

January 13<sup>th</sup>, 2021

File: 20-0268

**Tim Goodsell**  
2612 Henry Street  
Port Moody, BC V3H 2J6

Via e-mail: [timgoodsell@ymail.com](mailto:timgoodsell@ymail.com); [goodsell@triumf.ca](mailto:goodsell@triumf.ca)

Dear: Mr. Goodsell

**Re: Geotechnical Assessment**  
**2612 Henry Street, Port Moody, BC**

## **INTRODUCTION**

Fraser Valley Engineering Limited (FVEL) has completed a Geotechnical Assessment at the above-mentioned address. The purpose of the Geotechnical Investigation is to assess the subsurface conditions for suitability of the proposed garage with coach house (DADU) on the Property.

## **SITE LOCATION AND PROPERTY DESCRIPTION**

The civic address of the Property is 2612 Henry Street, which was also identified by the legal description Lot 4, Block 23, Plan NWP72, District Lot 201, New West District Part W ½ with PID 0011-452-927. Currently, the Property is occupied by a single-family dwelling accessed via Henry Street to the south and a detached garage with access from the laneway (Hope Street) to the north.

It is understood that the proposed development will consist of demolishing the existing garage building and constructing a new detached garage including coach house in its place. The single-family residential dwelling will remain. The backyard area will be re-landscaped as part of the proposed development. A parking space using permeable pavers will also be provided adjacent the proposed garage building.

The property can be described as being relatively flat to gently sloping in a south-north direction. As a result of the gently sloping conditions, FVEL does not identify slope stability or landslides as a concern to the Property or proposed development.

## **PREVIOUS STUDIES**

FVEL has previously conducted the following works for the Property:

- Geotechnical Hazard Assessment. 2612 Henry Street Port Moody, BC. December 17, 2020.
  - FVEL completed a Geotechnical Hazard Assessment (GHA) to determine if the proposed development and Property is safe for its intended use and to provide appropriate recommendations, as necessary.



- Stormwater Management Plan. January 11, 2021.
  - FVEL designed a stormwater management plan to direct roof water run-off and perimeter drainage to an infiltration basin to be located beneath the parking area adjacent the proposed garage.

#### *SURFICIAL GEOLOGY MAP*

FVEL also reviewed the surficial geology maps for the area. According to the surficial geology mapping, the Property is underlain by Postglacial and Pleistocene marine shore and fluvial sand up to 8m thick, Cb in part has been reworked and redeposited by lowland stream (SAh).

The surficial geology map also indicates that a recorded landslide (RS) has historically occurred in the area, presumably from near the Hatchley Creek or Kyle Creek areas. The landslides are discussed in the Geotechnical Hazard Assessment report (FVEL, 2020)

#### **SITE INVESTIGATION AND SOIL CONDITIONS**

FVEL conducted a subsurface investigation in conjunction with our GHA site reconnaissance on December 1<sup>st</sup>, 2020 to assess the subsurface soil conditions on the site. FVEL advanced a single (1) test hole via an excavator at a location between the existing dwelling and garage. Only the one test hole was advanced due to space limitations due to the locations of the buildings and the presence of underground utilities. The test pit was excavated to a depth of 3.3metres below ground surface (mbgs). Subsurface soil conditions consisted of silty sand topsoil material underlain by sand and gravels with traces of silt. The density of the soils increased with depth to very dense below 1.5mbgs, as well as inclusions of cobbles and traces of boulders. Minor groundwater seepage was encountered between 1.4-1.5mbgs. FVEL also completed a percolation test for the purpose of designing a stormwater infiltration basin, completed as a separate scope of work. The percolation test was conducted at 1.3mbgs and the results indicated a rate of approximately 5min/inch. A detailed test-pit log is attached.

#### **RECOMMENDATIONS**

##### *SOIL SUITABILITY & SITE PREPARATION*

Based on our GHA previously conducted, the Property is suitable for the proposed garage and coach house building and the land may be used safely for the use intended.

