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Permit No.
1002767

Forwarded by Email

May 10, 2022

Dr. Shammi & Geetika Saini
drshammi14@icloud.com

Our File: RGC-3511

Dear Dr. Shammi & Ms. Saini:

**Subject: Geotechnical Pre-Purchase Assessment
2204 Forsyth Drive, Penticton BC**

1.0 Introduction and Background

Dr. Shammi and Geetika Saini retained the services of Rock Glen Consulting (RGC) to complete a geotechnical pre-purchase assessment at 2204 Forsyth Drive in the Husula Highlands west of Penticton. The attached Figures 1 and 2 present a Location Plan and Site Plan respectively, for the property.

The intent of the Dr. Shammi and Ms. Saini is to construct a new house on the property if deemed appropriate for purchase. Specifically, they would like to build a 2-storey house with 6000 square feet (ft²) of living space on this property. There is a level bench on this lot that covers more than 5000 ft². A moderately steep slope is on the north of this bench with a gentler slope on the south side that extends down to a driveway and then continues down to Forsyth Drive.

2.0 Site Visit Observations

The property is situated on a terrace cut from a sand and gravel slope. The terrace was previously occupied by structures with concrete footings. At least one of these structures was a mobile home.

Paul Glen, P. Eng visited the site on May 5, 2022. Mr. Glen was also involved in previous investigations on the property in 2014.

The terrace is composed of sand, gravelly sand and gravel, part of the same glacial outwash deposits that continue to be mined as part of the Westhills Aggregates operation.

It is unlikely that the fill material pushed out to create the level bench area was compacted.

The slope above the terrace consists of fine to medium-grained sand with some gravel and is capped by about 2 m of fill. The fill is composed of fine-grained sand and silt with some gravel, cobbles, and boulders. The sand section of the slope is approximately 30° and the upper fill is 50-55°.

The slope is approximately 15 m high and sparsely vegetated. Boulders, approximately 30-50 cm in diameter were observed at the toe, indicating they had been eroded from the fill at the top of the slope.

The property is accessible by a driveway that extends from Forsyth Drive at the east corner of the lot up to the northwest corner of the property. The driveway is composed of fill, presumably from the excavation of the terrace. The side slopes of the driveway are approximately 43° (See Photo No. 4).

The overall slope of the property below the level bench area is approximately 30°. This lower slope is well vegetated with shrubs and grasses.

There are several potential locations for a septic disposal field including along the northeast side of the terrace.

3.0 Geotechnical Constraints

While there is sufficient area on the levelled bench area, there are two geotechnical issues to be dealt with as part of any residential development on the site. Firstly, the steep slope above the bench area building site represents a potential rockfall and landslide hazard requiring mitigation. And secondly, the presence of uncompacted, possibly loose, soils underlying the building site would need to be addressed.

RGC conducted slope stability analyses using SLIDE 6.0 and the Morgenstern-Price and Spencer slope failure models. It was determined that the slope overlooking the terrace on which a new house could be built was not stable in several regards.

Under normal, dry conditions, cobbles and boulders can be seen to have ravelled from the fill capping the slope. Further analyses indicate that the top of the slope has a safety factor less than 1 for a small, ~1 m deep landslide. Under wet conditions the slope is unstable and possible slope failures 3 to 6 m deep may occur. Under seismic conditions, using a Peak Ground Acceleration (PGA) of 0.139, the slope is also unstable.

4.0 Conclusions and Recommendations

- The natural sand and gravelly sand soils underlying the terraced portion of this lot are suitable for conventional home foundations. These soils can also accept in-ground disposal of stormwater runoff and septic effluent.
- It will be necessary to remove and replace, or rework, loose soils within any house footprint.
- There is a risk of rockfall (ravelling cobbles and boulders) and landslides from the slope above the property.
- In reviewing the rockfall and landslide risk, RGC recommends that a concrete or block retaining structure be constructed to protect any house at the base of the slope from ravelling material and landslides.
- Rockfall protection fencing could also be considered to intercept ravelling and rolling cobbles and boulders.
- In lieu of free-standing concrete or block walls, the foundation walls on the north side of any house at the base of the slope shall be structurally engineered to withstand a landslide.
- Test pits and insitu testing of soil hydraulic conductivity will also be required to confirm a suitable septic disposal field location for any new house.

