

GEOHAZARD ASSESSMENT MEMORANDUM

Client: Pender Island Golf and Country Club

Contact: Charlie Eigl

Email: eiglchar@gmail.com

Project Title: Proposed Maintenance Facility

Project Address: 2305 Otter Bay Road – North Pender Island

Date: January 26, 2026

Project No.: 3414-2

Proposed North and South Building Sites

As requested, we attended the referenced property on January 15, 2026, to perform a geotechnical assessment at two possible sites for a proposed maintenance facility. The proposed north site was previously reviewed in a “*Recommendations for Construction*” memorandum issued by Ryzuk on November 7, 2019. Our work has been conducted in accordance with, and is subject to, the accepted Terms of Engagement.

SOUTH SITE

The South Site is located within Parcel F (DD 787361) approximately 115 m to the southwest of the main clubhouse building, next to an existing pumphouse building and storage seacan. (Refer to attached South Site Plan.) The site is bounded by an existing driveway to the northeast and contains two concrete pads and several spoil piles within the proposed building area.

The site is characterized by a steep slope to the southwest, which also extends into the northwest end of the proposed building area. The rest of the proposed building area is level, likely as a result of historical cut and fill with site-sourced glacial till comprising mostly sand and gravel. While on site we performed a series of five 0.30-0.45 m deep test holes with a handheld power auger and found that the soil across the proposed building area consisted of gravel and sand with trace fines content, overlain by a thin layer of topsoil/plant matter.

We anticipate that the primary challenge to building within the South Site will be mitigating the risk of rock fall and landslide hazard from the slope to the southwest and regrading the northwest end of the site. The surface of the slope consists of boulders and topsoil/decaying plant matter, with soil consisting of sand and gravels present at the base. At the toe of the slope a sharp cut 1-2 m high is present, with an incline of approximately 45 degrees. Above the toe, the average incline of the slope is about 30 degrees. The lower 12 m of the slope is deforested, but logs and tree stumps remain along with moderate vegetation. Approximately 25 m up the slope is a tall vertical rock face with many fractures and overhangs, which will be a rockfall hazard source. Evidence of debris flows are present within the western corner of the building area from the slope.

We understand that the south site is not currently zoned to allow for the construction of a maintenance facility, however if such were resolved we anticipate that site preparation would consist of stripping away any topsoil, removing the spoil piles, and regrading the slope at the northwest corner of the site – likely necessitating the use of a permanent retaining structure or reinforced foundation wall. Site preparation may also involve relocating the driveway away from the proposed maintenance facility and constructing a rockfall/landslide barrier, such as a lock block wall or fence, and/or catchment ditch along the slope.

NORTH SITE

The North Site, previously identified as “Site 1”, is located within Lot A, Section 17 (VIP52327), approximately 130 m to the west of the main clubhouse building. (Refer to attached North Site Plan.) The site is bounded by an existing driveway to the northeast, and is characterized by a steep rock bluff to the southwest of the proposed building area. The proposed building area is mostly level, but with gently sloping bedrock outcrops within the northwest end, and a few spoil piles present. The existing subgrade consisted of shale bedrock with a thin veneer of topsoil throughout.

We anticipate that the primary challenge to building within the North Site will be mitigating the risk of rock fall and landslide hazard from the rock bluff to the southwest. The crest of the rock bluff ranges from 3-8 m above the proposed building area, increasing in height from southeast to northwest. The incline of the rock bluff ranges from 45 degrees to near vertical, with many fractures in the upper rock and with tree roots and topsoil overhanging the bluff.

The surface conditions above the bluff consisted of boulders and topsoil/decaying plant matter. Within 5-8 m of the crest of the bluff the terrain was moderately sloping at 10-20 degrees; beyond this distance the terrain is steeply sloping at 30-40 degrees. The upslope terrain showed signs of soil creep including “pistol-butted” tree trunks.

We anticipate that site preparation for a proposed building within the North Site would consist of stripping out any topsoil and removing the spoil piles, widening the area by placement of engineered fill and relocating the existing driveway to the northeast, scaling the top of the berm to remove overhanging soil and precariously situated boulders, and construction of a rock hazard barrier, such as a lock block wall or fence, and/or catchment ditch. To level the site engineered fill would need to be placed throughout the centre and southeast end of the proposed building area and/or rock chipping/blasting would need to be performed within the northwest end.

DISCUSSION

The advantages of the North Site include the presence of shallow bedrock throughout will provide excellent bearing capacity, and any shale rock that is removed will be a suitable material for engineered fill. Additionally, we understand that the North Site is situated within a property parcel for which the zoning allows new construction of this building type.

