

Tom Fitzgerald
Fitzgerald Building Company
Unit 101 – 7330 Arbutus St
Pemberton, BC
V0N 2L0

Attention: Tom Fitzgerald
tom@fitzgeraldinc.ca

**RE: Geotechnical Assessment
Multi-Family Residential
7421, 7423 & 7425 Prospect St, Pemberton, BC**

Dear Tom Fitzgerald,

1.0 INTRODUCTION

In accordance with your recent authorization, Kontur Geotechnical Consultants Inc. (Kontur) has completed this geotechnical assessment for the above-referenced project. The purposes of this study were to characterize the site from a geotechnical point-of-view and to provide comments and recommendations with respect to the construction of a multi-family residential building.

This letter, which summarizes the findings of the geotechnical assessment, has been prepared in accordance with standard and widely accepted geotechnical engineering principles and practices for similar projects in this region. This letter does not address any environmental issues or considerations related to the proposed project.

Review and use of this letter should be completed in accordance with the attached *Interpretation and Use of Study and Report* document. It is included as an integral part of this letter and should be read in conjunction with all parts of this letter.

2.0 UNDERSTANDING OF PROJECT

Based on review of provided information the project generally consists of the removal of three single family residential buildings and construction of a four-level building with underground parking. The lower level would consist of retail and office space, with the upper three levels being residential comprising a total of 45 units.

3.0 SOURCES OF INFORMATION

The following sources of information were used to assist this assessment:

- Information obtained from Kontur's in-house geotechnical database of nearby projects;
- Geotechnical exploration completed by Kontur on October 7, 2022;
- Rezoning application prepared by Stark/Fitzgerald Building Company;
- Project summary prepared by Stark/Fitzgerald Building Company;
- Site field survey completed by Doug Bush Survey Services Ltd. On October 5, 2021; and,



- Published surficial geology map “*Surficial Geology And Landslide Inventory Of The Upper Sea To Sky Corridor*” open file 5324.

4.0 FIELD AND LABORATORY WORK

On October 7, 2022, a geotechnical exploration program was completed which comprised four exploratory boreholes, designated BH-01 to BH-04, to depths ranging from 3.7m to 10m. The boreholes consisted of solid stem augers from a truck mounted rig. A Dynamic Cone Penetrometer Test was performed at each borehole from the surface to depths between 3.7m and 10m, to gather information on the relative density of the underlying soils.

Representative samples were taken for subsequent laboratory testing, which comprised four grain size distribution tests. Results of laboratory testing are attached.

The bores were backfilled using drilled spoil, tamped with the auger then capped with bentonite and sand in accordance with Provincial Groundwater Protection Regulations. The approximate test locations are shown in the attached ‘*Test Hole Location Plan – Proposed Multi-Family Residential Building*’ (Drawing 1). Detailed test hole logs are attached to this report.

5.0 SITE DESCRIPTION

5.1 General

The subject properties cover an approximate area of 1500m² situated within the Village of Pemberton. The subject properties extend across three civic address’; 7421, 7423 and 7425 Prospect Street; and cover an approximate rectangular dimension of 40m (aligned to the east-south-east) by 62m (aligned to the north-north-east). The property is bounded to the east by Prospect Street, to the north by neighbouring residential properties, to the west by an easement followed by neighbouring commercial properties and to the south by Aster Street.

At the time of geotechnical exploration, three single-family residential buildings were located within the subject site (one at each civic address). A lock block wall, about 1.8m exposed height, is offset laterally about 2m from the western property line, retaining a parking area and walkway for the commercial property.

Natural topography at the subject site sloped gently to the south-east. It should be noted that cut slopes (less than about 0.8m high) abutting to the pathway on the western side of Prospect Street indicates that previous site grading at the subject site had been completed for levelling purposes prior (or during) to the construction of the single-family residential buildings.

5.2 Sub-Surface Conditions

Review of surficial geology map “*Surficial Geology and Landslide Inventory of the Upper Sea To Sky Corridor*” indicates that the site is underlain by fan sediments consisting of poorly sorted sand and gravel, generally 2m to 15m thick.

Sub-surface conditions encountered during the geotechnical investigation generally comprised the following:



- **Unit A – SANDY SILT:** Encountered at BH-01 and BH-02 from the surface up to 0.3m depth (eastern portion of site). Stiff or very stiff, some surficial grass and rootlets.
- **Unit B – SILTY SAND:** Encountered at BH-03 and BH-04 from the surface to between about 1.5m and 2.1m depth (western portion of site). Typically compact, locally very loose to loose between about 1.2m and 2.1m depth in BH-04.
- **Unit C – GRAVELLY SAND/SANDY GRAVEL (compact):** Encountered in BH-01 through BH-03, beneath Units A and B, silt portion varies with depth and location. Locally loose to compact in BH-01 between about 3.7m and 6.7m depth.
- **Unit D – SILTY SAND (compact to dense):** Locally encountered in BH-02 between about 6.1m and 7.9m depth.
- **Unit E – GRAVELLY SAND (very dense):** Encountered in BH-01 and BH-02 below about 7.9m and 8.5m depth; and in BH-03 and BH-04 below about 2.1m and 3m depth (practical auger refusal depth, likely due to presence of boulder or till-like soils).

The sub-surface soil conditions encountered in the boreholes appeared to be in general agreement with the geological mapping. Detailed borehole logs are attached to this report.

Direct measurement of groundwater was not achievable due to borehole collapse. Observations of moisture content in the soil profile suggest that groundwater may be within the order of 6m to 8.5m depth. It should be noted that the exploratory program was undertaken following a prolonged period of dry weather.

It should be noted that the soil and groundwater conditions described above and encountered in the borehole is representative of the soil conditions in the immediate vicinity of each test location. Variation in stratigraphic conditions should be expected.

6.0 COMMENTS AND RECOMMENDATIONS

6.1 General

It is understood that the proposed development comprises the construction of a four-level multi-family residential building with underground parking. Excavations for the proposed underground parkade are expected to be in the order of 3m to 4m below existing site grades, anticipated to expose soil Unit C at the eastern portion of the site, and Unit E at the western portion. Special considerations may be necessary to ensure undermining of neighbouring structures is not induced.

