February 20, 2012

GEOTECHNICAL INVESTIGATION

PROPOSED OFFICE BUILDINGS, MISSION INSTITUTION, MISSION, BC

Submitted to:
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REPORT

Report Number: 1114470264-2020-004-R-Rev0

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1.0 INTRODUCTION

As requested, Golder Associates Ltd. (Golder) has carried out a geotechnical investigation for the proposed new office buildings and parking lot additions at the Mission Medium Security Institution in Mission, BC (see Figure1). The purpose of the investigation was to determine the soil and groundwater conditions at the site and based on this information provide geotechnical comments and recommendations as input to the design of the proposed new buildings and parking lot additions.

The scope of this report is limited to the geotechnical engineering aspects of this development, and does not include any provision for the sampling, testing or investigation of the soils or groundwater for contamination, or the provision of bioscience related consulting services or archaeological assessments for this site. Golder has the capability and will be pleased to provide such specialist services, if requested.

This report should be read in conjunction with the "***Important Information and Limitations of This Report***" attached following the text of this report. The reader's attention is specifically drawn to this information, as it is essential that it is followed for the proper use and interpretation of this report.

2.0 SITE AND PROPOSED DEVELOPMENT

The subject sites are located both outside, and within, the secured perimeter fence line and will include two new office buildings and a parking lot addition. It is understood that one of the proposed new office buildings will be located within the secured perimeter fence adjacent to the south perimeter fence in an area currently occupied by tennis courts (as shown on Figure 2). The other new office building will be located outside of the secured perimeter fence located west of the main entrance to the Institution (as shown on Figure 2). It is also understood that the new parking lot will be added to the west and south of the proposed location of the new office building located outside of the secured perimeter fence line.

It is understood that the office buildings will be two-storey steel-framed structures and will be constructed approximately at-grade (i.e. no basement and less than about 0.25 m of additional grade fills above the existing ground surface). The office buildings will each occupy a building footprint of approximately 525 m^2. No further details were provided at the time of preparing this report.

3.0 GEOTECHNICAL INVESTIGATION

On November 24 and 25, 2011, Golder carried out a drilling investigation at the site using a truck-mounted auger drill rig owned and operated by Downrite Drilling Ltd. of Chilliwack, B.C. at the approximate locations shown on Figure 2. The investigation program consisted of drilling eight (8) solid stem augerholes designated as AH11-01, AH/DCPT11-02 to AH/DCPT11-04, AH11-05, and AH/DCPT11-06 to AH/DCPT11-08. The augerholes were advanced to depths up to about 8.8 m below the existing ground surface. In addition, six (6) Dynamic Cone Penetration Test (DCPT) probes were put down in advance of six (6) of the augerholes to depths up to about 7.9 m below the existing ground surface in those augerholes designated as AH/DCPT11-02 to AH/DCPT11-04, and AH/DCPT11-06 to AH/DCPT11-08. The DCPT probe was put down to obtain information on the relative penetration resistance of the various subsurface strata and from this, to infer consistency or relative density of the various strata encountered. The DCPT probe was advanced using a 63.5 kg (140 lb) automatic trip hammer

(rated efficiency of 95%) and AWJ drill rods to advance a 73 mm diameter cone (with a 60 degree cone angle and blunt centre) located at the bottom of a 154 mm long sleeve. The geometry of the cone, which slides onto the end of the drill rods and is left down in the testhole at the end of the test, has been designed to produce DCPT blow counts that are approximately equivalent to N60 blow counts from the Standard Penetration Test (SPT). DCPT blow counts (blows per 0.3 m) are included on the Record of Augerhole Log sheets.

Two standpipe piezometers were installed to about 3.4 and 4.3 m depth in AH/DCPT11-04 and AH/DCPT11-06, respectively. Each piezometer included a 1.5 m slotted screen that allowed for the groundwater to flow into the standpipe and allowing for the measurement of a stabilized groundwater level. The screen portion of each standpipe piezometer was backfilled with filter sand, a bentonite seal, and soil cuttings placed above the bentonite and filter sand. The standpipes were both protected with a flush-mounted steel cover that was secured in place with concrete.

The fieldwork was carried out under the full-time inspection of a member our geotechnical staff, who located the augerholes in the field, logged in detail the soil and groundwater conditions encountered in each of the augerholes, recorded the blow counts per 0.3 m advance of the DCPT probe, and collected representative soil samples for further detailed examination and index testing in Golder's Abbotsford laboratory.

Following completion of logging and sample collection, the augerholes were backfilled with soil cuttings and bentonite chips. Cold patch asphalt was placed at the ground surface for AH/DCPT11-02, AH/DCPT11-03, AH11-05, AH/DCPT11-07 and AH/DCPT11-08. The sealing of all of the augerholes was carried out in accordance with the current British Columbia Groundwater Protection Legislation.

The locations of the augerholes were approximately located in the field by a handheld Global Positioning System (GPS) unit typically accurate to within about 5 m; no survey work was carried out to determine the exact locations or elevations of the augerholes. The approximate locations of the augerholes are shown on the attached Figure 2.

3.1 Laboratory Testing

Laboratory testing, comprising moisture content determinations, was carried out on thirty-one (31) samples of the soils collected from the augerholes. In addition, particle size distribution analysis tests were performed on seven (7) samples of the soils collected and Atterberg limits tests were performed on two (2) samples of the cohesive soils encountered.

4.0 SUBSURFACE CONDITIONS

Detailed descriptions of the soil and groundwater conditions encountered in the augerholes are presented in the Record of Augerhole Log sheets following the text of this report. In general, the subsurface consists of asphalt and/or variable surficial fills, underlain by deposits of silt and sand. Some organic silt layers were also encountered under the location of the proposed new office building located outside of the secured perimeter fence line. Some variations in the subsurface conditions were noted between the augerhole locations. Similar, and possibly greater, variations in subsurface conditions should be anticipated across the site. The following sections summarize the soil conditions encountered in the augerholes.

4.1 Asphalt

Asphaltic Concrete was encountered at the surface in all of the augerholes, except AH11-01. The thickness of the asphaltic concrete was about 0.1 m.

4.2 Fill

Variable fill materials were encountered at the surface or below the asphalt in of all of the augerholes. In AH/DCPT11-07, there was no recovery for the upper 1.5 m but it was noted at the surface to consist of sand and gravel fill with the presence of cobbles. The fill thickness ranges from about 0.2 to 3.2 m below the existing ground surface, with an average of about 1.0 m. Water content determination tests carried out on several samples of the fills indicate a natural moisture content that ranges between about 17 and 36 per cent, with an average of about 27 per cent. In addition, a single particle size distribution test was performed on the variable fill materials. The results of the laboratory testing can be seen in Appendix II. Based on the observed resistance to auger drilling and DCPT probing, the fills were inferred to be generally loose to dense in the non-cohesive fills and generally soft for the cohesive fill materials.

4.3 Organic Silt

Deposits of organic silt were encountered in AH/DCPT11-03 and AH/DCPT11-04. In AH/DCPT11-03, the organic silt deposits were encountered between about 0.8 and 1.5 m below the existing ground surface. In AH/DCPT11-04, these deposits were encountered below the fill materials and extended down to a depth of about 1.8 m below the existing ground surface. Water content determination tests carried out on several samples of the organic silt deposits indicate a natural moisture content that ranges between about 91 and 113 per cent, with an average of about 102 per cent. Based on the observed resistance to auger drilling and DCPT probing, the organic silt deposits were inferred to be generally soft.

4.4 Variable Silt and Sand

Deposits of silt and sand of varying composition were encountered in all of the augerholes. Trace amounts of clay were encountered in some of these deposits in AH/DCPT11-03, AH/DCPT11-07 and AH/DCPT11-08. Trace amounts of organics were also encountered in these deposits in AH/DCPT11-03. These deposits were encountered below the fill and organic silt deposits and each augerhole was terminated in these deposits.

Water content determination tests carried out on samples of these deposits indicate a natural moisture content that ranges between about 10 and 67 per cent, with an average of about 19 per cent. In addition, several particle size distribution tests and Atterberg limits tests were performed on samples of the variable silt and sand deposits. The results of the laboratory testing can be seen in Appendix II. Based on the observed resistance to auger drilling and DCPT probing, these deposits were inferred to be generally loose to very dense.

4.5 Groundwater Conditions

Groundwater was observed in AH/DCPT11-04, AH/DCPT11-06, AH/DCPT11-07 and AH/DCPT11-08 at the time of drilling between about 1.8 and 2.7 m below the existing ground surface. Groundwater levels taken on December 13, 2011 from the standpipe piezometers in AH/DCPT11-04 and AH/DCPT11-06 indicated a stabilized measurement between about 1.4 and 1.6 m below the existing ground surface. We anticipate that the groundwater level at the site may fluctuate in response to seasonal fluctuations in precipitation and runoff, possibly rising during and following periods of extended wet weather and/or due to fluctuations in nearby watercourses. In addition, it is anticipated that "perched" water levels may develop above the silty materials during and following periods of sustained wet conditions.

5.0 GEOTECHNICAL ENGINEERING COMMENTS

5.1 General

As indicated above, the results of our geotechnical investigation indicate that the general soil profile at the site consists of asphalt and/or variable fill materials, underlain by a variable sequence of silt, sand and silt and sand deposits. The proposed new office buildings may be supported by conventional spread footings on a layer of well-compacted structural fill.

The following sections provide our geotechnical engineering comments and recommendations as input to the design of the proposed new office buildings and parking lot additions. It is recommended that the site preparation and foundation design details and construction be reviewed by Golder prior to construction to confirm that they are consistent with the recommendations provided herein.

5.2 Site Preparation

5.2.1 Office Building Sites

It is recommended that all topsoil, organics, asphalt, unsuitable fill materials, organic silt soils, and any other deleterious materials be completely removed from the entire footprint of the proposed new buildings. However, at the site for the proposed building inside secured perimeter fence, the fill material extends below the water table. The results of AH/DCPT11-06 to AH/DCPT11-08 indicate that the existing fill is generally granular in nature. Therefore, consideration may be given to limiting the subexcavation depth to 2 m depth. The existing fill may be considered suitable for re-use as structural fill; however, geotechnical assessment is required as described in Section 5.4. It is recommended that the excavation extend laterally a distance equal to the depth from the underside of the proposed footings to the base of the excavation. The footings for the proposed new buildings may be founded on well-compacted structural fill (as described in Section 5.4).