5.0 Closure and Limitations

RGC completed this assessment work to assist Dr. Shammi and Geetika Saini in deciding whether to purchase the property at 2204 Forsyth Drive, Penticton.

This report presents the findings of an assessment of existing site conditions. The conclusions presented in this letter were based upon a visual assessment of site conditions on the subject property and a review of a previous engineering report and site photos. This work was completed following generally accepted geotechnical engineering practice. No other warranty expressed or implied is intended.

Please contact us if you have any questions regarding this work.

Yours truly,



Paul Glen, P.Eng.
Rock Glen Consulting Ltd.
EGBC Permit No. 1002767

- Attachments:
- 1) Photos
 - 2) Figure 1: Location Plan
 - 3) Figure 2: Site Plan



Photo No. 1 – Steep slope above north side of building area



Photo No. 2 – Steep north slope. Note boulders on slope and at toe of slope



Photo No. 3 – View across steep north slope.

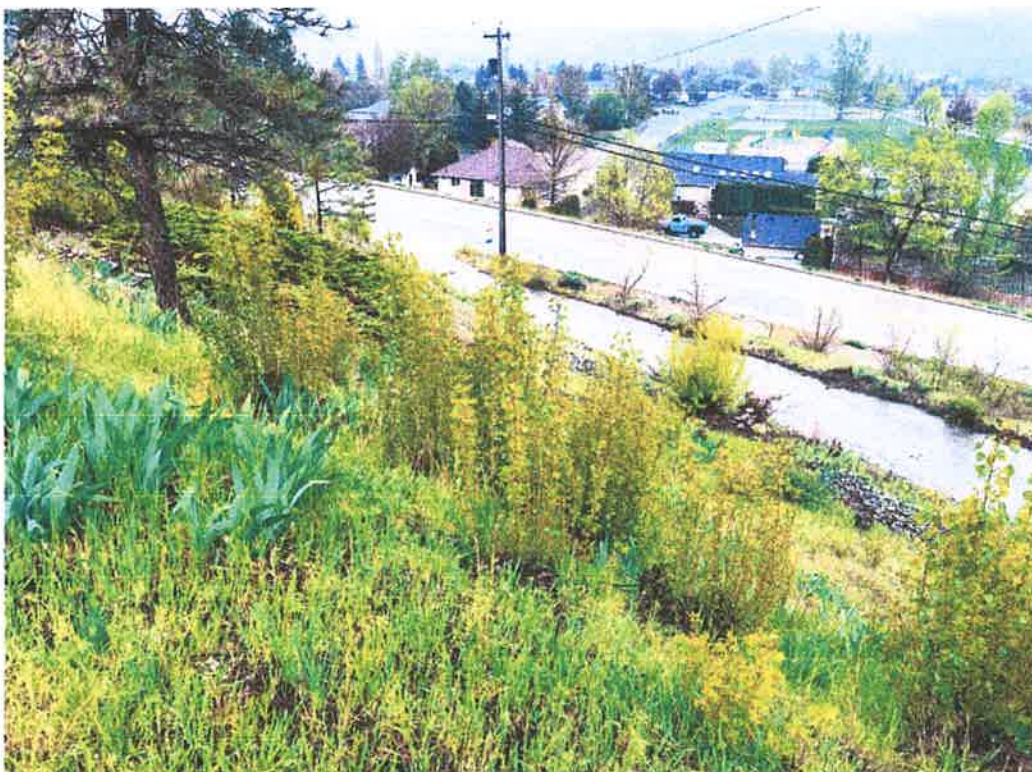


Photo No. 4 – Driveway access with slope below potential building site.