Compact to dense granular soils, or structural fill placed thereon, would provide adequate bearing support for the proposed development on conventional pad and strip footings.

6.2 Temporary Excavations and Dewatering

Excavations deeper than 1.2m will require an initial review by the Geotechnical Engineer. Temporary excavations should be planned for inclinations no steeper than 1H:1V (Horizontal:Vertical). If significant seepage is encountered during excavation flatter slopes may be required. Excavation guidelines provided by WorkSafeBC must be followed.



Special considerations may be required regarding excavations adjacent to neighbouring properties and hard landscape features. Such features include, but are not limited to;

- Lock-block wall located alongside the western property boundary (offset from the subject property line about 2m);
- Footpath abutting to the eastern and southern property line; and,
- Adjacent property to the north.

For preliminary purposes, temporary excavations should not intrude into a zone defined as a 1H:1V gradient line projected down from the toe of any neighbouring structure, to the base of the excavation.

Temporary shoring may be required where excavations cannot meet the above guidelines. Kontur could provide additional guidance regarding temporary excavations/shoring as site plans develop.

Temporary slopes should be continually reviewed by the contractor who will be on site on a full-time basis and will be able to note changes in slope profile and monitor performance of the cut slope. Kontur should be notified immediately of any significant changes to temporary slopes.

Temporary construction dewatering of the excavations should be carried out as required to facilitate the excavations and placement of structural fill in the dry. Based on Kontur's experience for similar projects in the area, conventional ditch and sump methods would likely be sufficient for construction dewatering. However, the contractor would need to select a dewatering system in response to actual seepage volumes encountered during construction.

6.3 Site Preparation

Site preparation for the proposed construction should include the removal of organics, topsoil, moisture affected subgrade and other deleterious material to expose dry, compact native granular soils. Exposed native granular soils should be compacted with suitable equipment to achieve at least 95% Modified Proctor Maximum Dry Density (MPMDD) in the upper 300mm.

For areas requiring reinstatement of grade, structural fill consisting of 150mm minus or 75mm minus crushed sand and gravel with less than 5% fines passing the #200 sieve (0.075mm) should be placed in lifts no greater than 300mm thick, and compacted with a heavy ride-on type vibratory drum roller to achieve at least 95% Modified Proctor Maximum Dry Density (MPMDD).

6.4 Backfill and Structural Fill

Backfill and structural fill should comprise 75mm minus sand and gravel. Fill should be placed in lifts with a maximum thickness of 300mm compacted with suitable equipment to achieve at least 95% MPMDD. Structural fill should have no more than 5% fines content passing the 0.075 mm sieve (#200).

Any structural fill placed on ground inclined steeper than 5H:1V should be placed on horizontal benches, at least 300mm wide, progressively cut into the slope from bottom to top to prevent the creation of a preferential slip plane.

Structural fill should be placed on subgrade reviewed and approved by the geotechnical engineer. Compaction of fill should be confirmed by density testing.



6.5 Seismic Considerations

The British Columbia Building Code (BCBC 2018) provides guidelines and parameters for seismic design. The design earthquake corresponds to a 2% probability of exceedance in 50 years which is equivalent to a 1 in 2475-year return period. The Natural Resources Canada website provides interpolated site-specific hazard values and indicates a peak horizontal firm ground acceleration of 0.17g for the subject property.

Based on the characterization of the anticipated subsurface conditions within the subject property provided in this report, compact to dense granular soils, liquefaction of subsurface soil layers during the design earthquake is considered unlikely. Site Class D for Seismic Response Table 4.1.8.4.A is considered appropriate for the subject site.

6.6 Foundation Design

It is anticipated that conventional pad and strip footings, if required, will be placed on compact native granular soils represented by soil Unit C, or structural fill placed thereon.

Post construction settlement is expected to be less than about 25mm, with differential settlement being less than about 12mm over 8m. The following foundation values should be used for the design of footings:

Foundation Material	Factored Ultimate Bearing Resistance	Allowable Bearing Pressure
Native compact granular soils or structural fill placed thereon	150 kPa	100 kPa

The bearing capacities above are subject to the following conditions:

- Strip and pad footings have minimum widths of 450 mm and 600 mm, respectively;
- Footings are founded at least 0.6m below adjacent finished grade for confinement and frost protection purposes; and,
- Site preparations have been completed as described in Section 6.3 (site preparation) and load bearing surfaces should be reviewed by the geotechnical engineer.

6.7 Perimeter Drainage

A perimeter drain should be installed for areas of the building where the floor slab is less than 150 mm above adjacent grade. The perimeter drain should consist of a 150 mm perforated PVC pipe surrounded by at least 150 mm of 19 mm clear crushed gravel separated from the remaining backfill with a non-woven filter fabric. The perimeter drain should be installed no deeper than the adjacent footing base and at least 200 mm below adjacent floor slabs. The perimeter drain should be connected to a suitable outlet, anticipated to comprise of a sump/permanent pump at this site. Roof drains should not discharge into the perimeter drain system.

The perimeter drain should be hydraulically connected to a 19mm clear crush gravel chimney drain at least 450mm wide adjacent to any below grade wall.



6.8 Slab on Grade

Slab-on-grade should be supported on suitable prepared subgrades as described in Sections 6.3 and 6.4. A 100 mm thick layer of 19 mm clear crushed gravel, compacted with a vibratory compactor should be placed beneath concrete slabs to provide a bedding and drainage layer for potential seepage zones. A layer of 6 mil poly vapour barrier should also be placed over the clear crushed gravel to protect it from concrete contamination and to limit dampness of the slab from capillary moisture which could damage floor coverings.

6.9 Permanent Slopes or Retaining Walls

Compacted structural fill should be no steeper than 2H:1V with planted vegetation to protect against erosion. Slope inclinations may be steepened with the use of retaining walls. Retaining walls may include, but is not limited to, rock stack, concrete lock block or Allan block. If required, recommendations and design of retaining walls can be provided by Kontur under separate cover. Cast-in-place concrete retaining walls should be designed by a structural engineer.