It is required by the British Columbia Building Code (BCBC), 2006, that the exposed subgrade be inspected by an experienced geotechnical engineer prior to fill placement to confirm that the subgrade conditions are consistent with those assumed for design. Provisions should be made to subexcavate and replace any weak, disturbed, or unsuitable soils, with structural fills (as described in Section 5.4). Any soft spots encountered during the subgrade inspection shall be removed and filled with structural fill.

5.2.2 Parking Lot Additions

The parking lot addition is underlain by fill and finer-grained soils that are susceptible to some compression (settlement) due to the increased weight of the granular fill used to construct the pavement structure and any additional fill required to meet design grades. It is recommended that site preparation for the parking lot include excavation of the existing fill and silty soils to a depth of at least 600 mm to accommodate the pavement structure recommended in Section 5.8. It is also recommended that given the fine-grained nature of the soils likely to be exposed, that the site preparation work be carried out during periods of dry weather taking care not to track construction equipment directly onto wet soft subgrade conditions. Additional subexcavation or a woven geotextile (Nilex 2002 or approved equivalent) may be required for use as a separation layer between the subgrade and the pavement structure if fine grained soils are encountered at the subgrade of the pavement structure. The initial lift of granular fill placed may require nominal compaction due to the possible presence of weaker soils. A qualified geotechnical inspector should be on site to monitor the placement and compaction of all fill materials to assess compaction requirements.

5.3 Excavation and Dewatering

Subexcavation and removal of existing asphalt, topsoil, fill materials and underlying organic soils, as part of site preparation for the proposed new office building, will require excavation depths of about 2 m below the existing ground surface. In general, cut slopes of limited height in compact granular fill and soft organic soils above the water table may be developed at 1.5H:1V, or flatter. Cut slopes below the water table would need to be flattened further. In addition, depending on the proximity of adjacent structures or nature of ground conditions encountered, suitably braced and shored near-vertical trench excavations, which meet the requirements of WCB, may be necessary.

Assuming that the excavations do not extend significantly deeper than about 2 m below the existing ground surface and are carried out during dry weather that typically occurs in late spring, summer and early fall, no significant dewatering is likely required. Conventional sump and pump methods can be used to control localized ponding or seepage within the fill. However, if excavations extend below the water table or are carried out during periods of prolonged wet weather, then a suitably designed wellpoint dewatering system may be required.

5.4 Structural Fills

It is recommended that structural fills placed beneath and around the proposed new office buildings consist of clean, well-graded, 75 mm minus sand or sand and gravel having less than 5 per cent passing the 0.075 mm (USS No. 200) sieve size. The fills should be placed on a suitably prepared subgrade in horizontal lifts not exceeding 150 mm uncompacted thickness, and compacted to at least 100 per cent of Standard Proctor Maximum Dry Density (SPMDD) as per ASTM D698 within the footprint of the new office buildings. Any structural fill supporting the perimeter footings of the buildings should extend outside the edge of the foundations a horizontal distance at least equal to the depth of excavation below the underside of the footing. Any clean native sand and gravel deposits or fill materials removed as part of site preparation may be considered for re-use as structural fill if it can be properly segregated during excavation and subject to approval by a qualified geotechnical professional. Clean sand and gravel is considered to have less than 5% fines (fraction passing the

0.075 mm (USS No. 200 sieve size)). It is recommended that qualified geotechnical personnel inspect and test all structural fill.

All fill delivered to site should be dry of optimum moisture content, and if stockpiled on site for any reason, should be covered with polyethylene sheeting or equivalent to prevent saturation due to rain. Any fill material which is allowed to get excessively wet prior to compaction may become unworkable and may need to be removed from the site and replaced with drier material.

It is recommended that compaction of the fills take place as soon as possible after placement. As part of the BCBC, 2006, requirements to provide assurance of professional design and field review, qualified geotechnical personnel should inspect and test all site grading fills. It is recommended that qualified geotechnical personnel inspect and test all structural fill.

5.5 Building Foundations

The proposed new buildings may be supported using conventional spread footings founded on well-compacted structural fills compacted to at least 100 per cent of the SPMDD. It is recommended that the Serviceability Limit States (SLS) soil bearing resistance for the foundations be limited to 100 kPa (2,100 psf) for footings founded on the suitably prepared base material as described above and assuming post-construction long term deformation/settlements of less than about 25 mm. We recommend an Ultimate Limit States (ULS) factored soil bearing resistance of 150 kPa (3,100 psf) which is based on an ultimate bearing resistance/capacity of 300 kPa (6,300 psf) with a resistance modification factor (Φ) of 0.5 to compute the factored resistance for Limit States Design (LSD).

Regardless of bearing pressure considerations, it is recommended that strip and rectangular footings have a minimum width of 450 and 600 mm, respectively. For footing embedment and frost protection purposes, it is recommended that all exterior foundations be provided with a minimum of 600 mm of soil cover. Similarly, interior foundations and slabs on grade in unheated portions of the structure should be constructed such that the subgrade soils have at least 600 mm of non-frost susceptible granular soil to prevent damage due to frost heaving. This minimum frost depth may need to be increased depending on local by-law requirements and this should be confirmed prior to completion of the building design.

We recommend that any slab on grade areas be underlain by a minimum 100 mm thickness of 19 mm minus crushed sand and gravel (road mulch) to the final underside of slab grade to provide a stable surface for placing concrete for the slab. These underslab fills should be compacted to at least 100 per cent of SPMDD, and should be compacted as soon as possible after placement.

Expected settlements due to applied building and live loadings will depend on the size and elevation of footings and the magnitude and geometry of the loads imposed. The settlements at a given location may also be influenced by loadings from adjacent foundations and live loads, such as aggregate or fill stockpiles, depending on the proximity and loading levels. Anticipated settlements should be confirmed by Golder once site grading and building design is finalized.

If the final proposed floor slab elevation is at least 150 mm above all surrounding grades, the exterior ground surface is sloped away from the building and some dampness or wetting of the underside of the slab is acceptable, consideration may be given to deletion of the perimeter tile drains.

5.6 Seismic Design Considerations

It is understood that the site will be designed in accordance with the seismic design provisions in the 2010 National Building Code of Canada (NBCC) and the 2006 British Columbia Building Code (BCBC). The 2006 BCBC requires that buildings be designed to ground motions with a return period of 1:2,475 years, which is equivalent to a 2 per cent probability of exceedance in 50 years.

The 2006 BCBC has adopted the use of foundation factors that are dependent on local site soil conditions, shaking level, and site period. The effects of local site conditions are characterized based on the average shear wave velocity and relative density of soils in the upper 30 m. For a given site class, the effects of shaking level and period are incorporated via the short-period and long-period foundation factors Fa and Fv defined in Table 4.1.8.4B and Table 4.1.8.4C of the 2006 BCBC, respectively.

5.6.1 Site Class

According to the site class descriptions in Table 4.1.8.4A of 2006 BCBC, the subject site is classified as Site Class D which can be used to analyze the effects of strong shaking on structure response. This classification is based on the average shear wave velocity of the upper 30 m of site soils based on estimated soil densities and published correlations with shear wave velocity for the upper 9 m, supplemented with other regional data below 9 m depth below the existing ground surface.

5.6.2 Amplification Factors

The spectral and peak hazard values as determined for firm ground (NBCC 2005 Soil Class C – Average Shear Wave Velocity 360-760 m/s) for the sites for 5 per cent damping (obtained from the interactive website maintained by the Geological Survey of Canada based on site coordinates) are provided in Appendix I. The site-specific short-period and long-period foundation factors Fa and Fv, respectively, for Site Class D are summarized in Table 1. These foundation factors can be used to estimate the base shear loads.

Table 1: Seismic Parameters Based on 2010 NBCC and 2006 BCBC

Probability of exceedance in 50 years (return period)	Estimate Average Vs (m/s)	Site Class	Site Class D ONLY	
			Fa	Fv
2 % (1:2,475 years)	180-360 m/s	D	1.1*	1.2*

* *Linearly Interpolated Value*

5.7 Liquefaction Susceptibility

Based on our review of the existing soil conditions at the site, we consider the risk of potential liquefaction within the compact sand and silt deposits which underlie the site to be moderate and in the dense strata to be low. There may be potential for liquefaction in any saturated looser sand and silt deposits which underlie the site. In addition, some limited strain softening may occur in any of the soft or firm cohesive soils which underlie the site. It should be noted that the earthquake provisions of the current National Building Code and BC Building Code are intended to reduce the risk of collapse of a structure due to an earthquake, but are not intended to ensure that no damage to the residence will occur.

5.8 Pavement Structure

We understand that it is proposed to extend the existing parking lot towards the west and south of the proposed location of the new office building located outside of the secured perimeter fence line (see Figure 2).

Provided that the subgrade is prepared as described above and any weak or unsuitable materials are sub-excavated and replaced, the pavement structure and material quality should conform to the District of Mission municipal specifications for the proposed parking areas with the following minimum pavement structure recommended over the prepared subgrade:

- 35 mm thickness of asphaltic concrete surface course;
- 40 mm thickness of asphaltic concrete base course;
- 150 mm thickness of base course consisting of 19 mm minus clean, well graded, crushed sand and gravel (road mulch), compacted to 100 per cent of SPMDD; and,
- 400 mm thickness of sub-base course consisting of clean, well-graded, 75 mm minus pit-run sand and gravel compacted to at least 100 per cent of SPMDD.

As previously noted, the parking lot additions will likely experience some settlement, due to the increased weight of the pavement structure. It is recommended that the granular layers of the pavement structure be constructed and parking lot additions be used temporarily as a gravel-surfaced parking area for a period of time to allow for some settlement to occur prior to placement of the asphalt surfacing.

6.0 CLOSURE

We trust the information contained in this report is sufficient for your immediate requirements. Should you have any questions, please do not hesitate to contact us.

GOLDER ASSOCIATES LTD.

ORIGINAL SIGNED

Craig Smith, EIT
Geotechnical Group

ORIGINAL SIGNED

Brian L. J. Mylleville, Ph.D., P.Eng.
Principal and Senior Geotechnical Engineer

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IMPORTANT INFORMATION AND LIMITATIONS OF THIS REPORT

Standard of Care: Golder Associates Ltd. (Golder) has prepared this report in a manner consistent with that level of care and skill ordinarily exercised by members of the engineering and science professions currently practising under similar conditions in the jurisdiction in which the services are provided, subject to the time limits and physical constraints applicable to this report. No other warranty, expressed or implied is made.

