



CORPORATION OF THE CITY OF VERNON

ADVISORY PLANNING COMMITTEE

JULY 18, 2023, AT 4:00 PM

OKANAGAN LAKE ROOM (COUNCIL CHAMBER) CITY HALL

A G E N D A

1) CALL TO ORDER

2) LAND ACKNOWLEDGEMENT

As chair of the City of Vernon's Advisory Planning Committee (APC), and in the spirit of this gathering, I recognize the City of Vernon is located in the traditional territory of the Syilx people of the Okanagan Nation.

3) ADOPTION OF AGENDA

4) ADOPTION OF MINUTES

a) June 27, 2023 (Attached)

5) NEW BUSINESS

- a) DVP00596 (8354 OKANAGAN LANDING ROAD)
- b) DVP00598 (8511 OKANAGAN LANDING ROAD)
- c) ZON00394 / DVP00597 (5311 20TH STREET)
- d) DVP00599 (69 KESTREL PLACE) – ***Report to follow***

6) INFORMATION ITEMS

a) Staff Liaison to provide verbal update of APC related items discussed at the last Council meeting.

7) NEXT MEETING

The next meeting is tentatively scheduled for **August 15, 2023**

8) ADJOURNMENT



THE CORPORATION OF THE CITY OF VERNON

**MINUTES OF THE
ADVISORY PLANNING COMMITTEE MEETING**

HELD JUNE 27, 2023 AT 4:00 PM

OKANAGAN LAKE ROOM (COUNCIL CHAMBERS) CITY HALL

PRESENT: Mayor Cumming
Jessica Kirkham
Kennedy Mund
Scott Chatterton (*Acting Chair*)
Jordan Hart
Craig Neville
Clair Ishoy
Margo Lupien
Harpreet Nahal
Kyla Gaudreau

ABSENT: Monique Hubbs-Michiel
Margo Jarman

STAFF: Roy Nuriel, Acting General Manager, Planning
Michelle Austin, Planner
Matt Faucher, Planner
Jennifer Pounder, Committee Clerk

ORDER

The meeting was called to order at 4:10 p.m.

LAND ACKNOWLEDGEMENT

As Chair of the City of Vernon's Advisory Planning Committee, and in the spirit of this gathering, I recognize the City of Vernon is located in the traditional territory of the Syilx people of the Okanagan Nation.

ADOPTION OF THE AGENDA

Moved by M. Lupien, seconded by C. Neville:

THAT the agenda of the June 27, 2023 Advisory Planning Committee meeting be adopted.

CARRIED

ADOPTION OF THE MINUTES

Moved by C. Ishoy, seconded by M. Lupien:

THAT the minutes of the June 13, 2023 Advisory Planning Committee meeting be adopted.

CARRIED

NEW BUSINESS:

ZON00401 (811 39TH AVENUE)

M. Faucher, Planner, provided an overview of the application as follows:

- The application is to rezone the property from CR NORD – Country Residential to A1 – Agriculture within the ALR.
- The subject property was annexed to the City on September 16, 2011. At that time, secondary suites were not a permitted use in the Regional District of North Okanagan’s (RDNO) Country Residential zone. Therefore, regardless of suites being permissible under current land use regulations in RDNO, they are not a permitted use on the subject property.
- The proposed zoning amendment provides the subject property with an appropriate City zone and eliminates challenges created by having a property within the City with a zoning designation from another jurisdiction.
- If the rezoning is successful, the applicant intends to add a secondary suite to the subject property.

There were no questions or comments from the Committee.

Moved by H. Nahal, seconded by C. Neville:

THAT the Advisory Planning Committee recommends that Council support Rezoning 00401 (ZON00401) to rezone Lot 4, Sec 2, TWP 8, ODYD, Plan 4327 Except Plans 35714 and EPP85237 (811 39th Avenue) from CR NORD – Country Residential to A1 – Agriculture within the ALR as outlined in the report titled “Rezoning Application for 811 39th Avenue” dated

June 19, 2023 and respectfully submitted by the Current Planner;

AND FURTHER, that Council direct Administration to prepare a proposed bylaw and public notice of initial readings to rezone Lot 4, Sec 2, TWP 8, ODYD, Plan 4327 Except Plans 35714 and EPP85237 (811 39th Avenue) from CR NORD – Country Residential to A1 – Agriculture within the ALR;

AND FURTHER, that Council not hold a public hearing on a proposed bylaw to rezone Lot 4, Sec 2, TWP 8, ODYD, Plan 4327 Except Plans 35714 and EPP85237 (811 39th Avenue) from CR NORD – Country Residential to A1 – Agriculture within the ALR.

CARRIED

DVP00582 (903 MT. GRIFFIN ROAD)

M. Austin, Planner, provided an overview of the application as follows:

- The owner of the property is in the process of constructing a single detached house with a secondary suite. A building permit for this purpose was issued in September 2022. Retaining walls have concurrently been constructed along the east side property line and rear (south) of the house along an existing no build/no disturb covenant line. All retaining walls over 1.2m high require variance approval from Council and a building permit. Fencing has not yet been constructed.
- The applicant is requesting the following:
 - To allow the construction of buildings, structures or swimming pools on slopes >30%;
 - To increase the height of a retaining wall from 1.2m to 2.4m along 19ft of the east property line, from 1.2m to 2.4m at the west end of the retaining wall, up to 2.9m along 47ft along the covenant line adjacent to the pool, and from 1.2m to 2m along a 32ft section paralleling the covenant line;
 - To increase the combined height of a fence on top of a retaining wall from 2m to 3.5m along a 19ft section on

the east property line, from 2m to 3.6m at the west end of the retaining wall, up to 4.1m along a 47ft section paralleling the covenant line, and from 2m to 3m along a 32ft section paralleling the covenant line.

- The owner's development objectives are to create a patio area for a secondary suite and create an at-grade pool and back yard area at the rear of the house.

The following questions and comments were posed by the Committee:

- Staff confirmed that the neighbors are not in favor of this application.
- The Committee commented that this is not creating more housing. Rather, it is benefitting one family while negatively impacting the appearance of the hillside for the broader public.
- Staff confirmed that the original house designs for the Mt. Griffin Road subdivision were for two storey walk outs, with one storey from the street. However, the house designs have changed to two storeys, which requires filling the backyard level and using retaining walls. Had the original house designs been implemented, fill and retaining walls to the extent proposed would not be required.
- Staff confirmed surface treatments are recommended to blend the concrete wall with the natural surroundings.

Moved by J. Hart, seconded by J. Kirkham:

THAT the Advisory Planning Committee recommends that Council support a modified version of Development Variance Permit Application 00582 (DVP00582) to vary Zoning Bylaw 5000 for Lot 24, Sec 27, TWP 9, ODYD, Plan EPP96153 (903 Mt. Griffin Road) as outlined in the report titled "Development Variance Permit Application for 903 Mt. Griffin Road" dated June 22, 2023 and respectfully submitted by the Current Planner, as follows:

- a) Section 4.15.1, to allow construction of buildings, structures or swimming pools on a slope of 30% or greater;

AND FURTHER, that Council’s approval of DVP00582 is subject to the following:

- a) That the retaining wall and fencing locations and heights comply with an updated site, elevation and cross section plan to be attached to and form part of DVP00582; and
- b) That the retaining wall complies with the Geotechnical Letter, prepared by Horizon Geotechnical Ltd., dated June 16, 2023 (Attachment 5) to be attached and form part of DVP00582.
- c) That the concrete wall aesthetic be enhanced with a surface treatment that blends in with natural surroundings, to the satisfaction of Administration.

CARRIED
with H. Nahal opposed

INFORMATION ITEMS:

M. Austin provided an update of recent Council decisions on bylaws and applications previously considered by the Advisory Planning Committee.

NEXT MEETING

The next meeting for the Advisory Planning Committee is set for July 18, 2023 at 4:00 p.m.

ADJOURNMENT

The meeting of the Advisory Planning Committee adjourned at 4:56pm by call of the Chair.

CERTIFIED CORRECT:

_____ Chair



THE CORPORATION OF THE CITY OF VERNON REPORT TO COUNCIL

SUBMITTED BY: Michelle Austin
Planner, Planning

COUNCIL MEETING: REG COW I/C
COUNCIL MEETING DATE: August 14, 2023
REPORT DATE: July 12, 2023
FILE: 3090-20 (DVP00596)

SUBJECT: **DEVELOPMENT VARIANCE PERMIT APPLICATION FOR 8354 OKANAGAN
LANDING ROAD**

PURPOSE:

To present for Council's consideration a development variance permit application to allow the construction of a semi-detached building and a retaining wall at 8354 Okanagan Landing Road.

RECOMMENDATION:

THAT Council support Development Variance Permit Application 00596 (DVP00596) to vary Zoning Bylaw 5000 for Lot 4, DL 6, ODYD, Plan KAP69591 (8354 Okanagan Landing Road) as outlined in the report titled "Development Variance Permit Application for 8354 Okanagan Landing Road" dated July 12, 2023 and respectfully submitted by the Planner, as follows:

- a) Section 4.15.1, to allow construction of a semi-detached building and retaining wall on a slope of 30% or greater on Proposed Lot A; and
- b) Section 6.5.11, to increase height of a retaining wall supporting the inside curve of the driveway from 1.2m to 2.3m as shown in an orange bold line on Drawing 01, Retaining Wall Design Memo, prepared by Tetra Tech Canada Inc., dated March 3, 2023 (Attachment 4);

AND FURTHER, that Council's support of DVP00596 is subject to the following:

- a) That the development generally complies with the site and topography plan, prepared by Russell Shortt Land Surveyors, dated November 15, 2022 (Attachment 1) to be attached to and form part of DVP00596;
- b) That the development complies with the Retaining Wall Design Memo, prepared by Tetra Tech Canada Inc., dated March 3, 2023 (Attachment 4) to be attached and form part of DVP00596;
- c) That the development complies with the Letter of Assurance, provided by Tetra Tech Canada Inc., dated February 17, 2023 (Attachment 6) to be attached and form part of DVP00596;
- d) That the development complies with the Preliminary Geotechnical Report, prepared by Tetra Tech Canada Inc., dated December 9, 2022 (Attachment 5) to be attached and form part of DVP00596;
- e) That, prior to the issuance of DVP00596, a Final Geotechnical Assessment Report and Landslide Assurance Statement be provided stating that the land may be used safely for the use intended;
- f) That a Permit is ready for issuance in accordance with Soil Removal and Deposition Bylaw 5259; and
- g) That the verti-blocks used to construct the retaining wall resemble coloured textured stone (Attachment 4 – Drawing 01).

ALTERNATIVES & IMPLICATIONS:

1. THAT Council not support Development Variance Permit Application 00596 (DVP00596) to vary Zoning Bylaw 5000 for Lot 4, DL 6, ODYD, Plan KAP69591 (8354 Okanagan Landing Road) as outlined in the report titled “Development Variance Permit Application for 8354 Okanagan Landing Road” dated July 12, 2023 and respectfully submitted by the Planner, as follows:
 - a) Section 4.15.1, to allow construction of a semi-detached building and retaining wall on a slope of 30% or greater on Proposed Lot A; and
 - b) Section 6.5.11, to increase height of a retaining wall supporting the inside curve of the driveway from 1.2m to 2.3m as shown in an orange bold line on Drawing 01, Retaining Wall Design Memo, prepared by Tetra Tech Canada Inc., dated March 3, 2023 (Attachment 4).

Note: Alternative 1 would prohibit the owners from developing the property.

ANALYSIS:

A. Committee Recommendations:

At its meeting of July 18, 2023, the Advisory Planning Committee passed the following resolution:

“(That the Advisory Planning Committee recommends that Council...)”

B. Rationale:

1. The subject property is located at 8354 Okanagan Landing Road (Figures 1 and 2). It is a vacant, one-acre lot sloping uphill from the road with a view of Okanagan Lake.
2. The owners are proposing to subdivide the subject parcel into two parcels (Attachment 1) and construct a semi-detached building on each (Attachment 2).
3. Access to both parcels and residential buildings is being proposed through a shared driveway. This would be accomplished through an access easement and agreement between the owners of each new lot. The semi-detached house on the lower lot (Attachment 3) would be accessed from the south elevation at the rear of the house.

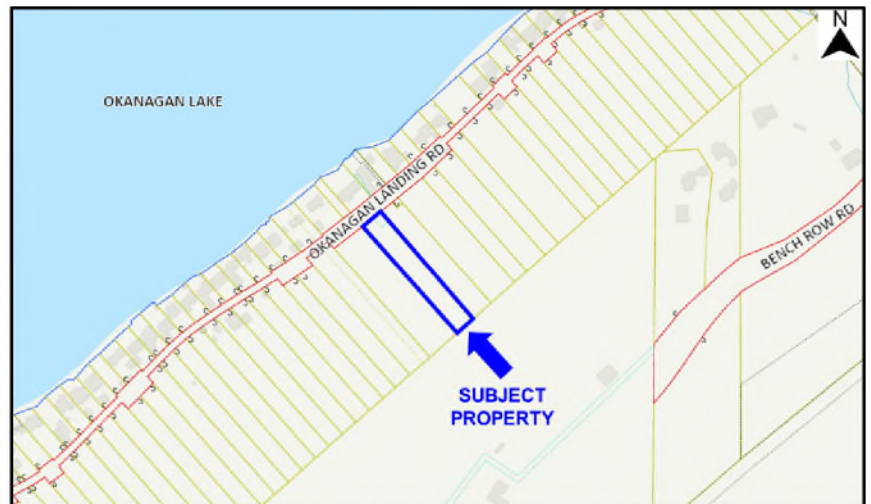


Figure 1 – Location Map

4. To proceed with the proposed development, the owners require variances to:
 - allow the construction of a semi-detached building (Attachment 3) and a retaining wall (Attachment 4) on a slope of 30% or greater (Figure 3) on Proposed Lot A; and
 - increase the height of a retaining wall supporting the inside curve of the driveway from 1.2m (3.9ft) to 2.3m (7.5ft).

5. Zoning Bylaw 5000, Section 6.5.11, allows retaining walls that are required as a condition of subdivision approval to exceed a height of 1.2m. The Approving Officer can provide approval for increased retaining wall height through the subdivision process, provided that the owner demonstrates that the retaining walls are necessary for development. Should Council deny the request for increased retaining wall height, it could be approved through the subdivision process.



Figure 2 – Aerial Map

6. The following geotechnical documents have been provided to support the variance application:

- Retaining Wall Design Memo (Attachment 4) – this memo provides preliminary recommendations for the design of a retaining wall on Proposed Lot A;
- Preliminary Geotechnical Report (Attachment 5) – this report provides preliminary recommendations for the construction of two semi-detached buildings but acknowledges that additional investigation and verification are required; and
- Letter of Assurance (Attachment 6) – this letter provides assurance of professional design and commitment for field reviews by the Engineer of Record.



Figure 3 – $\geq 30\%$ Slopes

7. Attachment 7 shows the slopes of the subject property prior to recent land alterations and Attachment 8 shows the slopes currently. Slopes $\geq 30\%$ are shown in red. Site preparation works have been done in anticipation of constructing the lower semi-detached house, a driveway and a retaining wall. As noted in Sec. 6 above, three preliminary geotechnical documents have been provided. These documents are general in nature and do not provide assurance that the buildings and ancillary structures can be safely constructed on the property. Therefore, Administration recommends that, prior to the issuance of DVP00596, a Final Geotechnical Assessment Report and Landslide Assurance Statement be provided stating that the land may be used safely for the use intended.
8. The retaining wall design utilizes two feet high verti-blocks (Attachment 4 – Drawing 01). Approximately four blocks stacked above grade would be visible (Figure 4). Provided the blocks used resemble colored textured stone, as opposed to smooth concrete, the wall should be appealing.
9. In addition to this variance application (DVP00596), the following applications are concurrently in process with the City for the subject property:

- SUB00841 – this application is to subdivide the parcel into two parcels (Attachment 1) and construct a semi-detached building on each new parcel. Proposed Lot A would be approximately 0.3 acres. Proposed Lot B would be a panhandle lot with an area of approximately 0.7 acres. This subdivision cannot be approved until any development variance permits, development permits and soil removal and deposition permits have been supported and issued by the appropriate approving authority.



Figure 4: Approximate height of retaining wall

- DP001004 – A DP is required in order to subdivide, alter land or construct a building or structure. The development proposal triggers environmental and fire interface development permit (DP) requirements of Official Community Plan (OCP) Bylaw 5470. The subject property is designated as having medium conservation value (yellow) and as being within Fire Interface Area 2 (medium). The owners have altered the land (Attachment 9) within an Environmentally Sensitive Area and are therefore in contravention of OCP Bylaw 5470. They have provided an Environmental Impact Assessment (EIA) (Attachment 10) and a wildfire interface covenant (Attachment 11) to satisfy the DP guidelines. Administration has the authority to issue development permits under Delegation of Authority Bylaw 5727. As indicated in the EIA, the proposed development avoids areas with the highest conservation values. All proposed development would occur within the portion of the subject property that is most impacted by invasive weed species. No development is proposed within high conservation areas and 42% of the subject property in the south would be protected by a no build-no disturb covenant.
- SRD00108 – this application is to request the removal and/or deposition of soil. The application has not progressed as Administration is awaiting required information from the applicant. Further, a soil permit cannot be issued until a $\geq 30\%$ slope variance has been supported and issued by Council. The owners have removed or deposited at least 50m^3 of soil within an Environmentally Sensitive Area and are therefore in contravention of Soil Removal and Deposition Bylaw 5259.
- BP008969 – this application is to construct a semi-detached building (Attachment 3) on Proposed Lot A. A Building Permit would also be required for any over-height retaining walls. This permit cannot be issued until any development variance permits, development permits and soil permits have been supported and issued by the appropriate approving authority. Should the Approving Officer approve the subdivision, the owners would apply for a building permit for a second semi-detached building on Proposed Lot B.

10. Administration supports the variance requests for the following reasons:

- a) A Professional Engineer has committed to being the responsible person for the multi-family building development, including retaining walls.
- b) The recommendation includes a condition that, prior to the issuance of DVP00596, a Final Geotechnical Assessment Report and Landslide Assurance Statement be provided stating that the land may be used safely for the use intended.

- c) The pending soil removal and deposition permit would address drainage, erosion and sediment controls, and grading for the site.
- d) The proposed development avoids areas with the highest conservation values. These areas (approximately 42% of the subject property) would be protected with a no build no disturb covenant.
- e) The recommendation includes a condition that the blocks used to construct the retaining wall resemble colored textured stone. This would help to enhance the walls aesthetic.

C. Attachments:

- Attachment 1: Site and Topography Plan
- Attachment 2: Applicant Rationale Letter
- Attachment 3: Design Drawings
- Attachment 4: Retaining Wall Design Memo
- Attachment 5: Preliminary Geotechnical Report
- Attachment 6: Letter of Assurance
- Attachment 7: Slope Analysis Plan (Pre-Land Alterations)
- Attachment 8: Slope Analysis Plan (Post-Land Alterations)
- Attachment 9: Photos
- Attachment 10: Environmental Impact Assessment
- Attachment 11: Wildfire Interface Covenant

D. Council's Strategic Plan Alignment:

- | | |
|---|--|
| <input type="checkbox"/> Governance & Organizational Excellence | <input type="checkbox"/> Livability |
| <input type="checkbox"/> Recreation, Parks & Natural Areas | <input type="checkbox"/> Vibrancy |
| <input type="checkbox"/> Environmental Leadership | <input checked="" type="checkbox"/> Not Applicable |

E. Relevant Policy/Bylaws/Resolutions:

1. OCP Bylaw 5470, Section 26.0 Development Permit Areas (All) and Section 29.0 Development Permit Area #3 (Hillside Residential and Heritage District):
 - Designated as having medium conservation value (yellow); and
 - Designated as being within Fire Interface Area 2 (medium).
2. Zoning Bylaw 5000, Section 4.15.1:
 - No construction of a building, structure or swimming pool is permitted on slopes 30% or greater.
3. Zoning Bylaw 5000, 6.5 Fencing and Retaining Walls:
 - 6.5.11 Retaining walls on all residential lots, except those required as a condition of subdivision approval, must not exceed a height of 1.2m measured from grade on the lower side, and must be constructed so that multiple retaining walls are spaced to provide at least a 1.2m horizontal separation between them; and

6.5.12 In the case of a retaining wall constructed in accordance with Section 6.5.11, the combined height of a fence on top of a retaining wall at the property line or within 1.2m of the property line shall not exceed 2.0m, measured from natural grade at the property line (Figure 5).

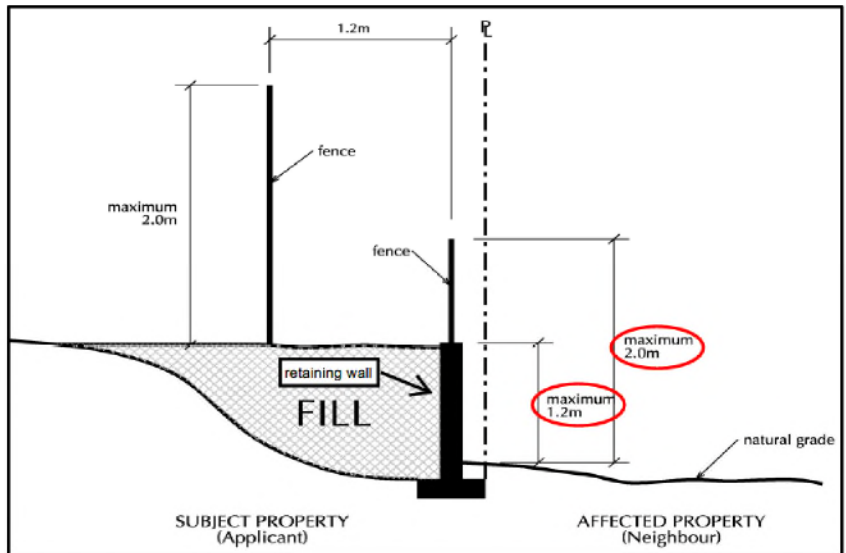


Figure 5 - Diagram 6.1

BUDGET/RESOURCE IMPLICATIONS:

N/A

FINANCIAL IMPLICATIONS:

- None
 Budget Previously Approved
 New Budget Request
 (Finance Review Required)

Prepared by:

Approved for submission to Council:

X
 Michelle Austin
 Planner, Planning

 Patricia Bridal, CAO

Date: _____

X
 Roy Nuriel
 Acting General Manager, Planning

REVIEWED WITH

- | | | |
|--|---|--|
| <input type="checkbox"/> Corporate Services | <input type="checkbox"/> Operations | <input type="checkbox"/> Current Planning |
| <input type="checkbox"/> Bylaw Compliance | <input type="checkbox"/> Public Works/Airport | <input type="checkbox"/> Long Range Planning & Sustainability |
| <input type="checkbox"/> Real Estate | <input type="checkbox"/> Facilities | <input checked="" type="checkbox"/> Building & Licensing |
| <input type="checkbox"/> RCMP | <input type="checkbox"/> Utilities | <input checked="" type="checkbox"/> Engineering Development Services |
| <input type="checkbox"/> Fire & Rescue Services | <input type="checkbox"/> Recreation Services | <input type="checkbox"/> Infrastructure Management |
| <input type="checkbox"/> Human Resources | <input type="checkbox"/> Parks | <input type="checkbox"/> Transportation |
| <input type="checkbox"/> Financial Services | | <input type="checkbox"/> Economic Development & Tourism |
| <input checked="" type="checkbox"/> COMMITTEE: APC (Jul.18/23) | | |
| <input type="checkbox"/> OTHER: | | |

ATTACHMENT 1

Client: Woodstyle Homes
 Civic address: 8354 Okanogan Landing Road

SCALE 1:250

The enlarged part size of this plan is 884mm in width by 556mm in height (A4S 2) when plotted at a scale of 1:250

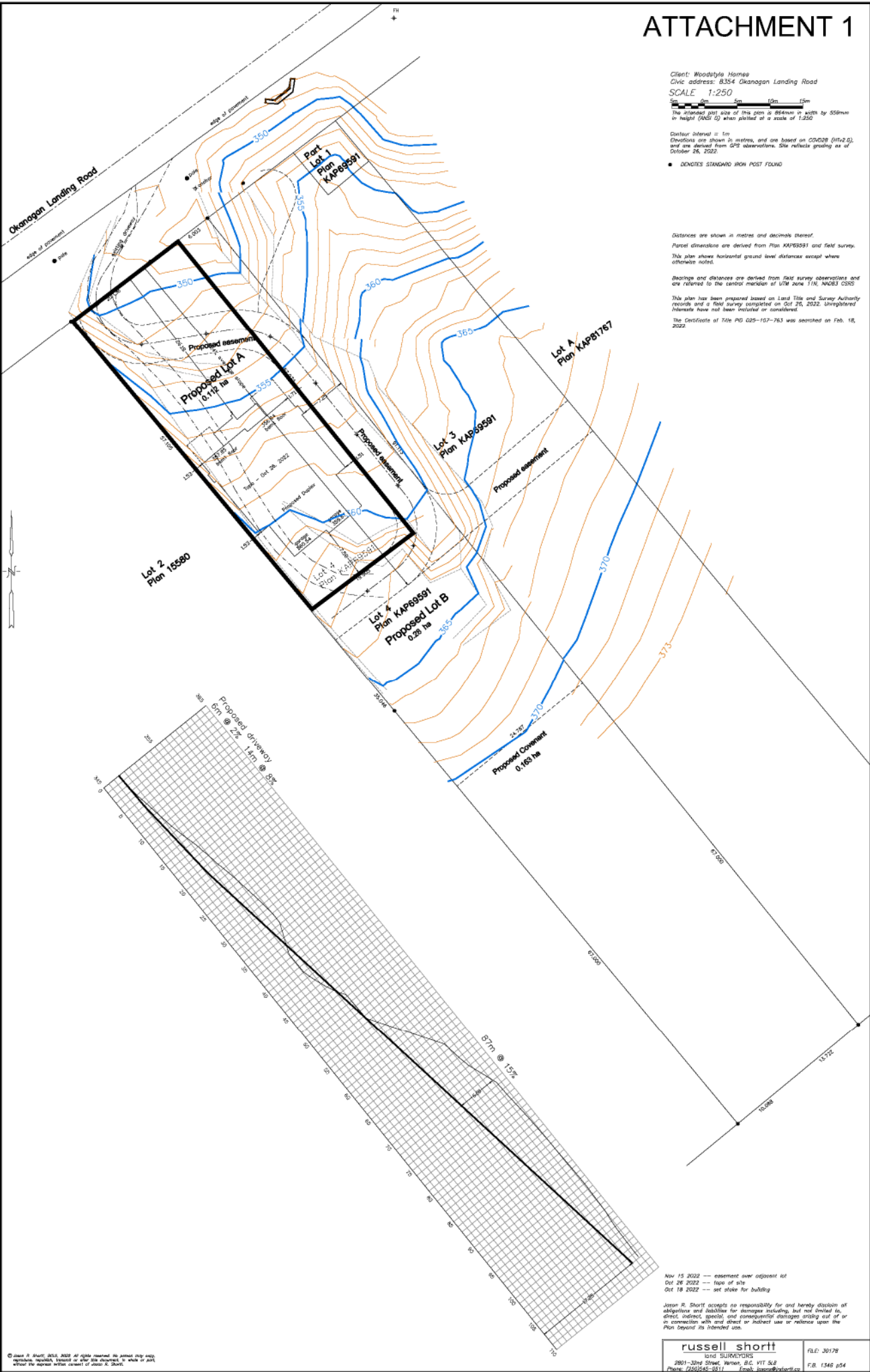
Contour Interval = 1m
 Elevation are shown in metres, and are based on CGD2011 (11x2.0), and are derived from GPS observations. Site reflects grading as of October 26, 2022.