The advantages of the South Site are that the height of any rockfall prevention barriers are likely to be lower, and that the trees above the site have already been felled. Also, the existing levelled area is larger.

Design and modelling of a rockfall/landslide barrier could be provided upon request for one or both sites, and would depend on the available/proposed building setback from the rockfall/landslide hazard in question, and proposed building elevation.

In accordance with the 2020 National Building Code of Canada (NBCC 2020) and BC Building Code 2024 (BCBC 2024), we consider Site Designation 'C' to be appropriate for both sites. If foundations bear directly on bedrock at the North Site, a Site Designation of 'B' may be used instead. Seismic design spectra for Site Design 'B' and 'C' may be obtained using the 2020 NBCC Seismic Hazard calculator, available online.

We note that a subgrade bearing resistance of 150 kPa (SLS) / 225 kPa (ULS) is considered appropriate for foundation design for both sites.

CLOSURE

We trust the preceding is suitable for your purposes at present. If you have any questions or require anything further, please do not hesitate to contact us.

Sincerely,

Ryzuk Geotechnical

Karl Hiscock, EIT
Advanced Junior Engineer

Cameron Schellenberg, P.Eng.
Lead Geotechnical Engineer

Permit to Practice Number: 1002996

Attachment(s):

- Photo Table – South Site
- Photo Table – North Site
- South Site Plan
- North Site Plan

Photo Table – South Site (January 15, 2025)

#	Photos	Comments
1		Proposed building area – facing south
2		Toe of slope – facing northwest

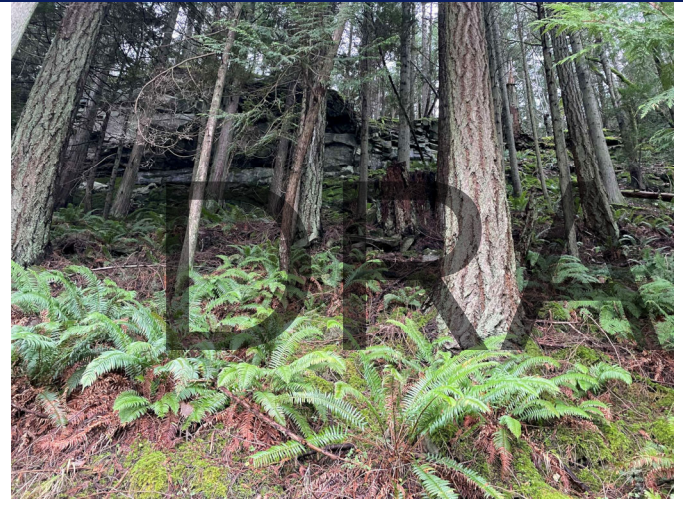
3		• Slope above building area – facing southeast
4		• Rock bluff above slope – facing southwest

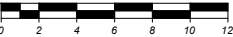
Photo Table – North Site (January 15, 2025)

#	Photos	Comments
1		Proposed building area and rock bluff – facing northwest
2		Bedrock outcrop within west corner of site – facing northwest

3		• Profile view of rock bluff, height = ~6 m – facing southwest
4		• Slope above rock bluff, including pistol butted tree trunks – facing northwest

5		• Building area from rock bluff above – facing southeast
6		 • Slope beyond rock bluff – facing west

TOPOGRAPHIC SITE PLAN OF PART OF PARCEL F (DD 78736i) OF SECTION 17,
PENDER ISLAND, COWICHAN DISTRICT, EXCEPT PARTS IN PLANS 22933 AND 36581
PID 009-675-698



The intended plot size of this plan is 560mm in width by 864mm in height (D-Size) when plotted at a scale of 1:200.

All distances and elevations are in metres and decimals thereof, unless otherwise noted.

Elevations are assumed and are based on found Capped Post 1003 with an elevation of 50.0 metres.

Contour interval is 0.5 metres

LEGEND

- denotes Standard Capped Post found
- denotes Traverse Hub placed
- denotes Stake placed
- denotes Driveway
- denotes Top of Bank
- denotes Bottom of Bank
- denotes Tree - Coniferous
- denotes Spot Elevation

Setbacks are derived from field survey completed on Dec 16, 2025, and are measured from the proposed building

The civic address of the building is:
2305 Otter Bay Road, Pender Island

There are no non-financial charges shown on the current Certificate of Title that may affect the property.

This document shows the relative location of the surveyed buildings and features with respect to the boundaries of the parcel described hereon. This document shall not be used to define property lines or property corners.