Basis and Use of the Report: This report has been prepared for the specific site, design objective, development and purpose described to Golder by the Client. The factual data, interpretations and recommendations pertain to a specific project as described in this report and are not applicable to any other project or site location. Any change of site conditions, purpose, development plans or if the project is not initiated within eighteen months of the date of the report may alter the validity of the report. Golder can not be responsible for use of this report, or portions thereof, unless Golder is requested to review and, if necessary, revise the report.

The information, recommendations and opinions expressed in this report are for the sole benefit of the Client. No other party may use or rely on this report or any portion thereof without Golder's express written consent. If the report was prepared to be included for a specific permit application process, then upon the reasonable request of the client, Golder may authorize in writing the use of this report by the regulatory agency as an Approved User for the specific and identified purpose of the applicable permit review process. Any other use of this report by others is prohibited and is without responsibility to Golder. The report, all plans, data, drawings and other documents as well as all electronic media prepared by Golder are considered its professional work product and shall remain the copyright property of Golder, who authorizes only the Client and Approved Users to make copies of the report, but only in such quantities as are reasonably necessary for the use of the report by those parties. The Client and Approved Users may not give, lend, sell, or otherwise make available the report or any portion thereof to any other party without the express written permission of Golder. The Client acknowledges that electronic media is susceptible to unauthorized modification, deterioration and incompatibility and therefore the Client can not rely upon the electronic media versions of Golder's report or other work products.

The report is of a summary nature and is not intended to stand alone without reference to the instructions given to Golder by the Client, communications between Golder and the Client, and to any other reports prepared by Golder for the Client relative to the specific site described in the report. In order to properly understand the suggestions, recommendations and opinions expressed in this report, reference must be made to the whole of the report. Golder can not be responsible for use of portions of the report without reference to the entire report.

Unless otherwise stated, the suggestions, recommendations and opinions given in this report are intended only for the guidance of the Client in the design of the specific project. The extent and detail of investigations, including the number of test holes, necessary to determine all of the relevant conditions which may affect construction costs would normally be greater than has been carried out for design purposes. Contractors bidding on, or undertaking the work, should rely on their own investigations, as well as their own interpretations of the factual data presented in the report, as to how subsurface conditions may affect their work, including but not limited to proposed construction techniques, schedule, safety and equipment capabilities.

Soil, Rock and Groundwater Conditions: Classification and identification of soils, rocks, and geologic units have been based on commonly accepted methods employed in the practice of geotechnical engineering and related disciplines. Classification and identification of the type and condition of these materials or units involves judgment, and boundaries between different soil, rock or geologic types or units may be transitional rather than abrupt. Accordingly, Golder does not warrant or guarantee the exactness of the descriptions.

Special risks occur whenever engineering or related disciplines are applied to identify subsurface conditions and even a comprehensive investigation, sampling and testing program may fail to detect all or certain subsurface conditions. The environmental, geologic, geotechnical, geochemical and hydrogeologic conditions that Golder interprets to exist between and beyond sampling points may differ from those that actually exist. In addition to soil variability, fill of variable physical and chemical composition can be present over portions of the site or on adjacent properties. The professional services retained for this project include only the geotechnical aspects of the subsurface conditions at the site, unless otherwise specifically stated and identified in the report. The presence or implication(s) of possible surface and/or subsurface contamination resulting from previous activities or uses of the site and/or resulting from the introduction onto the site of materials from off-site sources are outside the terms of reference for this project and have not been investigated or addressed.

Soil and groundwater conditions shown in the factual data and described in the report are the observed conditions at the time of their determination or measurement. Unless otherwise noted, those conditions form the basis of the recommendations in the report. Groundwater conditions may vary between and beyond reported locations and can be affected by annual, seasonal and meteorological conditions. The condition of the soil, rock and groundwater may be significantly altered by construction activities (traffic, excavation, groundwater level lowering, pile driving, blasting, etc.) on the site or on adjacent sites. Excavation may expose the soils to changes due to wetting, drying or frost. Unless otherwise indicated the soil must be protected from these changes during construction.

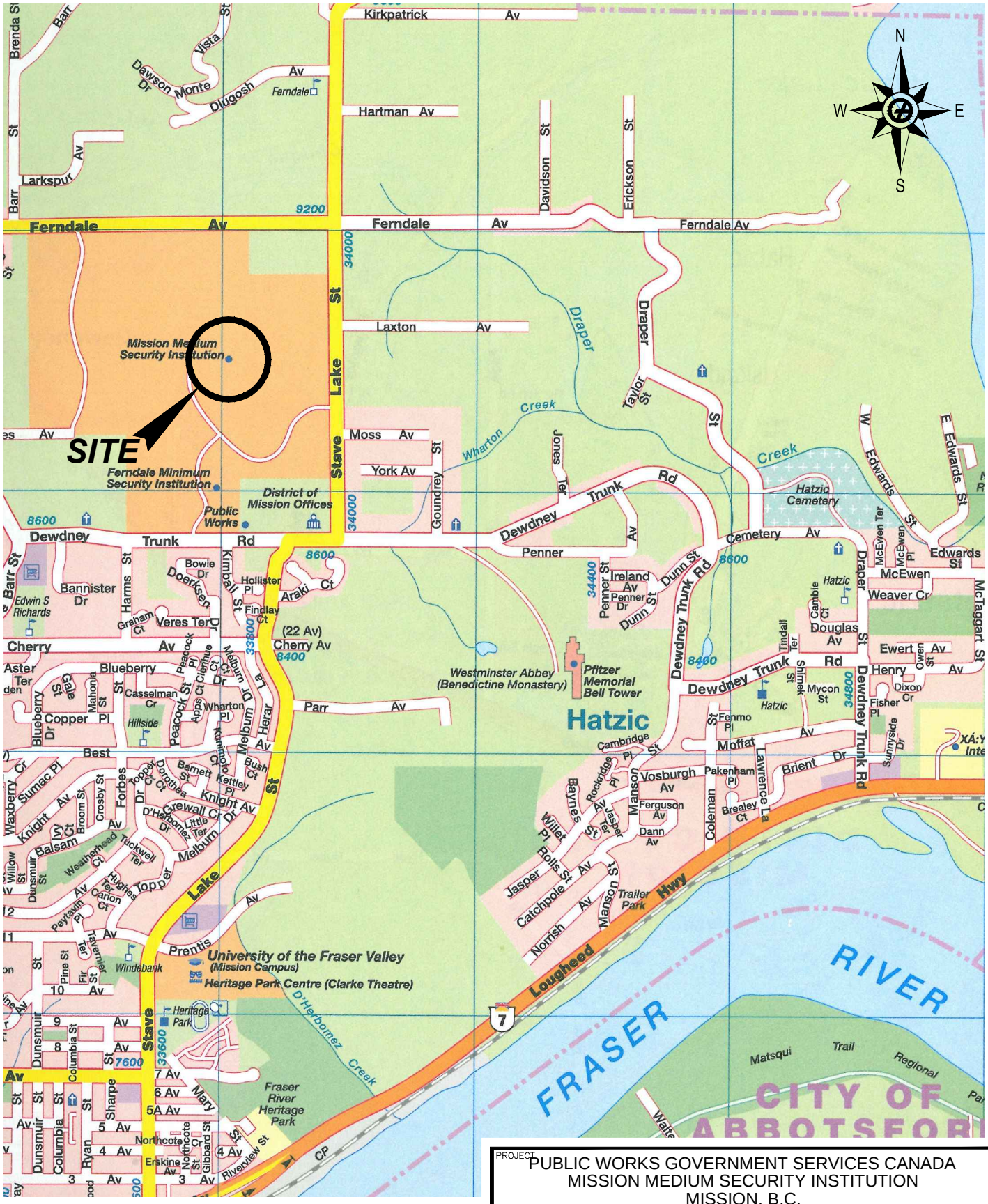
Sample Disposal: Golder will dispose of all uncontaminated soil and/or rock samples 90 days following issue of this report or, upon written request of the Client, will store uncontaminated samples and materials at the Client's expense. In the event that actual contaminated soils, fills or groundwater are encountered or are inferred to be present, all contaminated samples shall remain the property and responsibility of the Client for proper disposal.

Follow-Up and Construction Services: All details of the design were not known at the time of submission of Golder's report. Golder 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 Golder's report.

During construction, Golder should be retained to perform sufficient and timely observations of encountered conditions to confirm and document that the subsurface conditions do not materially differ from those interpreted conditions considered in the preparation of Golder's report and to confirm and document that construction activities do not adversely affect the suggestions, recommendations and opinions contained in Golder's report. Adequate field review, observation and testing during construction are necessary for Golder to be able to provide letters of assurance, in accordance with the requirements of many regulatory authorities. In cases where this recommendation is not followed, Golder's responsibility is limited to interpreting accurately the information encountered at the borehole locations, at the time of their initial determination or measurement during the preparation of the Report.

Changed Conditions and Drainage: Where conditions encountered at the site differ significantly from those anticipated in this report, either due to natural variability of subsurface conditions or construction activities, it is a condition of this report that Golder be notified of any changes and be provided with an opportunity to review or revise the recommendations within this report. Recognition of changed soil and rock conditions requires experience and it is recommended that Golder be employed to visit the site with sufficient frequency to detect if conditions have changed significantly.

Drainage of subsurface water is commonly required either for temporary or permanent installations for the project. Improper design or construction of drainage or dewatering can have serious consequences. Golder takes no responsibility for the effects of drainage unless specifically involved in the detailed design and construction monitoring of the system.



PROJECT

PUBLIC WORKS GOVERNMENT SERVICES CANADA
MISSION MEDIUM SECURITY INSTITUTION
MISSION, B.C.