6.10 Lateral Earth Pressures

Retaining and parkade walls should be provided with adequate drainage to prevent the build-up of hydrostatic pressure behind the wall. A chimney drain, at least 450mm wide, comprised of clear crushed gravel should be placed directly against any below grade walls, hydraulically connected to a perimeter drain. The wall backfill should be compacted to at least 85% MPMDD in non-structural areas and at least 95% MPMDD in areas where pavement or other hard landscape features is proposed.

A uniform lateral earth pressure of 20kPa should be used for design for compaction effort adjacent to below ground walls up to 3m in height. A static lateral earth pressure of 5.5kPa/m with a triangular distribution and a seismic lateral earth pressure of 2.2kPa/m with an inverted triangular distribution should be used for below grade walls greater than 3m height.

7.0 FIELD REVIEW

To sign-off on the work, Kontur must complete the necessary field reviews during the construction stage of the project. Field reviews may be required, but are not limited to, the following stages:

- Bulk excavation, stripping and final excavation;
- Subgrade and bearing surface review and approvals;
- Placement and compaction of fills; and/or,
- Installation of perimeter and/or site drainage.

Kontur requires at least 48 hours of advanced notice to visit the site when the work is ready for review.

8.0 CLOSURE

The comments and recommendations presented in this letter are based on the referenced information and Kontur's understanding of the project as described herein. If site conditions or project parameters differ from those described in this letter, Kontur should be notified promptly to review geotechnical



aspects of the project and provide additional or modified comments and recommendations, as deemed appropriate. Contractors should make their own assessments of subsurface conditions at this site and select the construction means and methods that are most appropriate for encountered site conditions.

The subject properties are considered "safe" for intended purpose, that being the construction of a multi-family residential building. The term "safe" specifically refers to the ability of the subsurface soils to support the proposed building within typically tolerable settlement for such buildings and global slope stability being adequate for static and seismic conditions.

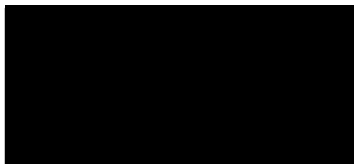
This letter has been prepared for the exclusive use of Fitzgerald Building Company and/or their designated agents or consultants. Any use of the information contained in this letter for other than its intended purpose or by any other party must first be verified in writing by Kontur. Kontur does not accept any responsibility or damages because of any other party relying on or using the information, interpretations, opinions, comments, and/or recommendations that are contained in this letter.

Kontur trusts that the information described above meets your current requirements. If you should have any concerns or questions, please do not hesitate to contact the undersigned.

Sincerely,

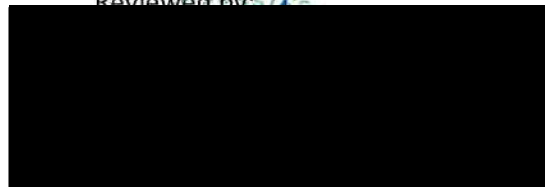
Kontur Geotechnical Consultants Inc.
EGBC Permit to Practice #1000925

Per:



Peter Knott EIT
Geotechnical Engineer

Reviewed by:



Evan Sykes P.Eng
Principal | Geotechnical Engineer

Attachments: Interpretation and Use of Study and Report Document
Photographs
Drawing 1 – Site and Test Location Plan
Borehole Logs
Results of Laboratory Testing



INTERPRETATION AND USE OF STUDY AND REPORT DOCUMENT

1.0 STANDARD OF CARE

This study and Report have been prepared in accordance with generally accepted engineering consulting practices in this area. No other warranty, expressed or implied, is made. Engineering studies and reports do not include environmental engineering or consulting.

2.0 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.

3.0 BASIS OF THE REPORT

The Report has been prepared for the specific site, development, building, design or building assessment objectives and purpose 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 are only valid to the extent that 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.

4.0 USE OF THE REPORT

The information and opinions expressed in the Report, or any document forming 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. WE WILL CONSENT TO ANY REASONABLE REQUEST BY THE CLIENT TO APPROVE THE USE OF THIS REPORT BY OTHER PARTIES AS "APPROVED USERS". The contents of the Report remain our copyright property and we authorise only the Client and Approved Users to make copies of the Report 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 the Report, or any portion thereof, available to any party without our written permission. Any use which a third party makes of the Report, or any portion of the Report, are the sole responsibility of such third parties. We accept no responsibility for damages suffered by any third party resulting from unauthorised use of the Report.

5.0 INTERPRETATION OF THE REPORT

Nature and Exactness of Descriptions: Classification and identification of soils, rocks, geological units, contaminant materials, building envelopment assessments, and engineering estimates 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 and even comprehensive sampling and testing programs, implemented with the appropriate equipment by experienced personnel, may fail to locate some conditions. All investigations, or building envelope descriptions, utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarising 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 all persons making use of such documents or records should be aware of, and accept, this risk. 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.

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 persons providing information.

To avoid misunderstandings, KONTUR should be retained to work with the other design professionals to explain relevant engineering findings and to review their plans, drawings, and specifications relative to engineering issues pertaining to consulting services provided by KONTUR. Further, KONTUR should be retained to provide field reviews during the construction, consistent with building codes guidelines and generally accepted practices. Where applicable, the field services recommended for the project are the minimum necessary to ascertain that the Contractor's work is being carried out in general conformity with KONTUR's recommendations. Any reduction from the level of services normally recommended will result in KONTUR providing qualified opinions regarding adequacy of the work.

