



205 – 38026 2<sup>nd</sup> Ave  
Squamish, BC V8B 0C3  
604-785-8957

Tiyata Properties  
1688 Ayleslynn Drive  
North Vancouver, BC, V7J 2T3

December 20, 2018  
File: 1067

Attention: Bruce Van Mook

**Re: Flood Hazard Review, Proposed Townhome Development, Lot A,  
Between Prospect St. and Pemberton Meadows Road, Pemberton, BC**

## 1.0 INTRODUCTION

We understand that it is proposed to construct a townhome development at the above referenced address. The development is to consist of 44 townhomes and a four storey apartment building with 27 units. There are to be two entrances to the development, one from Prospect Street and one from Pemberton Meadows Road.

Preliminary layout drawings prepared by DNA/Don Nicholson Architecture, dated December 3, 2018, have been reviewed in preparing this report. It is understood that the townhomes are to have a garage on the main floor with all habitable space constructed above the garage level. The apartment building is to have parking on the lower level and three storeys of wood framed construction above.

The property is located within the Lillooet River floodplain and thus a flood hazard exists. This report presents our review of the flood hazards defined by others and makes recommendations for a 200-year flood construction level (FCL) for the development and provides general geotechnical recommendations related to flooding.

## 2.0 Site Description

The property is currently undeveloped and much of the area is covered in trees, small bushes and grasses. The site becomes less treed moving west where it becomes marshy and covered in relatively low lying vegetation.

According to the Geological Survey of Canada map 5324 the general geology of the region is described as a combination of fan and floodplain sediments. The floodplain sediments are described as flat lying, consisting of sand and silt and commonly including organic material. The surficial flood plain deposits are expected to be underlain by loose sand to sand and gravel interbedded with finer silty flood deposits.

The site is relatively flat with grades of approximately 207.3 m to 208.4 m geodetic from north to south.

## 3.0 FCL Review

We have based our FCL determination on the Floodplain Mapping prepared by Northwest Hydraulic Consultants, dated August 31, 2018 as part of a Lillooet River Floodplain Study.

EGBC, 2018, defines the FCL as the design flood level plus an allowance for freeboard. Normally we recommend that a minimum freeboard of 0.3 m be applied to the maximum instantaneous flood surface elevations presented on the flood plain map. However, we understand that the Lillooet River Floodplain Study has accounted for freeboard in the flood levels shown. An allowance for projected climate change impacts has also been incorporated within the study to the year 2100. **Therefore, the recommended FCL for this project is 212.1 m.**

Provincial guidelines, best practices, and SFA recommend that all habitable space be located above the FCL. In the context of flood assessments habitable space typically includes any area used for living, commercial use, or storage of goods damageable by floodwaters. In habitable areas, the top of any concrete slabs-on-grade or the underside of wooden floor systems should be located above the FCL. Typically, building areas located below the FCL are limited to entry foyers, crawl spaces and garages. Any major electrical equipment or mechanical equipment should be located above the FCL.

#### **4.4 Further Considerations**

The portions of the structure located below the FCL will be subject to flooding and therefore the owners and any future tenants of the buildings must be made aware of this risk and should fully appreciate that the portion of the building below the FCL would be subject to flood damage, any contents or stored goods within these areas would be subject to flood damage, and that following major flooding a significant restorative effort would likely be required.

SFA Geotechnical Inc. will not accept any liability resulting from damage to goods or equipment, or structures constructed below the FCL. This letter should be registered as a covenant on the title and should be provided to future building tenants.

Much of the surrounding area would likely be cut off from access and safe egress during extreme flood events. We recommend that evacuation of the properties be prepared for and implemented at the onset of predicted moderate to large flooding in accordance with Village of Pemberton evacuation procedures.

Specific flood flow velocities for the site are currently undefined. It is recommended that flood flow velocities be determined and that appropriate scour and erosion protection be incorporated into the design.

The structural designer must consider the hydrodynamic loading which could be imparted by the flood flow velocities and flood depths described above. The structure must be able to safely withstand these flood flows from a structural design standpoint. A statement should be provided by the structural engineer confirming that the structural design has taken the effects of flooding into consideration in their design.

#### **5.0 CLOSURE**

Sections 919.1 and 921 of the Local Government Act allows a local government to request a report from a qualified professional stating that the land may be used safely for the use intended. The phrase “used safely” is not defined. In the context of this report “used safely” is interpreted to mean that the direct effects of the flood itself are unlikely to cause structural damage that would prevent egress from the buildings.

In consideration of the hazards described herein, and assuming that the hazard mitigation strategies described above are implemented, we consider that the land may be used safely for the use intended. Prior to issuance of a building permit a Qualified Professional should be asked to review and confirm that the final design drawings have been prepared in consideration of the recommendations described in this report.

We are pleased to assist you with this project. Please contact the undersigned should require any clarification or additional details.

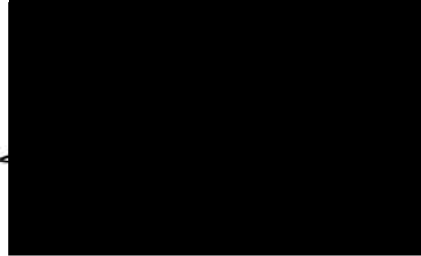
For:  
**SFA Geotechnical Inc.**



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Will Gerhard, P.Eng.  
Geoscientist

Reviewed by:



. 20, 2018

Steven Fofonoff, M.Eng., P.Eng.  
Principal