TITLE

KEY PLAN

Golder Associates

PROJECT No. 11-1447-0264			PHASE 2000	TASK 2020	
DESIGN	R.H.	DEC-06-11	FILE No.1114470264_2020-01		
CADD	M.R.	DEC-15-11	SCALE AS SHOWN	REV. 0	
CHECK	C.S.	FEB-17-12	**FIGURE 1**		
REVIEW	B.L.J.M.	FEB-17-12			

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FERNDALE
COMPOST & EQUIPMENT
STORAGE SHED

FERNDALE
IN VESSEL COMPOST
BUILDING

UNIT MC

UNIT I

UNIT M

UNIT LU5

UNIT I02

UNIT LU2

UNIT E/S

UNIT LU4

UNIT Y

UNIT U

UNIT A-M

UNIT W

UNIT R

UNIT A-W

UNIT A-K

UNIT LU1

AH/DCPT11-03

AH/DCPT11-02 AH/DCPT11-04

AH11-01

UNIT A-P

UNIT H

UNIT LU3

UNIT E

AH11-05

AH/DCPT11-07

AH/DCPT11-08 AH/DCPT11-06

UNIT 3

UNIT A-R

UNIT C

UNITS 1&2

UNIT T01

UNIT T04

N

W E

S

LEGEND

- EXISTING BUILDINGS
- PROPOSED BUILDINGS
- PROPOSED PARKING ADDITIONS
- APPROXIMATE AUGERHOLE LOCATIONS
- APPROXIMATE AH/DCPT LOCATIONS

REFERENCE

PUBLIC WORKS GOVERNMENT SERVICES CANADA, FILE: MISSIONsite GO AND GI TESTS.dwg, DATED: DECEMBER 6, 2011

0 50

SCALE (m)

PROJECT
PUBLIC WORKS GOVERNMENT SERVICES CANADA
MISSION MEDIUM SECURITY INSTITUTION
MISSION, B.C.

TITLE
SITE PLAN

Golder Associates

PROJECT No. 11-1447-0264			PHASE 2000	TASK 2020	
DESIGN	R.H.	DEC-06-11	FILE No1114470264_2020-02		
CADD	M.R.	DEC-15-11	SCALE AS SHOWN	REV.	
CHECK	C.S.	FEB-17-12	**FIGURE 2**		
REVIEW	B.L.J.M.	FEB-17-12			

PROJECT No.: 11-1447-0264/2020

RECORD OF AUGERHOLE: AH11-01

SHEET 1 OF 1

LOCATION: See Figure 2.
N: ~5445910 E: ~551669
Note: Northing and Easting Coordinates have been determined by GPS in the field and are approximate only.

DRILLING DATE: November 24, 2011
DRILLING CONTRACTOR: Downrite Drilling Ltd.

DATUM: Local

INCLINATION: -90°

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp — W — Wl; NP - Non-Plastic) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
		Ground Surface									
0	Truck Mounted Auger Drill / Solid Stem Auger	Compact, moist, brown-grey SILT and fine SAND, trace gravel and organics (roots). [possible FILL]		0.00	1	AS			○	M	No Groundwater Seepage Encountered in Open Hole.
1		Compact, moist, brown, fine sandy SILT, trace gravel.		0.46	2	AS			○		
2		Dense, moist, brown-grey SILT, some fine sand, trace gravel.		1.83							
3		Compact, moist, grey SILT, trace to some fine sand.		2.59	3	AS			○		
4		Compact to dense, moist, brown, sandy SILT, some gravel.		3.05	4	AS			○		
5		End of Augerhole.		4.57							
6											
7											
8											
9											
10											

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: AN
CHECKED: DEN

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PROJECT No.: 11-1447-0264/2020

RECORD OF AUGERHOLE: AH/DCPT11-02

SHEET 1 OF 1

LOCATION: See Figure 2.
N: ~5445907 E: ~551685
Note: Northing and Easting Coordinates have been determined by GPS in the field and are approximate only.

DATUM: Local

DRILLING DATE: November 24, 2011
DRILLING CONTRACTOR: Downrite Drilling Ltd.

INCLINATION: -90°

PENETRATION TEST HAMMER, 63.5kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m
0		Ground Surface					
	Truck Mounted Auger Drill, Solid Stem Auger	Asphaltic Concrete.		0.09			
		Compact, moist, grey, gravelly SAND, trace silt. [possible FILL]			1	AS	
1		Dense to very dense, moist, mottled grey, silty SAND, trace gravel.		0.76	2	AS	
		Very dense, moist, brown-grey, sandy SILT, trace gravel.		1.52	3	AS	
2		Very dense, moist, grey, sandy SILT, trace gravel with trace to some gravel at about 3.05 to 4.6 m (possible cobbles).		1.83	4	AS	
3							
					5	AS	
4							
		End of Augerhole.		4.57			
5							
6							
7							
8							
9							
10							

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20, 40, 60, 80)
SHEAR STRENGTH Cu, kPa (20, 40, 60, 80) — nat V. + Q - ● — rem V. ⊕ U - ○

HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6}, 10^{-5}, 10^{-4}, 10^{-3})
WATER CONTENT PERCENT (10, 20, 30, 40) — Wp, W, Wl
NP - Non-Plastic

End of Dynamic Cone Penetration Test.

ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
M	No Groundwater Seepage Encountered in Open Hole.

DEPTH SCALE
1 : 50

LOGGED: AN
CHECKED: DEN

Golder Associates

PROJECT No.: 11-1447-0264/2020

RECORD OF AUGERHOLE: AH/DCPT11-03

SHEET 1 OF 1

LOCATION: See Figure 2.
N: ~5445907 E: ~551695
Note: Northing and Easting Coordinates have been determined by GPS in the field and are approximate only.

DRILLING DATE: November 24, 2011
DRILLING CONTRACTOR: Downrite Drilling Ltd.

DATUM: Local

INCLINATION: -90°

PENETRATION TEST HAMMER, 63.5kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m
0		Ground Surface					
	Truck Mounted Auger Drill, Solid Stem Auger	Asphaltic Concrete.					
		Compact, moist, brown SILT, some sand, trace gravel. [FILL]		0.09	1	AS	
		Loose to compact, moist, brown SILT, some fine sand, trace gravel and organics (roots).		0.30	2	AS	
1		Soft, wet, dark brown ORGANIC SILT, trace fine sand and gravel.		0.76	3	AS	
2		Dense, moist, grey, sandy SILT, trace gravel.		1.52	4	AS	
3		Dense to very dense, moist, grey, sandy SILT. trace clay and fine gravel.		3.05	5	AS	
4							
5					6	AS	
		End of Augerhole.		5.18			
6							
7							
8							
9							
10							

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m: 20, 40, 60, 80

SHEAR STRENGTH Cu, kPa: nat V. + Q - ●; rem V. ⊕ U - ○; 20, 40, 60, 80

HYDRAULIC CONDUCTIVITY, k, cm/s: 10^{-6}, 10^{-5}, 10^{-4}, 10^{-3}

WATER CONTENT PERCENT: Wp, W, Wl; NP - Non-Plastic; 10, 20, 30, 40

ADDITIONAL LAB. TESTING: 67, 91, A

End of Dynamic Cone Penetration Test.

PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION: No Groundwater Seepage Encountered in Open Hole.

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: AN
CHECKED: DEN

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PROJECT No.: 11-1447-0264/2020

RECORD OF AUGERHOLE: AH/DCPT11-04

SHEET 1 OF 1

LOCATION: See Figure 2.
N: ~5445907 E: ~551706
Note: Northing and Easting Coordinates have been determined by GPS in the field and are approximate only.

DRILLING DATE: November 24, 2011
DRILLING CONTRACTOR: Downrite Drilling Ltd.

DATUM: Local

INCLINATION: -90°

PENETRATION TEST HAMMER, 63.5kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m
0	Truck Mounted Auger Drill / Solid Stem Auger	Ground Surface					
		Asphaltic Concrete.		0.09			
		Loose, moist, brown SILT, some fine sand, trace gravel and organics (roots). [FILL]			1	AS	
					2	AS	
1				0.91			
		Soft, moist, dark brown ORGANIC SILT, trace fine sand and gravel.			3	AS	
		Compact, wet, grey SAND, some silt, trace gravel.		1.83	4	AS	
2				2.13			
		Compact, wet, mottled grey SILT and fine SAND, trace gravel.			5	AS	
3				3.05			
		Dense to very dense, moist, grey SILT and fine SAND trace gravel with presence of cobbles.			6	AS	
4							
5					7	AS	
6				6.10			
		End of Augerhole.					
7							
8							
9							
10							

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m: 20, 40, 60, 80

SHEAR STRENGTH Cu, kPa: 20, 40, 60, 80 — nat V. + Q - ● — rem V. ⊕ U - ○

HYDRAULIC CONDUCTIVITY, k, cm/s: 10^{-6}, 10^{-5}, 10^{-4}, 10^{-3}

WATER CONTENT PERCENT: Wp — W — Wl; NP - Non-Plastic: 10, 20, 30, 40

113

End of Dynamic Cone Penetration Test.

ADDITIONAL LAB. TESTING: M, M

PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION

Soil Cuttings.

12/13/2011

11/24/2011

Screen
Filter Sand

DEPTH SCALE
1 : 50

LOGGED: AN
CHECKED: DEN

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PROJECT No.: 11-1447-0264/2020

RECORD OF AUGERHOLE: AH11-05

SHEET 1 OF 1

LOCATION: See Figure 2.
N: ~5445891 E: ~551696
Note: Northing and Easting Coordinates have been determined by GPS in the field and are approximate only.

DRILLING DATE: November 24, 2011
DRILLING CONTRACTOR: Downrite Drilling Ltd.

DATUM: Local

INCLINATION: -90°

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl, NP - Non-Plastic) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
0	Truck Mounted Auger Drill / Solid Stem Auger	Ground Surface Asphaltic Concrete.									
		Compact, moist, grey SAND and GRAVEL, trace silt. [FILL]		0.15							
		Compact, moist, brown SILT, some fine sand to sandy, trace gravel.			1	AS				M	
1		Compact, wet, brown-orange SILT and SAND, trace to some gravel.		0.76	2	AS					No Groundwater Seepage Encountered in Open Hole.
		Compact, moist, mottled grey, silty SAND, trace gravel.		1.22	3	AS					
2											
				2.13	4	AS					
3		Compact to dense, moist, brown-grey SILT, some fine sand, trace gravel.									
4					5	AS					
		End of Augerhole.		4.57							
5											
6											
7											
8											
9											
10											

DEPTH SCALE
1 : 50

LOGGED: AN
CHECKED: DEN

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PROJECT No.: 11-1447-0264/2020

RECORD OF AUGERHOLE: AH/DCPT11-06

SHEET 1 OF 1

LOCATION: See Figure 2.

DATUM: Local

DRILLING DATE: November 25, 2011

DRILLING CONTRACTOR: Downrite Drilling Ltd.