Feature labels are descriptive. The user is encouraged to refer to the appropriate land use bylaw for specific feature definitions.

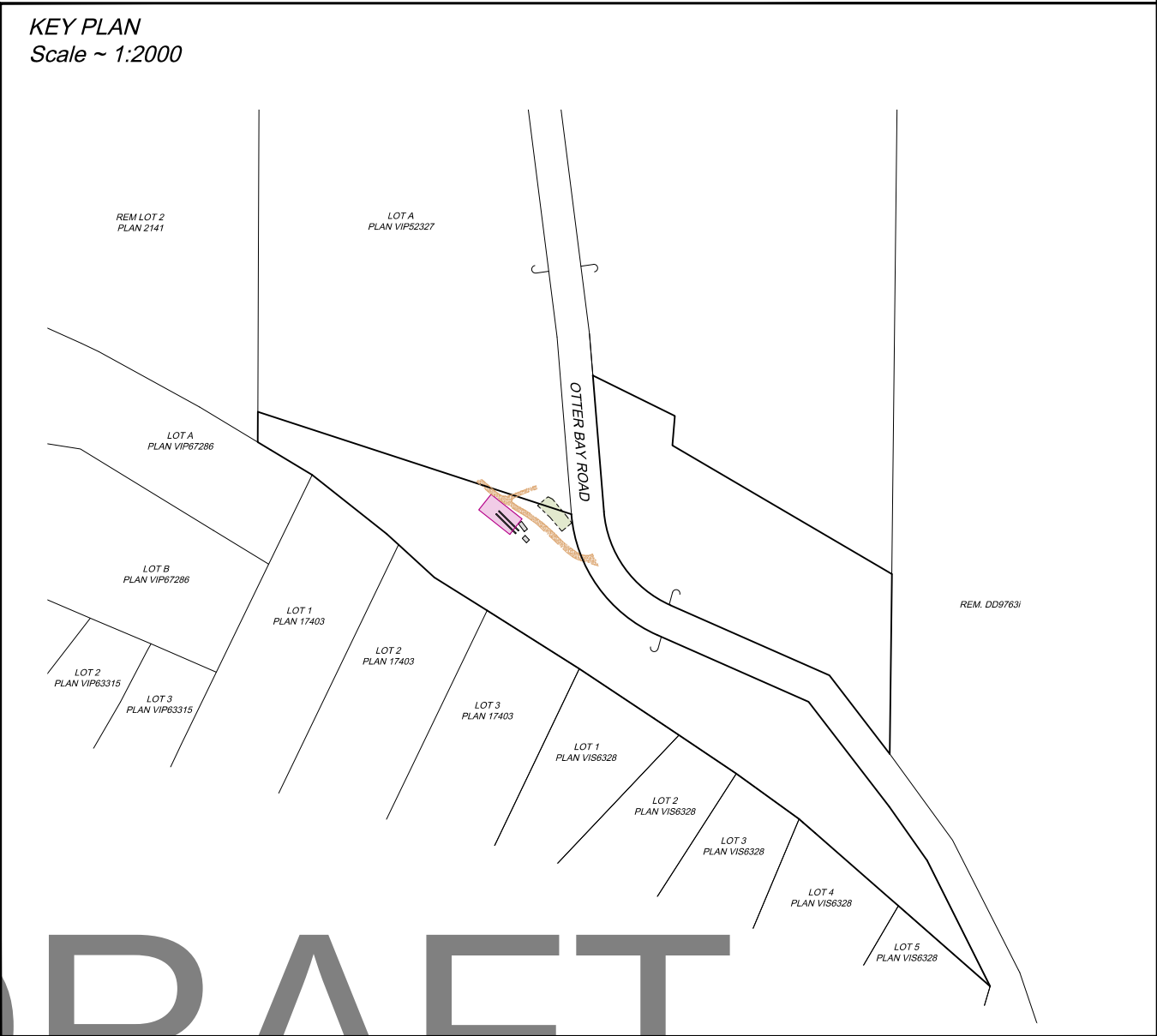
Additional buildings or structures not shown on this plan may be located on the property.

Tree species and diameter are estimated and should be confirmed by a Certified Arborist.

This site plan is Certified Correct in accordance with the Practice of Land Surveying as of the 16th day of December, 2025.