6.0 ALTERNATE REPORT FORMAT

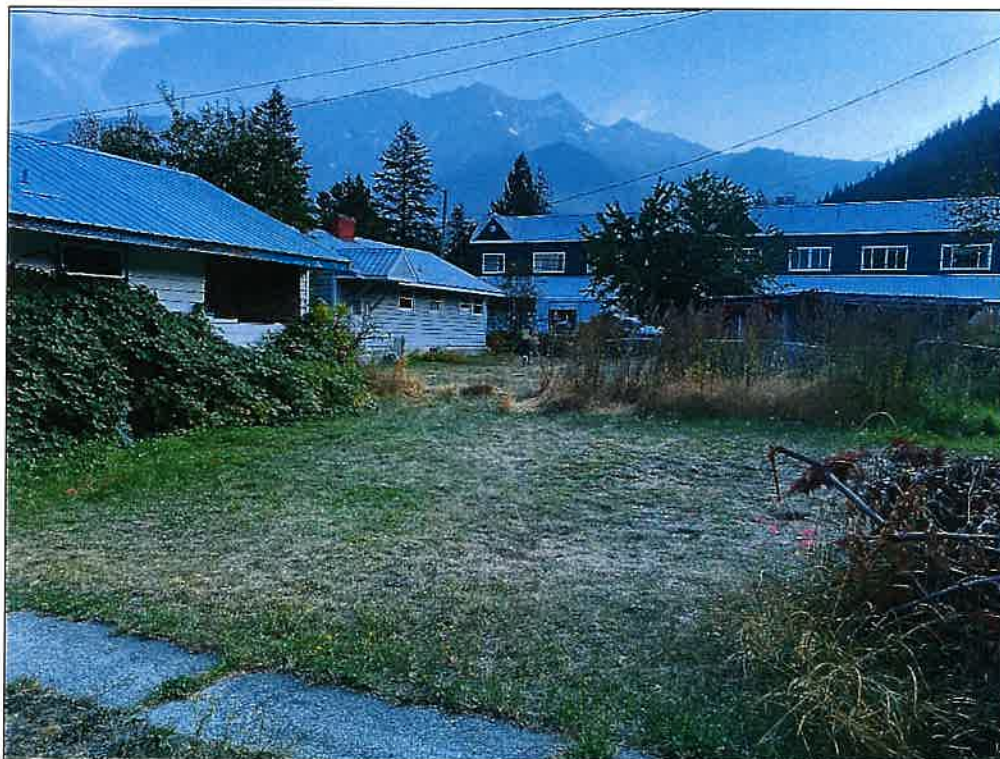
When KONTUR submits both electronic file and hard copies of reports, drawings and other documents and deliverables (KONTUR's instruments of professional service), the Client agrees that only the signed and sealed hard copy versions shall be considered final and legally binding. The hard copy versions submitted by KONTUR shall be the original documents for record and working purposes, and, in the event of a dispute or discrepancy, the hard copy versions shall govern over the electronic versions. Furthermore, the Client agrees and waives all future right of dispute that the original hard copy signed version archived by KONTUR shall be deemed to be the overall original for the Project.

The Client agrees that both electronic file and hard copy versions of KONTUR's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except KONTUR. The Client warrants that KONTUR's instruments of professional service will be used only and exactly as submitted by KONTUR.

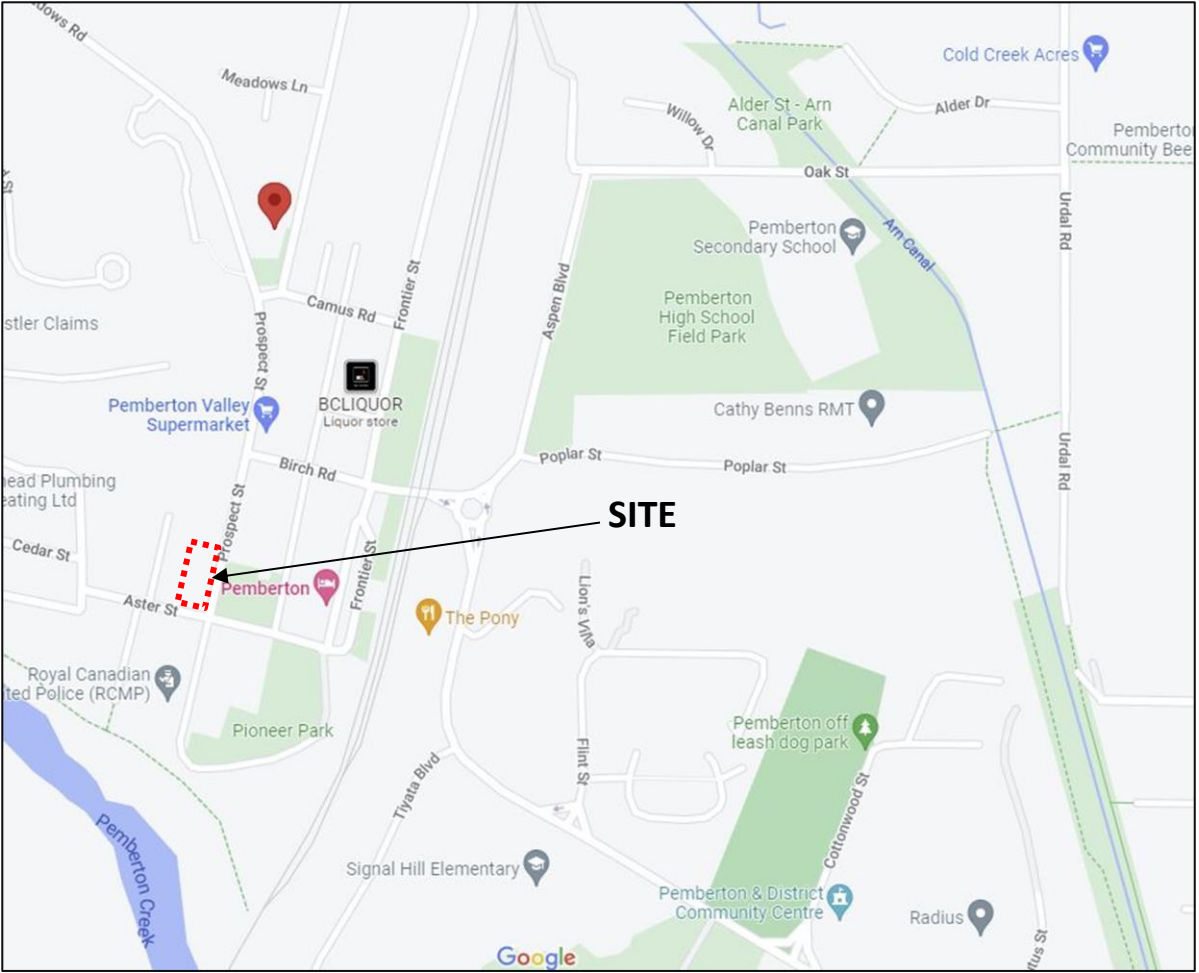
The Client recognizes and agrees that electronic files submitted by KONTUR have been prepared and submitted using specific software and hardware systems. KONTUR makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.