INCLINATION: -90°

PENETRATION TEST HAMMER, 63.5kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m
0	Truck Mounted Auger Drill Solid Stem Auger	Ground Surface					
		Asphaltic Concrete.		0.08			
		Compact to dense, moist, grey SAND and GRAVEL, to gravelly, SAND, trace silt. [FILL]			1	AS	
1							
		Loose, moist, grey SILT and SAND, trace gravel. [FILL]		1.83	2	AS	
2							
		Soft, moist, brown-grey CLAYEY SILT, trace fine sand and gravel. [FILL]		2.90	3	AS	
3		Loose to compact, wet, mottled grey SILT, some fine sand, trace gravel.		3.20	4	AS	
4		Compact, wet, grey, fine sandy SILT, trace gravel with silty SAND layer from about 6.7 to 7.0 m.		3.96	5	AS	
5							
					6	AS	
6							
					7	AS	
7		Dense to very dense, moist, grey, sandy SILT, trace gravel.		7.47	8	AS	
				7.62			
8		End of Augerhole.					
9							
10							

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20, 40, 60, 80)

SHEAR STRENGTH Cu, kPa — nat V. + Q - ● rem V. ⊕ U - ○ (20, 40, 60, 80)

HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6}, 10^{-5}, 10^{-4}, 10^{-3})

WATER CONTENT PERCENT (10, 20, 30, 40)

Wp — W — Wl

NP - Non-Plastic

ADDITIONAL LAB. TESTING

PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION

Soil Cuttings. 12/13/2011

11/25/2011

Screen Filter Sand

End of Dynamic Cone Penetration Test.

DEPTH SCALE

1 : 50

LOGGED: AN

CHECKED: DEN

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PROJECT No.: 11-1447-0264/2020

RECORD OF AUGERHOLE: AH/DCPT11-07

SHEET 1 OF 1

LOCATION: See Figure 2.

DRILLING DATE: November 25, 2011

DATUM: Local

DRILLING CONTRACTOR: Downrite Drilling Ltd.

INCLINATION: -90°

PENETRATION TEST HAMMER, 63.5kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl, NP - Non-Plastic) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
0	Truck Mounted Auger Drill, Solid Stem Auger	Ground Surface Asphaltic Concrete.		0.08							
1		No recovery. Noted at surface to be SAND and GRAVEL with presence of cobbles [FILL]									
2		Compact, moist, mottled brown, fine sandy SILT. trace clay and gravel.		1.52	1	AS				A	Water level observed in open hole during drilling
3		Compact, wet, brown SILT and fine SAND. trace gravel.		2.44	2 3	AS AS				M	
4		Compact, wet, brown-grey SAND, trace silt and gravel.		4.11	4	AS					
5		Compact, moist, light brown, fine sandy SILT, trace gravel.		4.57	5	AS					
		Compact, wet, grey, fine sandy SILT, trace gravel.		5.33	6	AS					
6		Compact, wet, brown, silty, fine SAND.		5.79	7	AS					
		Compact to dense, moist, grey SILT, some fine sand, trace gravel.		6.10	8	AS					
7		End of Augerhole.		6.71							
8								End of Dynamic Cone Penetration Test.			
9											
10											

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: AN

CHECKED: DEN

PROJECT No.: 11-1447-0264/2020

RECORD OF AUGERHOLE: AH/DCPT11-08

SHEET 1 OF 1

LOCATION: See Figure 2.

DATUM: Local

DRILLING DATE: November 25, 2011

DRILLING CONTRACTOR: Downrite Drilling Ltd.

INCLINATION: -90°

PENETRATION TEST HAMMER, 63.5kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl; NP - Non-Plastic) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER, STANDPIPE OR THERMISTOR INSTALLATION
0		Ground Surface									
		Asphaltic Concrete.									
		Compact to dense, moist, brown, gravelly SAND, trace silt. [FILL]		0.08	1	AS					
				0.46	2	AS			○		
1		Compact to dense, moist, brown-grey SILT and SAND, trace gravel.									
2					3	AS					Water level observed in open hole during drilling
				2.13							
		Compact, wet, grey SILT and SAND. trace gravel.			4	AS			○	M	
3											
		Compact, wet, brown-grey SILT, trace to some fine sand, trace gravel.		3.35	5	AS			○		
4	Truck Mounted Auger Drill Solid Stem Auger	Compact to dense, wet, brown-grey SAND, trace to some silt.		3.96	6	AS					
		Loose to compact, wet, grey SILT and fine SAND, trace gravel.		4.57	7	AS			○	M	
5											
				5.18	8	AS			○		
6											
		Dense to very dense, moist, grey SILT, some fine sand, trace clay and gravel with layers of silty SAND from about 7 to 7.3 m.							End of Dynamic Cone Penetration Test.		
7					9	AS			○		
8											
					10	AS					
9		End of Augerhole.		8.84							
10											

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: AN

CHECKED: DEN

APPENDIX I

2010 National Building Code Seismic Hazard Calculation (from Geological Survey of Canada website)

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: Craig Smith, Golder Associates Ltd. January 09, 2012

Site Coordinates: 49.1643 North 122.2907 West

User File Reference: Mission Institution

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)
0.913	0.616	0.309	0.165	0.450

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.*** Avertissement: Vous êtes dans une région qui considère l'aléa d'un événement déterministe de subduction de Cascadia pour le code de bâtiment national. Les valeurs déterminées pour les probabilités élevées (0.01 par an) dans cette région ne considèrent pas le risque de ce type de tremblement de terre.

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)	0.220	0.482	0.656
Sa(0.5)	0.142	0.319	0.438
Sa(1.0)	0.074	0.158	0.216
Sa(2.0)	0.038	0.083	0.115
PGA	0.114	0.242	0.325

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

APPENDIX II

Results of Laboratory Testing

PARTICLE SIZE ANALYSIS OF SOILS

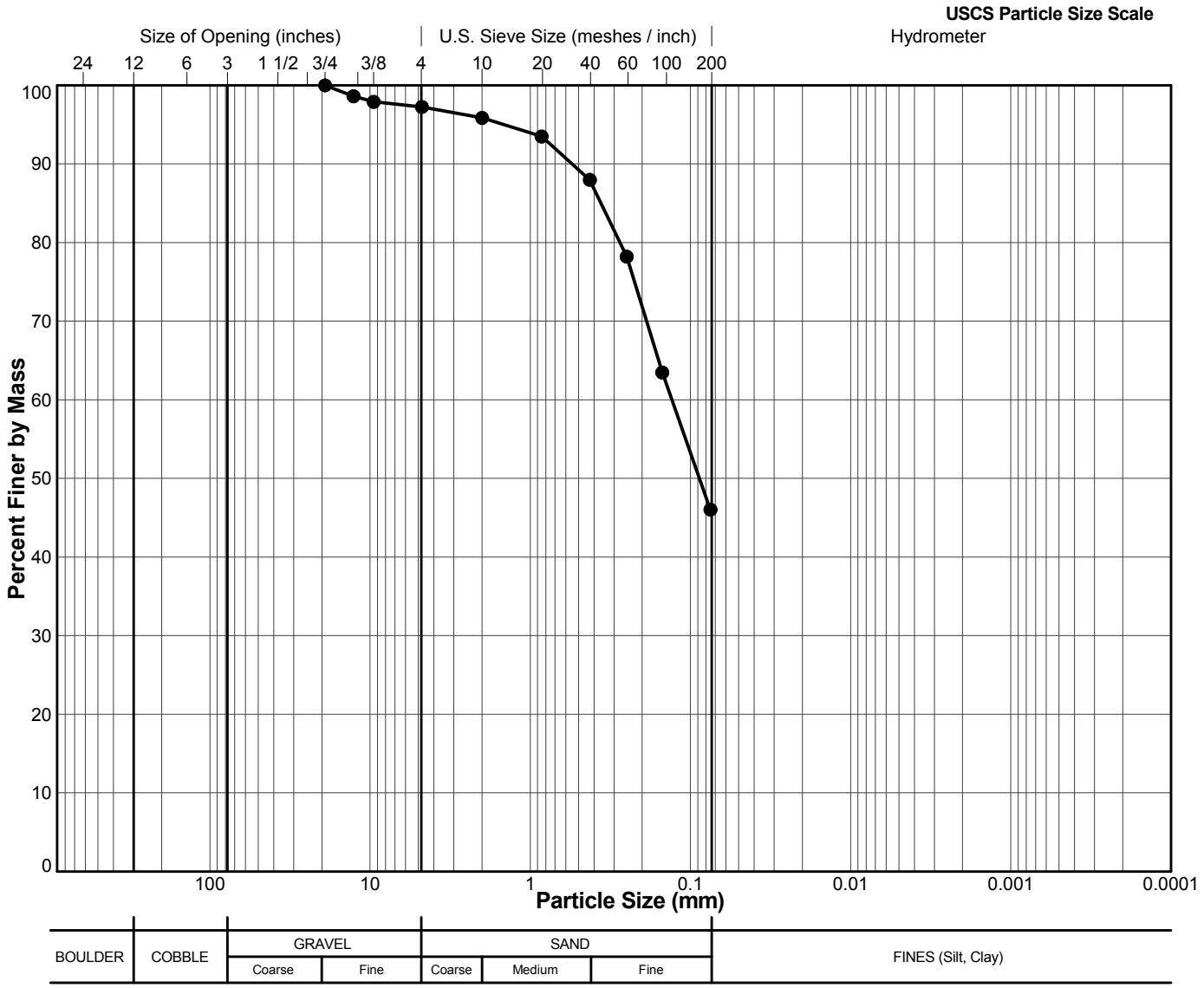
Reference(s)
ASTM D 422-63 (2007)

Client:	PWGSC	**Sample Location:**	AH11-01
Project:	PWGSC - Geotechnical Services - Mission Institution	**Sample No.:**	1
Location:	Mission Institution, Mission	**Depth Interval (m):**	0.15 to 0.46
Project No.:	11-1447-0264/2020 **Phase:** 2000 **Task:** 2020	**Lab Schedule No.:**	11-55