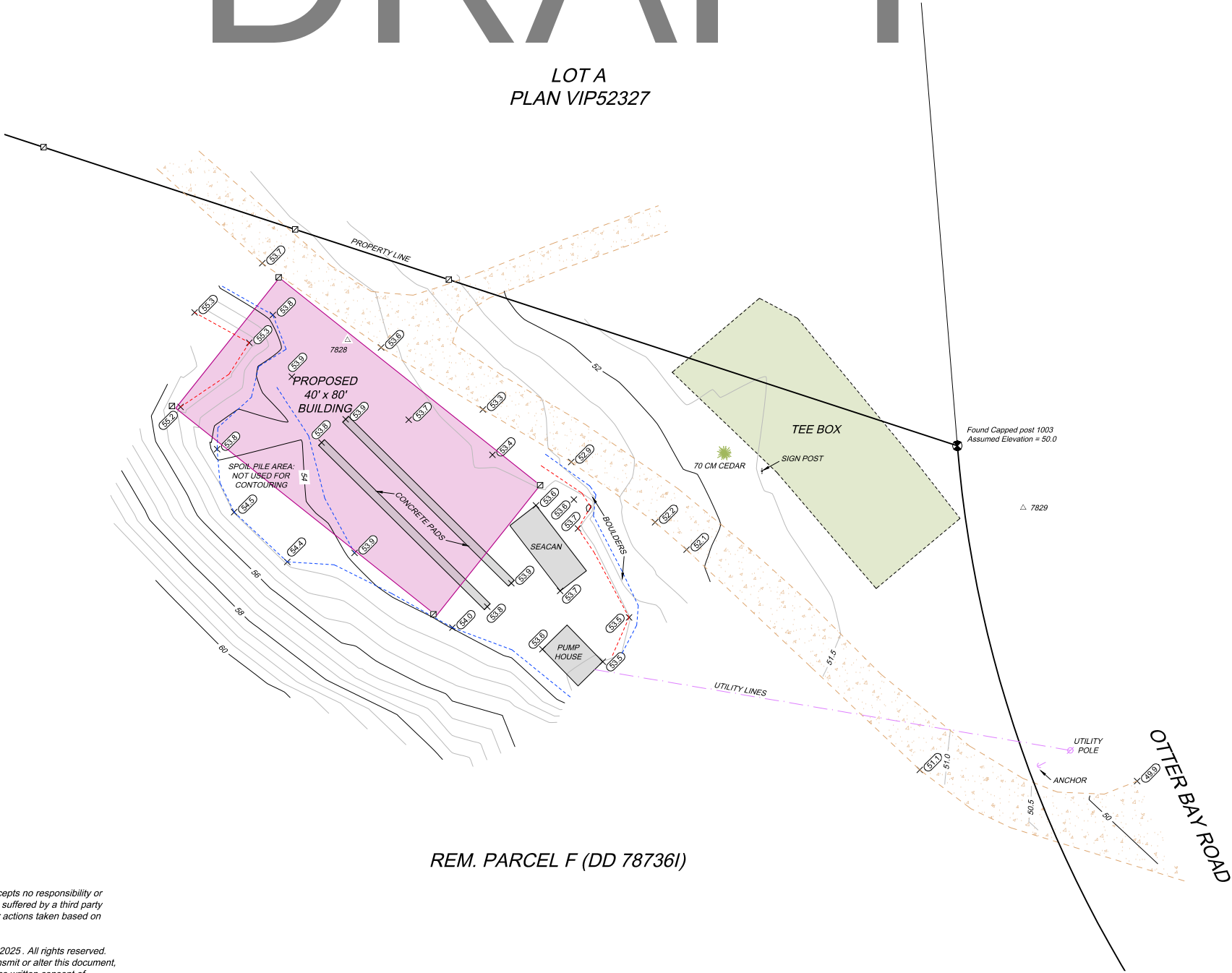
G. A. Hol, BCLS 646

KEY PLAN
Scale ~ 1:2000



DRAFT

LOT A
PLAN VIP52327



Polaris Land Surveying 2024 Inc. accepts no responsibility or liability for any damages that may be suffered by a third party as a result of any decisions made, or actions taken based on this document.

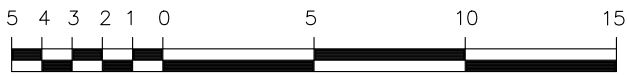
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POLARIS
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Date: 2025-12-23
File: 4695-01
Drawing: 4695-01_C3D.dwg
Layout: D-Size

Site Plan Of A Portion Of:
Lot A, Section 17, Pender Island,
Cowichan District, Plan VIP52327.
P.I.D. 017-337-178



Scale = 1:250

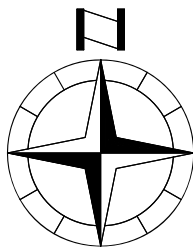
Dated this 26th day of November, 2019.