To prepare the subsurface soils for the proposed development, FVEL recommends that the sub-grade be prepared following the removal of the existing garage. The native sand and gravel (sub-grade) may be used as foundation soils and must be re-compacted adequately if disturbed during excavation. If structural fill is required to bring the soils to the desired final grade, structural fill should be placed in lifts. Each lift should not be greater than 300mm in thickness and compacted to a minimum density of 100% based on the Standard Proctor Maximum Dry Density Test (SPMDDT).

FVEL must review the sub-grade once the compaction or excavation is completed and monitor field densities.



*BUILDING FOUNDATION SUPPORT (BEARING CAPACITY)*

The proposed building is expected be supported on conventional footings. Footings are to be founded in the compacted native sand and gravel or compacted structural fill and can be designed with a factored Ultimate Limit State (ULS) bearing pressure of 3,000 psf (144 kPa), per the National Building Code (2015). The Serviceability Limit State (SLS) pressure is 2,000 psf (96 kPa). The minimum width of continuous footings should not be less than 0.45 m (18 in). A minimum embedment depth of 0.45 m (1.5 ft) must be provided for frost protection.

In terms of seismic design, the Site Classification for this property is D – stiff soil (in accordance with the BC Building Code 2018, Table 4.1.8.4.A). The peak Ground Acceleration (PGA) for this site is 0.326g with a probability of occurrence of 2% in 50 years, which was obtained from the web-site of Natural Resources Canada. The Spectral Response Acceleration Values  $S_a(T)$ , for Site Class C:

*Table 1: 2015 National Building Code interpolated seismic hazard values*

| <u>Sa</u><br><u>(0.05)</u> | <u>Sa</u><br><u>(0.1)</u> | <u>Sa</u><br><u>(0.2)</u> | <u>Sa</u><br><u>(0.3)</u> | <u>Sa</u><br><u>(0.5)</u> | <u>Sa</u><br><u>(1.0)</u> | <u>Sa</u><br><u>(2.0)</u> | <u>Sa</u><br><u>(5.0)</u> | <u>Sa</u><br><u>(10.0)</u> | <u>PGA</u><br><u>(g)</u> | <u>PGV</u><br><u>(m/s)</u> |
|----------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|----------------------------|--------------------------|----------------------------|
| 0.396                      | 0.604                     | 0.751                     | 0.749                     | 0.660                     | 0.378                     | 0.233                     | 0.075                     | 0.027                      | 0.326                    | 0.490                      |

*LIQUEFACTION*

As discussed in FVEL’s GHA (December 2020), According to the City’s OCP – DPA 5 Hazardous Lands Map 14, the Site lies in the designated “Moderate to High Risk of Earthquake Soil Liquefaction” zone. Soil liquefaction describes a phenomenon whereby a saturated or partially saturated soil substantially loses strength and stiffness in response to an applied stress, usually earthquake shaking or other sudden change in stress condition, causing it to behave like a liquid. It is our understanding that, the hazard zoning by the City was based on the soil type (sand, gravel till, crushed stone – Postglacial) on the Geological Survey of Canada Map. The sand and gravel soil was confirmed by FVEL. Based on our observations during our test pit investigation, the sand and gravel was found to be dense to very dense. Groundwater seepage was encountered at a depth of 1.4-1.5mbgs. Based on the concept that there is no saturation, and the soils were found to be dense, FVEL is of the opinion that the liquefaction potential for the Property is very low (<1:2,450).

**CONSTRUCTION REVIEWS**

FVEL should review the final structural design to ensure that our recommendations have been incorporated into the design. We recommend FVEL is retained for the purposes of excavation review, foundation review, and structural fill compaction review, if required.



## LIMITATIONS

This report is based on the field reconnaissance, review of background information available at the time of our study, and our knowledge of the proposed project site. We have prepared this report in substantial accordance with generally accepted geotechnical engineering practice. No warranty is expressed or implied. This report may be used only by the client and the City of Port Moody, and only for the purposes stated, within a reasonable time from its issuance.