● DENOTES STANDARD IRON POST FOUND

Distances are shown in metres and decimals thereof.
 Parcel dimensions are derived from Plan KAP69591 and field survey.
 This plan shows horizontal ground level distances except where otherwise noted.

Bearings and distances are derived from field survey observations and are referred to the control meridian of UTM zone 11N, NAD83 CSRS

This plan has been prepared based on Land Title and Survey Authority records and a field survey completed on Oct 26, 2022. Unregistered interests have not been included or considered.
 The Certificate of Title PD 025-157-763 was searched on Feb. 18, 2022.



Nov 15 2022 — assessment over adjacent lot
 Oct 26 2022 — top of site
 Oct 18 2022 — set stake for building

Jason R. Shortt accepts no responsibility for and hereby disclaims of all negligence and liability for damages including, but not limited to, direct, indirect, special and consequential damages arising out of or in connection with and direct or indirect use or reliance upon the Plan beyond its intended use.

russell shortt
 land SURVEYORS
 2801-33rd Street, Vernon, B.C. V1T 5L8
 Phone: (250)646-5511, Fax: (250)646-5512

F.L.S. 30178
 F.B. 1346 p04

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ATTACHMENT 2

DVP00596 8354 Okanagan Landing rd Vernon

Design Rationale – A detailed explanation of the proposed development or land use for the site, including:

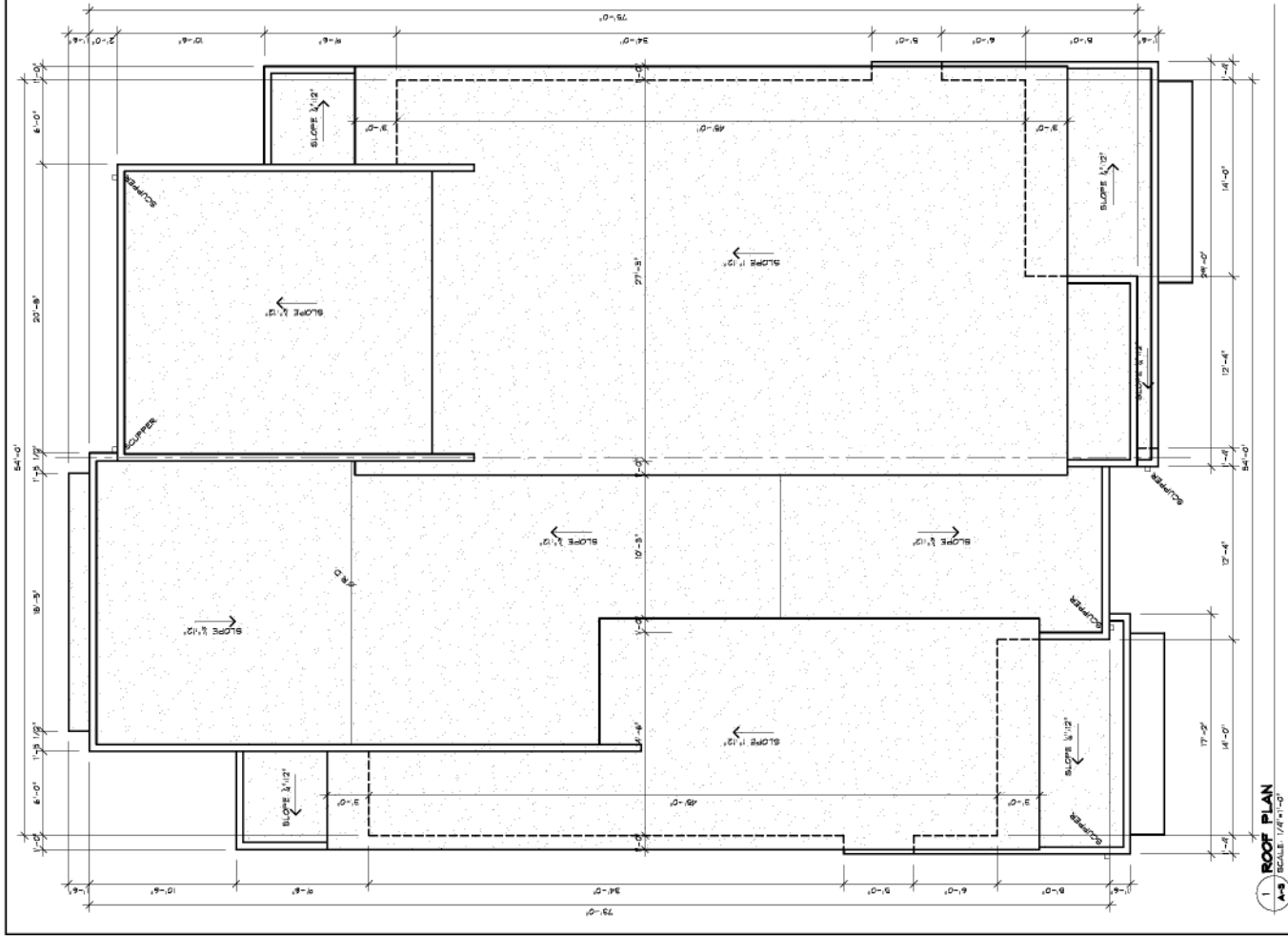
- Rationale for any proposed deviation of each applicable Zoning Bylaw regulation
- Number of lots, units and / or gross floor area (if applicable)
- Explanation of benefits and impacts on the existing neighborhood

The purpose is to provide a zone for the development of residential housing along the lakefront in the of single detached, semi-detached or duplex housing. The R6c sub-zoning district allows for care centre, major as an additional use. The R6h sub-zoning district allows for home based business, major as an additional use. Click on the button at right to view PDF file.

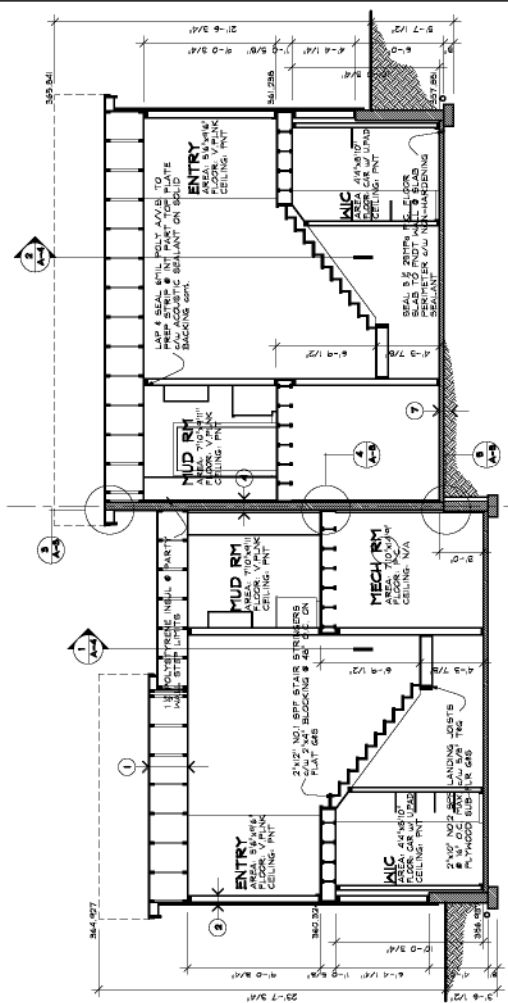
With following protocol and understanding the R6 zoning we found that we were able to use this land to its full potential, with subdividing and higher density, which is much needed in our community.

With the Okanagan becoming a destination location we want to provide quality building and support the local economy along with increasing property tax to allow for better maintenance.

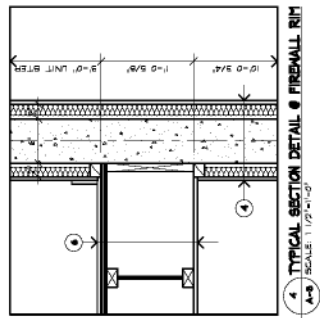
We are looking to make this 0.97acre into 2 lots with 1 duplex per lot.



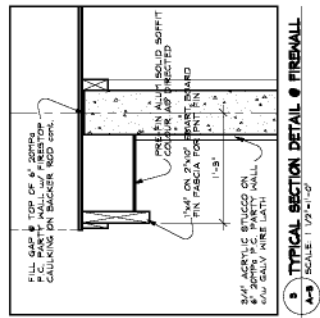
1 ROOF PLAN
SCALE: 1/8"=1'-0"



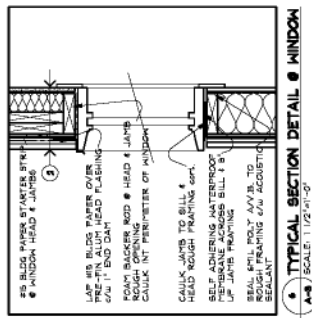
2 BUILDING CROSS SECTION THRU PARTY WALL
SCALE: 1/8"=1'-0"



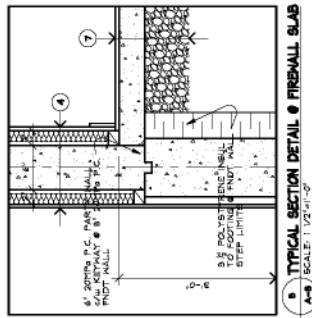
4 TYPICAL SECTION DETAIL OF FIREWALL RIM
SCALE: 1/2"=1'-0"



5 TYPICAL SECTION DETAIL OF FIREWALL
SCALE: 1/2"=1'-0"



6 TYPICAL SECTION DETAIL OF WINDOW
SCALE: 1/2"=1'-0"



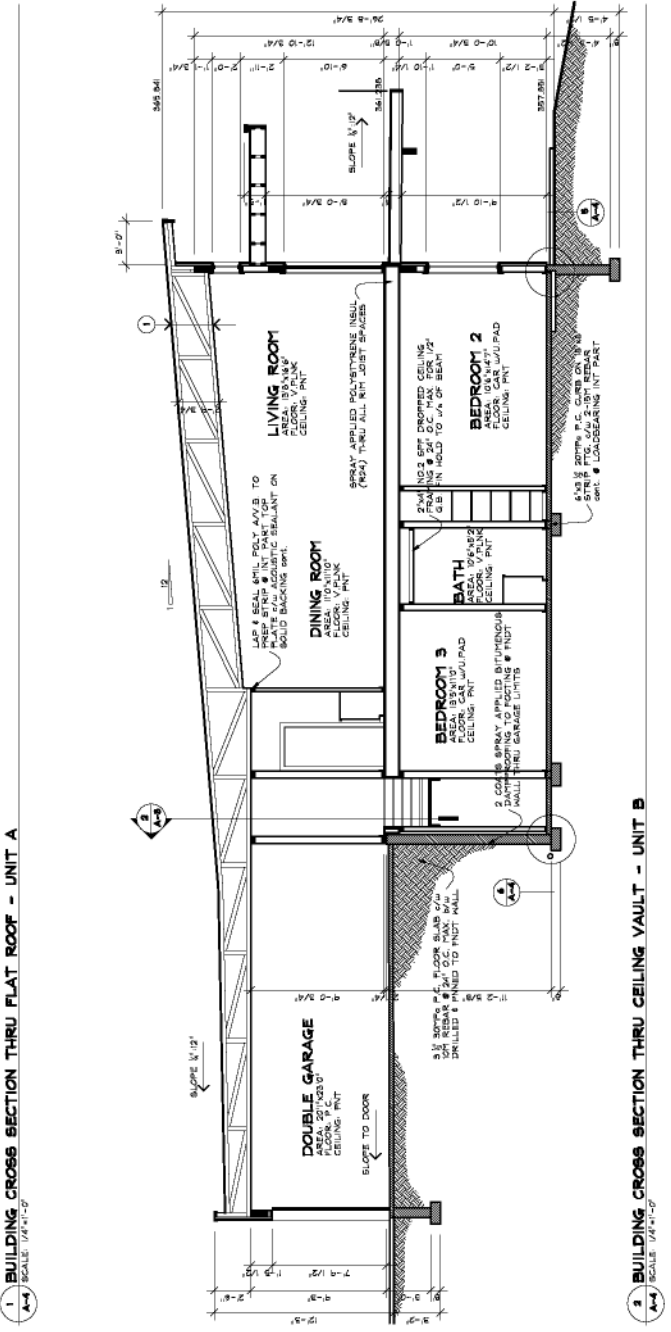
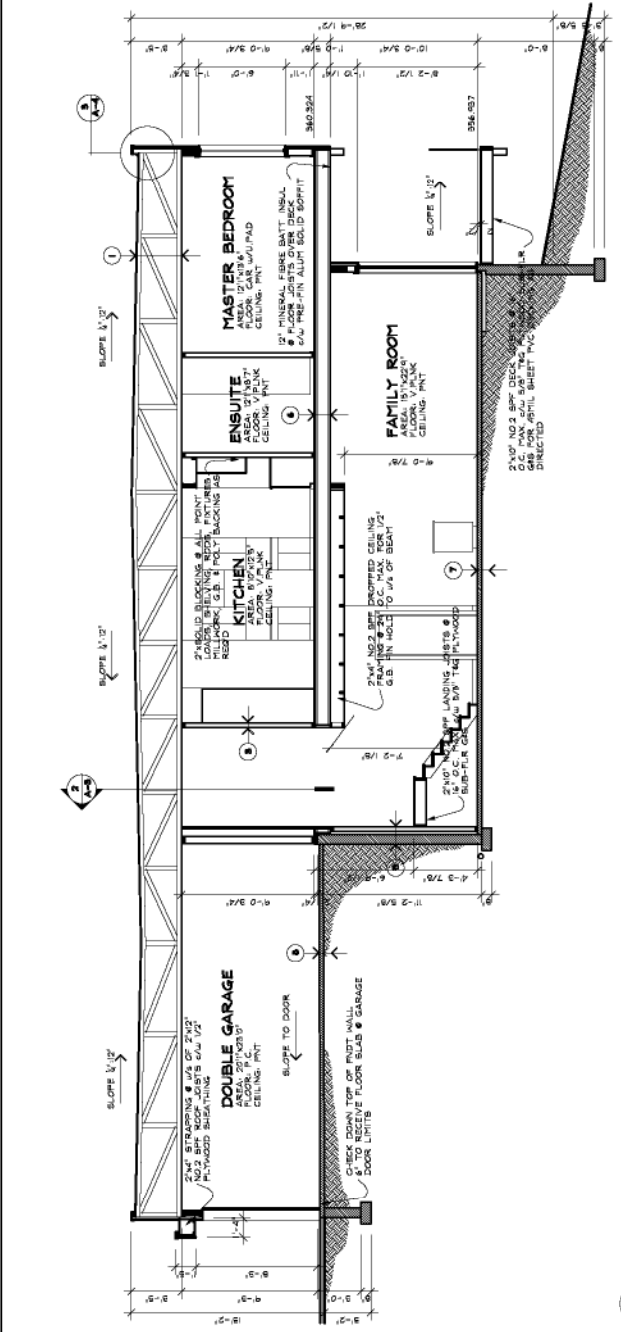
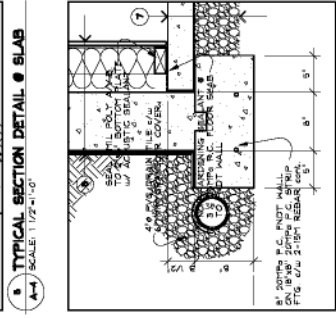
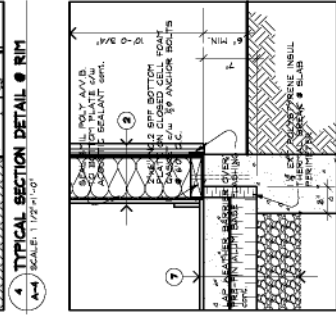
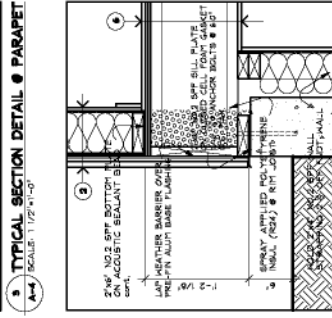
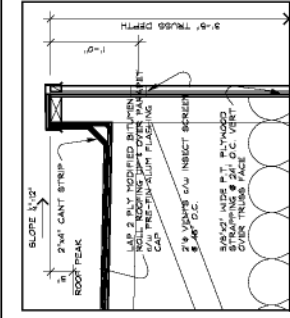
7 TYPICAL SECTION DETAIL OF FIREWALL SLAB
SCALE: 1/2"=1'-0"

No.	DRW	Revisions	By

Hillette Design & Drafting Inc.
1022 Sherbrooke Street East, Suite 100, Verdun, QC H3E 1K1
Phone: 514-733-1111

DUPLEX ON OKANAGAN LANDING ROAD

Project No. _____
Date: 16.02.23
Drawn By: ST
Check: AS
Scale: A-3
Sheet: 1 of 6
Building Part: Construction



CONSTRUCTION NOTES

- THREE NOTES SHALL APPLY TO ALL PAGES IN THE CONSTRUCTION DOCUMENTS A-1 THRU A-4 INCLUSIVE OF REVISIONS & ADDENDUMS
- SEE GENERAL NOTES TO ARCHITECTURAL DRAWINGS TO COVER 37-UP-18 TO 37-UP-18-10
- SEE GENERAL NOTES TO ARCHITECTURAL DRAWINGS TO COVER 37-UP-18 TO 37-UP-18-10
- SEE GENERAL NOTES TO ARCHITECTURAL DRAWINGS TO COVER 37-UP-18 TO 37-UP-18-10
- SEE GENERAL NOTES TO ARCHITECTURAL DRAWINGS TO COVER 37-UP-18 TO 37-UP-18-10
- SEE GENERAL NOTES TO ARCHITECTURAL DRAWINGS TO COVER 37-UP-18 TO 37-UP-18-10
- SEE GENERAL NOTES TO ARCHITECTURAL DRAWINGS TO COVER 37-UP-18 TO 37-UP-18-10
- SEE GENERAL NOTES TO ARCHITECTURAL DRAWINGS TO COVER 37-UP-18 TO 37-UP-18-10
- SEE GENERAL NOTES TO ARCHITECTURAL DRAWINGS TO COVER 37-UP-18 TO 37-UP-18-10
- SEE GENERAL NOTES TO ARCHITECTURAL DRAWINGS TO COVER 37-UP-18 TO 37-UP-18-10
- SEE GENERAL NOTES TO ARCHITECTURAL DRAWINGS TO COVER 37-UP-18 TO 37-UP-18-10
- SEE GENERAL NOTES TO ARCHITECTURAL DRAWINGS TO COVER 37-UP-18 TO 37-UP-18-10
- SEE GENERAL NOTES TO ARCHITECTURAL DRAWINGS TO COVER 37-UP-18 TO 37-UP-18-10
- SEE GENERAL NOTES TO ARCHITECTURAL DRAWINGS TO COVER 37-UP-18 TO 37-UP-18-10
- SEE GENERAL NOTES TO ARCHITECTURAL DRAWINGS TO COVER 37-UP-18 TO 37-UP-18-10

1. HILLSLIDE DESIGN & DRAFTING INC.
2. 1000 WEST 10TH AVENUE, SUITE 200, VANCOUVER, BC V6M 1Y1
3. TEL: (604) 275-1111
4. WWW.HILLSLIDEDESIGN.COM

5. DATE: 02/22/2017
6. PROJECT: DUPLEX ON OKANAGAN LANDING ROAD

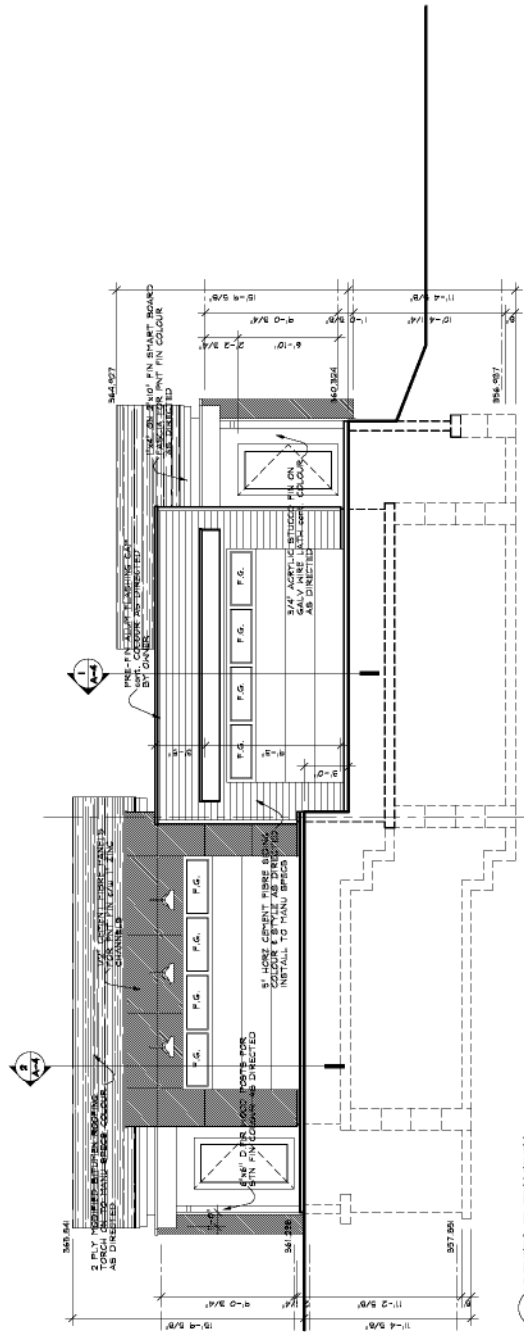
7. SHEET: BUILDING CROSS SECTIONS & TYPICAL DETAILS
8. TOTAL SHEETS: 10

9. CLIENT: [REDACTED]

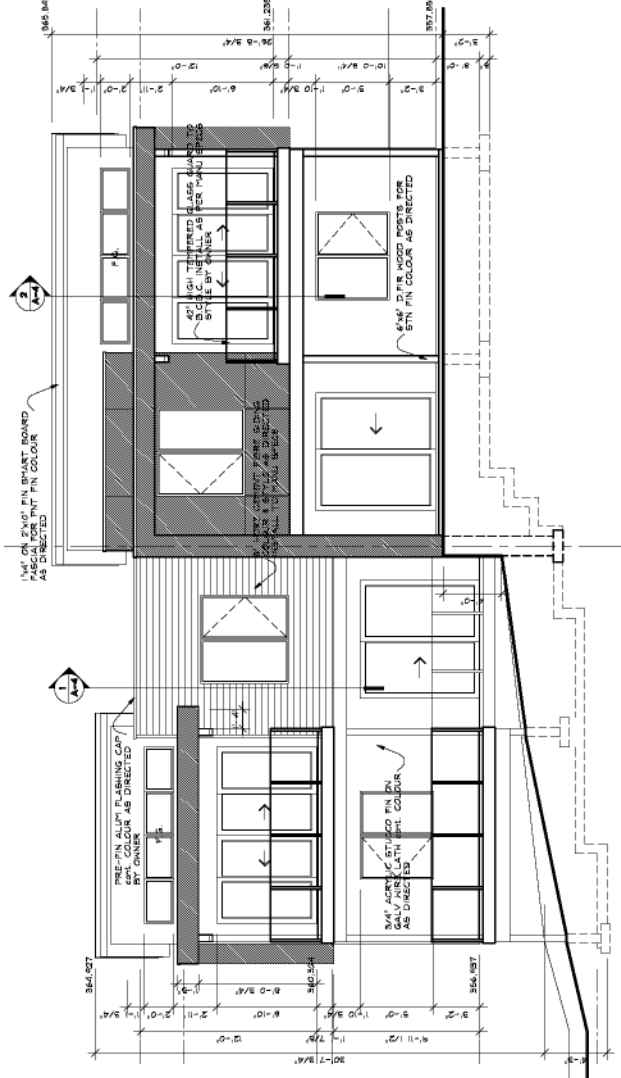
10. ARCHITECT: [REDACTED]

Project No. [REDACTED]
Drawn By: GT
Checked By: GT
Scale: AS SHOWN
Title: BUILDING PART I CONSTRUCTION
Sheet: A-4