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 19.1	**Hardness:**

Method: Split, Washed



CS	**12/13/2011**	**DEN**	**12/27/2011**
Tech	Date	Checked	Date

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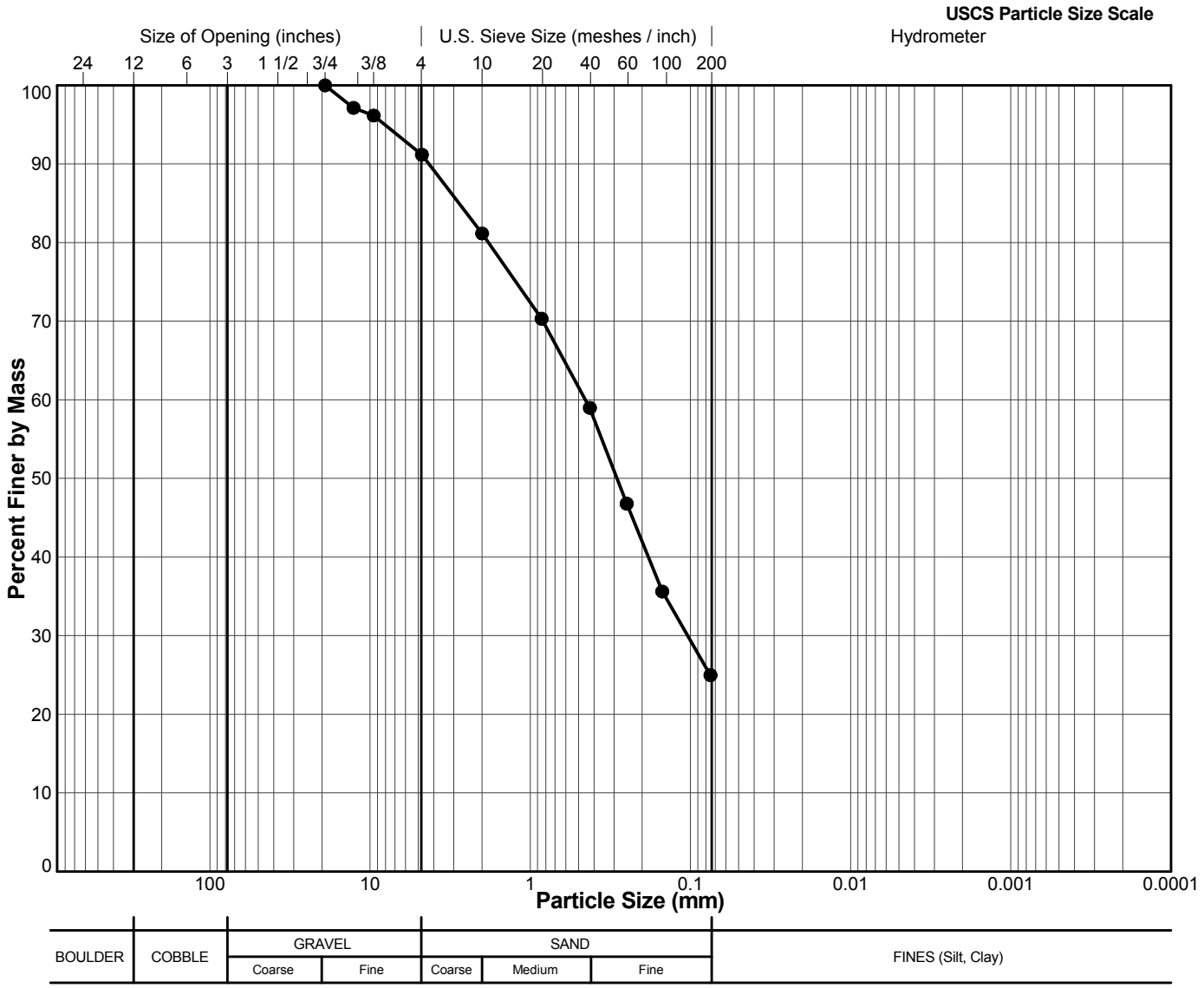
PARTICLE SIZE ANALYSIS OF SOILS

Reference(s)
ASTM D 422-63 (2007)

Client:	PWGSC	**Sample Location:**	AH/DCPT11-02
Project:	PWGSC - Geotechnical Services - Mission Institution	**Sample No.:**	2
Location:	Mission Institution, Mission	**Depth Interval (m):**	1.07 to 1.37
Project No.:	11-1447-0264/2020 **Phase:** 2000 **Task:** 2020	**Lab Schedule No.:**	11-55

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 19.1	**Hardness:**
Method: Split, Washed	



CS	**12/13/2011**	**DEN**	**12/27/2011**
Tech	Date	Checked	Date

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PARTICLE SIZE ANALYSIS OF SOILS

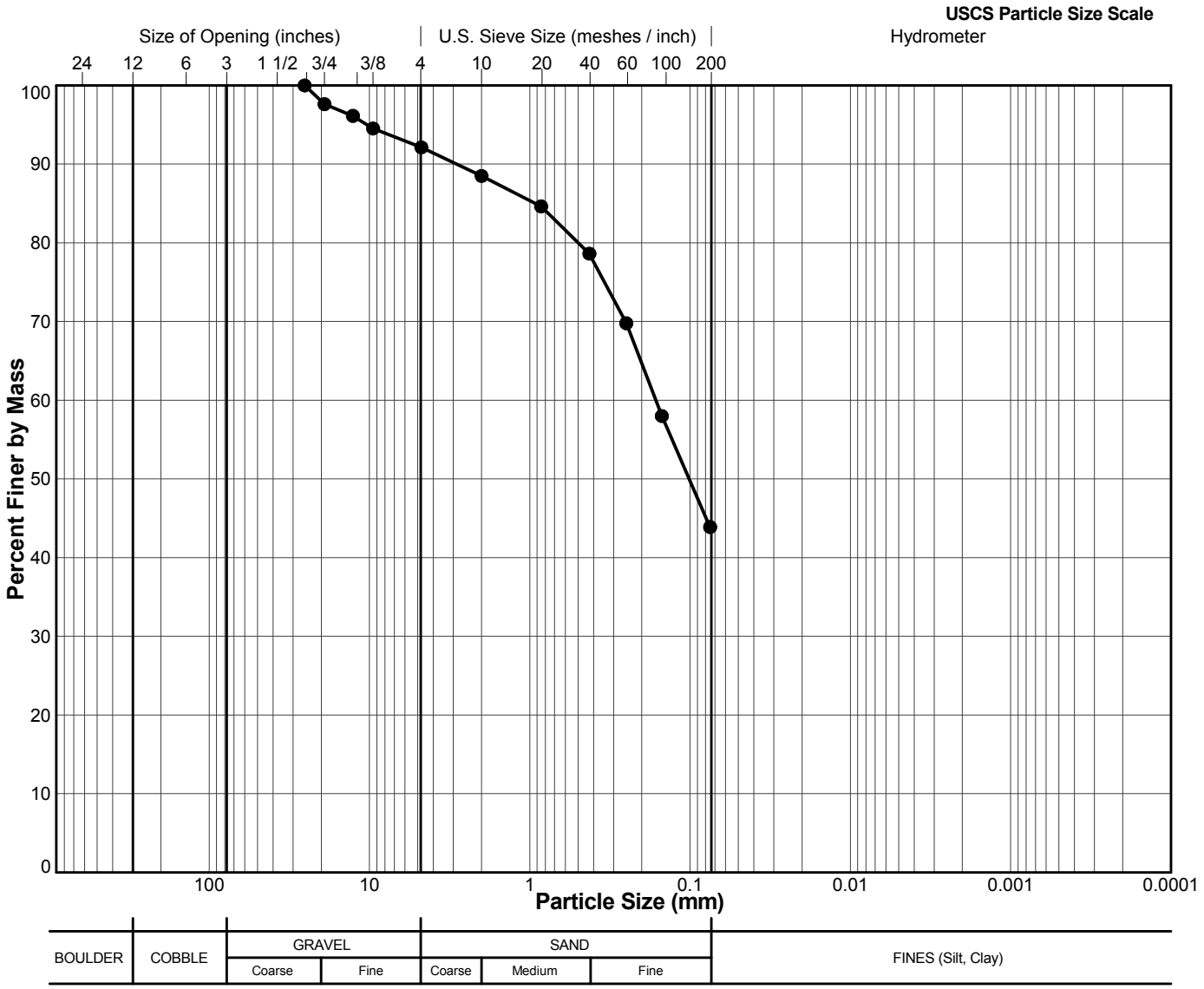
Reference(s)
ASTM D 422-63 (2007)

Client:	PWGSC	**Sample Location:**	AH/DCPT11-04
Project:	PWGSC - Geotechnical Services - Mission Institution	**Sample No.:**	5
Location:	Mission Institution, Mission	**Depth Interval (m):**	2.44 to 2.74
Project No.:	11-1447-0264/2020 **Phase:** 2000 **Task:** 2020	**Lab Schedule No.:**	11-55