## CLOSURE

We trust that this letter provides you with the information required at this time. If you have any questions, please do not hesitate to call.

Yours truly,

**Fraser Valley Engineering Ltd.**

Steven Rohde, B.A.Sc. E.I.T.  
Environmental Engineer

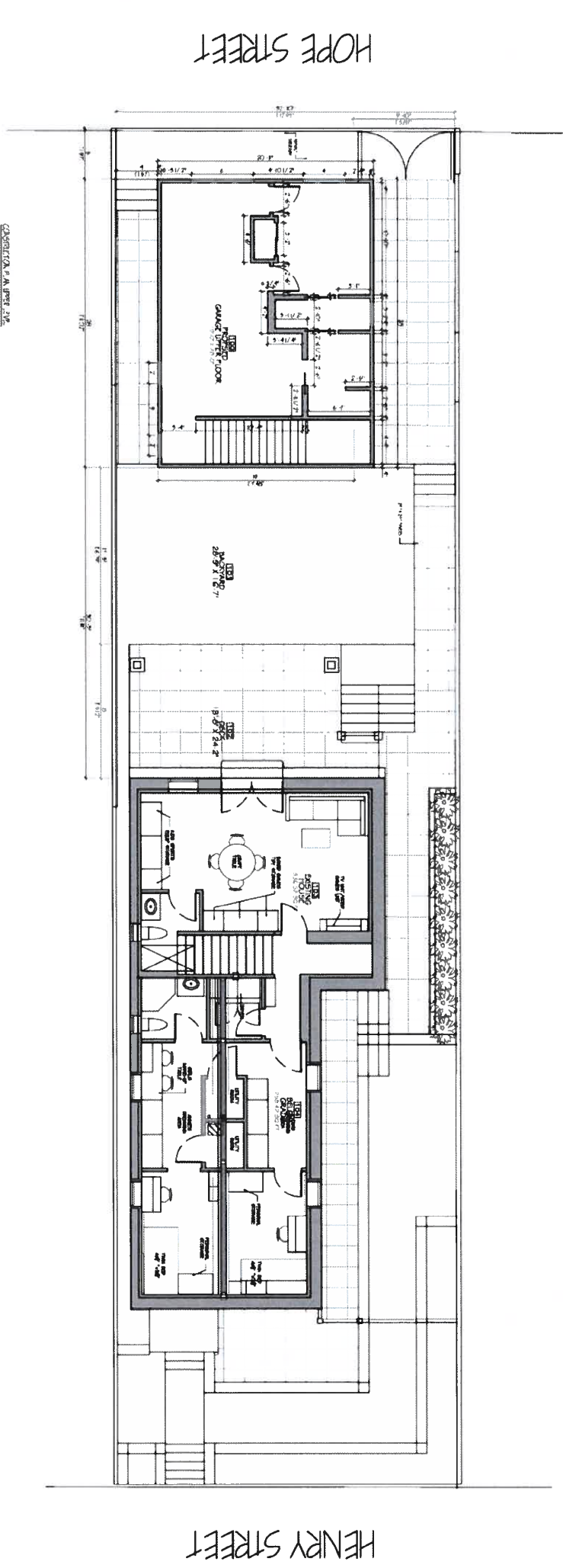
Reviewed by:

Jairo Prada, P. Eng.  
Principal

Attachments:

Architectural Site Plan (Aug 8, 2020)  
Test Pit Log





CONSTRUCTION AREA, JUNE 2010  
 10'0" x 10'0"