DATE: 02/22/2017
DRAWN BY: GT
CHECKED BY: GT
SCALE: AS SHOWN
TITLE: BUILDING PART I CONSTRUCTION
SHEET: A-4



1 SOUTH ELEVATION
SCALE: 1/4"=1'-0"



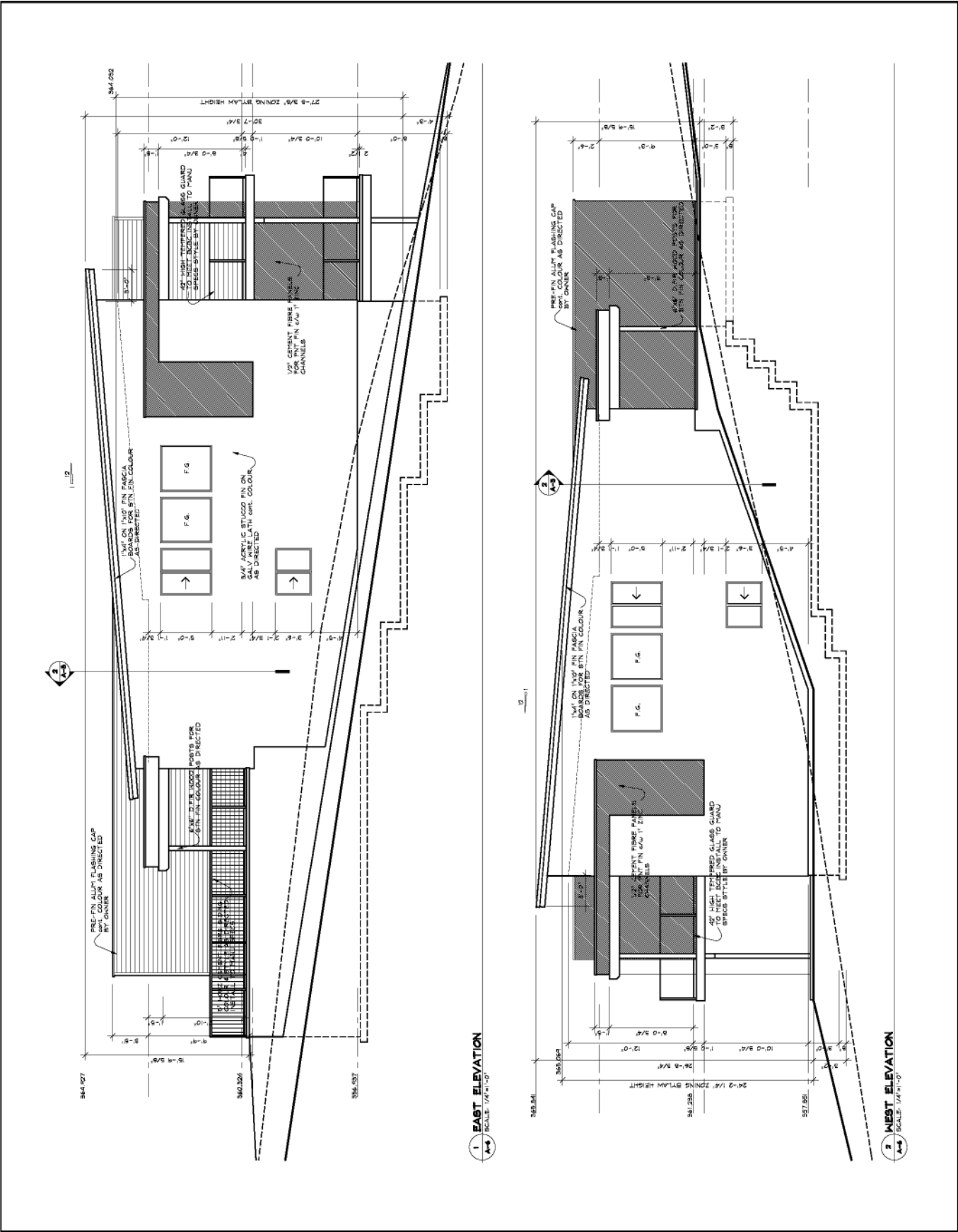
2 NORTH ELEVATION
SCALE: 1/4"=1'-0"

No.	Date	Revisions	By

Hillside Design & Drafting Inc.
 1832 Beaver Road, Oakton, VA 22129, 570.328.1437
 Project Title: **DUPLEX ON OKANAGAN LANDING ROAD**

ELEVATIONS

Project No.	16-02-29
Client No.	GT
Client Name	1/4"=1'-0"
Sheet No.	A-5
Sheet Title	ELEVATIONS



SPATIAL SEPARATION CALCULATIONS	
NORTH ELEVATION	
MIN. DIST. TO ADJ. WALL	N/A
AREA OF EXPOSURE WALL	N/A
1 X 6 AGGREGATE AREA OF GLAZED OPENINGS	17.76 SQ. FT. (1.62)
AREA OF GLAZED OPENINGS	N/A
SOUTH ELEVATION	
MIN. DIST. TO ADJ. WALL	N/A
AREA OF EXPOSURE WALL	50.88 SQ. FT. (4.69)
1 X 6 AGGREGATE AREA OF GLAZED OPENINGS	17.76 SQ. FT. (1.62)
AREA OF GLAZED OPENINGS	54.48 SQ. FT. (5.03)
EAST ELEVATION	
MIN. DIST. TO ADJ. WALL	N/A
AREA OF EXPOSURE WALL	50.88 SQ. FT. (4.69)
1 X 6 AGGREGATE AREA OF GLAZED OPENINGS	17.76 SQ. FT. (1.62)
AREA OF GLAZED OPENINGS	54.48 SQ. FT. (5.03)
WEST ELEVATION	
MIN. DIST. TO ADJ. WALL	N/A
AREA OF EXPOSURE WALL	50.88 SQ. FT. (4.69)
1 X 6 AGGREGATE AREA OF GLAZED OPENINGS	17.76 SQ. FT. (1.62)
AREA OF GLAZED OPENINGS	54.48 SQ. FT. (5.03)

Hillside Design & Drafting Inc.

1400 Street West, Suite 100, Whitecourt, AB T8S 0A2

PHONE: 780-738-1111

DUPLEX ON OKANAGAN LANDING ROAD

DATE: 7/18/2023

PROJECT: 23-001

SCALE: 1/4" = 1'-0"

REVISIONS:

No.	DATE	REVISIONS

ELEVATIONS

FIGURE NO. 1/2

DATE: 07/18/2023

SCALE: 1/4" = 1'-0"

PROJECT: 23-001

CLIENT: BILLING BENNETT & CONSTRUCTION

A-6

March 2, 2023

Woodstyle Homes Ltd.
PO Box 21021
Vernon, BC V1T 9T7

ISSUED FOR REVIEW
FILE: 704-ENG.KGEO03313-01.015
Via Email: woodstyle@telus.net

Attention: Donovan Imbeau

Subject: Lot A – Retaining Wall Design Memo
8354 Okanagan Landing Road, Vernon, BC

1.0 INTRODUCTION

Tetra Tech Canada Inc. (Tetra Tech) has been engaged by Woodstyle Homes Ltd., to provide geotechnical consulting services as needed to support a proposed multi-family development located at 8354 Okanagan Landing Road, in Vernon, BC.

The development plans for the project include two duplex sites located within the 8354 Okanagan Landing Road parcel.

This report provides general recommendations for construction of the Lot A retaining wall proposed along the access and below the proposed structure. Tetra Tech's recommendations and design have been based on-site reconnaissance of surficial features, primarily a review of historical information from the public domain.

2.0 SCOPE OF WORK

The site plans for the proposed development indicate two retaining walls will be required, one on Lot A and the other on Lot B. The scope of this assignment is for the design of the first wall on Lot A. This wall will be a flexible permanent wall, and as such, "active" earth pressure (k_a) conditions have been used in calculating lateral earth pressures.

3.0 RETAINING WALL DESIGN

3.1 General

Based on field observations and experience in design/construction of retaining wall systems we recommend the following:

- A leveling pad 0.5 m deep by 1.2 m wide shall be placed and compacted to 100% Standard Proctor Maximum Dry Density (SPMDD). The leveling course shall consist of 25 mm(-) crushed rock with <5% fines (passing 0.075 mm sieve).
- The first row of lock blocks will be placed on the compacted material and be embedded a minimum of 0.5 m below the adjacent finished road grade.

- A minimum 100 mm diameter perforated, or slotted drainpipe should be placed behind the lock blocks at the adjacent site grade and should be bedded on and surrounded by a free draining crushed rock. The drainpipe should be installed with sufficient gradient to initiate flow, and the outfall should be connected to a positive and permanent discharge.
- To provide some degree of drainage control behind the wall, a rock drainage filter should be installed immediately behind the Verti-Blocks. This drain rock layer should be at least 0.3 metres thick and could be composed of 50 to 100 mm minus crush rock with no fines. The drain rock will be separated from the retaining wall backfill by a layer of geotextile.
- Finished grade at the top of the wall shall slope away from the wall and away from the structure a swale may be required to divert runoff.

3.2 Design Criteria

There is no nationally adopted level of slope stability safety for Canada, however, Engineers and Geoscientist of British Columbia (EGBC) have published Professional Practice Guidelines for Retaining Wall design which are to be used where no other local authority has stated requirements.

The EGBC adopted design criteria for this structure is shown in Figure 1.0 below

External Stability		Internal Stability	
FOS Sliding :	1.50	FOS Tensile Over-Stress :	1.50
FOS Overturning :	2.00	FOS Pullout :	1.50
FOS Bearing Capacity :	2.00	FOS Internal Sliding :	1.50
Base Reinforcement Ratio (L/H) :	0.60		
Reinf./Retain Soil Friction Angle		Anchorage Length (m) : 0.30	
Reinf./Retain Soil Factor :	1.00	Wall/Soil Friction Factor :	0.67
Friction Angle (degrees) :	38.00	Friction Angle (degrees) :	25.46
Wall/Footing Soil Friction Coeff.		Max Reinforcement Spacing (m) : 0.75	
Footing Friction Coeff. (μb) :	0.70		
Facing Stability			
FOS Connection :	1.50		
FOS Crest Toppling :	1.50		

Figure 1 – Design Criteria for Wall Stability

3.3 Seismicity

3.3.1 Seismic Hazard

Table 3-1 below presents the NBC 2020 values corresponding to the 2,475-year design return period event. These values were obtained from the interactive website <http://www.earthquakescanada.nrcan.gc.ca/index-eng.php> maintained by the Geological Survey of Canada. These values are for a 2% in 50-year (0.000404 per annum) probability of exceedance.

Table 3-1: Spectral Response Accelerations for Site Class C, 2% in 50 Years

Seismic Hazard	PGA	Sa (0.2)	Sa (0.5)	Sa (1.0)	Sa (2.0)
2020 NBC	0.105	0.253	0.236	0.181	0.130

3.3.2 Site Classification

Based on the site information, geological maps and previous experience in the area and information presented in 2018 BCBC Table 4.1.8.4.-A, Seismic Site Class D conditions have been used for structural analyses.

3.4 Design Methodology for Retaining Walls

Global and Internal wall stability was evaluated using the latest proprietary software available from Verti-Block, VertiBlock Design Software, developed by Race Engineering Assoc., version 6.0.22224.635.

3.5 Geotechnical Design Parameters

Geotechnical design parameters have been derived based on the geotechnical site investigation, in situ testing results, and published material correlations from Harder and Seed (1986) and Schmertmann (1975).

The analysis generally assumes that the soil shear strength is governed by the Mohr-Coulomb criteria given by:

$$\tau = c' + \sigma' \tan \phi'$$

$$\tau = \text{Soil Shear Strength} \quad \sigma' = \text{Normal Effective Stress}$$

$$c' = \text{Effective Cohesion} \quad \phi' = \text{Effective Angle of Internal Friction}$$

The design effective angle of internal friction (ϕ') and unit weight (γ') for encountered soils were estimated using accepted values for these material types. Geotechnical parameters are summarized in Table 3-2 for various analyses of the proposed retaining walls.

Table 3-2: Summary of Soil Parameters

Material Name	Strength Type	Unit Weight (kN/m ³)	Cohesion (kPa)	Friction Angle (°)
Retained Soil	Mohr-Coulomb	20	0	30
Foundation Soil	Mohr-Coulomb	20	0	30
Infill Soil	Mohr-Coulomb	21	0	30
Leveling Pad	Mohr-Coulomb	21		36

The retaining wall will support, in part, the foundation for the proposed duplex. Surcharge loading has been modelled in the analysis using a uniformly distributed dead load of 25 kPa offset 1.5.m from the back of the wall and 1.5 m below grade.

3.6 Global Stability Results

A summary of the numerical analyses results is outlined in Table 3-3. The obtained values meet, exceed, or are within tolerable proximity, given the material properties and assumptions made in the analysis, to the factor of safety values set out in Canadian Geotechnical Society Foundation Engineering Manual, for both design cases.

Table 3-3: Summary of Global Stability Analyses Results

Required Factor of Safety		Minimum Calculated Factors of Safety	
Static	Pseudo-Static	Static	Pseudo-Static*
1.5	1.1	1.75	1.63

4.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Woodstyle Homes Ltd., and their agents. Tetra Tech Canada Inc. (operating as Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Woodstyle Homes Ltd., or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on the Use of this Document attached in the Appendix A or Contractual Terms and Conditions executed by both parties.

5.0 CLOSURE

We trust this report meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully Submitted,
 Tetra Tech Canada Inc.

FILE: 704-ENG.KGEO03313-01.015
 FILE: 704-ENG.KGEO03313-01.015
 FILE: 704-ENG.KGEO03313-01.015
 FILE: 704-ENG.KGEO03313-01.015
 FILE: 704-ENG.KGEO03313-01.015
 FILE: 704-ENG.KGEO03313-01.015

Prepared by:
 Anthony Schaefer, P.Eng.
 Geotechnical Engineer
 Engineering Practice
 Direct Line: 778.214.1844
 anthony.schaefer@tetrattech.com

Reviewed by:
 German Martinez, P.Eng.
 Senior Geotechnical Engineer
 Engineering Practice
 Direct Line: 778.940.1224
 german.martinez@tetrattech.com

/bi

- Attachments: Appendix A Tetra Tech’s Limitations on the Use of this Document
 Appendix B Analysis
 Appendix C Drawings

APPENDIX A

TETRA TECH'S LIMITATIONS ON THE USE OF THIS DOCUMENT

LIMITATIONS ON USE OF THIS DOCUMENT

GEOTECHNICAL

1.1 USE OF DOCUMENT AND OWNERSHIP

This document pertains to a specific site, a specific development, and a specific scope of work. The document may include plans, drawings, profiles and other supporting documents that collectively constitute the document (the "Professional Document").

The Professional Document is intended for the sole use of TETRA TECH's Client (the "Client") as specifically identified in the TETRA TECH Services Agreement or other Contractual Agreement entered into with the Client (either of which is termed the "Contract" herein). TETRA TECH does not accept any responsibility for the accuracy of any of the data, analyses, recommendations or other contents of the Professional Document when it is used or relied upon by any party other than the Client, unless authorized in writing by TETRA TECH.

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1.2 ALTERNATIVE DOCUMENT FORMAT

Where TETRA TECH submits electronic file and/or hard copy versions of the Professional Document or any drawings or other project-related documents and deliverables (collectively termed TETRA TECH's "Instruments of Professional Service"), only the signed and/or sealed versions shall be considered final. The original signed and/or sealed electronic file and/or hard copy version archived by TETRA TECH shall be deemed to be the original. TETRA TECH will archive a protected digital copy of the original signed and/or sealed version for a period of 10 years.

Both electronic file and/or hard copy versions of TETRA TECH's Instruments of Professional Service shall not, under any circumstances, be altered by any party except TETRA TECH. TETRA TECH's Instruments of Professional Service will be used only and exactly as submitted by TETRA TECH.

Electronic files submitted by TETRA TECH have been prepared and submitted using specific software and hardware systems. TETRA TECH makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

1.3 STANDARD OF CARE

Services performed by TETRA TECH for the Professional Document have been conducted in accordance with the Contract, in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Professional judgment has been applied in developing the conclusions and/or recommendations provided in this Professional Document. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of the Professional Document.

If any error or omission is detected by the Client or an Authorized Party, the error or omission must be immediately brought to the attention of TETRA TECH.

1.4 DISCLOSURE OF INFORMATION BY CLIENT

The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

1.5 INFORMATION PROVIDED TO TETRA TECH BY OTHERS

During the performance of the work and the preparation of this Professional Document, TETRA TECH may have relied on information provided by third parties other than the Client.

While TETRA TECH endeavours to verify the accuracy of such information, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information even where inaccurate or unreliable information impacts any recommendations, design or other deliverables and causes the Client or an Authorized Party loss or damage.

1.6 GENERAL LIMITATIONS OF DOCUMENT

This Professional Document is based solely on the conditions presented and the data available to TETRA TECH at the time the data were collected in the field or gathered from available databases.

The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this document, at or on the development proposed as of the date of the Professional Document requires a supplementary exploration, investigation, and assessment.

TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

1.7 ENVIRONMENTAL AND REGULATORY ISSUES

Unless stipulated in the report, TETRA TECH has not been retained to explore, address or consider and has not explored, addressed or considered any environmental or regulatory issues associated with development on the subject site.

1.8 NATURE AND EXACTNESS OF SOIL AND ROCK DESCRIPTIONS

Classification and identification of soils and rocks are based upon commonly accepted systems, methods and standards employed in professional geotechnical practice. This report contains descriptions of the systems and methods used. Where deviations from the system or method prevail, they are specifically mentioned.

Classification and identification of geological units are judgmental in nature as to both type and condition. TETRA TECH does not warrant conditions represented herein as exact, but infers accuracy only to the extent that is common in practice.

Where subsurface conditions encountered during development are different from those described in this report, qualified geotechnical personnel should revisit the site and review recommendations in light of the actual conditions encountered.

1.9 LOGS OF TESTHOLES

The testhole logs are a compilation of conditions and classification of soils and rocks as obtained from field observations and laboratory testing of selected samples. Soil and rock zones have been interpreted. Change from one geological zone to the other, indicated on the logs as a distinct line, can be, in fact, transitional. The extent of transition is interpretive. Any circumstance which requires precise definition of soil or rock zone transition elevations may require further investigation and review.

1.10 STRATIGRAPHIC AND GEOLOGICAL INFORMATION

The stratigraphic and geological information indicated on drawings contained in this report are inferred from logs of test holes and/or soil/rock exposures. Stratigraphy is known only at the locations of the test hole or exposure. Actual geology and stratigraphy between test holes and/or exposures may vary from that shown on these drawings. Natural variations in geological conditions are inherent and are a function of the historical environment. TETRA TECH does not represent the conditions illustrated as exact but recognizes that variations will exist. Where knowledge of more precise locations of geological units is necessary, additional exploration and review may be necessary.

1.11 PROTECTION OF EXPOSED GROUND

Excavation and construction operations expose geological materials to climatic elements (freeze/thaw, wet/dry) and/or mechanical disturbance which can cause severe deterioration. Unless otherwise specifically indicated in this report, the walls and floors of excavations must be protected from the elements, particularly moisture, desiccation, frost action and construction traffic.

1.12 SUPPORT OF ADJACENT GROUND AND STRUCTURES

Unless otherwise specifically advised, support of ground and structures adjacent to the anticipated construction and preservation of adjacent ground and structures from the adverse impact of construction activity is required.

1.13 INFLUENCE OF CONSTRUCTION ACTIVITY

Construction activity can impact structural performance of adjacent buildings and other installations. The influence of all anticipated construction activities should be considered by the contractor, owner, architect and prime engineer in consultation with a geotechnical engineer when the final design and construction techniques, and construction sequence are known.

1.14 OBSERVATIONS DURING CONSTRUCTION

Because of the nature of geological deposits, the judgmental nature of geotechnical engineering, and the potential of adverse circumstances arising from construction activity, observations during site preparation, excavation and construction should be carried out by a geotechnical engineer. These observations may then serve as the basis for confirmation and/or alteration of geotechnical recommendations or design guidelines presented herein.

1.15 DRAINAGE SYSTEMS

Unless otherwise specified, it is a condition of this report that effective temporary and permanent drainage systems are required and that they must be considered in relation to project purpose and function. Where temporary or permanent drainage systems are installed within or around a structure, these systems must protect the structure from loss of ground due to mechanisms such as internal erosion and must be designed so as to assure continued satisfactory performance of the drains. Specific design details regarding the geotechnical aspects of such systems (e.g. bedding material, surrounding soil, soil cover, geotextile type) should be reviewed by the geotechnical engineer to confirm the performance of the system is consistent with the conditions used in the geotechnical design.

1.16 DESIGN PARAMETERS

Bearing capacities for Limit States or Allowable Stress Design, strength/stiffness properties and similar geotechnical design parameters quoted in this report relate to a specific soil or rock type and condition. Construction activity and environmental circumstances can materially change the condition of soil or rock. The elevation at which a soil or rock type occurs is variable. It is a requirement of this report that structural elements be founded in and/or upon geological materials of the type and in the condition used in this report. Sufficient observations should be made by qualified geotechnical personnel during construction to assure that the soil and/or rock conditions considered in this report in fact exist at the site.

1.17 SAMPLES

TETRA TECH will retain all soil and rock samples for 30 days after this report is issued. Further storage or transfer of samples can be made at the Client's expense upon written request, otherwise samples will be discarded.

1.18 APPLICABLE CODES, STANDARDS, GUIDELINES & BEST PRACTICE

This document has been prepared based on the applicable codes, standards, guidelines or best practice as identified in the report. Some mandated codes, standards and guidelines (such as ASTM, AASHTO Bridge Design/Construction Codes, Canadian Highway Bridge Design Code, National/Provincial Building Codes) are routinely updated and corrections made. TETRA TECH cannot predict nor be held liable for any such future changes, amendments, errors or omissions in these documents that may have a bearing on the assessment, design or analyses included in this report.

APPENDIX B

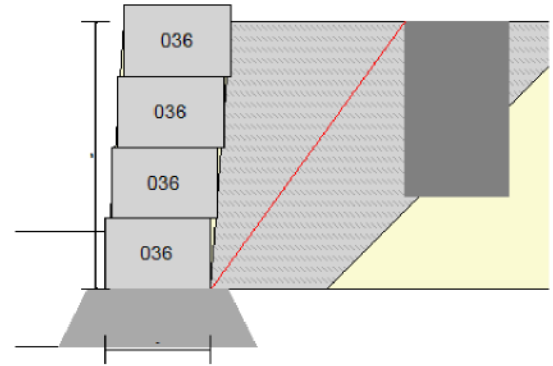
ANALYSIS

REA Analysis

Project: 8354-Okanagan Landing Road
 Location: Vernon B.C.
 Designer: Anthony Schaefer, P.Eng.
 Date: 2023-02-27
 Section: Section 1
 Design Method: NCMA_09_3rd_Ed, Ignore Vert. Force
 Design Unit: VertiBlock CIP

Seismic Acc: 0.105

SOIL PARAMETERS	ϕ	coh	γ
Select Soil:	30 deg	0.00 kN/m ²	20.00 kNcm
Retained Soil:	30 deg	0.00 kN/m ²	20.00 kNcm
Foundation Soil:	30 deg	0.00 kN/m ²	20.00 kNcm
Infill Soil:	30 deg	0.00 kN/m ²	20.00 kNcm
LvlPad / Drain Mat:	36 deg	0.00 kN/m ²	21.00 kNcm
Crushed Stone			



GEOMETRY

Design Height:	2.30 m	Live Load:	0.00 kN/m ²
Wall Batter/Tilt:	5.20/ 0.00 deg	Live Load Offset:	0.00 m
Embedment:	0.50 m	Live Load Width:	0.00 m
Leveling Pad Depth:	0.50 m	Dead Load:	25.00 kN/m ²
Slope Angle:	0.0 deg	Dead Load Offset:	1.5 m
Slope Length:	0.0 m	Dead Load Width:	0.90 m
Slope Toe Offset:	0.0 m	D.L. Embedment:	1.50 m
Leveling Pad Width:	1.21 m		
Vert δ on Single Dpth			
Select Fill Offset:	1.00 m		
Select Fill Angle:	45.00 deg.		

Note: for typical designs the passive resistance in front of the wall units is ignored for sliding, overturning (eccentricity) and bearing calculations.

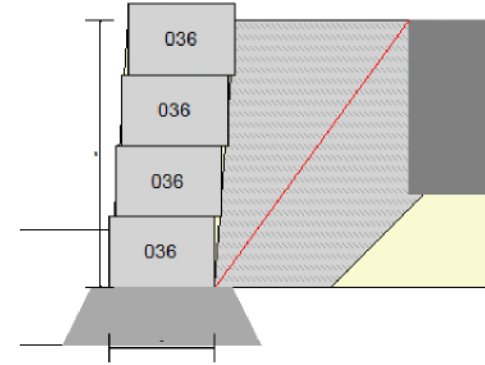
FACTORS OF SAFETY (Static / Seismic)

Sliding:	1.50 / 1.125	Overturning:	1.50 / 1.125
Bearing:	2.00 / 1.5		

Note: Calculations and quantities are for PRELIMINARY ANALYTICAL USE ONLY and MUST NOT be used for final n or construction without the independent review, verification, and approval by a qualified professional engineer.