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 25.4	**Hardness:**

Method: Split, Washed



CS	**12/13/2011**	**DEN**	**12/27/2011**
Tech	Date	Checked	Date

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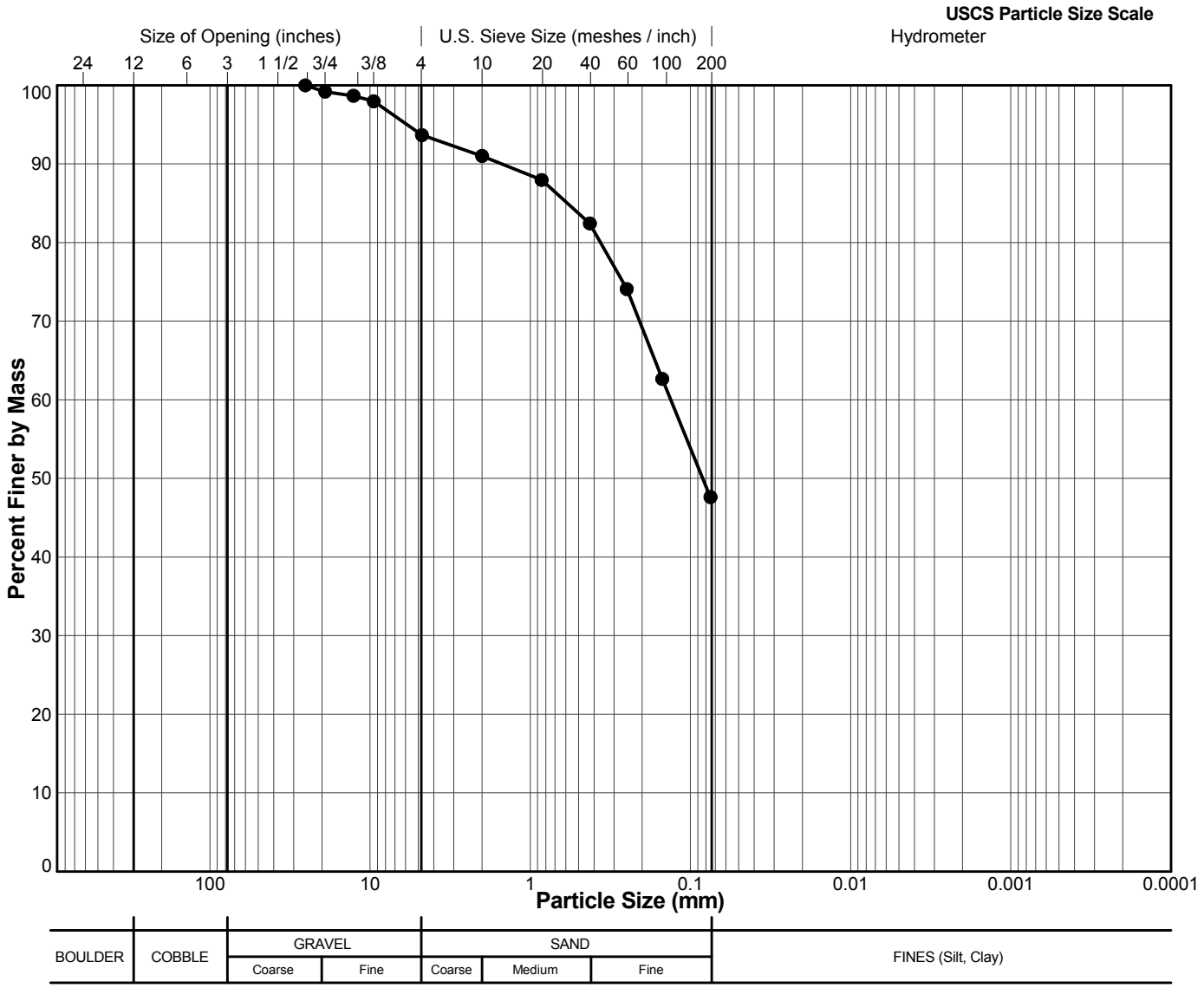
PARTICLE SIZE ANALYSIS OF SOILS

Reference(s)
ASTM D 422-63 (2007)

Client:	PWGSC	**Sample Location:**	AH/DCPT11-04
Project:	PWGSC - Geotechnical Services - Mission Institution	**Sample No.:**	6
Location:	Mission Institution, Mission	**Depth Interval (m):**	3.96 to 4.27
Project No.:	11-1447-0264/2020 **Phase:** 2000 **Task:** 2020	**Lab Schedule No.:**	11-55

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 25.4	**Hardness:**
Method: Split, Washed	



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Tech	Date	Checked	Date

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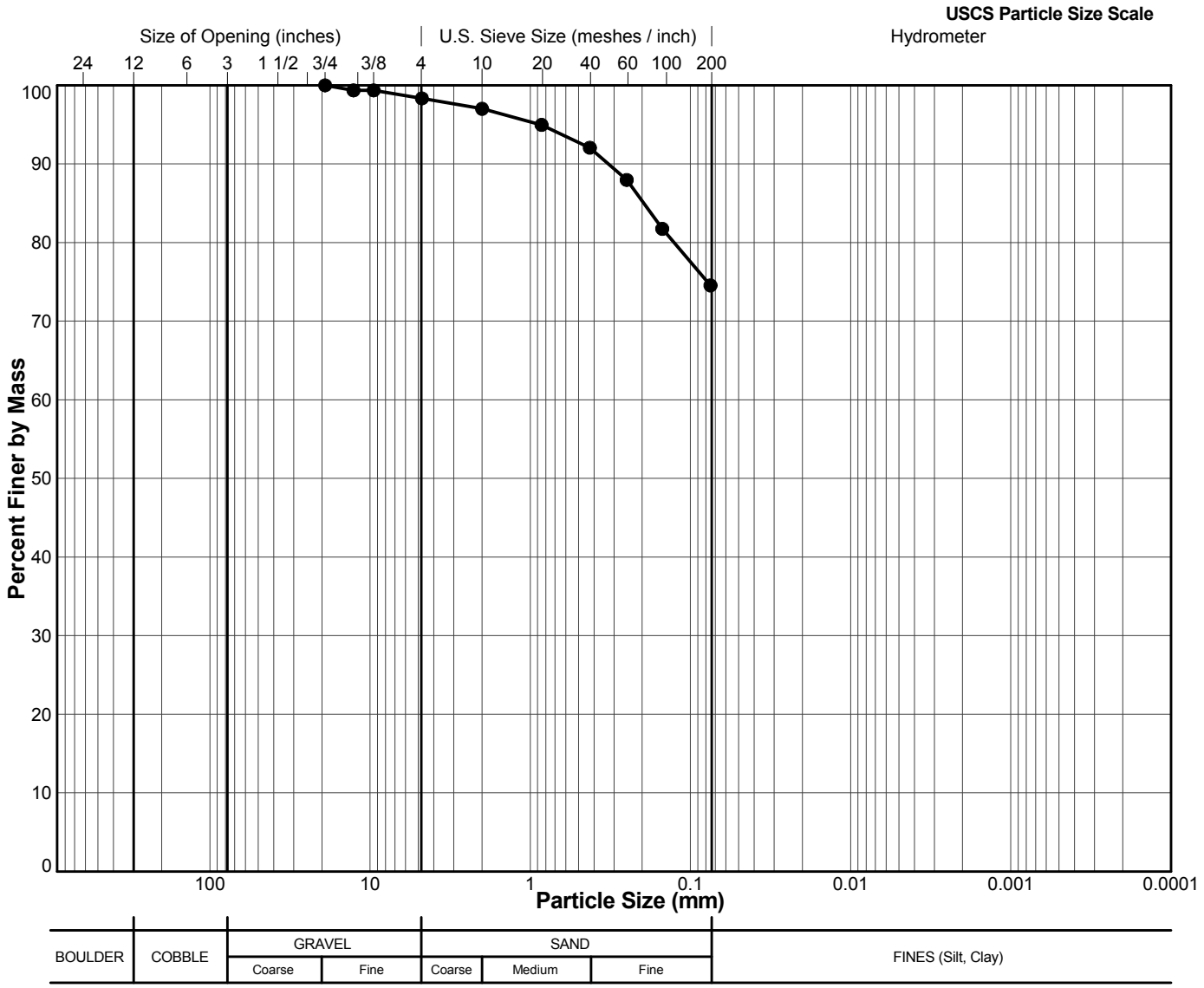
PARTICLE SIZE ANALYSIS OF SOILS

Reference(s)
ASTM D 422-63 (2007)

Client:	PWGSC	**Sample Location:**	AH11-05
Project:	PWGSC - Geotechnical Services - Mission Institution	**Sample No.:**	1
Location:	Mission Institution, Mission	**Depth Interval (m):**	0.46 to 0.76
Project No.:	11-1447-0264/2020 **Phase:** 2000 **Task:** 2020	**Lab Schedule No.:**	11-55

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 19.1	**Hardness:**
Method: Split, Washed	



CS	**12/13/2011**	**DEN**	**12/27/2011**
Tech	Date	Checked	Date

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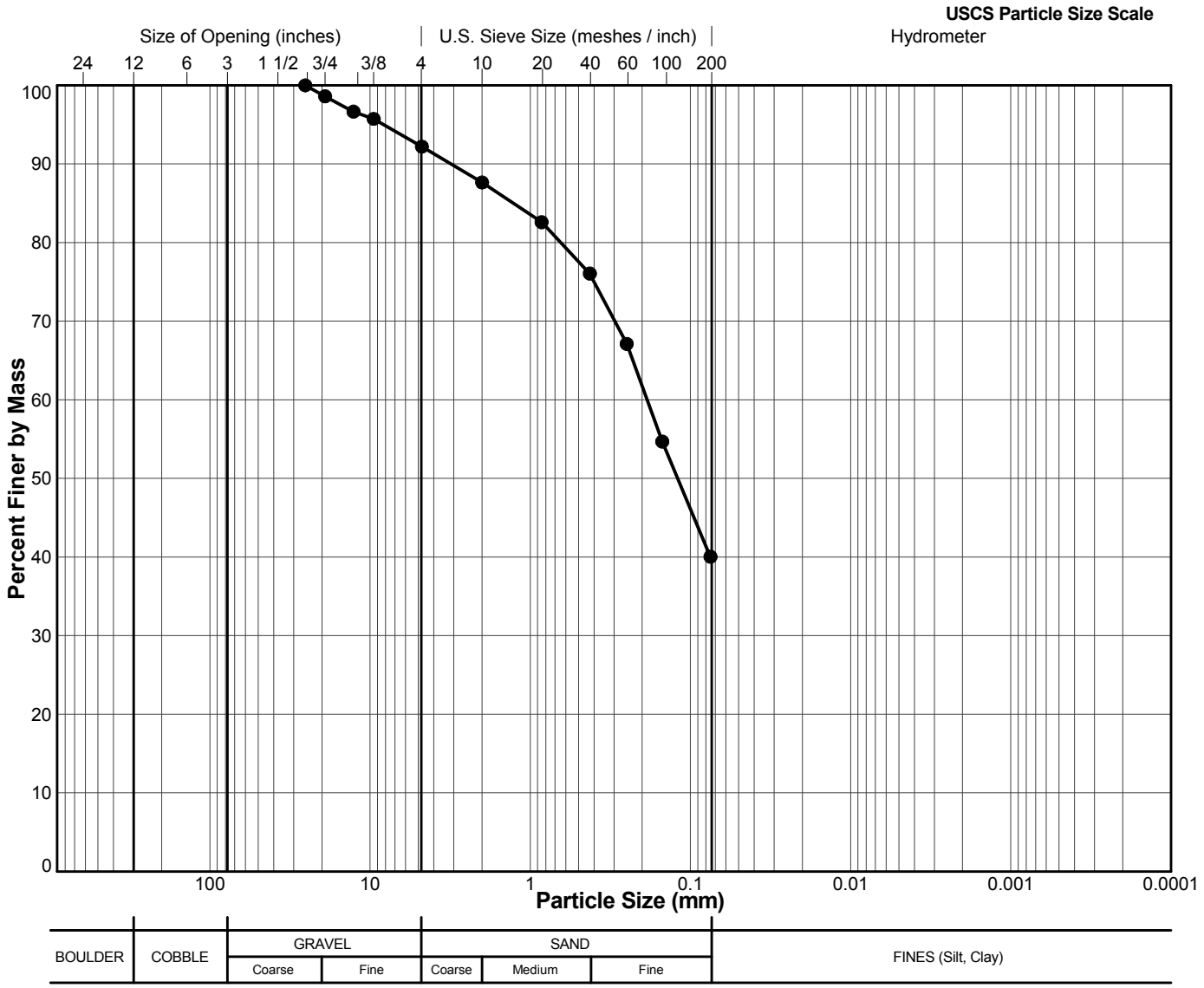
PARTICLE SIZE ANALYSIS OF SOILS