Photograph 1 – Drilling BH-02 on October 7, 2022 looking north-west




Photograph 2 – Western portion of property looking south-south-east on October 7, 2022



SITE LOCALITY PLAN

- Notes:
- 1. Aerial image extrapolated from Google Earth Pro.
 - 2. Site locality plan extrapolated from Google Maps.
 - 3. Test locations are approximate only and shown with reference to existing features.

 Unit 65, 1833 Coast Meridian Road, Port Coquitlam, B.C. V3C 6G5 t. 1 (778) 730 1747 toll-free: +1 (833) 301 7575 e. info@kontur.ca www.kontur.ca	SEAL	VERSIONS			TITLE		PROJECT NO.:				
					Test Hole Location Plan – Multi-Family Residential Building		K-221341-00				
		NO	DESCRIPTION	DATE							
		0	Test Hole Location Plan	12 Oct 2022							
					CLIENT		Fitzgerald Building Company		DATE:	SCALE:	DWG NO.:
									12 Oct 22	NA	1
					PROJECT LOCATION		9421, 9423 & 9425 Prospect Street, Pemberton BC		PAK	PAK	EGS
									DRAFT:	DESIGN:	CHECK:



Kontur Geotechnical Consultants Inc.
65-1833 Coast Meridian Road
Port Coquitlam, B.C. V3C 2W2
Telephone: (778) 730-1747

RECORD OF TESTHOLE : BH-01

PAGE 1 OF 1

CLIENT Fitzgerald Building Company
PROJECT NAME Multi-Family Residential
DRILLING DATE 2022-10-07
DRILLING METHOD Hollow Stem Auger
DRILLING CONTRACTOR Blue Max Environmental Drilling
EQUIPMENT TYPE CME 55 Truck Mounted Rotary Drill

PROJECT NUMBER K-221341-00
PROJECT LOCATION 7421, 7423 & 7425 Prospect St, Pemberton BC
BOREHOLE LOCATION _____
ELEVATION 217.4m (approx. - interpolated off site plan by Doug Bush-Oct 10, 2021)
▽ GROUNDWATER DEPTH AT TIME OF DRILLING _____
LOGGED BY PAK CHECKED BY EGS

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. DEPTH (m)	SAMPLES			SPT 'N' VALUE BLOWS/0.3m ▲ 20 40 60 80 DYNAMIC CONE BLOWS/0.3m ■ 20 40 60 80	POCKET PEN. (kPa) ● 100 200 300 400 FIELD VANE SHEAR (kPa) Peak Remold ● ○ 40 80 120 160	FINES CONTENT (%) □ 20 40 60 80 PLASTIC & LIQUID LIMIT WATER CONTENT PL MC LL 20 40 60 80	GROUNDWATER
				NUMBER	TYPE	RECOVERY %				
1		SANDY SILT, sand is fine grained, rootlets, pale brown, dry (very stiff)	217.1	S1	GB		18			
		SANDY GRAVEL, some silt and cobbles, pale brown, dry (compact), gravel and cobbles are sub-rounded, gravel is dominantly medium to coarse grained	0.3				52			
							53			
							31			
2		GRAVELLY SAND, some silt and cobbles, pale brown, dry (compact), gravel and cobbles are sub-rounded, gravel is dominantly medium to coarse grained	215.9	S2	GB		10			
							16			
							45			
							15			
3							21			
							21			
							69			
4		GRAVELLY SAND, trace silt, brown, damp (loose to compact), gravel is subrounded and dominantly fine to medium grained	213.8	S3	GB		67			
							25			
5							5			
							7			
							10			
6		- Becoming moist below approximately 4.9m depth		S4	GB		11			
							11			
							12			
							7			
							7			
7		GRAVELLY SAND, some silt, brown, moist to wet (compact), gravel is subrounded and dominantly fine to medium grained	210.7	S5	GB		6			
							36			
							39			
							15			
8							14			
							9			
9		GRAVELLY SAND, some silt, trace cobbles, brown, wet (very dense)	208.9				11			
							73			
							100			
10			207.4							

Bottom of hole at 10.1m.



Kontur Geotechnical Consultants Inc.
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RECORD OF TESTHOLE : BH-02

PAGE 1 OF 1

CLIENT Fitzgerald Building Company
PROJECT NAME Multi-Family Residential
DRILLING DATE 2022-10-07
DRILLING METHOD Hollow Stem Auger
DRILLING CONTRACTOR Blue Max Environmental Drilling
EQUIPMENT TYPE CME 55 Truck Mounted Rotary Drill

PROJECT NUMBER K-221341-00
PROJECT LOCATION 7421, 7423 & 7425 Prospect St, Pemberton BC
BOREHOLE LOCATION _____
ELEVATION 218.0m (approx. - interpolated off site plan by Doug Bush-Oct 10, 2021)
▽ GROUNDWATER DEPTH AT TIME OF DRILLING _____
LOGGED BY PAK CHECKED BY EGS