VertiBlock Wall Designer 6.0.22224.635

Verti-Block. Retaining Walls



RESULTS (Static / Seismic)

FoS Sliding: 6.88 (lvlpd) / 6.34 FoS Overturning: 9.08 / 7.88
 Bearing: 120.69 / 112.26 FoS Bearing: 4.13 / 3.49

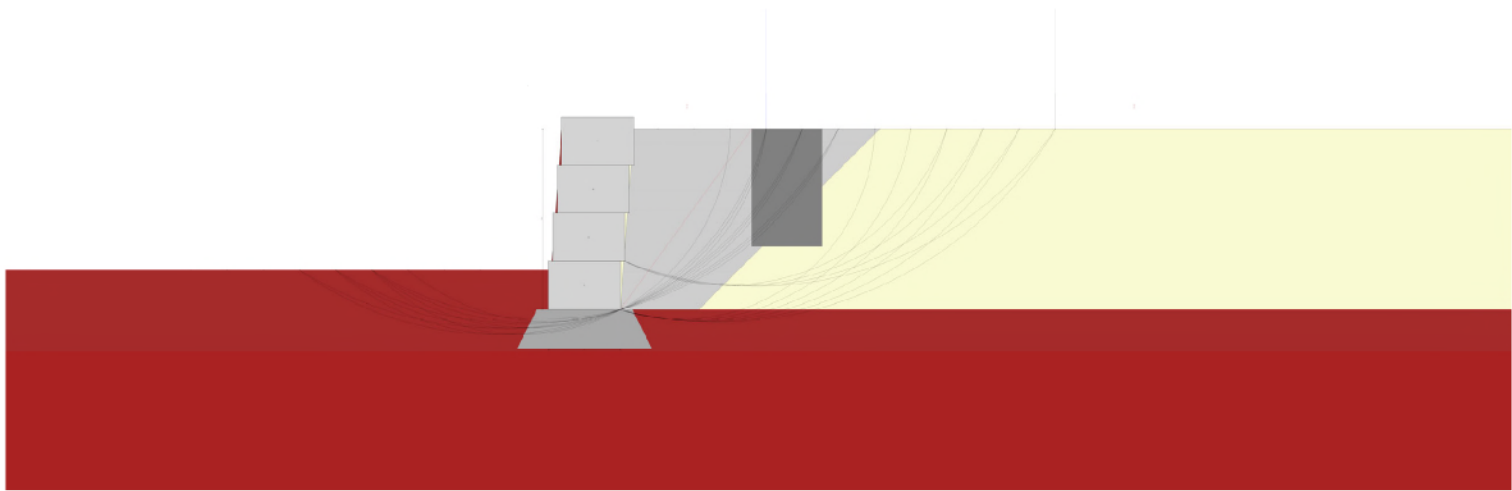
Name	Elev.	ka	kae	Pa	Pae	Pir	Paqd	PaT	FSsl	siesFSsl	FoS OT	FoS SeisOT
036	1.83	0.297	0.321	0.66	0.71	1.44	0.00	2.65	103.66	97.01	100.00	100.00
036	1.22	0.262	0.285	0.58	0.85	2.88	0.00	3.11	160.20	111.60	100.00	100.00
036	0.61	0.262	0.285	7.48	8.13	4.32	0.00	39.98	16.21	15.16	16.19	14.36
036	0.00	0.262	0.285	13.85	15.06	5.76	0.00	74.01	6.88	6.34	9.08	7.88

Column Descriptions:

- ka: active earth pressure coefficient
- kae: active seismic earth pressure coefficient
- Pa: active earth pressure
- Pae: dynamic earth pressure
- Pir: inertia force
- Paq: live surcharge earth pressure
- Paq2: live load 2 surcharge earth pressure
- Paqd: dead surcharge earth pressure
- (PaC): reduction in load due to cohesion
- PaT: sum of all earth pressures
- FSsl(lvl Pad): factor of safety for sliding at each layer. (FS sliding below the leveling pad)
- FSot: factor of safety of overturning about the toe.

Note: Calculations and quantities are for PRELIMINARY ANALYTICAL USE ONLY and MUST NOT be used for final n or construction without the independent review, verification, and approval by a qualified professional engineer.

VertiBlock Wall Designer 6.0.22224.635



Note: Calculations and quantities are for PRELIMINARY ANALYTICAL USE ONLY and MUST NOT be used for final design or construction without the independent review, verification, and approval by a qualified professional engineer.

VertiBlock Wall Designer 6.0.22224.635

Verti-Block. Retaining Walls

COMPOUND RESULTS

Compound stability is a global analysis (Bishop) with the failure planes originating at the top of the slope / wall and exiting out through the face of the wall. For MSE walls, the resistance of the geogrid reinforcement is included in the analysis and the shear resistance of the face units is included.

ID	Enter Point X	Enter Point Y	Exit Point X	Exit Point Y	Center X	Center Y	Radius	FoS
2	6.45	2.30	0.91	0.00	2.15	4.83	4.99	4.093
2	5.99	2.30	0.91	0.00	2.06	4.22	4.38	4.199
2	5.53	2.30	0.91	0.00	1.96	3.67	3.82	4.234
2	5.07	2.30	0.91	0.00	1.87	3.18	3.32	4.298
2	4.61	2.30	0.91	0.00	1.77	2.73	2.86	4.472
2	4.15	2.30	0.91	0.00	1.68	2.34	2.47	4.632
2	5.99	2.30	0.97	0.61	2.52	4.30	4.00	4.801
2	6.45	2.30	0.97	0.61	2.64	4.90	4.61	4.811
2	5.53	2.30	0.97	0.61	2.39	3.75	3.45	5.008
2	5.07	2.30	0.97	0.61	2.27	3.26	2.95	5.082

GLOBAL RESULTS

Global stability is a global analysis (Bishop) with the failure planes originating at the top of the slope / wall and exiting out below the wall in the area in front of the structure. For MSE walls, the resistance of the geogrid reinforcement is included in the resisting forces. The curve may go through the base of the wall and the wall shear would be included. In most cases the failure plane will pass below the structure.

ID	Enter Point X	Enter Point Y	Exit Point X	Exit Point Y	Center X	Center Y	Radius	FoS
1	2.77	2.30	-2.25	0.50	-0.26	2.84	3.07	1.745
1	3.23	2.30	-2.25	0.50	-0.17	3.40	3.57	1.746
1	2.77	2.30	-1.79	0.50	0.00	2.63	2.78	1.747
1	3.23	2.30	-2.71	0.50	-0.43	3.66	3.90	1.757
1	2.77	2.30	-2.71	0.50	-0.51	3.04	3.36	1.766
1	2.31	2.30	-2.25	0.50	-0.34	2.33	2.64	1.773
1	3.69	2.30	-2.71	0.50	-0.33	4.32	4.50	1.781
1	3.23	2.30	-3.17	0.50	-0.68	3.91	4.22	1.787
1	3.69	2.30	-2.25	0.50	-0.07	4.01	4.13	1.798
1	3.69	2.30	-3.17	0.50	-0.59	4.63	4.87	1.806

Note: Calculations and quantities are for PRELIMINARY ANALYTICAL USE ONLY and MUST NOT be used for final design or construction without the independent review, verification, and approval by a qualified professional engineer.

VertiBlock Wall Designer 6.0.22224.635

Verti-Block. Retaining Walls

RETAINING WALL UNITS

STRUCTURAL PROPERTIES:

N is the normal force [or factored normal load] on the base unit

The default leveling pad to base unit shear is $0.8 \tan(\phi)$ [AASHTO 10.6.3.4] or

may be the manufacturer supplied data. ϕ is assumed to be 40 degrees for a stone leveling pad.

Unit	Ht (mm)	Width (mm)	Depth (mm)	Cncr_Vol (m3/m)	Cncr_Density	CG (mm)	Aggr_Den	Aggr_Den (pcf/ft)	Aggr_CG (mm)
Standard	609.60	1219.20	914.40	0.29	22.31	415.29, 304.80	0.27	120.00	512.83, 512.83

Note: Calculations and quantities are for PRELIMINARY ANALYTICAL USE ONLY and MUST NOT be used for final n or construction without the independent review, verification, and approval by a qualified professional engineer.

VertiBlock Wall Designer 6.0.22224.635

Verti-Block. Retaining Walls

CALCULATION RESULTS

OVERVIEW

VertiBlock calculates stability assuming the wall is a rigid body. Forces and moments are calculated about the base and the front toe of the wall. The base block width is used in the calculations. The concrete units and granular fill over the blocks are used as resisting forces.

EARTH PRESSURES

The method of analysis uses the Coulomb Earth Pressure equation (below) to calculate active earth pressures. Wall friction is assumed to act at the back of the wall face. The component of earth pressure is assumed to act perpendicular to the boundary surface. The effective δ angle is δ minus the wall batter at the back face. If the slope breaks within the failure zone, a trial wedge method of analysis is used.

EXTERNAL EARTH PRESSURES

Effective δ angle (2/3 retained phi)	$\delta = 20.0$ deg
Coefficient of active earth pressure	$k_a = 0.262$
External failure plane	$\rho = 54$ deg
Effective Angle from horizontal	$\theta = 95.20$ deg
Coefficient of passive earth pressure: $k_p = (1 + \sin(\phi)) / (1 - \sin(\phi))$	$k_p = 3.00$

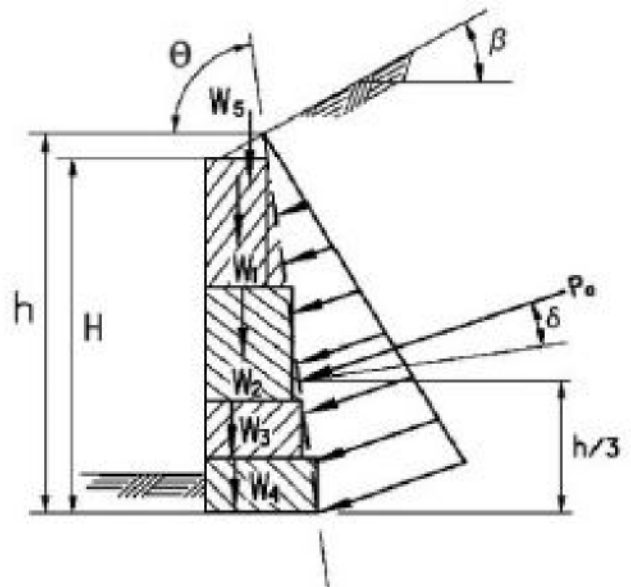
$$k_a = \frac{\sin^2(\theta + \phi')}{\Gamma[\sin^2 \sin(\theta - \delta)]}$$

in which:

$$\Gamma = \left[1 + \frac{\sin(\phi' + \delta)\sin(\phi' - \beta)}{\sin(\theta - \delta)\sin(\theta + \beta)} \right]^2$$

where :

- δ = friction angle between fill and wall (degrees)
- β = angle of fill to the horizontal (degrees)
- θ = angle of bck face of wall to the horizontal (degrees)
- ϕ' = effective angle of internal friction (degrees)



Note: Calculations and quantities are for PRELIMINARY ANALYTICAL USE ONLY and MUST NOT be used for final n or construction without the independent review, verification, and approval by a qualified professional engineer.

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Verti-Block. Retaining Walls

FORCE DETAILS

The details below shown how the forces are calculated for each force component. The values shown are not factored. All loads are based on a unit width (ppf / kNpm).

Layer	Block Wt	Soil Fill Wt	Soil Wt
1	6	32	
2	6	32	
3	6	32	
4	6	32	

Block Weight (Force v (Block Wt + Infill Soil)) = 154.93 kN/m X-Arm = 0.50 m

Soils Block Weight (Force v) = 0.00 kN/m X-Arm = 0.00 m

Active Earth Pressure Pa = 13.85 kN/m

Pa_h (Force H) = Pa cos(δ - batter) = 13.85 x cos(20.0 - (5.2)) = 13.39 kN/m
Y-Arm = 0.77 m

Pa_v (Force V) = Pa sin(δ - batter) = 13.85 x sin(20.0 - (5.2)) = 3.54 kN/m
X-Arm = 0.97 m

Note: Calculations and quantities are for PRELIMINARY ANALYTICAL USE ONLY and MUST NOT be used for final n or construction without the independent review, verification, and approval by a qualified professional engineer.

VertiBlock Wall Designer 6.0.22224.635

Verti-Block. Retaining Walls

FORCES AND MOMENTS

The program resolves all the geometry into simple geometric shapes to make checking easier. All x and y coordinates are referenced to a zero point at the middle of the base block for eccentricity calculations.

LOADS FOR OVERTURNING ABOUT THE TOE

Name	Force (V)	Force (H)	X-len	Y-len	Mo	Mr
Soil Fill(W0)	129.32	--	0.60	--	--	77.08
Face Blocks(W1)	25.61	--	0.50	--	--	12.77
Pa_h	--	13.39	--	0.77	10.27	--
Pa_v	3.54	--	0.97	--	--	3.43
Sum V / H	158	13		Sum Mom	10	93

W0: stone within units

W1: facing units

W2: soil wedge behind the face

X-Len: is measured from the center of the base (+) Driving, (-) Resisting.

Pa_h: horizontal earth pressure

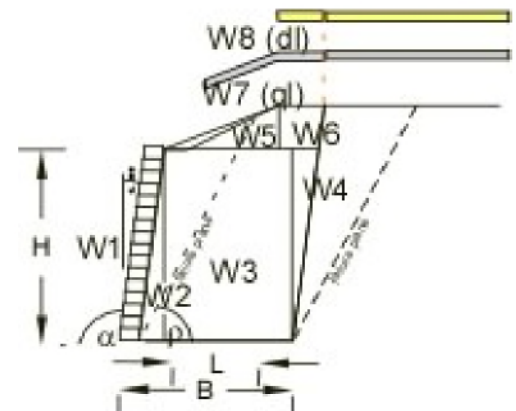
Pa_v: vertical earth pressure

Pq_h: horizontal surcharge pressure

Pq_v: vertical surcharge pressure

BEARING LOADS: NCMA

Name	Force (V)	Force (H)	X-len	Y-len	Mo	Mr
Soil Fill(W0)	129.32	--	-0.14	--	--	-17.96
Face Blocks(W1)	25.61	--	-0.04	--	--	-1.06
Pa_h	--	13.39	--	0.77	10.27	--
Pa_v	3.54	--	-0.51	--	--	-1.81
Sum V / H	158	13		Sum Mom	10	-21



Note: Calculations and quantities are for PRELIMINARY ANALYTICAL USE ONLY and MUST NOT be used for final n or construction without the independent review, verification, and approval by a qualified professional engineer.

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Verti-Block. Retaining Walls

BASE SLIDING

Sliding at the base is checked at the block to leveling pad interface between the base block and the leveling pad.

$$\text{Forces Resisting sliding} = W_0 + W_1 + P_{av}$$

$$129.32 + 25.61 + 3.54$$

$$N = 158.47 \text{ kN/m}$$

$$\text{Resisting force at pad} = (N * 0.8 * \tan(\text{slope}) + \text{intercept} * L)$$

$$158.47 * 0.8 * \tan(36.0) + 0.0$$

$$R_f = 92.11$$

Passive resistance is calculated using $k_p = (1 + \sin(30)) / (1 - \sin(30))$

$$k_p = 3.00$$

Force at top of resisting trapezoid, $d_1 = 0.50$

$$F_{p1} = 30.00$$

Force at base of resisting trapezoid, $d_2 = 1.00$

$$F_{p2} = 60.00$$

Depth of trapezoid

$$\text{depth} = 0.50$$

$$P_p = (F_{p1} + F_{p2}) / 2 * \text{depth}$$

$$22.50$$

Friction angle = minimum of the leveling pad or F_{nd}

$$\phi = 30.00 \text{ deg}$$

N_1 includes N + leveling pad (LP)

Where:

$$LP = \text{lvl pad thickness} * 21.00 \text{pcf} * (L + \text{lvl pad thickness})$$

L is the base block width

$$158.47 + 12.23$$

$$N_1 = 170.70 \text{ kN/m}$$

Resisting force at $f_{nd} = (N_1 \tan(\phi) + c L) + P_p$

$$170.70 * \tan(30) + 0.00 * 1.4 + 22.50$$

$$R_{f1} = 121$$

Driving force is the horizontal component of

P_{ah}

$$13.39$$

$$D_f = 13.39$$

$$FS_{sl} = (R_f / D_f) \text{ and } (R_{f1} / D_f)$$

$$FS_{sl} = 6.88 / 9.04$$

Note: Calculations and quantities are for PRELIMINARY ANALYTICAL USE ONLY and MUST NOT be used for final n or construction without the independent review, verification, and approval by a qualified professional engineer.

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Verti-Block. Retaining Walls

OVERTURNING ABOUT THE TOE

Overturning at the base is checked by assuming rotation about the front toe by the block mass and the soil retained on the blocks. Allowable overturning can be defined by eccentricity (e/L). For concrete leveling pads eccentricity is checked at the base of the pad.

$$\begin{aligned} \text{Moments Resisting Overturning} &= M_0 + M_1 + MP_{av} \\ 77.08 + 12.77 + 3.43 \end{aligned}$$

$$M_r = 93.28 \text{ kN-m}$$

$$\begin{aligned} \text{Moments causing Overturning} &= MP_{ah} \\ 10.27 \end{aligned}$$

$$M_o = 10.27 \text{ kN-m}$$

$$FS_{ot} = M_r / M_o$$

$$FS_{ot} = 93.28 / 10.27$$

$$FS_{ot} = 9.08$$

Note: Calculations and quantities are for PRELIMINARY ANALYTICAL USE ONLY and MUST NOT be used for final n or construction without the independent review, verification, and approval by a qualified professional engineer.

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Verti-Block. Retaining Walls

ECCENTRICITY AND BEARING

Eccentricity is the calculation of the distance of the resultant away from the centroid of mass. In wall design the eccentricity is used to calculate an effective footing width.

Calculation of Eccentricity

$$\text{SumV} = W0 + W1 + P_{av}$$

$$129.32 + 25.61 + 3.54$$

Moment Resisting

Moment Driving

$$\text{SumV} = 158.47$$

$$M_r = -20.83$$

$$M_d = 10.27$$

$$e = (\text{Sum}M_r + \text{Sum}M_d)/(\text{SumV})$$

$$e = (-10.56 / 158.47)$$

$$e = 0.000 \text{ m}$$

Note: Calculations and quantities are for PRELIMINARY ANALYTICAL USE ONLY and MUST NOT be used for final n or construction without the independent review, verification, and approval by a qualified professional engineer.

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Verti-Block. Retaining Walls

BEARING

Bearing Capacity Factors [Foundation]

$$N_c = 30.14$$

$$N_q = 18.40$$

$$N_g = 22.40$$

Shape Factors [Foundation]

$$S_c = 1.06$$

$$S_q = 1.06$$

$$S_g = 0.96$$

Modified Bearing Capacity Factors [Foundation]

$$N_{cm} = N_c \times S_c = 31.98$$

$$N_{qm} = N_q \times S_q \times df = 19.46$$

$$N_{gm} = N_g \times S_g = 21.51$$

Depth Correction Factor

$$df = 1.14$$

Water Correction Factor

$$C_{wq} = 1.00$$

$$C_{wg} = 1.00$$

Base width at foundation, Bf

$$B_f = W_u + \text{height of leveling pad}$$

$$B'_f = B_f - 2e$$

$$1.41 - 2 \times 0.00$$

$$B'_f = 1.41 \text{ m}$$

Calculation of Bearing Pressures on Foundation

$$q_n = (c \times N_{cm} + q \times N_{qm} \times C_{wq} + 0.5 \times \gamma \times B'_f \times N_{gm} \times df \times C_{wq})$$

$$[(0.00 \times 31.98) + (10.00 \times 19.46 \times 1.00) + (0.5 \times 20.00 \times 1.41 \times 21.51 \times 1.14 \times 1.00)]$$

$$q_{ult} = 498.82 \text{ kN/m}^2$$

Nbrg = Bearing at Foundation Level

$$N_{Brg} = 171 \text{ kN/m}^2$$

Calculate Ultimate Bearing, qult

$$q_{ult} = 498.82 \text{ kN/m}^2$$

Bearing Pressures (σ)

$$N_{brg}/B'_f = 120.69 \text{ kN/m}^2$$

Calculated Factor of safety for bearing

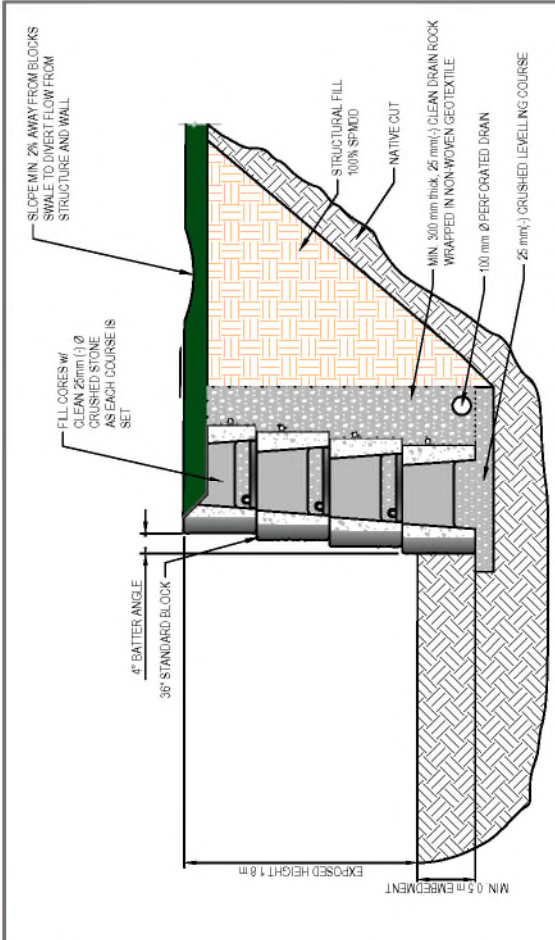
$$q_{ult}/\sigma = 4.13$$

Note: Calculations and quantities are for PRELIMINARY ANALYTICAL USE ONLY and MUST NOT be used for final n or construction without the independent review, verification, and approval by a qualified professional engineer.

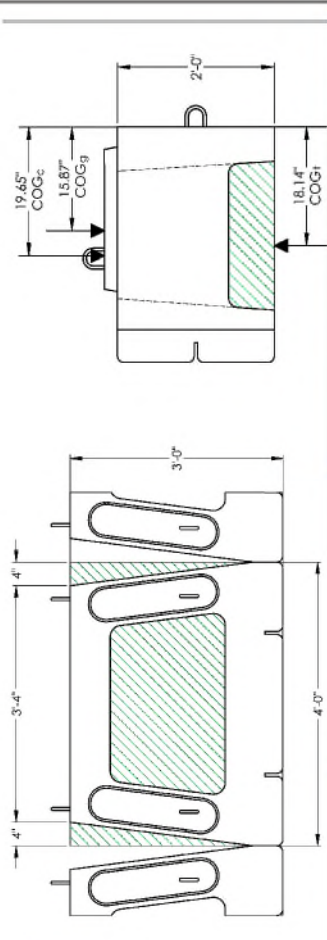
VertiBlock Wall Designer 6.0.22224.635

APPENDIX C

DRAWINGS



LOT A - TYPICAL 1.8 m VERTI-BLOCK RETAINING WALL SECTION



NUM	DATE	APR	DESCRIPTION
0	Mar 1-23	AS	ISSUED FOR REVIEW
		APR	DESCRIPTION

NUM	DATE	APR	DESCRIPTION
		APR	DESCRIPTION

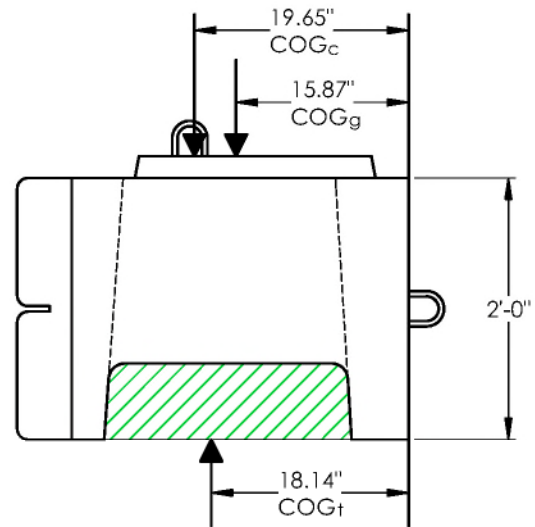
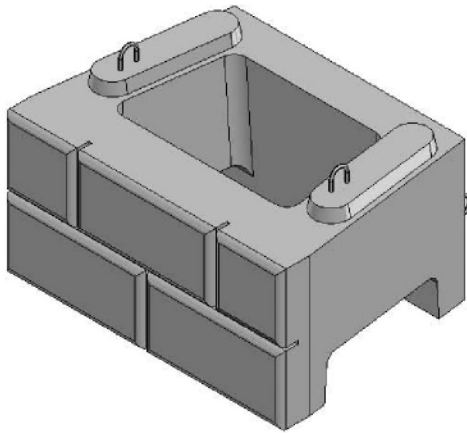
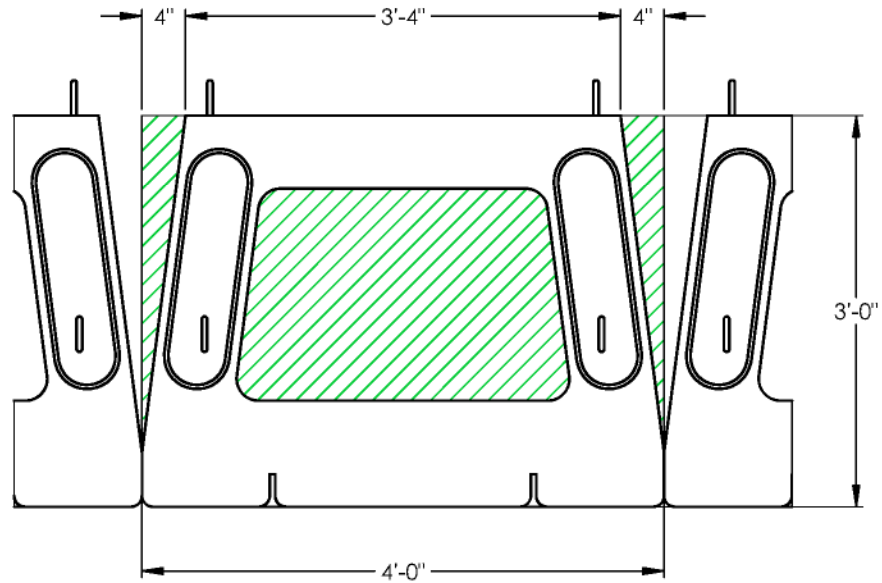
NUM	DATE	APR	DESCRIPTION
		APR	DESCRIPTION

PROJECT No.	OFFICE	DES	CD	REV	DRAWING
704-ENG-0318-018	KEL	AS	GM	0	

DATE	SHEET No.	DWN	APP	STATUS
March 1, 2023	1 of 1	AS	AS	01

8354 OKANAGAN LANDING RD. MULTI-FAMILY RESIDENTIAL DEVELOPMENT		LOT A PROPOSED RETAINING WALL	
WOODSTYLE HOMES		PROFESSIONAL SEAL	
		PERMIT	

36" STANDARD BLOCK & GRAVEL INFILL



CONCRETE BLOCK DATA

DESIGN UNIT WEIGHT (γ_c) = 142 pcf
 VOLUME (V_c) = 12.36 cft
 BLOCK WEIGHT (W_c) = 1,755 lbs
 CENTER OF GRAVITY (COG_c) = 19.65" (SEE NOTES)

GRAVEL INFILL DATA

DESIGN UNIT WEIGHT (γ_g) = 110 pcf
 VOLUME (V_g) = 11.64 cft
 GRAVEL INFILL WEIGHT (W_g) = 1,280 lbs
 CENTER OF GRAVITY (COG_g) = 15.87" (SEE NOTES)

NOTES:

- VOLUME, WEIGHT AND COG CALCULATIONS WERE DONE USING CAD SOFTWARE.
- COG MEASUREMENTS ARE FROM BACK OF BLOCK

COMBINED UNIT DATA

DESIGN UNIT WEIGHT (γ_t) = (1,755 lbs + 1,280 lbs) / 24 cft = 126 pcf
 VOLUME (V_t) = 12.36 cft + 11.64 cft = 24.00 cft
 TOTAL UNIT WEIGHT (W_t) = 3,035 lbs
 CENTER OF GRAVITY (COG_t) = 18.14" (SEE NOTES)



DRAWN BY	DATE	TITLE:
DAN BALLING	11/25/2013	STANDARD BLOCK
16500 SOUTH 500 WEST BLUFFDALE, UTAH 84065 PHONE: (801) 571-2028		DWG NO. BD-02
SCALE: 1:15		SHEET 1 OF 1

December 9, 2022

Woodstyle Homes Ltd.
PO Box 21021
Vernon, BC V1T 9T7

ISSUED FOR USE
FILE: 704-ENG.KGEO03313-01.015
Via Email: woodstyle@telus.net

Attention: Donovan Imbeau

Subject: Preliminary Geotechnical Report - 8354 Okanagan Landing Road, Vernon, BC

1.0 INTRODUCTION

Tetra Tech Canada Inc. (Tetra Tech) has been engaged by Woodstyle Homes Ltd., to provide geotechnical consulting services as needed to support a proposed multi-family development located at 8354 Okanagan Landing Road, in Vernon, BC.