HENRY STREET

HOPE STREET

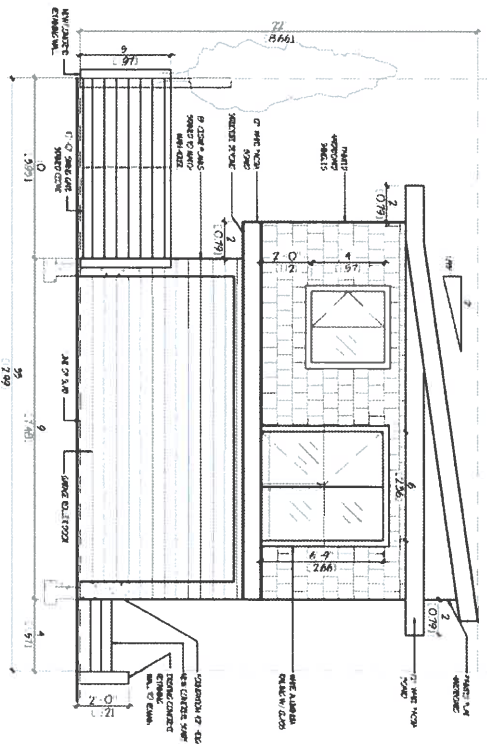
| NO. | DATE | REVISION |
|-----|------|----------|
|     |      |          |
|     |      |          |
|     |      |          |

PERSONAL RES.  
 2617 Henry Street  
 San Mateo, CA 94403

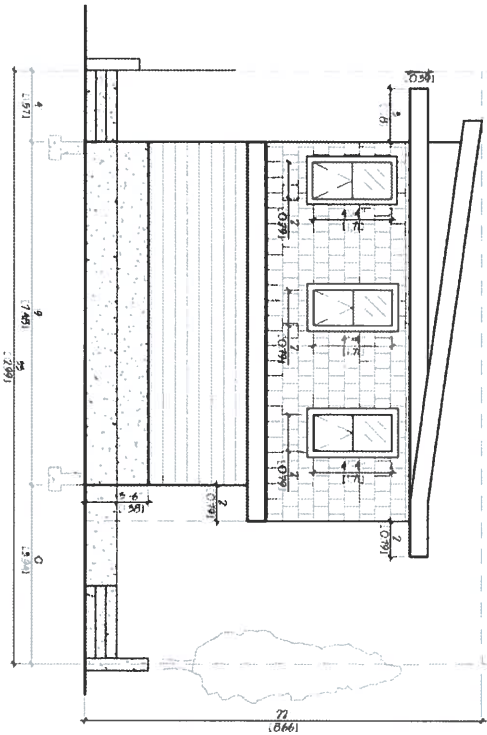
CONSTRUCTION  
 OF UPPER  
 FLOOR OF  
 LANEWAY  
 HOUSE

| REV. | DATE       | BY      | DESCRIPTION        |
|------|------------|---------|--------------------|
| 01   | 06/10/2010 | AK/NPRT | ISSUED FOR PERMITS |