Distances and elevations shown are in metres.

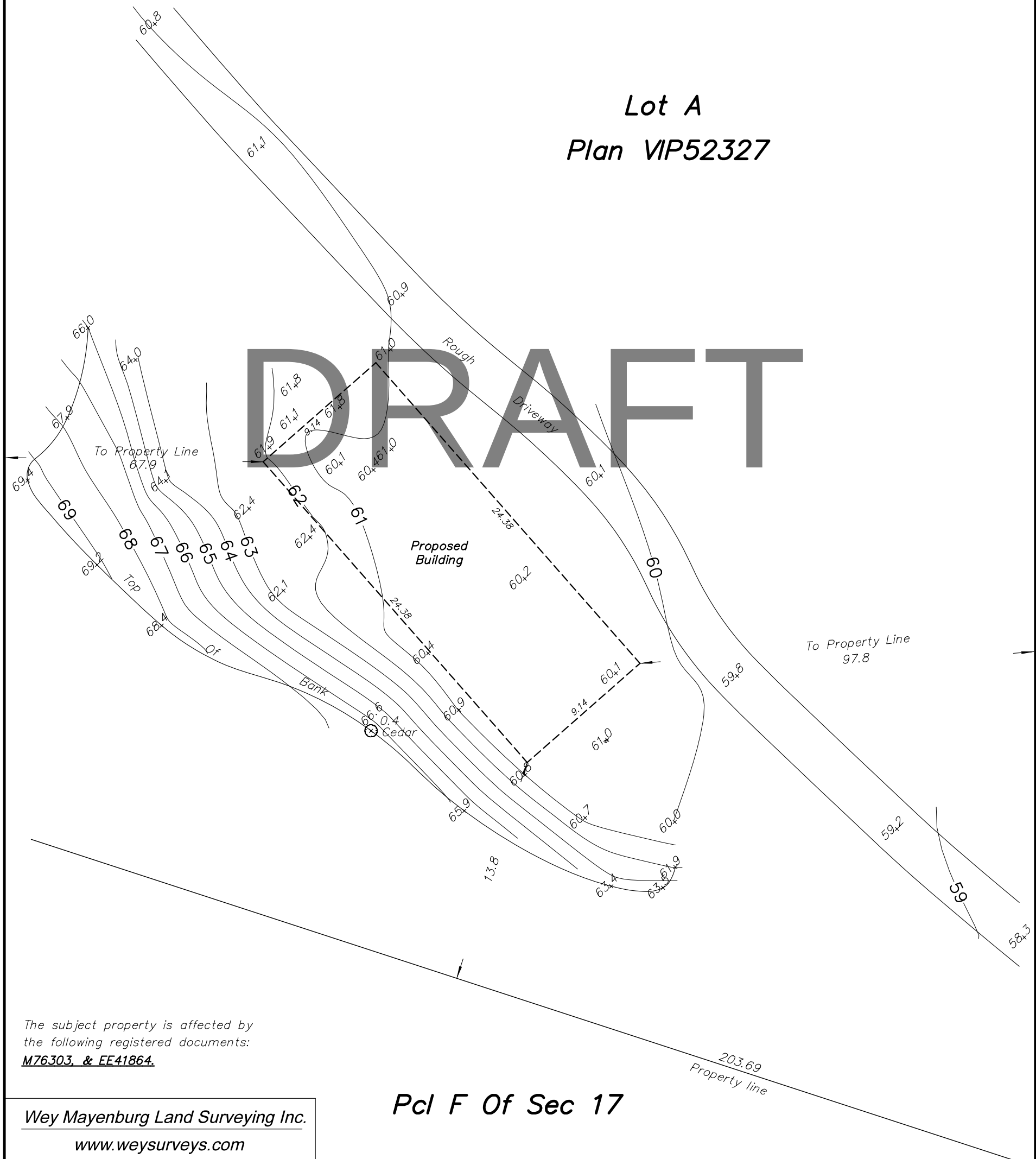
Elevations are based on assumed datum.

This site plan is for building and design purposes and is for the exclusive use of our client.

This document shows the relative location of the surveyed structures and features with respect to the boundaries of the parcel described above. This document shall not be used to define property lines or property corners.



Lot A
Plan VIP52327



The subject property is affected by the following registered documents:
M76303, & EE41864.

Wey Mayenburg Land Surveying Inc.

www.weysurveys.com

#4-2227 James White Boulevard

Telephone (250) 656-5155

File: 140160B\SIT\GH

Pcl F Of Sec 17

203.69
Property line