The development plans for the project include two duplex sites located within the 8354 Okanagan Landing Road parcel.

This report provides general recommendations for construction of the development based on-site reconnaissance of surficial features, primarily a review of historical information from the public domain to support the development permit applications. Additional investigations and verification of the assumed subsurface stratigraphy will be required and can be done during the initial site grading stages of development.

2.0 SITE RECONNAISSANCE

The site was visited on November 30, 2022, by Anthony Schaefer (Tetra Tech). The proposed development site is located south side of Okanagan Landing Road. Figure 1.1 shows an overlay of the general site features and legal boundaries relative to aerial imagery for reference.

2.1 Soil Deposits

The Surficial Geology Map of Vernon, map 1392A (R.J. Fulton, 1963-65) shows that the surficial geology at the site is comprised of Lacustrine deposits comprised of silt with sand and gravel, gently rolling with closed depressions and areas of low-lying relief. This is consistent with the site visit by Tetra Tech on November 30, 2022.

2.2 Existing Topography

The site exists within a small roughly concave topographic feature; shallow, and downward sloping running from the rear of the property in the southeast to Okanagan Landing Road in the northwest. From the rear of the property, the slope begins steep at 30 to 50 degrees, softening to a 12-to-30-degree slope around the center of the property, and steeping again nearing the road. The hillside grade assessment for the parcel is shown in Figure 2.1 attached.

2.3 Groundwater

There is surficial evidence of a preferential flow path or ephemeral subsurface channel observed in a concentrated greening of grasses and increase in shrubbery down the closed depression with relief through approximately the center of the property. Rain falling within the boundaries of the closed depression will be channeled towards the lowest point of relief near the property entrance. With historical runoff control issues along portions of Okanagan Landing Road, to the east of the subject property (between 8091 and 8239) a detailed stormwater design is recommended for this site.

3.0 GEOTECHNICAL RECOMMENDATIONS

3.1 Site Construction and Parcel Layout

3.1.1 Site Preparation and Material Reuse

Within the footprint of the building and driveway all vegetation has been cleared, and all topsoil and organic mixed layers have been stripped to expose native soils. Based on the limited observations during the initial site visit sub-excavation may not be required. The subgrade materials are to be confirmed and deemed competent by Tetra Tech personnel during the site preparation.

As no geotechnical investigation has been performed on or near the property, recommendations on the reuse of materials are subject to the determination of the composition of the native soils. Any material found to have organics present in any notable quantity is not recommended for reuse except for landscaping purposes. All other materials are potentially reusable subject to approval following laboratory testing.

The sand and gravels exposed within the existing cuts on-site should be considered preferred structural fill while the sands, silts or other granular fine grained soils encountered on-site may be used as common fill or hauled off-site as excess material.

3.2 Foundations

Given the anticipated concept design, Tetra Tech is of the opinion that the foundation system may be comprised of shallow foundations. Foundation preparation should include the following:

- Excavate to suitable subgrade materials approved by a qualified geotechnical engineer. Approval shall be based on visual inspection and laboratory testing if required.
- Footings shall be founded a minimum of 0.9 m below the final grade to ensure adequate frost protection.
- Backfill to the finished grades with approved structural backfill compacted to 100% Standard Proctor Maximum Dry Density (SPMDD).
- Where design grades result in a transition from cut to fill through any section of a continuous structure the excavation shall be lowered 1.0 m and brought up to grade with structural fill to mitigate differential settlement across the structure.

Upon completion of the pending geotechnical investigations Tetra Tech will revise this report to include the bearing capacity at the proposed foundation locations.

3.3 Retaining Walls

The site plans for the proposed development indicate multiple retaining walls will be required and will need to be designed as either rigid or flexible wall systems. For the design of rigid (non-yielding) permanent walls constructed in place, "at-rest" earth pressure (k_0) conditions should be used in calculating lateral earth pressures for static conditions and for a flexible permanent wall, "active" earth pressure (k_a) conditions shall be used in calculating lateral earth pressures for active conditions. As such, earth pressure design parameters shall be calculated using active and passive earth pressure coefficients applicable to the backfill and foundation soils anticipated for construction.

Retaining wall design is not included in the current scope of work but can be undertaken as part of the next phase of work pending discussions with client and a preliminary design in place.

3.4 Cut / Fill Slopes

3.4.1 Structural Fill

Structural fill shall step into the native subgrade by benching to a maximum 1.0 m high and 1.0 m wide. Where topsoil cover greater than 150 mm is to be applied to finish (landscaped) slopes, structural fill slopes must not be steeper than 2.0 Horizontal to 1.0 Vertical.

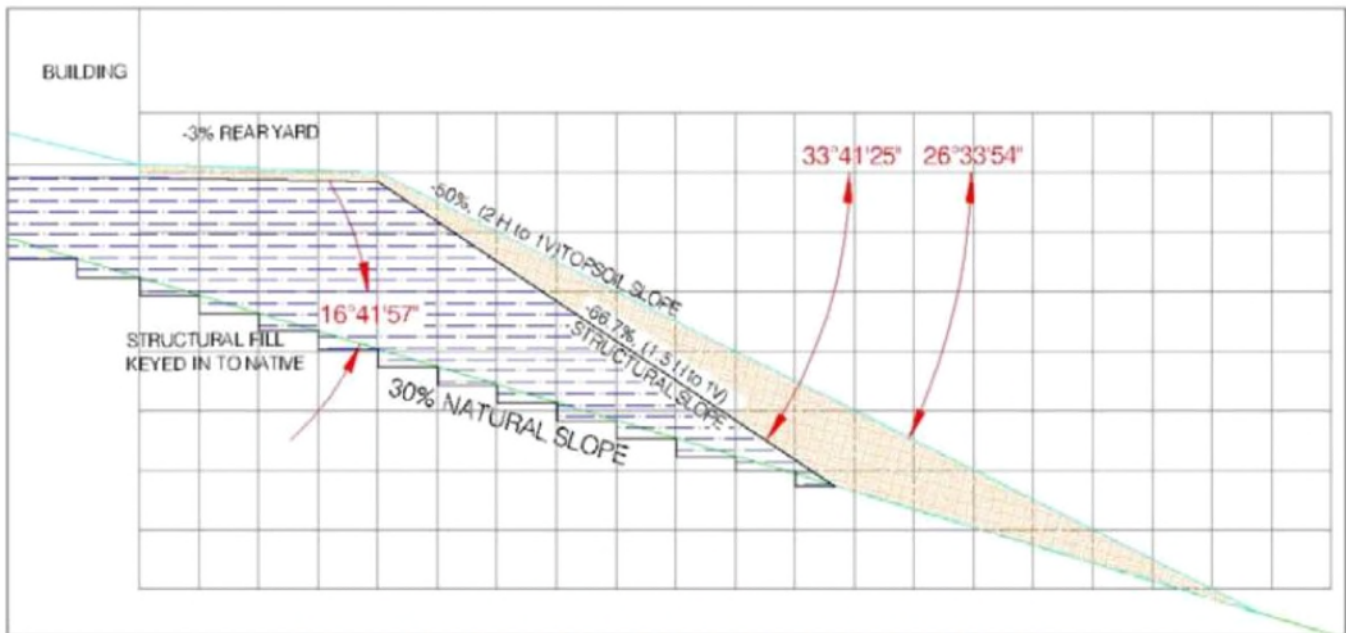


Figure 3.1 Structural Fill and Landscaped Finished Slopes

Foundations or other structural loadings must be set back a minimum of 3 m from the face of the structural fill slope at the depth of their influence. Deepening of the foundation and utilizing a larger foundation wall is acceptable to achieve the minimum setback distance.

3.4.2 Permanent Cut Slopes

Permanent cut slopes shall be constructed at angles no steeper than 1.5 Horizontal to 1 Vertical and must be protected by a suitable vegetative cover or commercially available erosion and sediment control product.

The site plan indicates that permanent cut slopes will extend into the neighboring property, and it is the responsibility of the owner to ensure proper agreements, easements or statutory right-of-way have been established. If during the retaining wall design geogrid extends onto the neighboring property a geotechnical covenant may need to be registered on title.

3.4.3 Temporary Excavations and Underground Utilities

All work, conducted in and around excavations, should be carried out in accordance with requirements specified by WorkSafe BC Occupational Health & Safety Regulations, Part 20. Unsupported excavations greater than 1.2 m depth should be reviewed by a professional engineer in accordance with WorkSafe BC. Alternatively, service line trenches or excavations deeper than 1.2 m must be shored. Temporary trenches for underground utilities excavated within existing subgrade and structural fill materials should be excavated at a slope no steeper than 1H:1V.

3.5 Roadways and Pavement

Following the site grading the roadway and access subgrade preparation should include:

- Excavated subgrade should be compacted using a smooth drum roller on all silty/sandy soils to minimum 100% SPMDD and proof-roll tested.
- Failing areas should be remediated and retested following appropriate replacement treatment to confirm subgrade stability.
- Water pooling and/or excessive rutting from trucks should be avoided to prevent subgrade degradation and loss of strength.

Given the above subgrade preparation is undertaken, an in situ CBR greater than 6% can be assumed. Table 3-1 below presents the minimum thicknesses for the pavement structure for driveways and private access which do not need to meet the City of Vernon requirements.

Table 3-1: Recommended Pavement Section for Driveways and Private Access

Structural Component	Recommended Minimum Thickness
Asphalt	50 mm
Crushed Gravel Base Course	50 mm
Gravel Sub-base Course	150 mm

Sub-base and base materials should be compacted to a minimum of 100% SPMDD, respectively, and within 2% of optimum moisture content. We recommend that the actual compaction of all granular materials placed should be confirmed with in situ density testing.

Good drainage provisions will optimize pavement performance. The finished pavement surface should be free of depressions and should be sloped (preferably at a minimum grade of two percent) to provide effective surface

drainage towards a ditch and/or catch-basins. Surface water should not be allowed to pond adjacent to the outside edges of pavement areas.

3.6 Site Drainage

Development of the subject property will increase the potential for surface flows to concentrate. These concentrated surface flows from driveways and roofs must be collected and disposed of by stormwater collection systems or designed overland flow structures. Uncontrolled overland flow shall not be permitted. Perimeter foundation drains shall be provided around all foundations as well as behind retaining walls and shall discharge to a controlled system.

Given the sandy, gravelly silt deposits suspected to cover the site, the permissibility of conventional drywells, rock pits, or infiltration trenches will need to be determined by performing infiltration testing. It is recommended that surface, roof runoff and perimeter drains be connected to a designed stormwater retention system. The design of this system must be completed by a qualified professional.

Final site grading should have a minimum 0.5% grade away from structures to promote gravity flow. Final grading alongside the foundations should maintain a 0.5% grade such that gravity flow will be maintained.

3.7 Construction Monitoring

The recommendations presented in this report assume that Tetra Tech will be retained to provide field review during construction, to confirm that soil conditions encountered are consistent with our design assumptions, and work is carried out in general accordance with the intent of our recommendations.

4.0 ADDITIONAL GEOTECHNICAL INVESTIGATIONS/SERVICES

During construction Tetra Tech can provide personnel to assist with additional geotechnical investigations to support and confirm the recommendations made in this report. Some investigations which may be required would include:

- Testpits – to verify mineral soil deposits and assumptions of the soil stratigraphy.
- Infiltration testing – to verify the necessity, permissibility, and sizing of rock pits and infiltration trenches.
- Laboratory testing – to confirm index properties of structural fill and support the design of retaining wall systems.

5.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Woodstyle Homes Ltd., and their agents. Tetra Tech Canada Inc. (operating as Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Woodstyle Homes Ltd., or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on the Use of this Document attached in the Appendix or Contractual Terms and Conditions executed by both parties.

6.0 CLOSURE

We trust this document meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
Tetra Tech Canada Inc.

FILE: 704-ENG.KGEO03313-01.015
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FILE: 704-ENG.KGEO03313-01.015
FILE: 704-ENG.KGEO03313-01.015

Prepared by:
Chris Stuart, EIT
Geotechnical Engineer
Direct Line: 250.309.3652
chris.stuart@tetrattech.com

Reviewed by:
Anthony Schaefer, P.Eng.
Geotechnical Engineer
Direct Line: 778.214.1844
anthony.schaefer@tetrattech.com

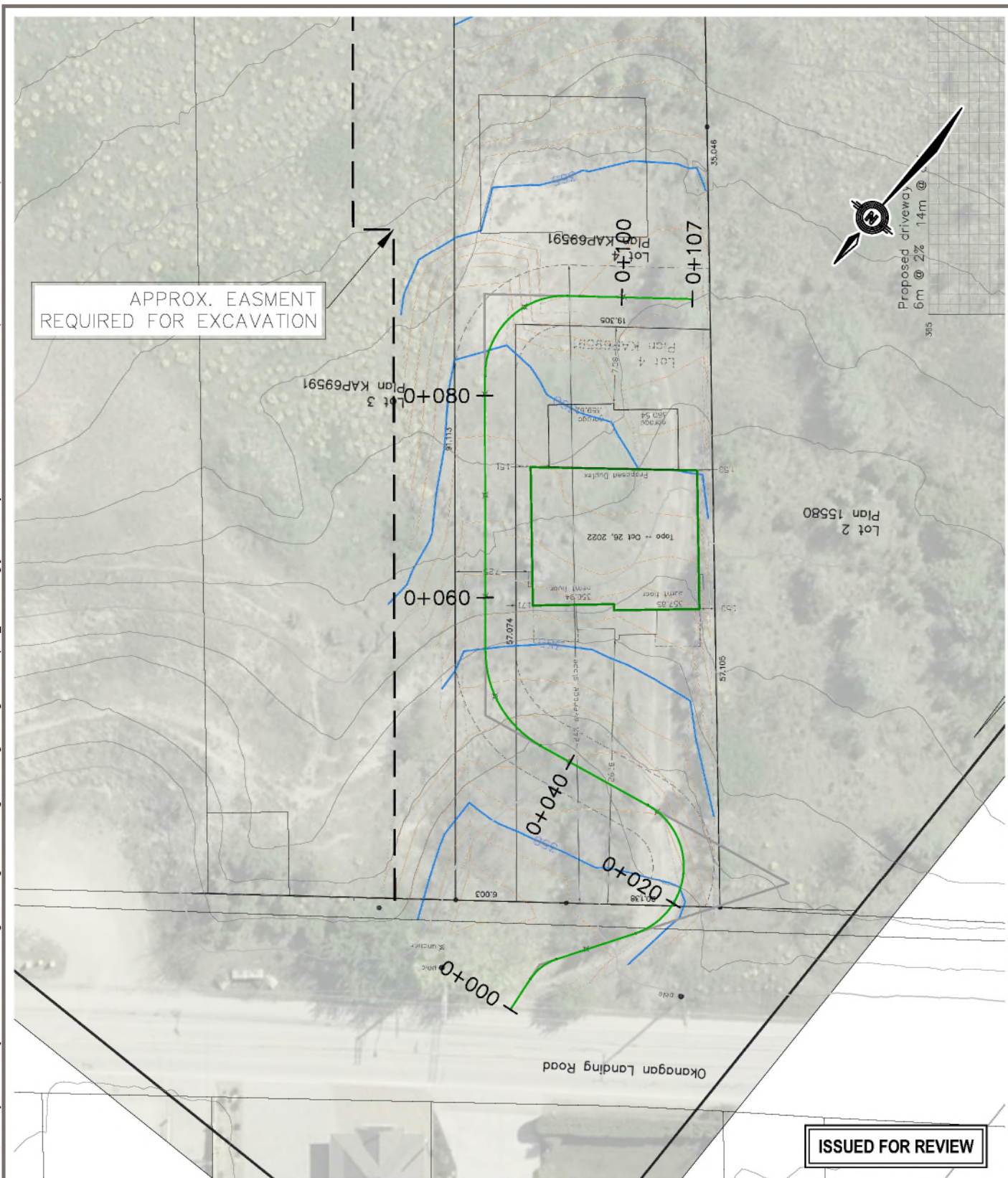
/bi

Attachments: Figure 1.1 Site Plan
 Figure 2.1 Existing Site Topography
 Photographs
 Appendix A Tetra Tech's Limitations on The Use Of This Document

FIGURES

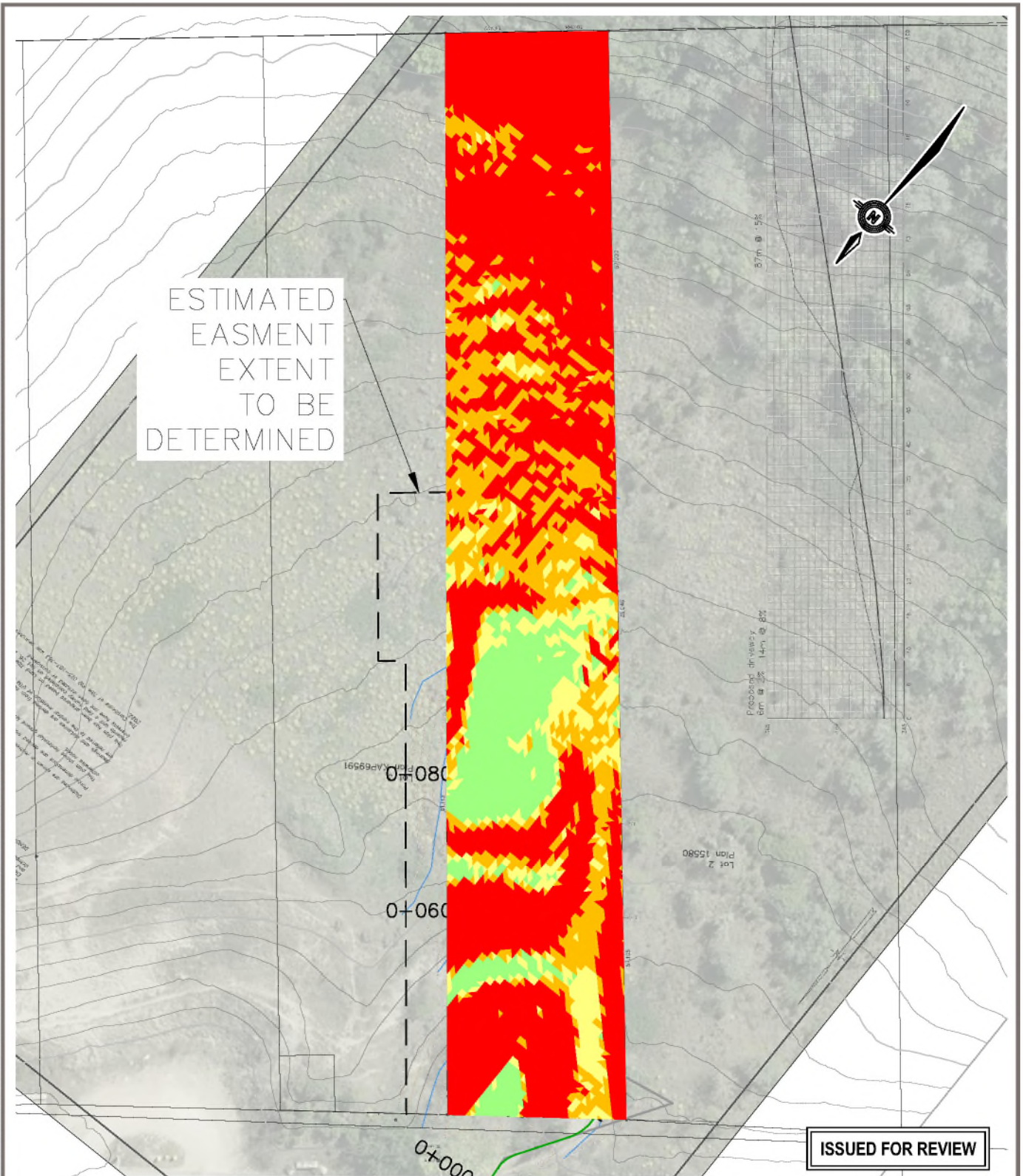
- Figure 1.1 Site Plan
Figure 2.1 Existing Site Topography

C:\Users\anthony.schaefer\OneDrive - Tetra Tech, Inc\Projects\Woodstyle Homes\8354 Okanagan Landing\Drawings\8354 Duplex_recover.dwg [FIGURE 1] December 09, 2022 - 9:18:20 am (BY: SCHAEFER, ANTHONY)



ISSUED FOR REVIEW

<p>CLIENT</p> <p>Woodstyle Homes</p>	<p>Multi Duplex Site 8354 - Okanagan Landing Road</p>			
	<p>Site Plan</p>			
	<p>PROJECT NO.</p> <p>704-ENG.KGEO03313-01</p>	<p>DWN</p> <p>AS</p>	<p>CKD</p> <p>AS</p>	<p>REV</p> <p>0</p>
	<p>OFFICE</p> <p>KEL</p>	<p>DATE</p> <p>December 9, 2022</p>		
				<p>Figure 1.1</p>



ISSUED FOR REVIEW

Slopes Table				
Number	Minimum Slope	Maximum Slope	Area	Color
1	0.01%	12.00%	468.65	Green
2	12.00%	20.00%	382.46	Yellow
3	20.00%	30.00%	853.31	Orange
4	30.00%	150.00%	2256.41	Red

CLIENT

Woodstyle Homes



Multi Duplex Site
8354 - Okanagan Landing Road

Hillside Analysis

PROJECT NO. 704-ENG.KGE003313-01	DWN AS	CKD AS	REV 0
OFFICE KEL	DATE December 9, 2022		

Figure 2.1

PHOTOGRAPHS

- Photo 1 Project Site looking south from site entrance.
- Photo 2 Project Site looking south along western property boundary (orange ribbon and stakes).
- Photo 3 Project Site looking north from back of clearing limits through centerline of the property.
- Photo 4 Project Site looking north along eastern property boundary (orange ribbon and stakes). Note: excavation extends beyond the eastern property limits.



Photo 1: Project Site looking south from site entrance.



Photo 2: Project Site looking south along western property boundary (orange ribbon and stakes).



Photo 3: Project Site looking north from back of clearing limits through centerline of the property.



Photo 4: Project Site looking north along eastern property boundary (orange ribbon and stakes). Note: excavation extends beyond the eastern property limits.

APPENDIX A

TETRA TECH'S LIMITATIONS ON THE USE OF THIS DOCUMENT

LIMITATIONS ON USE OF THIS DOCUMENT

GEOTECHNICAL

1.1 USE OF DOCUMENT AND OWNERSHIP

This document pertains to a specific site, a specific development, and a specific scope of work. The document may include plans, drawings, profiles and other supporting documents that collectively constitute the document (the "Professional Document").

The Professional Document is intended for the sole use of TETRA TECH's Client (the "Client") as specifically identified in the TETRA TECH Services Agreement or other Contractual Agreement entered into with the Client (either of which is termed the "Contract" herein). TETRA TECH does not accept any responsibility for the accuracy of any of the data, analyses, recommendations or other contents of the Professional Document when it is used or relied upon by any party other than the Client, unless authorized in writing by TETRA TECH.

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Where TETRA TECH submits electronic file and/or hard copy versions of the Professional Document or any drawings or other project-related documents and deliverables (collectively termed TETRA TECH's "Instruments of Professional Service"), only the signed and/or sealed versions shall be considered final. The original signed and/or sealed electronic file and/or hard copy version archived by TETRA TECH shall be deemed to be the original. TETRA TECH will archive a protected digital copy of the original signed and/or sealed version for a period of 10 years.

Both electronic file and/or hard copy versions of TETRA TECH's Instruments of Professional Service shall not, under any circumstances, be altered by any party except TETRA TECH. TETRA TECH's Instruments of Professional Service will be used only and exactly as submitted by TETRA TECH.

Electronic files submitted by TETRA TECH have been prepared and submitted using specific software and hardware systems. TETRA TECH makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

1.3 STANDARD OF CARE

Services performed by TETRA TECH for the Professional Document have been conducted in accordance with the Contract, in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Professional judgment has been applied in developing the conclusions and/or recommendations provided in this Professional Document. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of the Professional Document.