Reference(s)
ASTM D 422-63 (2007)

Client:	PWGSC	**Sample Location:**	AH/DCPT11-07
Project:	PWGSC - Geotechnical Services - Mission Institution	**Sample No.:**	3
Location:	Mission Institution, Mission	**Depth Interval (m):**	3.35 to 3.66
Project No.:	11-1447-0264/2020 **Phase:** 2000 **Task:** 2020	**Lab Schedule No.:**	11-55

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 25.4	**Hardness:**
Method: Split, Washed	



CS	**12/13/2011**	**DEN**	**12/27/2011**
Tech	Date	Checked	Date

File:N:\ACTIVE\YEAR 2011\1447\11-1447-0264 (PWGSC - GEOTECH SERVICES - VARIOUS)\GINT DATABASE\11-1447-0264 (2020).GPJ Output Form:_LAB_PARTICLE SIZE (SINGLE) Template:BC REGION TEMPLATE BETA 1.GDT Library:BC REGION LIBRARY.GLB CRMSmith 02/17/12

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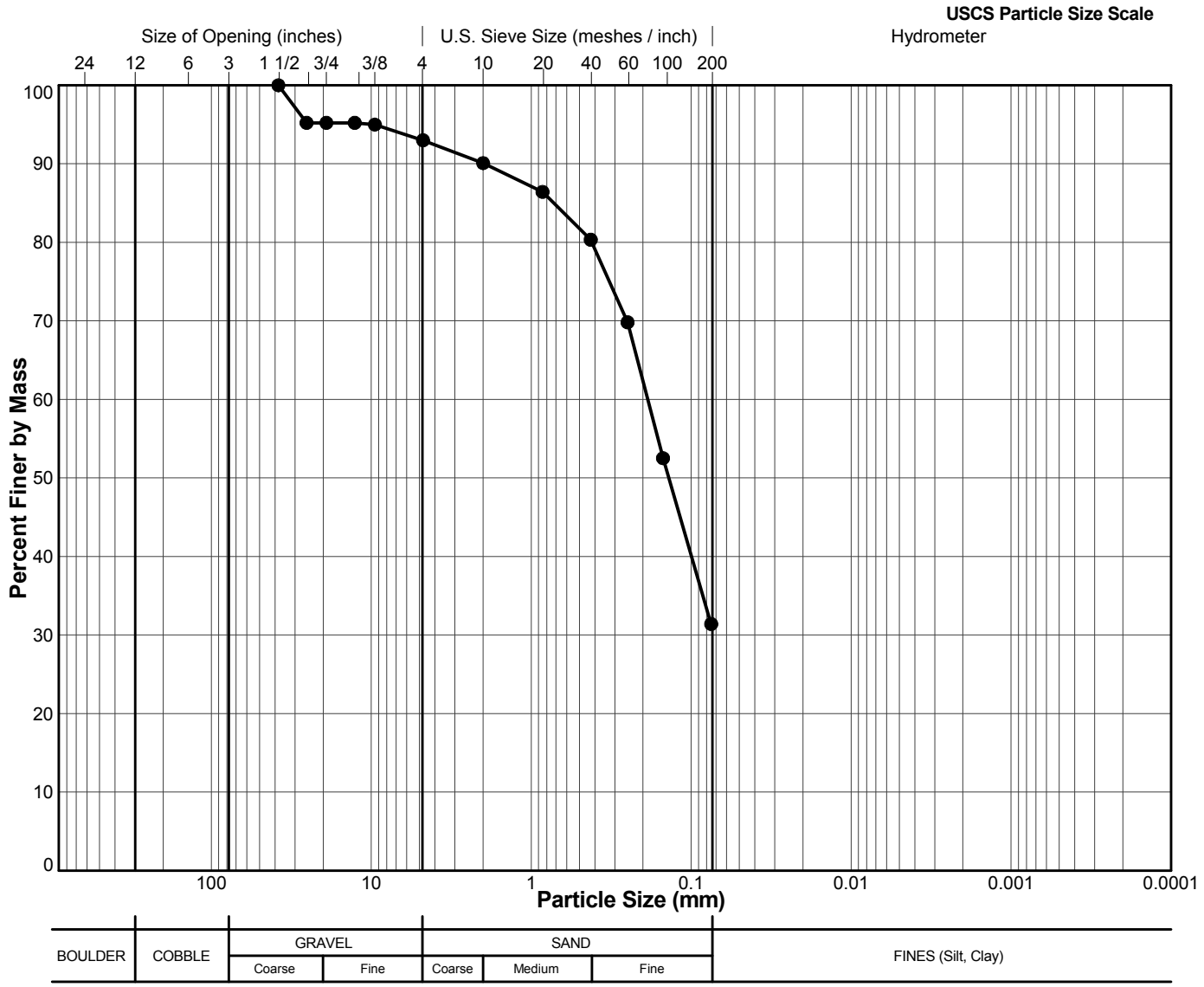
PARTICLE SIZE ANALYSIS OF SOILS

Reference(s)
ASTM D 422-63 (2007)

Client:	PWGSC	**Sample Location:**	AH/DCPT11-08
Project:	PWGSC - Geotechnical Services - Mission Institution	**Sample No.:**	4
Location:	Mission Institution, Mission	**Depth Interval (m):**	2.44 to 2.74
Project No.:	11-1447-0264/2020 **Phase:** 2000 **Task:** 2020	**Lab Schedule No.:**	11-55

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 38.1	**Hardness:**
Method: Split, Washed	



CS	**12/13/2011**	**DEN**	**12/27/2011**
Tech	Date	Checked	Date

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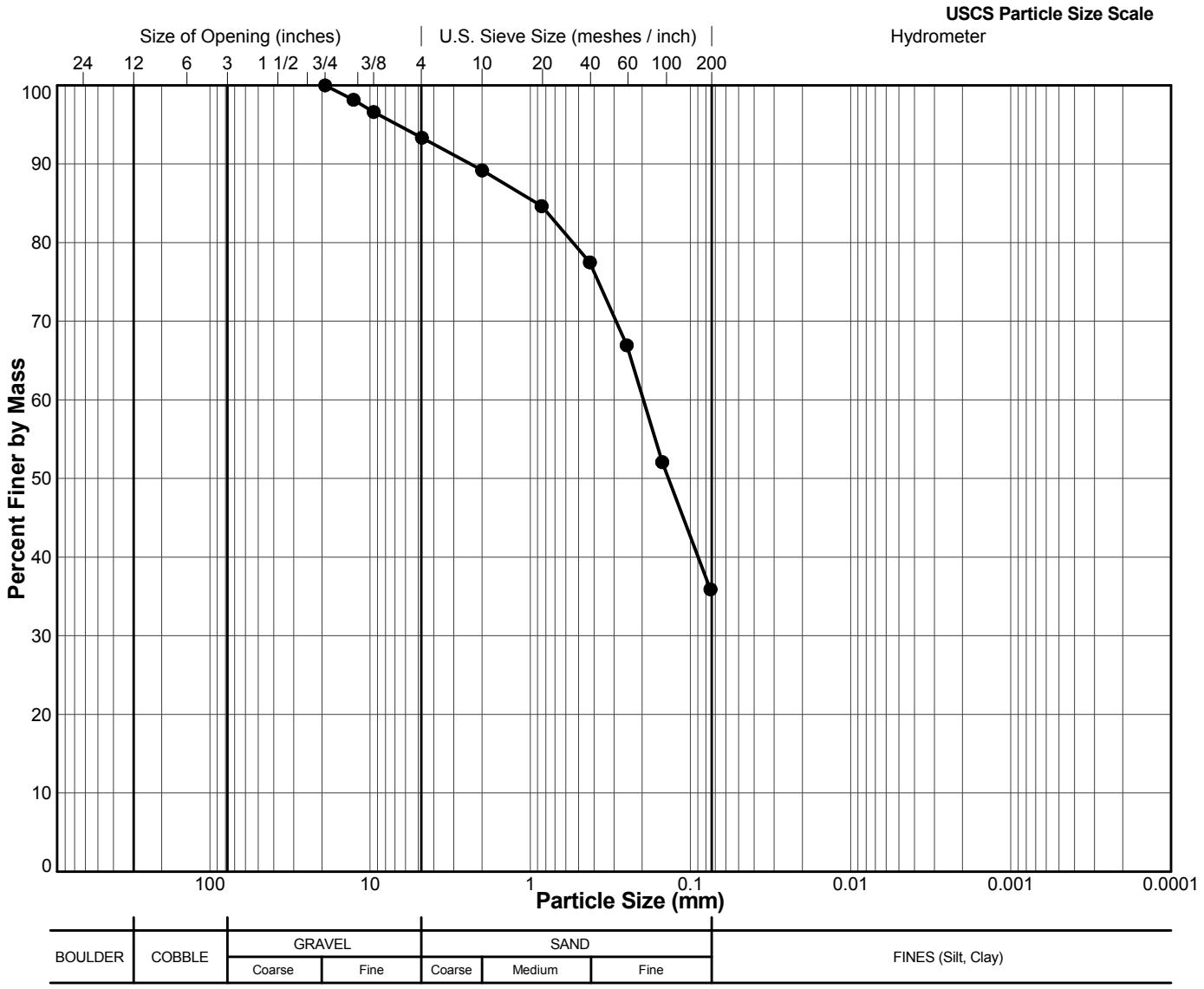
PARTICLE SIZE ANALYSIS OF SOILS

Reference(s)
ASTM D 422-63 (2007)

Client:	PWGSC	**Sample Location:**	AH/DCPT11-08
Project:	PWGSC - Geotechnical Services - Mission Institution	**Sample No.:**	7
Location:	Mission Institution, Mission	**Depth Interval (m):**	4.72 to 5.03
Project No.:	11-1447-0264/2020 **Phase:** 2000 **Task:** 2020	**Lab Schedule No.:**	11-55

Other Remarks: **N/A**

Specific Gravity (assumed):	**Shape:**
Max. Particle Size Passing (mm): 19.1	**Hardness:**
Method: Split, Washed	



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