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. DEPTH (m)	SAMPLES			SPT 'N' VALUE BLOWS/0.3m ▲	POCKET PEN. (kPa) ●	FINES CONTENT (%) □	GROUNDWATER
				NUMBER	TYPE	RECOVERY %	20 40 60 80	100 200 300 400	20 40 60 80	
							DYNAMIC CONE BLOWS/0.3m ■	FIELD VANE SHEAR (kPa) Peak Remold	PLASTIC & LIQUID LIMIT WATER CONTENT PL MC LL	
							20 40 60 80	40 80 120 160	20 40 60 80	
1		SANDY SILT, sand is fine grained, rootlets, pale brown, dry (stiff), surficial grass	217.7	S6	GB		14			
		GRAVELLY SAND, some silt and cobbles, pale brown, dry (compact), gravel and cobbles are sub-rounded	0.3				14			
		- Becoming dense below approximately 1.2m depth					20			
2			216.0	S7	GB		37			
							71			
							73			
		GRAVELLY SAND, trace silt, brown, damp (compact), gravel is sub-rounded	2.0	S8	GB		94			
3										
4										
5				S9	GB		16			
							8			
							17			
6				S8	GB		12			
							20			
							66			
7			211.9	S9	GB		28			
							13			
							11			
8		SILTY SAND, trace gravel, brown, wet (compact to dense), sand is dominantly fine grained	6.1	S9	GB		28			
							44			
							46			
9				S9	GB		21			
							30			
							14			
10			210.1	S9	GB		89			
							100+			
							100+100			
				S9	GB					
			208.0	S9	GB					

Bottom of hole at 10.1m.



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Telephone: (778) 730-1747

RECORD OF TESTHOLE : BH-03

PAGE 1 OF 1

CLIENT Fitzgerald Building Company
PROJECT NAME Multi-Family Residential
DRILLING DATE 2022-10-07
DRILLING METHOD Hollow Stem Auger
DRILLING CONTRACTOR Blue Max Environmental Drilling
EQUIPMENT TYPE CME 55 Truck Mounted Rotary Drill

PROJECT NUMBER K-221341-00
PROJECT LOCATION 7421, 7423 & 7425 Prospect St, Pemberton BC
BOREHOLE LOCATION _____
ELEVATION 218.2m (approx. - interpolated off site plan by Doug Bush-Oct 10, 2021)
▽ GROUNDWATER DEPTH AT TIME OF DRILLING _____
LOGGED BY PAK CHECKED BY EGS

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. DEPTH (m)	SAMPLES			SPT 'N' VALUE BLOWS/0.3m ▲	POCKET PEN. (kPa) ●	FINES CONTENT (%) □	GROUNDWATER
				NUMBER	TYPE	RECOVERY %	20 40 60 80	100 200 300 400	20 40 60 80	
							DYNAMIC CONE BLOWS/0.3m ■	FIELD VANE SHEAR (kPa) Peak Remold	PLASTIC & LIQUID LIMIT WATER CONTENT PL MC LL	
1		SILTY SAND, fine grained, pale brown, dry (compact) - Becoming loose to compact below approximately 0.6m depth	216.7	S10	GB		17 17 11 6			
2		GRAVELLY SAND, some cobbles, trace silt, pale brown, dry (compact)	1.5				19 24 16			
3		- Becoming very dense below approximately 3m depth	214.6	S11	GB		15 20 29 65 100			

Limit of investigation due to refusal on probable cobble, boulder or till-like soils

Bottom of hole at 3.7m.

NOTES: Attempted two additional test holes within 1m radius of original hole, refusal depth was consistent at approximately 3.7m depth



Kontur Geotechnical Consultants Inc.
65-1833 Coast Meridian Road
Port Coquitlam, B.C. V3C 2W2
Telephone: (778) 730-1747

RECORD OF TESTHOLE : BH-04

PAGE 1 OF 1

CLIENT Fitzgerald Building Company
PROJECT NAME Multi-Family Residential
DRILLING DATE 2022-10-07
DRILLING METHOD Hollow Stem Auger
DRILLING CONTRACTOR Blue Max Environmental Drilling
EQUIPMENT TYPE CME 55 Truck Mounted Rotary Drill

PROJECT NUMBER K-221341-00
PROJECT LOCATION 7421, 7423 & 7425 Prospect St, Pemberton BC
BOREHOLE LOCATION _____
ELEVATION 218.1m (approx. - interpolated off site plan by Doug Bush-Oct 10, 2021)
▽ GROUNDWATER DEPTH AT TIME OF DRILLING _____
LOGGED BY PAK CHECKED BY EGS

DEPTH (m)	STRATA	SOIL DESCRIPTION	ELEV. DEPTH (m)	SAMPLES			SPT 'N' VALUE BLOWS/0.3m ▲	POCKET PEN. (kPa) ●	FINES CONTENT (%) □	GROUNDWATER
				NUMBER	TYPE	RECOVERY %	20 40 60 80	100 200 300 400	20 40 60 80	
							DYNAMIC CONE BLOWS/0.3m ■ 20 40 60 80	FIELD VANE SHEAR (kPa) Peak Remold ● ○ 40 80 120 160	PLASTIC & LIQUID LIMIT WATER CONTENT PL MC LL 20 40 60 80	
1		SILTY SAND, fine grained, pale brown, dry (compact)	216.9	S12	GB		11 21 15			
2		SILTY SAND, fine grained, pale brown, dry (very loose to loose)	216.0				8 5 2 8			
3		GRAVELLY SAND, some silt and cobbles, brown grey, moist to wet (very dense) - Difficult auger drilling conditions below approximately 2.8m depth.	2.1				39 95 100+100			
4				S13	GB					
5			212.9				100+100			

Limit of investigation due to refusal on probable cobble, boulder or till-like soils

Bottom of hole at 5.2m.

NOTES: Attempted three additional test holes within 1m radius of original hole, refusal depth between 3.1m and 5m depth. Consistently difficult drilling below approximately 3m depth.