Base Map RDOS Public Parcel Viewer

RGC

Rod Glen Consulting



Figure 1: Location Plan
 2204 Forsyth Drive, Penticton

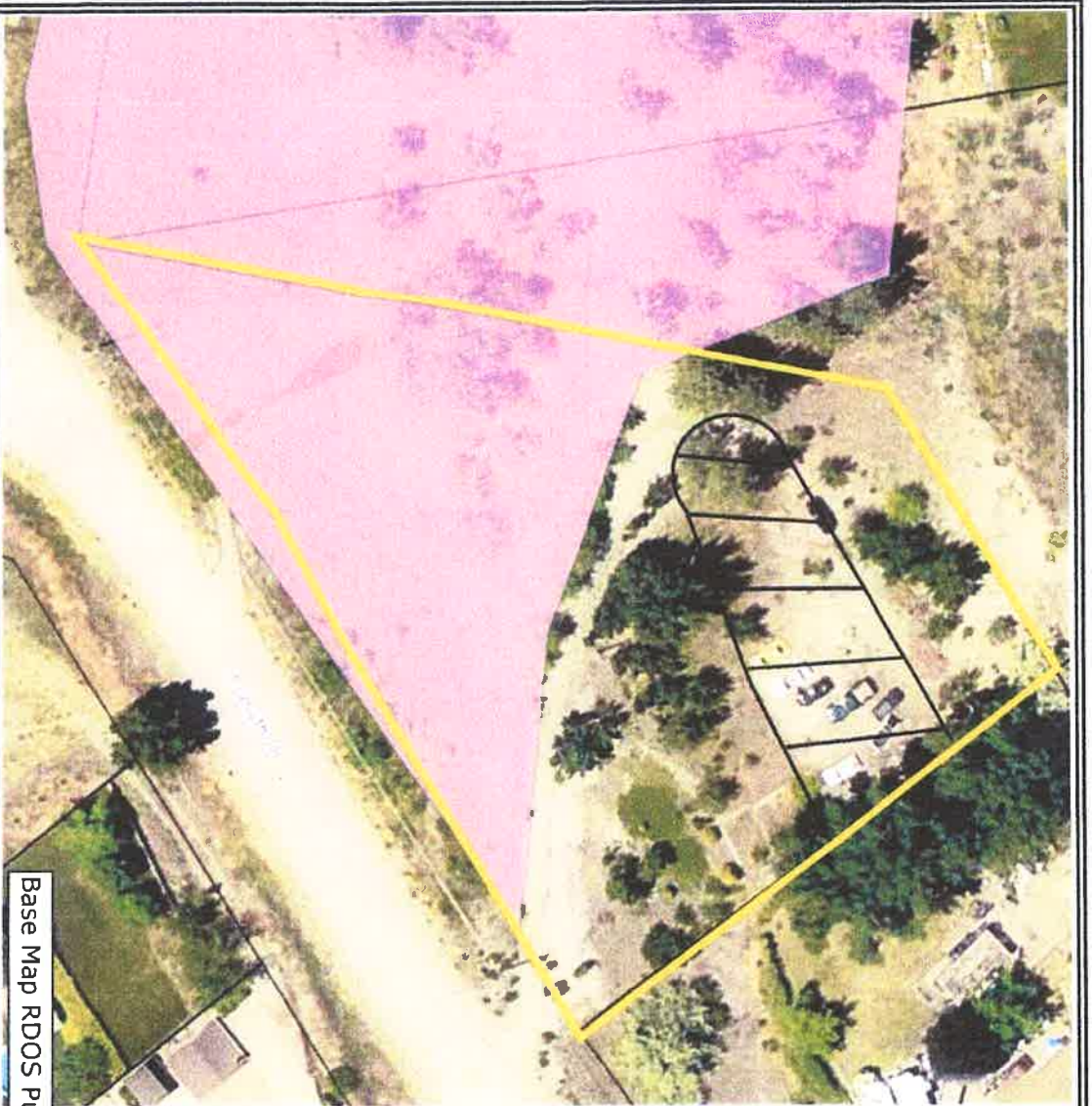
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 May 5, 2022

Design		Drawn	AB	2022 05 05
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Checks	Date	Name	Description
	2022 05 05	PG	

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Environmentally Sensitive Development
 Permit Area
 Approximate Extent of Bench Area

Base Map RDOS Public Parcel Viewer

Figure 2: Site Plan
2204 Forsyth Drive, Penticton, BC



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