If any error or omission is detected by the Client or an Authorized Party, the error or omission must be immediately brought to the attention of TETRA TECH.

1.4 DISCLOSURE OF INFORMATION BY CLIENT

The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

1.5 INFORMATION PROVIDED TO TETRA TECH BY OTHERS

During the performance of the work and the preparation of this Professional Document, TETRA TECH may have relied on information provided by third parties other than the Client.

While TETRA TECH endeavours to verify the accuracy of such information, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information even where inaccurate or unreliable information impacts any recommendations, design or other deliverables and causes the Client or an Authorized Party loss or damage.

1.6 GENERAL LIMITATIONS OF DOCUMENT

This Professional Document is based solely on the conditions presented and the data available to TETRA TECH at the time the data were collected in the field or gathered from available databases.

The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this document, at or on the development proposed as of the date of the Professional Document requires a supplementary exploration, investigation, and assessment.

TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

1.7 ENVIRONMENTAL AND REGULATORY ISSUES

Unless stipulated in the report, TETRA TECH has not been retained to explore, address or consider and has not explored, addressed or considered any environmental or regulatory issues associated with development on the subject site.

1.8 NATURE AND EXACTNESS OF SOIL AND ROCK DESCRIPTIONS

Classification and identification of soils and rocks are based upon commonly accepted systems, methods and standards employed in professional geotechnical practice. This report contains descriptions of the systems and methods used. Where deviations from the system or method prevail, they are specifically mentioned.

Classification and identification of geological units are judgmental in nature as to both type and condition. TETRA TECH does not warrant conditions represented herein as exact, but infers accuracy only to the extent that is common in practice.

Where subsurface conditions encountered during development are different from those described in this report, qualified geotechnical personnel should revisit the site and review recommendations in light of the actual conditions encountered.

1.9 LOGS OF TESTHOLES

The testhole logs are a compilation of conditions and classification of soils and rocks as obtained from field observations and laboratory testing of selected samples. Soil and rock zones have been interpreted. Change from one geological zone to the other, indicated on the logs as a distinct line, can be, in fact, transitional. The extent of transition is interpretive. Any circumstance which requires precise definition of soil or rock zone transition elevations may require further investigation and review.

1.10 STRATIGRAPHIC AND GEOLOGICAL INFORMATION

The stratigraphic and geological information indicated on drawings contained in this report are inferred from logs of test holes and/or soil/rock exposures. Stratigraphy is known only at the locations of the test hole or exposure. Actual geology and stratigraphy between test holes and/or exposures may vary from that shown on these drawings. Natural variations in geological conditions are inherent and are a function of the historical environment. TETRA TECH does not represent the conditions illustrated as exact but recognizes that variations will exist. Where knowledge of more precise locations of geological units is necessary, additional exploration and review may be necessary.

1.11 PROTECTION OF EXPOSED GROUND

Excavation and construction operations expose geological materials to climatic elements (freeze/thaw, wet/dry) and/or mechanical disturbance which can cause severe deterioration. Unless otherwise specifically indicated in this report, the walls and floors of excavations must be protected from the elements, particularly moisture, desiccation, frost action and construction traffic.

1.12 SUPPORT OF ADJACENT GROUND AND STRUCTURES

Unless otherwise specifically advised, support of ground and structures adjacent to the anticipated construction and preservation of adjacent ground and structures from the adverse impact of construction activity is required.

1.13 INFLUENCE OF CONSTRUCTION ACTIVITY

Construction activity can impact structural performance of adjacent buildings and other installations. The influence of all anticipated construction activities should be considered by the contractor, owner, architect and prime engineer in consultation with a geotechnical engineer when the final design and construction techniques, and construction sequence are known.

1.14 OBSERVATIONS DURING CONSTRUCTION

Because of the nature of geological deposits, the judgmental nature of geotechnical engineering, and the potential of adverse circumstances arising from construction activity, observations during site preparation, excavation and construction should be carried out by a geotechnical engineer. These observations may then serve as the basis for confirmation and/or alteration of geotechnical recommendations or design guidelines presented herein.

1.15 DRAINAGE SYSTEMS

Unless otherwise specified, it is a condition of this report that effective temporary and permanent drainage systems are required and that they must be considered in relation to project purpose and function. Where temporary or permanent drainage systems are installed within or around a structure, these systems must protect the structure from loss of ground due to mechanisms such as internal erosion and must be designed so as to assure continued satisfactory performance of the drains. Specific design details regarding the geotechnical aspects of such systems (e.g. bedding material, surrounding soil, soil cover, geotextile type) should be reviewed by the geotechnical engineer to confirm the performance of the system is consistent with the conditions used in the geotechnical design.

1.16 DESIGN PARAMETERS

Bearing capacities for Limit States or Allowable Stress Design, strength/stiffness properties and similar geotechnical design parameters quoted in this report relate to a specific soil or rock type and condition. Construction activity and environmental circumstances can materially change the condition of soil or rock. The elevation at which a soil or rock type occurs is variable. It is a requirement of this report that structural elements be founded in and/or upon geological materials of the type and in the condition used in this report. Sufficient observations should be made by qualified geotechnical personnel during construction to assure that the soil and/or rock conditions considered in this report in fact exist at the site.

1.17 SAMPLES

TETRA TECH will retain all soil and rock samples for 30 days after this report is issued. Further storage or transfer of samples can be made at the Client's expense upon written request, otherwise samples will be discarded.

1.18 APPLICABLE CODES, STANDARDS, GUIDELINES & BEST PRACTICE

This document has been prepared based on the applicable codes, standards, guidelines or best practice as identified in the report. Some mandated codes, standards and guidelines (such as ASTM, AASHTO Bridge Design/Construction Codes, Canadian Highway Bridge Design Code, National/Provincial Building Codes) are routinely updated and corrections made. TETRA TECH cannot predict nor be held liable for any such future changes, amendments, errors or omissions in these documents that may have a bearing on the assessment, design or analyses included in this report.



TETRA TECH

February 17, 2023

Woodstyle Homes Ltd.
PO Box 21021
Vernon, BC V1T 9T7

ATTACHMENT 6

ISSUED FOR REVIEW
FILE: 704-ENG.KGEO035708-02
Via Email: woodstyle@telus.net

Attention: Donovan Imbeau

Subject: Letter of Assurance for Professional Services - 8354 Okanagan Landing Road, Vernon, BC

Tetra Canada Inc. (Tetra Tech) continues to provide geotechnical design services in support of the multi-family development located at 8354 Okanagan Landing Road, in Vernon, BC.

This letter is being provided by Tetra Tech as an assurance of professional design and commitment for field reviews in accordance with our obligations as the Engineer of Record for these works.

Tetra Tech will adopt the published design criteria by EGBC to evaluate and prepare the design of retaining walls required at 8354 Okanagan Landing Road, Vernon BC. In all cases Tetra Tech's design will meet or exceed the published criteria.

Where any retaining wall shall exceed 3.0m in height, an independent design review by an experienced Engineering Professional, who was not involved in the preparation of the design, will be completed to satisfy the requirements of the EGBC guidelines and Tetra Tech's professional practice management plan.

Respectfully Submitted,

Anthony Schaefer, P.Eng.

ATTACHMENT 7

Client: Woodstyle Homes
 Civic address: 8354 Okanogan Landing Road

SCALE 1:250

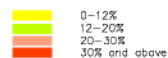


The enlarged plot size of this plan is 884m² in width by 358m² in height (AKS 3) when plotted at a scale of 1:250

Contour Interval = 1m
 Elevation are shown in metres, and are based on CGD38 (11x2.0), and are derived from GPS observations. Site reflects grading as of October 26, 2022.

● DENOTES STANDARD IRON POST FOUND

Slope legend

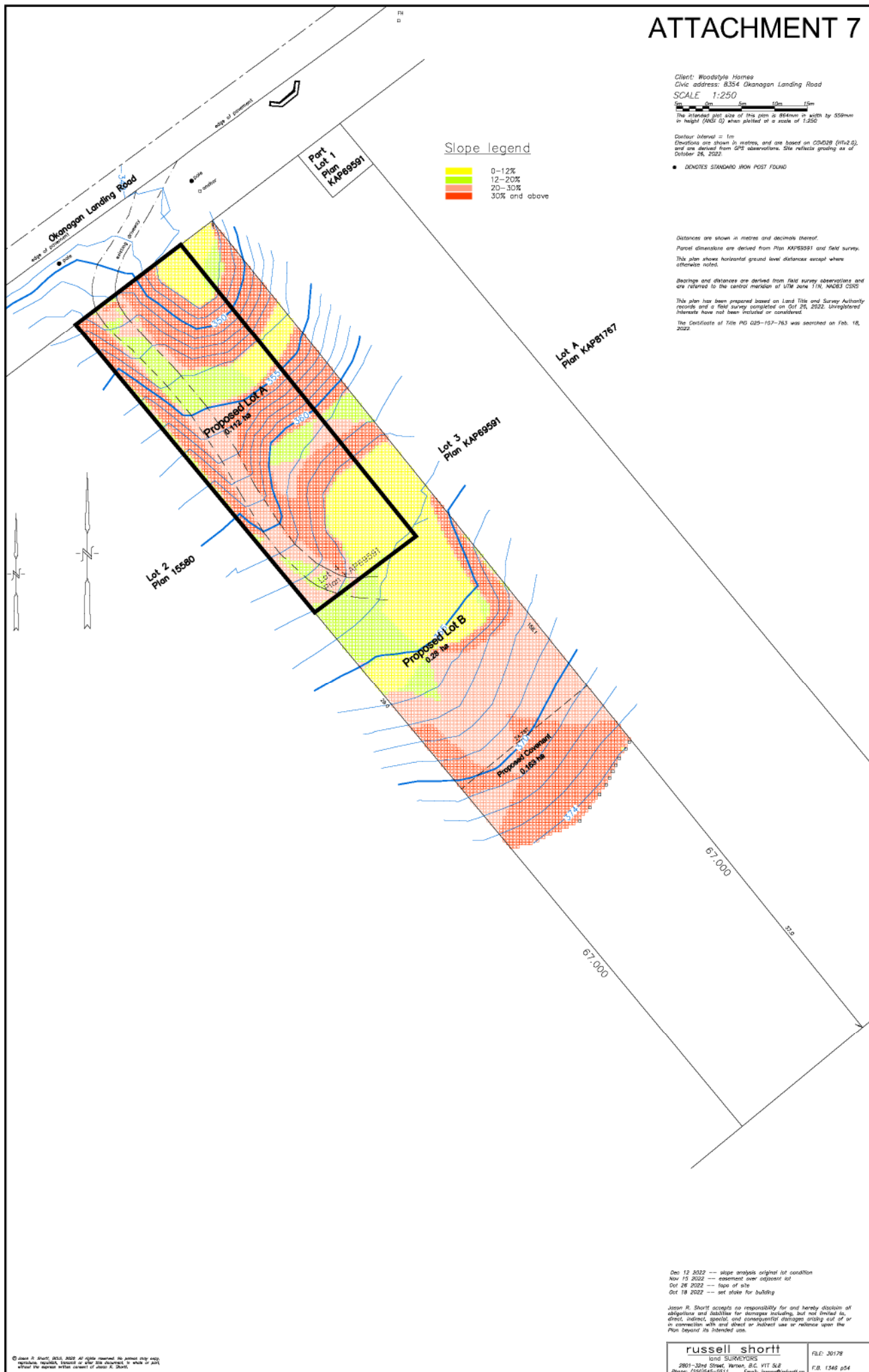


Distances are shown in metres and decimals thereof.
 Parcel dimensions are derived from Plan KAP69591 and field survey.
 This plan shows horizontal ground level distances except where otherwise noted.

Bearings and distances are derived from field survey observations and are referred to the control meridian of UTM zone 11N, NAD83 CSRS

This plan has been prepared based on Land Title and Survey Authority records and a field survey completed on Oct 26, 2022. Unregistered interests have not been included or considered.

The Certificate of Title PD 025-157-763 was searched on Feb. 18, 2022.



Oct 12 2022 --- slope analysis original lot condition
 Nov 15 2022 --- assessment over adjacent lot
 Oct 26 2022 --- top of site
 Oct 18 2022 --- set stake for building

Jesse R. Shortt accepts no responsibility for and hereby disclaims of all negligence and liability for damages including, but not limited to, direct, indirect, special and consequential damages arising out of or in connection with and direct or indirect use or reliance upon the Plan beyond its intended use.

russell shortt
 land SURVEYORS
 2801-33rd Street, Vernon, B.C. V1T 5J6
 Phone: 250/266-9511 Fax: 250/266-9512

R.L. 20178
 F.B. 1346 p54

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ATTACHMENT 8

Client: Woodthyla Homes
 Civic address: 8354 Okanagan Landing Road

SCALE 1:250

The intended and size of this plan is 856mm in width by 552mm in height (AHSI 0) when plotted at a scale of 1:250

Contour interval = 1m
 Elevations are shown in metres, and are based on CGVD2011 (fn14.0), and are derived from GPS observations. Site reflects post grading.

● DENOTES STANDARD IRON POST FOUND

Slope legend

- 0-12%
- 12-20%
- 20-30%
- 30% and above

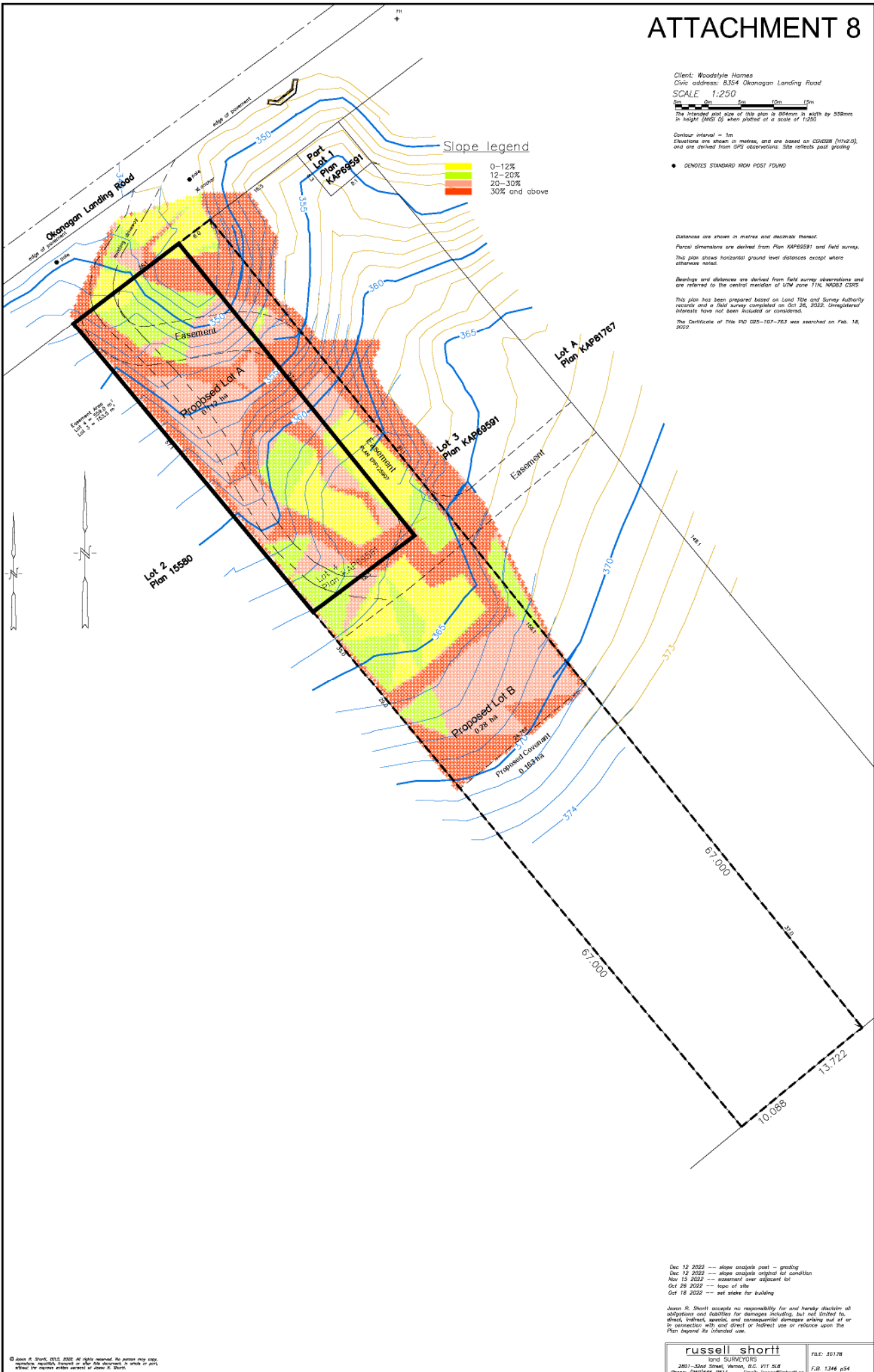
Distances are shown in metres and decimals thereof.

Parcel dimensions are derived from Plan KAP65591 and field survey. This plan shows horizontal ground level distances except where otherwise noted.

Bearings and distances are derived from field survey observations and are referred to the central meridian of UTM zone 11N, NAD83 CSRS.

This plan has been prepared based on Land Title and Survey Authority records and a field survey completed on Oct 26, 2022. Unpermitted interests have not been included or considered.

The Certificate of Title PD 025-107-763 was searched on Feb. 18, 2022.



- Dec 12 2022 -- slope analysis post - grading
- Dec 12 2022 -- slope analysis original lot condition
- Nov 15 2022 -- easement over adjacent lot
- Oct 28 2022 -- slope of site
- Oct 18 2022 -- set stake for building

Jean R. Shortt accepts no responsibility for and hereby disclaims all obligations and liabilities for damages including, but not limited to, direct, indirect, specific, and consequential damages arising out of or in connection with and direct or indirect use or reliance upon the Plan depend on intended use.

russell shortt land SURVEYORS 2607-23rd Street, Vernon, B.C. V1T 5L6 Phone: (250)545-0817 Fax: (250)545-0811		F.B.C. 30178 F.B. 1346 p54
---	--	-------------------------------

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Photo 1: Land alterations on Subject Property

Environmental Impact Assessment

**8354 OKANAGAN LANDING RD.
VERNON, BC.**

Prepared for:

Donovan Imbeau & Colleen Clack
1125 Galiano Road
Vernon, BC

Prepared by:



**Vernon, B.C.
May 2022**

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1 Introduction

1.1 Background

Canyon Wren Consulting Inc. was retained by Donovan Imbeau and Colleen Clack (the Proponents), to complete an Environmental Impact Assessment (EIA) for the proposed subdivision and associated residential development of 8354 Okanagan Landing Rd, Vernon, BC (Subject Property).

The Subject Property is located within the City of Vernon, on the south side of Okanagan Landing Road, and looks north over Okanagan Lake (Figure 1. General Project Location Map). The Property consists of approximately 0.396 ha (0.979 acres) of disturbed grassland and shrubland on north facing slopes.

It is located within the Cities Environmental Management Area (EMA) 3 zone (Hillside Residential and Agricultural District). Of the Cities three management areas, this one requires the most rigorous Environmental Impact Assessment (EIA). This EIA will conform to reporting and assessment requirements identified within the Cities “Environmental Management Areas Strategy – Implementation Guideline” (2014).



Figure 1. General Project Location Map.

1.2 Objectives

Specific objectives for this EIA are as follows:

- Conduct an inventory of biophysical features (including delineating ecological community boundaries, recording existing vegetation and invasive species, and determining wildlife habitat values) within the property;
- Correlate mapped ecological communities with Wildlife Habitat Ratings (WHR) used as part of the Vernon Commonage Sensitive Ecosystem Inventory (SEI);
- Conduct a Conservation Value (CV) analysis utilizing the Cities 3-class rating system;
- Address issues of habitat connectivity and wildlife movement within the study area and in adjacent lands;

- Assess the proposed development (i.e. access, services, parking, building footprints and yard space) and determine the environmental impacts; and
- Make recommendations for mitigation (i.e. location, size, timing) and/or compensation to reduce the overall impact of the proposed development.

1.3 Regulatory Requirements

In addition to City of Vernon EMA requirements, there are provincial and federal regulations that may apply to the proposed development. These relate specifically to: species at risk, migratory birds, and the presence of noxious weed species. Applicable regulatory bodies include the following:

- *Wildlife Act and Wildlife Amendment Act*: This Act is specific to British Columbia and protects vertebrate animals from direct harm, except as allowed by regulation¹ (e.g., hunting or trapping). In 2004, the Wildlife Amendment Act was passed to protect and recover certain species at risk identified by Cabinet, making it an offence to kill, harm, harass or capture an animal considered at risk².
- *Migratory Birds Convention Act*: The Act (1994) prohibits the unauthorized destruction and harassment of migratory bird nests and their eggs, and the deposition of harmful substances in areas frequented by migratory birds. Adverse effects to migratory bird nests, eggs and habitat have the potential to occur during construction and site occupancy³.
- *Weed Control Act*: The British Columbia Weed Control Act designates provincially and regionally noxious weeds and the associated regulations. The Act provides guidelines for noxious weed prevention and management. Under Schedule B of the Act, if noxious weeds are found in an area a notice to occupier to control weeds can be issued. If the weeds are not controlled, action will be taken and the occupier will be charged for the cost of weed control⁴.

2 Methods

This EIA involves the completion of baseline inventory through background information review, and two site assessments in 2022. No species specific surveys were conducted. The data gathered was used to refine existing Sensitive Ecosystem Inventory (SEI) mapping and create maps of the subject property, depicting updated Conservation Values (CVs) along with Species-At-Risk observations, key habitat features and wildlife corridors, as applicable. Properties immediately adjacent to the subject property were reviewed to help provide context to the proposed works, and aid in discussions pertaining to potential wildlife movement and utilization of the subject property. Methods are consistent with the City of Vernon's Environmental Management Areas Strategy (EMAS).

2.1 Background Review

The following data sets and associated papers formed the bulk of the background review process:

- BC Conservation Data Centre (BC CDC) was queried for rare, threatened, or endangered vegetation, communities and wildlife occurrences within the Subject Property and vicinity.

¹ Government of British Columbia. 1996. Wildlife Act (RSBC 1996 c. 488). Accessed Apr. 29, 2022. <https://www.canlii.org/en/bc/laws/stat/rsbc-1996-c-488/latest/rsbc-1996-c-488.html>

² Government of British Columbia. 2004. Wildlife Amendment Act (Bill 51 – 2004). Accessed Apr. 29, 2022. http://www.leg.bc.ca/37th5th/1st_read/gov51-1.htm

³ Government of Canada. 1994. Migratory Birds Convention Act, 1994. Department of Justice Canada. Accessed Apr. 29, 2022. <http://laws-lois.justice.gc.ca/eng/acts/M-7.01/>

⁴ Ministry of Agriculture and Lands 2001. Weed Control Act, Weed Control Regulations. Accessed Apr. 29, 2022. http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/10_66_85

- The Coldstream - Vernon⁵, Bella Vista⁶ and Vernon Commonage⁷ Sensitive Ecosystem Inventories (SEI), Terrestrial Ecosystem Mapping (TEM) and associated Wildlife Habitat Ratings (WHR) were reviewed to extrapolate information relevant to the Subject Property.
- City of Vernon ortho imagery (2010, 2013, 2016) was collected and used to assist in field assessment and map creation.
- Relevant City of Vernon GIS data sets (i.e. contours, property boundaries, etc.) helped depict site attributes.
- Proposed project footprint and layout were used to define project extent and impact locations.

2.2 Field Assessment

The field assessment consisted of 3 site visits conducted on April 12, 24, and May 2, 2022. Assessments were completed to:

- Delineate the presence of different ecological communities at a finer scale than typically mapped by TEM or SEI;
- Obtain site-specific vegetation and wildlife species occurrence information, including the occurrence or potential occurrence of identified provincial and federal species-at-risk;
- Assess the level of disturbance and overall function of communities within the Subject Property;
- Capture key habitat features, such as rock outcrops, hibernacula, etc., occurring in the Subject Property.

2.3 CV Mapping

SEI and TEM created as part of the Vernon Commonage mapping project⁷, was used as the base for all mapping updates. Boundaries of individual polygons within the Subject Property were adjusted and refined to a 1:1500 scale based on aerial imagery and site sampling. Polygons delineated within TEM contain areas of relatively uniform terrain, slope, aspect, vegetation and disturbance. Each resulting polygon was then classified to TEM site series and structural stage. Refined polygons in the subject Property contained a single unique habitat type within each polygon. Mapped site series were ground-truthed to ensure accuracy of classification and to assign ecological quality/condition values (i.e. identify the level of existing disturbance and the overall ecological quality and function of the polygon).

Conservation Value Mapping

Conservation Value (CV) designation provides managers with a method of identifying the highest value areas for conservation. Once TEM was refined and ground-truthed for the entire property and surrounding area, the methods described within Haney and Iverson (2009)⁸, were used to calculate CVs.

Initial SEI habitat values were established based on identified rankings for the habitat being assessed (e.g. GR:sh=9). These rankings are a function of general rarity, importance to wildlife and sensitivity to disturbance (Table 1). Individual polygon values were then adjusted downward based on ecological quality/condition values identified during fieldwork (Table 2). Finally, as part of the Vernon Commonage SEI mapping processes, Wildlife Habitat Ratings (WHR) were provided for key wildlife species and life requisites

⁵ Iverson, K. and P. Uunila. 2008. Sensitive Ecosystems Inventory: Coldstream - Vernon. Available: <https://a100.gov.bc.ca/pub/acat/public/viewReport.do?reportId=15353>

⁶ Iverson, K. and J. Shypitka. 2003. Sensitive Ecosystems Inventory (SEI) Based on Terrestrial Ecosystem Mapping: Bella Vista - Goose Lake Range 2002. Available: <https://a100.gov.bc.ca/pub/acat/public/viewReport.do?reportId=1306>

⁷ Iverson, K., P. Uunila, A. Haney and M. Sarell. 2006. Sensitive Ecosystems Inventory (SEI) - Vernon Commonage, 2005. Available: <https://a100.gov.bc.ca/pub/acat/public/viewReport.do?reportId=4159>

⁸ Haney, A. and K. Iverson. 2009. Conservation Analysis and Updated Ecosystem Mapping for the Central Okanagan Valley: Central Okanagan, South Slopes, Kelowna, Ellison and Joe Rich project areas.