TO: FITZGERALD BUILDING COMPANY
UNIT 101, 7330 ARBUTUS ST
PEMBERTON, BC
V0N 2L0

ATTN: TOM FITZGERALD

PROJECT NO.: K-221341

CLIENT: FITZGERALD BUILDING COMPANY

C.C.:

PROJECT: 7421 PROSPECT ST PEMBERTON

LOCATION: 7421, 7423 & 7425 PROSPECT ST
PEMBERTON

CONTRACTOR: FITZGERALD BUILDING COMPANY

SIEVE TEST NO.: 1

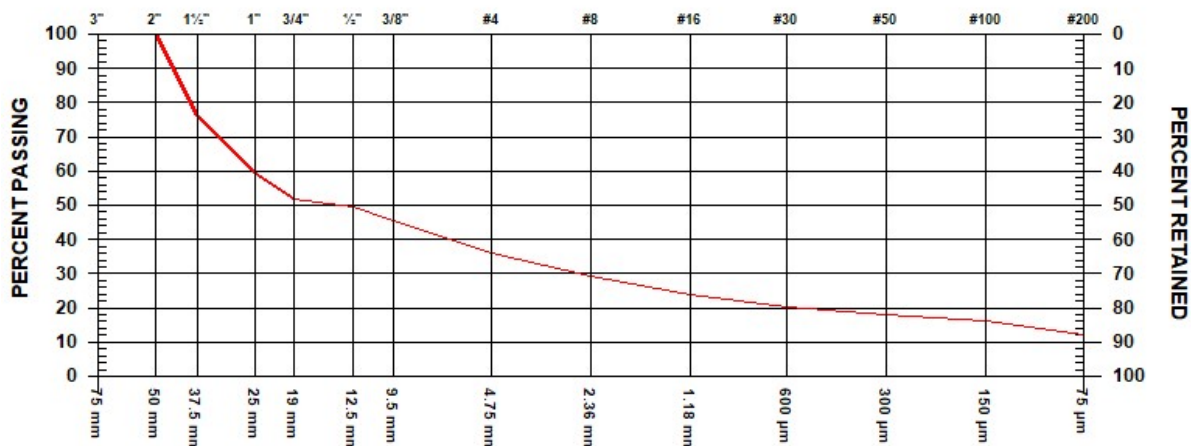
DATE RECEIVED: 2022.Oct.18

DATE TESTED: 2022.Oct.20

DATE SAMPLED: 2022.Oct.12

SUPPLIER: NATIVE MATERIAL
SOURCE: NATIVE SITE
SPECIFICATION:
MATERIAL TYPE: SANDY GRAVEL, some silt

SAMPLED BY: PK
TESTED BY: HA
TEST METHOD: WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm	100.0	
1 1/2"	37.5 mm	76.3	
1"	25 mm	59.4	
3/4"	19 mm	51.7	
1/2"	12.5 mm	49.7	
3/8"	9.5 mm	45.5	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	35.9	
No. 8	2.36 mm	29.1	
No. 16	1.18 mm	23.7	
No. 30	600 µm	20.3	
No. 50	300 µm	18.2	
No. 100	150 µm	16.1	
No. 200	75 µm	12.0	

COMMENTS:
LOCATION: BH-01, S1.



TO: FITZGERALD BUILDING COMPANY
UNIT 101, 7330 ARBUTUS ST
PEMBERTON, BC
V0N 2L0

ATTN: TOM FITZGERALD

PROJECT NO.: K-221341

CLIENT: FITZGERALD BUILDING COMPANY

C.C.:

PROJECT: 7421 PROSPECT ST PEMBERTON

LOCATION: 7421, 7423 & 7425 PROSPECT ST
PEMBERTON

CONTRACTOR: FITZGERALD BUILDING COMPANY

SIEVE TEST NO.: 2

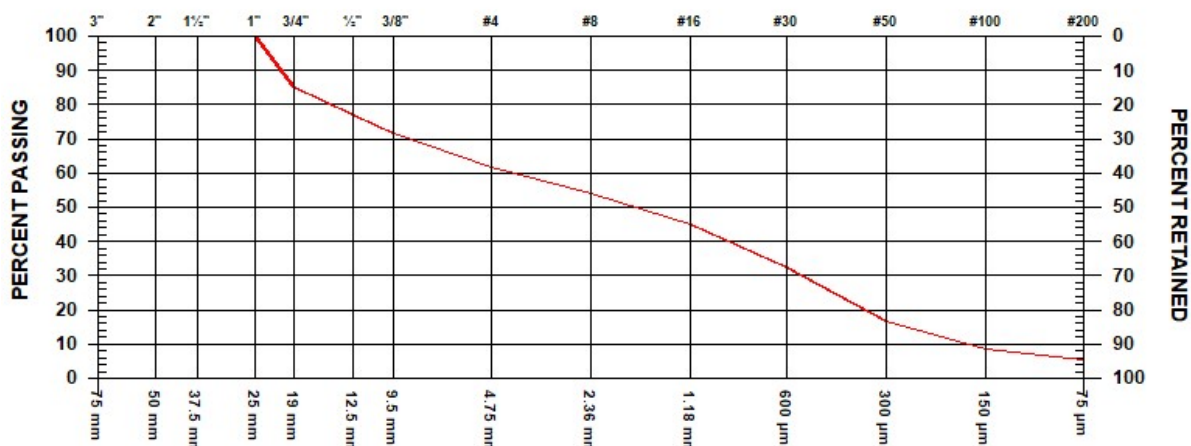
DATE RECEIVED: 2022.Oct.18

DATE TESTED: 2022.Oct.20

DATE SAMPLED: 2022.Oct.12

SUPPLIER: NATIVE MATERIAL
SOURCE: NATIVE SITE
SPECIFICATION:
MATERIAL TYPE: GRAVELLY SAND, trace silt

SAMPLED BY: PK
TESTED BY: HA
TEST METHOD: WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm		
1"	25 mm	100.0	
3/4"	19 mm	85.0	
1/2"	12.5 mm	77.1	
3/8"	9.5 mm	71.5	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	61.5	
No. 8	2.36 mm	53.9	
No. 16	1.18 mm	45.0	
No. 30	600 µm	32.3	
No. 50	300 µm	16.8	
No. 100	150 µm	8.6	
No. 200	75 µm	5.3	

COMMENTS:
LOCATION: BH-01, S3.

