER VICTORIA SCHOOL DISTRICT #61
DRAWN RRS	**ILLUSTRATIVE PROFILE (Sheet 2 of 2)**
DATE AUGUST 9, 2012	
APPROVED BRW.	OAK BAY HIGH SCHOOL REPLACEMENT GEOTECHNICAL INVESTIGATION — OAK BAY, B.C.
SCALE AS SHOWN	THURBER — DWG. NO. 14-188-10-5