(Table 3). The most critical life requisite for each species was selected and the maximum value of all potential species was used to represent the wildlife value of a particular polygon.

Table 1. Relative SEI values assigned to SEI categories within the Vernon Commonage.

SEI Category	SEI Code	SEI Value IDFxh1	Rationale (% of Vernon Commonage)
Riparian: fluvial fringe	RI:ff	10	Very sensitive, very important wildlife habitat, very rare (0.8%)
Grassland: shrubland	GR:sh	9	Very Sensitive & provincially rare; very rare in the study area (1%)
Grassland: disturbed	GR:dg	6	Disturbed but provide values for many grassland species including many rare and endangered species (13%)
Broadleaf Woodland: Aspen Copse	BW:ac	7	Sensitive & rare within the study area (3%)
Not a Sensitive or Other Important Ecosystem		0	Not sensitive (55%)

* All percentages are from: Iverson K., P.Uunila, A. Haney and M. Sarell. 2006. Sensitive Ecosystems Inventory (SEI) - Vernon Commonage, 2005.

Table 2. Ecological quality/condition adjustment values for mapped polygons.

Quality/Condition Rating	Assigned Value
Excellent (1)	1
Good (2)	0.8
Marginal (3)	0.5
Poor (4)	0.1

Table 3. Sensitive wildlife species and critical life requisites used in CV mapping.

Species	Species Code	Life Requisite	Subzone variant
Great Basin Spadefoot	A_SPIN	Reproduction	Ephemeral wetlands
Western Rattlesnake	R-CROR	General Living (foraging and denning)	Deep-soiled grasslands
Gopher Snake	R-PICA	General Living (foraging and denning)	Deep-soiled grasslands
Western Screech-owl	B-WSOW	Nesting	Mature or old riparian stands (cottonwood or birch)
Swainson's Hawk	B-SWHA	Nesting	Scattered trees or small stands in or adjacent to open area
Long-billed Curlew	B-LBCU	Nesting	Open grasslands
Grasshopper Sparrow	B_GRSP	General Living (nesting and foraging)	Open or slightly shrubby grasslands
Yellow-breasted chat	B-YBCH	General Living (nesting and foraging)	Shrubby riparian
American Badger	M-TATA	General Living (denning and foraging)	Deep-soiled grassland or other open areas

The mapping procedure is mathematically expressed by the following equation.

$$CV = [(2 * SEIval * QC) + WHR] / 3$$

Habitat polygons were then categorized based on resulting CV scores. CV categorization within the EMAS is as follows:

- low value (0 to 3),
- moderate value (3 to 6.9) and
- high value (7 to 10).

It should be noted that CV rankings are conservative by nature, as they incorporate the highest ranked species WHR per habitat polygon. Additionally, WHRs are a measure of wildlife habitat maximum capability. They do not take into account the current condition of the wildlife habitat (i.e. fragmentation, isolation, abundance of invasive species, etc). Within the CV analysis, SEI values are adjusted by habitat Quality/Condition, but WHRs are not.

3 Results

3.1 Climate, Biogeoclimatic Zones and Ecosystems

The Subject Property lies within the Okanagan Valley in the rain shadow of the Coast and Cascade Mountains, which is one of the warmest and driest areas of the province. The warmest temperatures generally occur in July, while the coolest are in January. The nearest climate station is the Vernon Bella Vista station (Lat. 50° 15.6' N, Lon. 119° 18.6' W). Mean July and January temperatures at this station for the period 1981-2010 were 20.5°C and -2.1°C, respectively⁹. The average annual precipitation was 428.1 mm of which 90.9 mm (water equivalent) fell as snow.

The Subject Property occurs within the Interior Douglas-fir biogeoclimatic zone (IDF), Okanagan very dry hot (xh1) variant. The IDFxh1 is the warmest and driest forested subzone in the IDF and is characterized by a relatively long growing season in which moisture deficits are common. The Douglas-fir (*Pseudotsuga menziesii*) and ponderosa pine (*Pinus ponderosa*) dominated forests, with bluebunch wheatgrass (*Agropyron spicatum*) and pinegrass (*Calamagrostis rubescens*) understories reflect the frequent shortage of moisture.

Results of the TEM mapping refinement and field verification indicate that there are 4 communities occurring in the property. These include: an area of exposed soil associated with previous site disturbance (00-ES, Photo 1), a seral grassland community, which also represents historic disturbance (91-Fwsw, Photo 2), a grassland associated shrub community (97-RF, Photo 3) and a grassland associated forest community, although currently in tall shrub structural stage (98-AS, Photo 4 - Table 4). No wetland habitats were observed within the Subject Property.

The ecological Quality/Condition ratings (Table 2) for all communities varied, but generally improved as distance from Okanagan Landing Road increased. Lower southern slopes, experienced more frequent and serious disturbance. This was in part expressed in increased weed species numbers and diversity. Observed weed species included: provincially noxious (knapweed sp., Canada thistle, hound’s tongue, dalmation toadflax), regionally noxious (sulphur cinquefoil, Scotch thistle, burdock) and general invasive species (cheatgrass, crested wheatgrass).

Due to competition for light and nutrients the weeds have had a harder time establishing in the more dense and intact AS and RF shrub communities, especially those with limited access.

Table 4. Mapped ecosystems located within the Subject Property.

Biogeoclimatic Unit	SEI unit	Common Name	BC Status ¹	Typical Conditions
IDFxh1/00 ES	NA	Exposed Soil / Bare Ground	NA	Generally associated with human disturbance
IDFxh1/98 AS	BW:ac	Trembling aspen – Snowberry – Kentucky bluegrass	Red	Associated with large broad depressions and moisture receiving areas in grassland
IDFxh1a/91 FW:sw	GR:dg	Big sagebrush – Bluebunch wheatgrass seral association	Red (for non seral stage)	Gentle slopes with deep medium textured soils – significant sage brush, mid to late seral association
IDFxh1a/97 RF	GR:sh	Common snowberry – Prairie rose	Blue	Occurs in moisture collecting depressions and swales in grasslands

¹ BC Status obtained from the CDC on Apr. 29, 2022: Red = indigenous species, subspecies or communities considered extirpated, endangered, or threatened. Blue = indigenous taxa or communities considered of special concern in BC. NA = not listed on the CDC

⁹ Environment Canada. 2016. Canadian Climate Normals 1981-2010. Accessed Apr. 29, 2022. http://climate.weather.gc.ca/climate_normals/index_e.html



Photo 1. Exposed soil / Bare ground (00-ES) community.



Photo 2. Disturbed grassland (91-FWsw) vegetation community.



Photo 3. Grassland low shrub (97-RF) vegetation community.



Photo 4. Early structural stage, aspen tall shrub (98-AS) vegetation community.

3.2 Rare and Endangered Species and Communities

Of the four communities observed within the Subject Property, the 91-FWsw grassland community, and aspen (00-AS) tall shrub community are identified as provincially Red listed. The 97-RF grassland low shrub community is Blue listed. There are no federally listed vegetation communities under SARA. The Exposed Soil community is not identified within the BC CDC database (see Table 4 above).

The BC CDC provincial database¹⁰ was also queried for records of rare species occurrences within a 2.5 kilometre radius surrounding the Subject Property. There were no records of red or blue-listed vascular plant or wildlife species occurrences within the Subject Property. There were however records of 7 listed species within the identified search radius. These species, their provincial and federal status and typically preferred habitats are listed in Table 5 below.

Table 5. Listed Vegetation and Wildlife species known to occur within 2.5 km of the Subject Property.

Species	Latin	BC Status ²	Federal SARA Status ³	Typical Conditions
American Badger	Taxidae taxus	Red	Endangered	Preference for deep soiled grasslands, fields or open canopied forests
Great Basin Gopher Snake	Pituophis catenifer deserticola	Blue	Threatened	Utilize burrows in grasslands and surrounding dry forests
Great Basin Spadefoot	Spea intermontana	Blue	Threatened	Breeds in ephemeral pools and overwinters in self excavated burrows, typically deeper friable soils
Rocky Mountain Ridged Mussel	Gonidea angulata	Red	Special Concern	Inhabits well-oxygenated substrate of lakes, streams and rivers; prefer constant flow, shallow water (typically < 3 m deep)
Western Harvest Mouse	Reithrodontomys megalotis	Blue	Special Concern	Nocturnal. Prefers dry bunchgrass valleys, grassy roadsides and fallow fields
Western Painted Turtle	Chrysemys picta intermountain pop	Blue	Special Concern	Breeds and lives in permanent wetlands
Western Screech-owl <i>macfarlanei</i>	Megascops kennicottii macfarlanei	Red	Endangered	Preference for lower elevation riparian forests with suitable nesting cavities in large old trees

During the site visits conducted in 2022, no listed species were observed within the Property. Timing of the site visits however, were not especially conducive to facilitating the observation of several species with potential to occur (i.e. snakes). No species specific vegetation or wildlife surveys were conducted.

Habitat for the three aquatic species listed in Table 5, is not available within the Subject Property. However, the healthy mix of native grassland and open shrub, along with deep soils on the Subject Property does provide suitable foraging and denning habitat for both of the mammals and the snake Species-At-Risk (SAR) observed in Table 5.

¹⁰ B.C. Conservation Data Centre. 2022. BC Species and Ecosystems Explorer. B.C. Government, Victoria B.C. Available: <http://a100.gov.bc.ca/pub/eswp/> Accessed Apr. 29, 2022.

3.3 Conservation Value Mapping

Within the Cities EMAS, CV mapping is presented using a three class rating system. This rating system produces the following categories: low value (0 to 3), moderate value (3 to 6.9) and high value (7 to 10). All the habitat polygons within the Subject Property produced moderate value CV ratings. The CV of all vegetation communities and areas of disturbance observed within the Subject Property are identified in Figure 1.

Table 6. CV, habitat types, areas of each and percentages within the Subject Property.

CV Class - Description	Total Property Area (m2)	% of Subject Property
Low (0 to 3) ES	1225	30.9
Moderate (3.01-6.9) FWsw	655	16.6
Moderate (3.01-6.9) RF	669	16.9
Moderate (3.01-6.9) AS	481	12.2
High (6.91 to 10) FWsw	930	23.5
Total	3658	100

Just over 30% of the Subject Property is ranked as low Conservation Value (Table 6, Figure 2). These areas consist entirely of previously disturbed exposed soils, with significant weed species.

Almost half (45%) of the Subject Property produced moderate CV ratings. These moderate CV sites consisted of almost equal portions of disturbed grasslands, grassland low shrub and aspen tall shrub communities. Invasive weed species were most highly observed adjacent to the existing site disturbances and Okanagan Landing Rd.

Finally, nearly 25% of the Subject Property yielded high CV ratings. This community was associated with excellent condition grassland (FWsw) habitat. It is surrounded by excellent condition aspen tall shrub to the south and high condition low shrub and grassland habitats to the north, east and west.

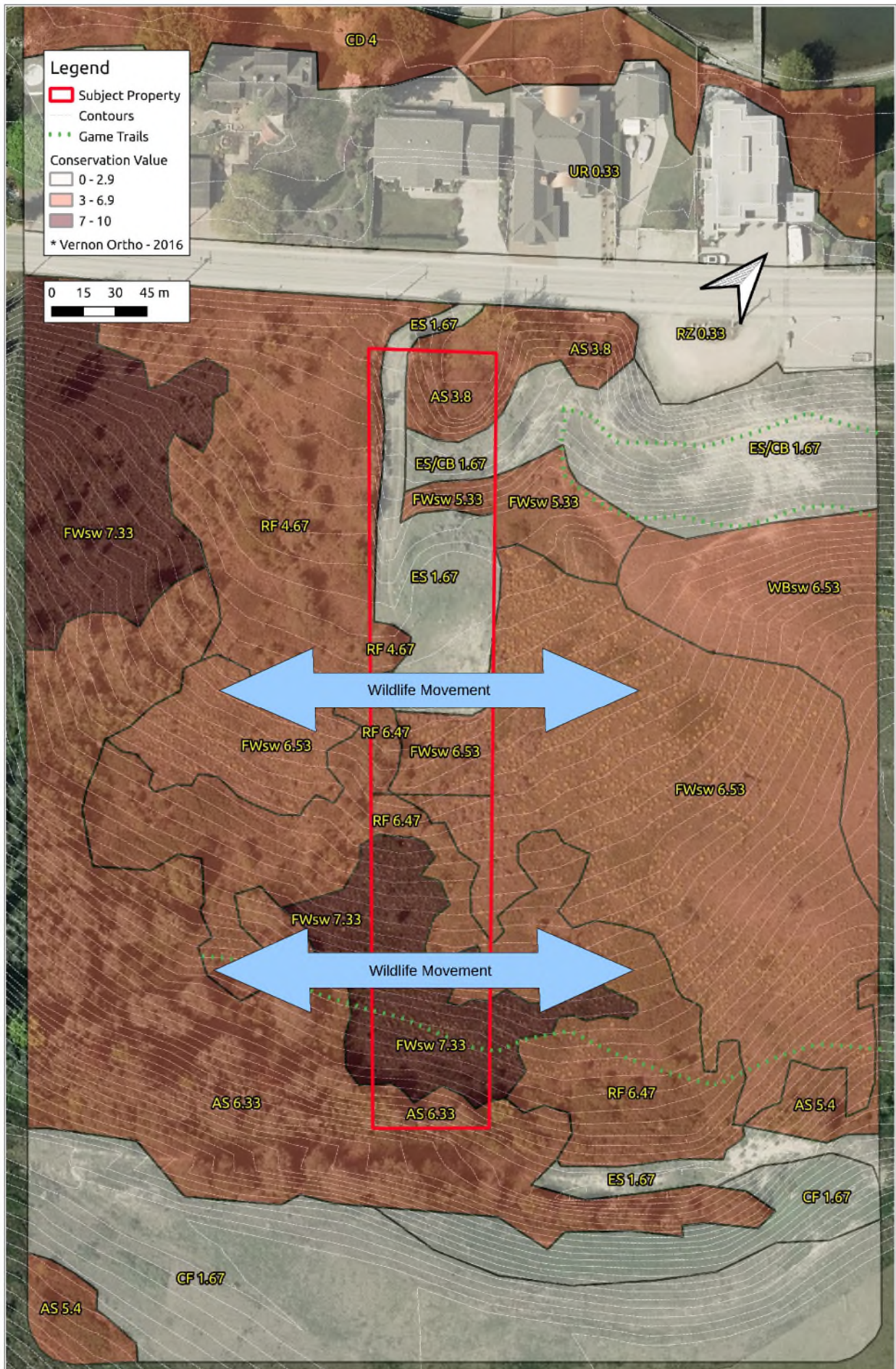


Figure 2. Conservation Values, Key Features and Wildlife Movement Map.

3.4 Noxious and Invasive Plants

As alluded to in Section 3.3, the low CV ratings and disparity between lower and higher valued moderate CV habitats, are in large part correlated to the relative abundance of noxious and invasive weed species. While these plants, were observed on and adjacent to the Subject Property, they were primarily limited to occurring within and adjacent to existing disturbance areas (i.e. Okanagan Landing Rd, driveway and cleared ES area). Scotch thistle, cheatgrass and crested wheatgrass were the most abundant invasive plants. Additional invasive plants observed within and immediately adjacent to the Subject Property are identified in Table 7 below.

Table 7. Noxious weed and other invasive plants within the Subject Property.

Noxious Weeds	Relative Abundance
Scotch thistle	Moderate
Sulphur cinquefoil	Low
Knapweed sp.	Low
Burdock	Trace
Dalmation toadflax	Trace
Hounds Tongue	Trace
Other Invasives	
Cheatgrass	Moderate
Crested wheatgrass	Moderate

3.5 Key Habitat Features and Wildlife Corridors

CV mapping is based on dominant habitat types or large landscape features. However, smaller key habitat features of significant ecological importance may also occur. Key habitat features include: sticknests, cavities, stand veteran trees, snags, hibernacula, ephemeral wetlands and cliffs. Generally, when key features occur in High rated CV classes, they are afforded some degree of protection due to decreased levels of development in these areas. However, when they occur in Low or Moderate CV classes, it may be important to ensure that these key wildlife features are preserved.

The site assessments revealed no hibernacula, nor habitat that looked particularly conducive to supporting either snake or bat hibernacula. Similarly, no mineral licks, dens, ephemeral wetlands, snags, tree cavities or sticknests were observed.

Wildlife, particularly large mammals, tend to travel long distances to fulfill seasonal and even daily life requisites. For instance, the best ungulate winter forage may be available on high south facing slopes, while thermal cover for bedding may only be available in denser lower elevation gullies and closed canopy forests. Similarly, snakes may travel tens of kilometres to move from summer foraging grounds to overwintering hibernacula. Wildlife corridors provide safe access to these daily (food, shelter, water) or seasonal (altitudinal migrations, den site migrations) life requisites.

For corridors to be effective, they need to 1) link key habitats and habitat features at a landscape scale, while 2) ensuring relatively undisturbed movement through local areas. Many preferred movement pathways are obvious, such as well-used mammal trails. Along these pathways, an effective movement corridor can be maintained by retaining a buffer of undisturbed dense shrub or forest cover.

Within the Subject Property, the most obvious movement is observed along a game trail adjacent to dense cover at the south end of the property (Figure 2). Okanagan Landing Rd and the dense row of lakeshore residences at the north end, provide a distinct movement corridor blockage. This is confirmed

by the game trails observed at the top of the slope above Okanagan Landing Rd, formed by deer and wildlife attempting to make their way down to the water, but deterred by the road and residences.

Regional Wildlife Movement Corridors within the vicinity of the Subject Property have not been identified. Evidence of wildlife use (i.e. scat/tracks, heavy browse, game trails) was observed within and adjacent to the Subject Property. General wildlife movement patterns are displayed in Figure 2.

4 Environmental Impact Assessment

The following section will identify impacts resulting from the proposed development, along with appropriate mitigation strategies. The EIA will deal directly vegetation and CV impacts, followed by wildlife resource impacts.

4.1 Impact Significance Determination

Impact evaluation criteria and definitions of significance determination are detailed below (Tables 8 and 9). Significance was determined for each Valued Ecosystem Component (VEC) identified in Table 10.

Table 8. Impact evaluation Criteria.

Criterion	Code	Definition
Magnitude	Low	Change is detectable but is within normal variability of baseline conditions
	Med	Change is substantially different from baseline conditions but under thresholds of natural variability
	High	Change exceeds thresholds and causes substantial alterations in VECs including loss of species or communities at risk
Geographic extent	Project	Impacts restricted to Subject Property
	Local	Impacts extend beyond Subject Property but not beyond 5 km
	Regional	Impacts extend beyond 5 km
Duration	Short	Impact occurs during subdivision development
	Medium	Impact continues for up to 5 years after construction operations
	Long	Impact continues for duration of the subdivision

Table 9. Definition of Significance Ratings.

Significance Rating	Level of Criteria Required
High	High magnitude, regional extent and long duration
	High magnitude, regional extent and medium duration
	High magnitude, project or local extent and long duration
	Medium magnitude, regional extent and long duration
Medium	High magnitude, local extent and medium duration
	High magnitude, regional extent and short duration
	High magnitude, project extent and medium duration
	Medium magnitude, and any combination of extent and duration not already identified
	Low magnitude, regional extent and long duration
Low	High magnitude, project extent and short duration
	Medium magnitude, project extent and short duration
	Low magnitude, any combination of extent and duration, except regional and long

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Table 10. Project Valued Ecosystem Components and Potential Impacts

Valued Ecosystem Components	Potential Impact
Vegetation community abundance and diversity	Direct vegetation removal
Vegetation community health	Introduction and spread of invasive species
Wildlife habitat availability	Direct or indirect (sensory disturbance) loss of available habitat
Wildlife movement	Barrier and obstruction to wildlife movement
Wildlife survival	Direct or indirect mortality

4.2 Proposed Development Plan

This Environmental Impact Assessment is based on the development plan, pictured below in Figure 3 and will assess impacts to vegetation, followed by those to wildlife resource.

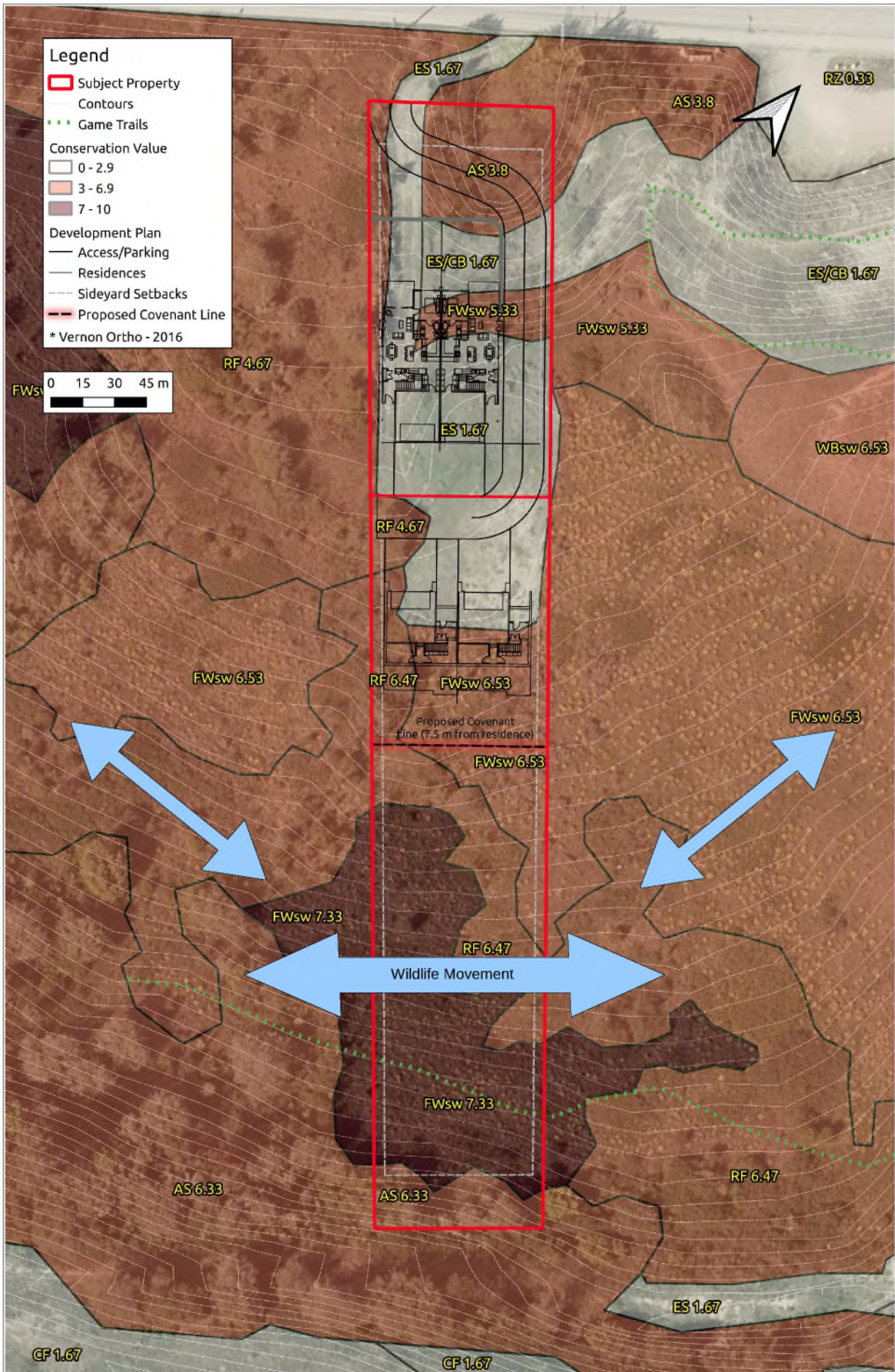


Figure 3. Identified Conservation Values, Development Layout, Lots, Proposed Covenant Area and Wildlife Movement Corridors.

4.3 Vegetation and CV Impacts and Mitigation Strategies

Impacts to vegetation and Conservation Values resulting from development, can take two forms: 1) direct removal and disturbance and 2) introduction and spread of invasive species. Both of these impacts can result in changes to vegetation community abundance, vegetation diversity and/or Conservation Values within and adjacent to the Subject Property.

The proposed subdivision and residential development will result in permanent native vegetation removal from essentially the north half (58.2%, 2305m²) of the Subject Property (Table 11). These losses will occur in Low (30.9%), 1225m²) and Moderate (27.3%, 1080m²) CV habitats. All proposed development will occur within the portion of the Subject Property that is most impacted by invasive weed species. No development is proposed within High CV areas, and nearly 42% of the Subject Property in the south, is proposed to be protected with a no build no disturb covenant (Figure 3).

Table 11. Areas of vegetation disturbance by CV.

CV Class - Description	Total Property Area (m ²)	% of Subject Property	Proposed Developed Area (m ²)	Proposed Developed % of Subject Property
Low (0 to 3) ES	1225	30.9	1225	30.9
Moderate (3.01-6.9) FWsw	655	16.6	458	11.6
Moderate (3.01-6.9) RF	669	16.9	310	7.8
Moderate (3.01-6.9) AS	481	12.2	312	7.9
High (6.91 to 10) FWsw	930	23.5	-	-
Total	3658	100	2305	58.2

As noted above, previous site vegetation disturbance has occurred, and resulted in the introduction and spread of invasive plants into adjacent native habitat. Invasive species are inadequate soil stabilizers, lack sufficient forage value for wildlife and typically out compete native plants, thus decreasing plant diversity. Further introduction and spread of invasive species is most likely to occur during construction activities. If not appropriately managed existing populations of invasive species within and adjacent to the Subject Property can take advantage of disturbed, bare soils and rapidly increase in numbers. Similarly, invasive plant propagules and seeds can be spread by construction equipment or in contaminated top soil and seed mixes.