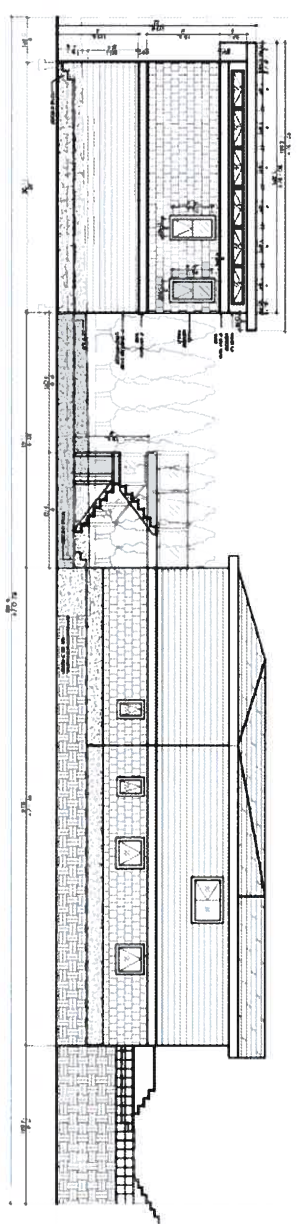




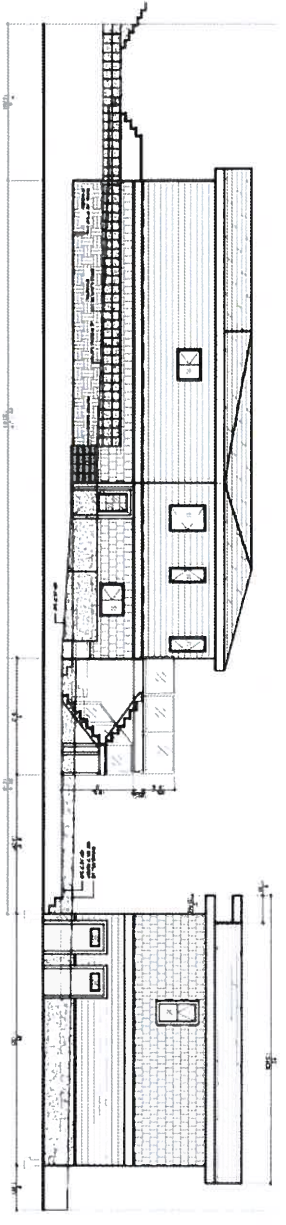
FRONT ELEVATION, MAIN FLOOR  
SCALE: 1/8" = 1'-0"



SIDE ELEVATION, MAIN FLOOR  
SCALE: 1/8" = 1'-0"



REAR ELEVATION  
SCALE: 1/8" = 1'-0"



LEFT SIDE ELEVATION  
SCALE: 1/8" = 1'-0"

|     |      |          |
|-----|------|----------|
| NO. | DATE | REVISION |
|     |      |          |
|     |      |          |

NO. FILE

PERSONA, B.S.  
2612 Perry Street  
San Mateo, CA 94403-2116

DESIGNED BY  
**ELEVATIONS OF  
LANEWAY HOUSE**

|             |          |
|-------------|----------|
| FILE NO.    |          |
| DESIGNER    | PERSONA  |
| CHECKED     | J.S.     |
| DATE        | MAR 2000 |
| SCALE       | AS SHOWN |
| DESIGNED BY | PERSONA  |

# SOIL LOG

TP-1

CLIENT NAME: Tim Goodsell  
 PROJECT NAME: Geotechnical Hazard Assessment  
 LOCATION: 2612 Henry St. Port Moody, BC  
 TEST METHOD: Excavator

GWT (ft):  
 TEST DATE: 01-Dec-20

PROJECT NO. 20-0268  
 ELEVATION:  
 NORTHING:  
 EASTING:

| SOIL SYMBOL | SOIL CLASSIFICATION | DEPTH IN METER | DEPTH IN FEET | SOIL DESCRIPTION   | MOISTURE CONTENT & ATTERBERG LIMITS<br>WP    W    WL<br>←    ○    → | ■ POCKET PENETROMETER<br>▲ Su VALUE (kPa)<br><br>● DCPT VALUE |
|-------------|---------------------|----------------|---------------|--|---|---|
| SP          |                     | 0.05           | 0.16          | Fine Sand (pool pad), med-dense, grey  |   | 0    0.5    1    1.5  |
| SM          |                     | 0.55           | 1.76          | Top soil, silty-sand, roots, med-dense, black, moist<br>1.3m perc test - 5min/in<br>1.4-1.5m - Minor gw seepage<br>1.6m very dense | 0    25    50    75   | 0    25    50    75   |
| SW          |                     | 1.5            | 4.81          | Sand and gravels, trace-some silt, med-dense, reddish-brown, moist   |   |   |
| GW          |                     | 3.3            | 10.6          | Sand, gravels, and cobbles, trace boulders, very dense, tan/grey   |   |   |

Note: Backfilled with excavated soil

Logged by: SR