Hamidreza Alaghenband
Laboratory Technician



TO: FITZGERALD BUILDING COMPANY
UNIT 101, 7330 ARBUTUS ST
PEMBERTON, BC
V0N 2L0

PROJECT NO.: K-221341

CLIENT: FITZGERALD BUILDING COMPANY

C.C.:

ATTN: TOM FITZGERALD

PROJECT: 7421 PROSPECT ST PEMBERTON

LOCATION: 7421, 7423 & 7425 PROSPECT ST
PEMBERTON

CONTRACTOR: FITZGERALD BUILDING COMPANY

SIEVE TEST NO.: 3

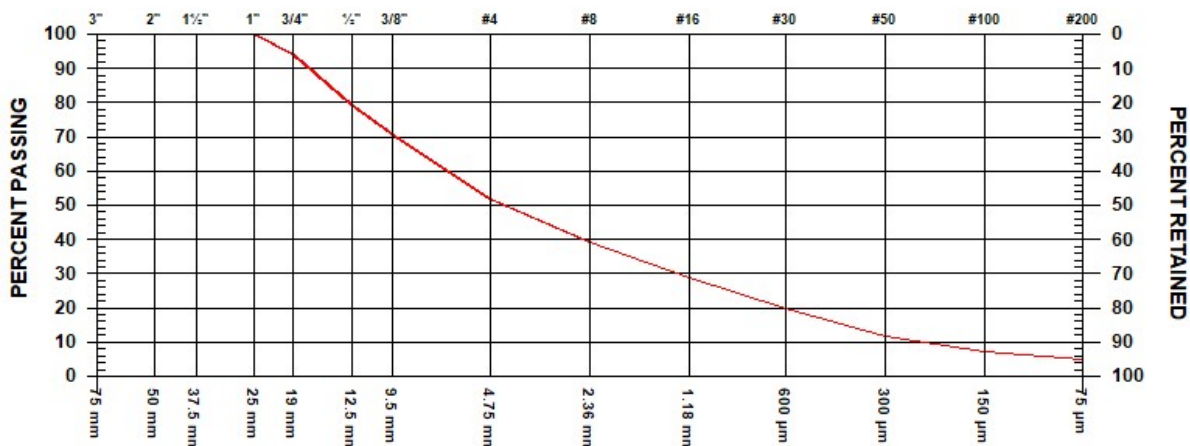
DATE RECEIVED: 2022.Oct.18

DATE TESTED: 2022.Oct.20

DATE SAMPLED: 2022.Oct.12

SUPPLIER: NATIVE MATERIAL
SOURCE: NATIVE SITE
SPECIFICATION:
MATERIAL TYPE: SAND & GRAVEL, trace silt

SAMPLED BY: PK
TESTED BY: HA
TEST METHOD: WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm		
1"	25 mm	100.0	
3/4"	19 mm	94.0	
1/2"	12.5 mm	79.2	
3/8"	9.5 mm	70.8	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	51.7	
No. 8	2.36 mm	39.1	
No. 16	1.18 mm	29.0	
No. 30	600 µm	19.9	
No. 50	300 µm	11.7	
No. 100	150 µm	7.4	
No. 200	75 µm	4.9	

COMMENTS:
LOCATION: BH-02, S7.

Hamidreza Alagheband
Laboratory Technician



TO: FITZGERALD BUILDING COMPANY
UNIT 101, 7330 ARBUTUS ST
PEMBERTON, BC
V0N 2L0

PROJECT NO.: K-221341

CLIENT: FITZGERALD BUILDING COMPANY

C.C.:

ATTN: TOM FITZGERALD

PROJECT: 7421 PROSPECT ST PEMBERTON

LOCATION: 7421, 7423 & 7425 PROSPECT ST
PEMBERTON

CONTRACTOR: FITZGERALD BUILDING COMPANY

SIEVE TEST NO.: 4

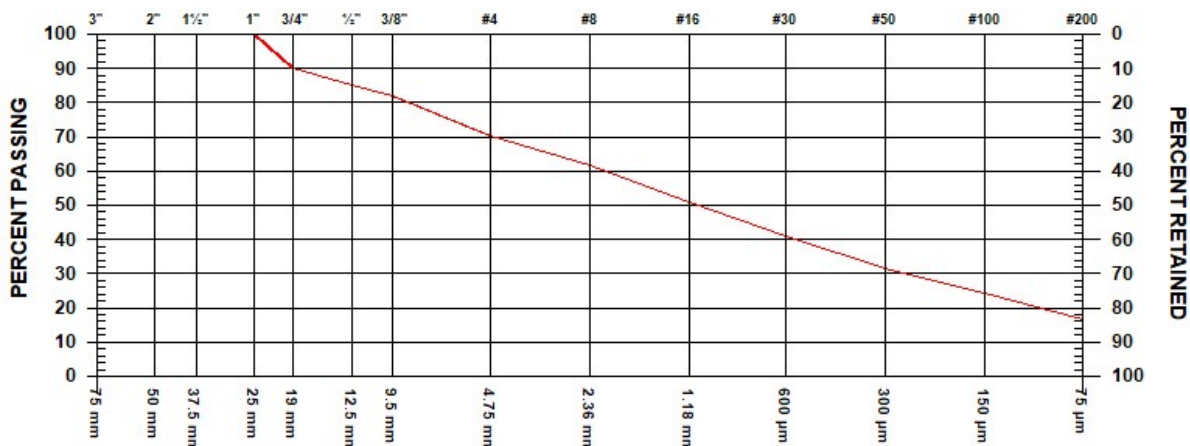
DATE RECEIVED: 2022.Oct.18

DATE TESTED: 2022.Oct.20

DATE SAMPLED: 2022.Oct.12

SUPPLIER: NATIVE MATERIAL
SOURCE: NATIVE SITE
SPECIFICATION:
MATERIAL TYPE: GRAVELLY SAND, some silt

SAMPLED BY: PK
TESTED BY: HA
TEST METHOD: WASHED



GRAVEL SIZES		PERCENT PASSING	GRADATION LIMITS
3"	75 mm		
2"	50 mm		
1 1/2"	37.5 mm		
1"	25 mm	100.0	
3/4"	19 mm	90.1	
1/2"	12.5 mm	85.2	
3/8"	9.5 mm	81.8	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	70.1	
No. 8	2.36 mm	61.5	
No. 16	1.18 mm	51.0	
No. 30	600 µm	40.8	
No. 50	300 µm	31.6	
No. 100	150 µm	24.3	
No. 200	75 µm	16.6	

COMMENTS:
LOCATION: BH-04, S13.