Significance of potential project interactions with vegetation and Conservation Values are expected to be medium to high in nature (Table 12), but will be further minimized by pursuing the mitigation strategies detailed below.

Table 12. Significance ratings of potential project interactions with vegetation based on magnitude, geographic extent and duration.

Potential Impact	Impact Characteristics			Significance Rating
	Mag	Geo Extent	Dur	
Vegetation				
Direct vegetation removal – permanent	High	Project	Long	High
Introduction and spread of invasive species	Med	Local	Long	Medium

Vegetation and CV Impact Mitigation

- a) Limit all vegetation and soil disturbance to the area north of the Proposed Covenant Line (see Figure 3).
- b) A “No build / No Disturb Covenant” is recommended for the southern 42% of the Subject Property (see Figure 3).

- c) A fence will be installed along the Proposed Covenant Line to deter residential encroachment in to the natural covenant area.
- d) Machinery utilized for development, will be washed of dirt, mud and plant matter prior to arriving on-site, to limit potential for additional weed seed/propagules to be introduced to the Subject Property.
- e) Within the development area, all previously disturbed top soils will be stripped and buried or removed from the site and disposed of appropriately. These soils are contaminated with a considerable array of noxious and invasive weed seeds, that pose a threat to adjacent native grasslands.
- f) Prior to landscaping, weed-free topsoil will be brought in to utilize where needed.
- g) Within the development area, disturbances that are not proposed to be lawn, will be promptly reseeded with an appropriate non-invasive, native dominated seed mix, along with selections of identified native trees and shrubs, as appropriate (see Appendix A). Re-vegetation will provide erosion control, limit potential for invasive plant establishment and re-establish vegetative cover, diversity and wildlife habitat.
- h) The Proponent should become familiar with the invasive plants identified in Table 7, and implement an invasive weed management program that applies weed control measures such as a combination of mechanical and chemical controls (examples in Appendix B), when invasives are identified. The Subject Property should be surveyed twice a year, in June and August. Spot sprayed with a suitable herbicide and/or mechanical control, should then be immediately implemented to reduce presence and competition from invasive species, most notably the following species: **Scotch thistle, knapweed, dalmation toadflax and sulfur-cinquefoil**. These efforts should start immediately.

4.4 Wildlife Impacts and Mitigation Strategies

Impacts to wildlife resulting from developments can take the following three forms: 1) decreased habitat availability, 2) blockage of movements and 3) direct or indirect project-related wildlife mortality.

Human activity can directly influence habitat availability through vegetation alteration and sensory disturbance. The subdivision has been designed such that it limits physical alteration of habitat to the northern half of the Subject Property and to habitats that were of lower relative value. Sensory disturbance to wildlife will be highest during construction, but will continue through residential occupancy. Again by locating all development nearest Okanagan Landing Rd, the proposed subdivision layout attempts to minimize additional long-term sensory disturbance and habitat fragmentation for wildlife, while maintaining a significant portion of intact high quality habitat in the southern half of the property.

Blockage of wildlife movements can occur from physical impediments as well as from sensory disturbance. Currently, within and immediately adjacent the Subject Property there are limited barriers to wildlife movement. The greatest being Okanagan Landing Road. By limiting development to roughly the northern half of the Subject Property, a significant portion of the Subject Property will remain intact and unfragmented, thus retaining the ability of large wildlife species to continue to use the existing East West movement corridor Figure 3.

Direct wildlife mortality as a result of project development may be incurred through clearing and construction (e.g. destruction of inhabited dens, nests, etc), vehicle collisions, or wildlife ingestion of harmful substances. For long-lived or rare wildlife species the loss of individuals has the potential to affect local genetic diversity or even population stability. For most species however, direct development-related mortality risks are expected to be low in nature. These concerns will be mitigated

by focusing on timing windows that are outside important periods for wildlife. Indirect mortality or site abandonment during long term subdivision occupation, is likely to be a greater issue. Minimization of these risks has been attempted to the degree possible, through avoidance of high CV habitats, covenant protection of these habitats and installation of fencing to limit human encroachment into them.

Significance of potential project interactions with wildlife resources are expected to be medium to high (Table 13), and will be further minimized by pursuing the mitigation strategies identified below.

Table 13. Significance ratings of potential project interactions with wildlife based on magnitude, geographic extent and duration

Potential Impact	Impact Characteristics			Significance Rating
	Mag	Geo Extent	Dur	
Wildlife				
Direct or indirect loss of available habitat	High	Project	Long	High
Barrier and obstruction to wildlife movement	Med	Local	Long	Medium
Direct or indirect mortality	Med	Project	Long	Medium

Wildlife Impact Mitigation

- a) Limit all vegetation and soil disturbance to the area north of the Proposed Covenant Line (see Figure 3).
- b) A “No build / No Disturb Covenant” is recommended for the southern 42% of the Subject Property (see Figure 3).
- c) A fence will be installed along the Proposed Covenant Line to deter residential encroachment in to the natural covenant and wildlife movement area.
- d) Maintain wildlife access through the covenant area by eliminating the use of fencing along NE and SW boundaries or using wildlife friendly split rail fencing, if fencing is required.
- e) Similarly, no fencing or wildlife friendly split rail fencing will be located along the NE and SW property boundaries, between the north and south lot garages. This will allow wildlife to move from habitat on either side of the Subject Property, should they desire to.
- f) During construction, machinery will only be run during daylight hours, allowing undisturbed wildlife movement between sunset and sunrise.
- g) Prior to development, conduct clearing of necessary native trees, shrubs and vegetation between August 16 and March 30, to discourage nesting of migratory birds, by removing suitable habitat.
- h) Avoid vegetation disturbance activities from April 1 through August 15 to reduce potential for destroying active bird nests. Active migratory bird nests are fully protected under the B.C. Wildlife Act and the federal Migratory Birds Convention Act; it is an offence to destroy nests occupied by a bird, its eggs or it’s young. Vegetation disturbance or removal activities during this nesting period will require an intensive series of per-construction bird nests surveys by a qualified wildlife biologist.
- i) Vegetation debris and brush piles planned for burning (if any) must be removed/burnt before mid-September, when snakes and small mammals may be tempted to use them as overwintering sites.
- j) Environmental Monitoring of development, to ensure adherence to the identified mitigation's, along with post-development reporting to the City, is recommended.

5 Summary

Project impacts to vegetation and wildlife resources, are expected to be moderate to high in nature. This is due in large part to the unavoidable removal of vegetation and habitats required of a residential subdivision. Habitat impacts were minimized to the greatest extent possible, by planning the majority of development within lower CV ranked habitats, as well as entirely avoiding high CV habitats and associated movement corridors. Implementation of the identified mitigation's will ensure that remaining adverse effects are minimized to the greatest extent possible. Key mitigation's include:

1. Maintaining development in oughly the northern half of the Subject Property, where lowest CV ranking habitats are located.
2. Control of on and off-site invasive plants through contaminated soil removal, prompt re-vegetation and implementation of a Weed Management Program,
3. Limiting future vegetation / habitat disturbance through the placement of a "No build/ No Disturb covenant on the southern 42% of the Subject Property, along with a fence delineating its boundary.
4. The adoption of timing constraints to reduce impacts to wildlife movement and mortality in the form of nest or den destruction.

In summary, it is clear there are environmental impacts associated with the proposed development of the subject property. However, through careful planning and adherence to the identified mitigation's, the proposed development plan has minimized those impacts to the greatest extent possible.

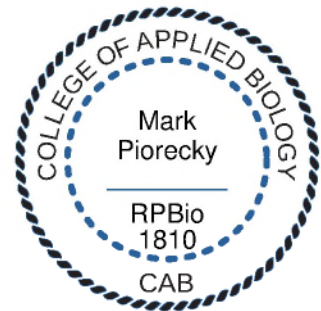
Respectfully,



Mark Piorecky, R.P.Bio. #1810

Canyon Wren Consulting Inc.

Dated: May 6, 2022



Appendix A - Seed Mixes, Native Trees and Shrubs

The following grass species can be utilized for effective erosion control and quick establishment. They are based on species are typically found in the vegetation communities within and surrounding the Subject Property.

Suitable native dominant grass species¹

Common name	Latin name
Slender wheatgrass	<i>Agropyron trachycaulum</i>
Pinegrass	<i>Calamagrostis rubescens</i>
Blue wildrye	<i>Elymus glaucus</i>
Idahoe fescue	<i>Festuca idahoensis</i>
Rough fescue	<i>Festuca scabrella</i>
Junegrass	<i>Koeleria macrantha</i>
Bluebunch wheatgrass	<i>Pseudoroegneria spicata</i>
Green needlegrass	<i>Stipa viridula</i>
Sandberg Bluegrass	<i>Poa secunda</i>
Canada Bluegrass	<i>Poa compressa</i>
Kentucky bluegrass (agronomic)	<i>Poa pratensis</i>
Perennial ryegrass (agronomic)	<i>Lolium perenne</i>

¹ Subject to change, depending on seed availability. Specific seed mixes are available from Interior Reforestation Co. Ltd., Cranbrook BC (www.intref.bc.ca)

The following is a suitable blend produced by Interior Landscape Reclamation in Winfield.

Species	% by Weight	% by Species
Bluebunch Wheatgrass	40%	16%
Rough fescue	25%	20%
Idaho Fescue	15%	19%
Perennial ryegrass	10%	6%
Sandberg Bluegrass	5%	13%
Junegrass	4%	19%
Canada Bluegrass	1%	7%

Some Native Tree and Shrub Species Suitable for restoration of the Subject Property.

Common name	Latin name
Shrubs	
Birch-leaved spirea	<i>Spirea betulifolia</i>
Chokecherry	<i>Prunus virginiana</i>
Douglas maple	<i>Acer glabrum</i>
Mock-orange	<i>Philadelphus lewisii</i>
Oregon Grape	<i>Mahonia aquifolium</i>
Saskatoon	<i>Amelanchier alnifolia</i>
Shrubby penstemon	<i>Penstemon fruticosus</i>
Snowberry	<i>Symphoricarpos albus</i>
Trees	
Trembling aspen	<i>Populous tremuloidies</i>
Douglas Fir	<i>Pseudotsuga menziesii</i>
Pnderosa pine	<i>Pinus ponderosa</i>

Appendix B - Potential Subject Property Weed Control Measures

Chemical Methods to Control <u>Sulphur Cinquefoil</u>			
Chemical	Trade Name	Application Timing	Remarks
2,4-D	Several names Killlex, etc	Postemergence when plants are in the pre-bud stage	<ul style="list-style-type: none"> • <u>broadleaf-selective and safe on most grasses.</u> • It has minimal soil activity. • Repeat application is usually required. • Do not apply when outside temperatures exceed 80°F.
Aminopyralid	Milestone	Postemergence when plants are in spring rosette to pre- bud stage.	<ul style="list-style-type: none"> • safe on most grasses, • applications can decrease seed production in some annual and perennial grass species
Picloram	Tordon 22K	Postemergence when plants are in the pre-bud stage or to fall regrowth.	<ul style="list-style-type: none"> • Picloram controls a wide range of broadleaf species and has relatively long soil residual activity. • well-developed grasses are not usually injured by labeled use rates

Biological and Chemical Methods to Control <u>Knapweed</u>			
Biological Controls			
As an additional alternative Contact John Friesen (RDNO bylaw enforcement) to see about arranging a release of biological control agents in Middleton Mountain Park.			
Chemical	Trade Name	Application Timing	Remarks
Aminopyralid	Milestone	any time during the growing season, including fall when plants are actively growing	<ul style="list-style-type: none"> • Adv – low use rates (5 to 7 fl oz product per acre) and safe near water
Clopyralid	Transline	applied during late bolt or bud stages, and least effective when applied after flowering (fall)	<ul style="list-style-type: none"> • Rate - 2/3 pint per acre • Adv – safe for conifers and no decrease in forb diversity • Disadv – cannot be used on sites with course-textured soil and shallow groundwater.
Aminopyralid + 2,4-D	GrazonNext HL	any time during the growing season or fall	<ul style="list-style-type: none"> • Rate - 1.5 to 2 pints per acre • Controls wider spectrum of broadleaf species compared to Milestone alone, but may also increase injury to desirable forbs

Mechanical and Chemical Methods to Control <u>Scotch Thistle</u>			
Control Technique	Application Season	Number of Treatments	Remarks
digging	Before flower heads open	Once should suffice	<ul style="list-style-type: none"> • Small infestations can be removed by manual methods. • Digging is effective and the preferred

			<ul style="list-style-type: none"> manual removal method. When digging, <u>sever the root below the soil surface (i.e. with polaski or shovel)</u>
<p>Note: The combination of cutting tall plants prior to seed emergence, combined with spraying the remaining rosette of leaves near the ground, with and appropriate chemical spray, will help to deplete the plants root reserves, and likely increase killing efficiency.</p>			
Chemical	Trade Name	Application Timing	Remarks
2,4-D	Several names <u>Killex</u> , etc	Post emergence from rosette to beginning of bolting, or fall rosette. Most effective on small rosettes.	<ul style="list-style-type: none"> Often tank-mixed with chlorsulfuron or dicamba for quicker burndown. Does not control large bolting plants. <u>broadleaf-selective and safe on most grasses.</u> It has minimal soil activity. Do not apply when outside temperatures exceed 80°F.
Aminopyralid	Milestone	Post emergence from the rosette to young bolting stage.	<ul style="list-style-type: none"> Longer soil residual than clopyralid. Safe on most grasses, Applications can decrease seed production in some annual and perennial grass species. Provides over 90% control when applied to rosettes. For post emergence applications, adding a non-ionic surfactant (0.25 to 0.5% v/v spray solution) enhances control under adverse conditions; this is not normally necessary.
Glyphosate	Roundup, Accord XRT II, and others	Post emergence to rapidly growing plants from the rosette to early bolting stage.	<ul style="list-style-type: none"> will only provide control in the year of application, and will not kill seeds or inhibit germination the following season. has no soil activity and is <u>nonselective</u>. It can create bare ground conditions that can make an area susceptible to weed recruitment. In areas with desirable vegetation, use spot treatment. Glyphosate is a good control option if reseeding is planned shortly after application, as it will not injure seedlings emerging after application.

Biological and Chemical Methods to Control <u>Dalmation Toadflax</u>			
Biological Controls			
As an additional alternative Contact John Friesen (RDNO bylaw enforcement) to see about arranging a release of biological control agents in Middleton Mountain Park.			
Chemical	Trade Name	Application Timing	Remarks
2,4-D	Several names <u>Killex</u> , etc	Post emergence when plants are growing rapidly. Applications in spring	<ul style="list-style-type: none"> 2,4-D is a selective herbicide for broadleaf species. It was found to provide only fair control of Dalmatian toadflax in a California study

		provide best control.	<ul style="list-style-type: none"> • Good coverage is necessary. Efficacy is improved when tank-mixed with picloram, chlorsulfuron, or metsulfuron.
Picloram	Tordon 22K	Post emergence when plants are growing rapidly in spring before full bloom, or in late summer to early fall.	<ul style="list-style-type: none"> • At 8 oz a.e./acre in a California study, picloram gave only partial control (80%) when applied at the dormant stage in mid-fall, and poor control at the rosette and bolting stages (< 60% control). • Higher rates may be necessary in some areas. • High levels of picloram can give long-term soil activity for broadleaves. Tordon 22K is a federally restricted use pesticide.
Imazapyr	Arsenal, Habitat, Stalker, Chopper, Polaris	Dormant application in mid-fall	<ul style="list-style-type: none"> • Imazapyr is a preemergent and postemergence herbicide effective for controlling broadleaf weeds and grasses. • In a California study using 3 pt product/acre, excellent control was only achieved with a mid-fall application to dormant plants. • It has fairly long soil residual activity.

TERMS OF INSTRUMENT - PART 2

COVENANT (FIRE/FORESTRY INTERFACE)

This Covenant dated for reference the day of , Nov 16, 2022

BETWEEN:

Imbeau- Clack Enterprises
1125 Galiano Rd
Vernon BC
V1B 3B3

AND:

THE CORPORATION OF THE CITY OF VERNON
3400 - 30th Street
Vernon, British Columbia V1T 5E6

Background

- A. The Covenantor is the owner in fee-simple of those certain parcels or tracts of land and premises, situate, lying and being in the City of Vernon, Province of British Columbia, and more particularly known and described as:

Parcel Identifier
Lot

8354 Okanagan Landing Rd Vernon BC

- B. Section 219 of the *Land Title Act*, R.S.B.C. 1996, chapter 250 and amendments thereto (the "Act") provides that there may be registered as a charge against title to land a covenant, whether of a negative or positive nature, in respect of the use of land or the use of building erected or to be erected on land, in favour of a municipality or the Crown.
- C. The Covenantee has requested that the Covenantor enter into this Covenant in order to reduce the fire hazard to the Lands and the Covenantor has agreed to do so.

Terms of Agreement

In consideration of the sum of Ten Dollars (\$10.00) of lawful money of Canada now paid by the Covenantee to the Covenantor (the receipt and sufficiency of which is hereby acknowledged) the parties agree as set out below.

1.0 Definitions

In this Agreement, the following words and phrases, unless there is something in the context inconsistent therewith, will have the following meanings: “**Coniferous Trees**” means conifer trees bearing their seed and pollen in cones and includes:

Western Larch	Mountain hemlock
Ponderosa pine	Western hemlock
Douglas fir	Engelmann spruce
Grand fir	Sitka spruce
White pine	Pacific silver fir
Lodgepole pine	Alpine fir
Western red cedar	

“**Fire Chief**” means the Fire Chief appointed by The Corporation of the City of Vernon from time to time;

“**Habitable Dwelling**” means a residence, building, improvement or mobile home which is used for the purpose of occupation as a residence.

2.0 Covenant with Respect to Trees and Other Growth and Natural Fuels Prior to Building

2.01 Prior to construction of any Habitable Dwelling on the Lands, the Covenantor shall:

- (a) fall all dead trees and remove all fallen trees from the Lands;
- (b) fall all Coniferous Trees less than ten (10) metres in height that will be within three (3) metres of the exterior of any building under construction, as measured from the centre of the tree trunk, and remove same under construction as per subparagraph (a) above, unless the area around such tree will be irrigated with an underground sprinkling system;
- (c) prune all Coniferous Trees located within ten (10) metres of any Habitable Dwelling under construction that are six (6) metres or more and less than nine (9) metres in height, of all limbs that are within the bottom one-third of the tree height;
- (d) prune all limbs off the bottom three (3) metres of all Coniferous Trees greater than nine (9) metres in height, that are located within ten (10) metres of any Habitable Dwelling under construction;

- (e) prune all limbs from the bottom three (3) metres of any Coniferous Trees greater than ten (10) metres in height;
- (f) have not more than five (5) trees of less than ten (10) metres in height in any one area of the Lands, unless there is a three (3) metre spacing between such clumps;
- (g) trim all dead branches from all trees and remove, as per subparagraph (a) above; and
- (h) remove and dispose of all accumulations of needles and dead twigs and branches from the Lands.

3.0 Covenant with respect to Maintenance

- 3.01 Subject to paragraph 3.03 herein, the Covenantor shall maintain the Lands in conformance with the terms of paragraph 2.01 herein.
- 3.02 The Covenantor shall remove any accumulations of needles, twigs, branches, buds and leaves from the roofs and eaves troughs of any Habitable Dwelling on an annual basis and, in any event, prior to the 15th day of May in any one year.
- 3.03 If the Covenantor is making use of any of the exceptions contained in subparagraphs 2.01(b), 4.01(c) and 5.01, the Covenantor shall ensure that its underground sprinkling system is operational from the 15th day of May to the 15th day of October.
- 3.04 The Covenantor shall follow the B.C. Fire Smart guidelines published and revised from time to time or any document replacing same.

4.0 Covenant with respect to Habitable Dwelling Materials and Construction

- 4.01 All Habitable Dwellings shall be constructed as follows:
 - (a) all exposed structural elements on the exterior of any Habitable Dwelling must be of a heavy timber construction. For the purposes of this subparagraph, “structural element” means any building material that is used for any load-bearing in the construction of a building. Load-bearing shall include any support for part of the building, its fixtures, the occupants and any chattels therein;
 - (b) subject to subparagraphs (c) herein and excepting any minor exterior trim and decking components, any other exposed exterior surfaces, including walls, roofs and decks, that are not of heavy timber construction or which are not of non-combustible materials must be pressure treated with fire-retardant chemicals and, in the case of roofs, meet a non-combustible fire rating;

- (c) all soffits must be metal, unless the surrounding grounds are irrigated by an operational and active underground sprinkling system, then the soffits may be closed, wood or construction vinyl grade;
- (d) all screening for attic and basement vents must be metal and of small enough openings to prevent sparks from passing into the Habitable Dwelling; and
- (e) all crawl spaces, and the underside of porches, decks and sheds must be sealed to prevent ground fire spread to the underside of such structures.

5.0 Restrictive Covenant with respect to Landscaping

- 5.01 No bark mulch or hog fuel may be used for landscaping on the Lands, unless the area covered by such mulch or fuel is irrigated by an underground sprinkling system, but the Covenantor may use pea gravel or rock or other non-flammable types of ground cover where there is no underground sprinkling system.
- 5.02 Aside from the provisions of paragraph 2.01 herein, the Covenantor may only plant low-growing (i.e. less than 1.5 metres tall) deciduous trees and shrubs, and plant and maintain mowed lawns and flower beds, provided they are irrigated, within three (3) metres of any Habitable Dwelling.

6.0 Fire Plans/Prevention

- 6.01 The Covenantor shall have a pre-planned escape route out of the area in case of emergency forest fire evacuations.
- 6.02 The Covenantor shall not store flammable debris under porches or decks of Habitable Dwellings.

THE COVENANTOR HEREBY COVENANTS TO AND AGREES WITH THE COVENANTEE as follows:

7.0 Breach of Contract

- 7.01 If any breach of the covenants contained herein occurs, the Covenantee shall have the right to require the Covenantor to rectify such breach. If the Covenantor does not rectify such breach after receiving notice in writing from the Covenantee, then the Covenantee, its servants, agents and workmen, shall have the right to enter on the Lands and shall be entitled to take such reasonable steps as are necessary to rectify the breach and to bill the Covenantor for the expense of doing same.

8.0 Interpretation

- 8.01 The covenants described herein shall be deemed to be covenants running with the Lands and, subject to paragraph 8.02, shall enure to the benefit of and be binding upon the parties

hereto and their respective heirs, successors, administrators and assigns, in perpetuity until such time as the covenants herein shall be ordered released and discharged by a Court of competent jurisdiction or released pursuant to s. 219(9) of the Act.

- 8.02 Notwithstanding anything contained herein, neither the Covenantor nor any future owner of the Lands shall be liable under any of the covenants or agreements contained herein where such liability arises by reason of an act or omission occurring after the Covenantor or such future owner ceases to have any further interest in the Lands.
- 8.03 The Covenantor acknowledges that damages for breach of the covenants contained herein are not an adequate remedy and that in any proceedings for injunctive relief by the Covenantant, the defence that damages are available as a remedy will not be raised by the Covenantor.
- 8.04 Nothing contained or implied herein shall prejudice or affect the Covenantant's rights and powers in the exercise of its functions pursuant to the *Local Government Act*, R.S.B.C. 2015, Chapter 1, and amendments thereto or its rights and powers under all of its public and private statutes, bylaws, orders and regulations to the extent that the same are applicable to the Lands, all of which may be fully and effectively exercised in relation to the Lands as if this Covenant had not been executed and delivered by the Covenantor.

9.0 **Priority Agreement**

- 9.01 The Lender, for and in consideration of the sum of ONE (\$1.00) DOLLAR the receipt and adequacy of which is hereby acknowledged, hereby consents to the within Covenant and grants priority over its Mortgage registered under number .

IN WITNESS WHEREOF the parties hereby acknowledge that this Agreement has been duly executed and delivered by executing the Forms C and D attached hereto.

Clack.
Drover



THE CORPORATION OF THE CITY OF VERNON REPORT TO COUNCIL

SUBMITTED BY: Teresa Campbell
Environmental Planning Assistant,
Planning

Michelle Austin
Planner, Planning

COUNCIL MEETING: REG COW I/C
COUNCIL MEETING DATE: August 14, 2023
REPORT DATE: July 10, 2023
FILE: 3090-20 (DVP00598)

SUBJECT: **DEVELOPMENT VARIANCE PERMIT APPLICATION FOR 8511 OKANAGAN
LANDING ROAD**

PURPOSE:

To present for Council's consideration a development variance permit application to allow for the repair and replacement of a roof and enclosure of a patio within the existing footprint at 8511 Okanagan Landing Road.

RECOMMENDATION:

THAT Council support Development Variance Permit Application 00598 (DVP00598) to vary Zoning Bylaw 5000 for Lot 2, DL 6, ODYD, Plan 30747, Except Plan KAP63065 (8511 Okanagan Landing Road) as outlined in the report titled "Development Variance Permit Application for 8511 Okanagan Landing Road" dated July 10, 2023 and respectfully submitted by the Environmental Planning Assistant and Planner, as follows:

- a) Section 4.13.2, to allow for repair and replacement of a roof and enclosure of a patio within the existing footprint of the single detached dwelling within 15m of the High Water Mark of Okanagan Lake.

AND FURTHER, that Council's support of DVP00598 is subject to the following:

- a) That the development generally complies with the renovation drawings prepared by MQN Interiors Ltd. dated January 27, 2023 (Attachment 2) to be attached and form part of DVP00598; and
- b) That development complies with the Riparian Areas Protection Regulation Assessment Report, prepared by Canyon Wren Consulting Inc, dated November 1, 2022 (Attachment 3) to be attached and form part of DVP00598.

ALTERNATIVES & IMPLICATIONS:

1. THAT Council not support Development Variance Permit Application 00598 (DVP00598) to vary Zoning Bylaw 5000 for Lot 2, DL 6, ODYD, Plan 30747, Except Plan KAP63065 (8511 Okanagan Landing Road) as outlined in the report titled "Development Variance Permit Application for 8511 Okanagan Landing Road" dated July 10, 2023 and respectfully submitted by the Environmental Planning Assistant and Planner, as follows:

- a) Section 4.13.2, to allow for repair and replacement of a roof and enclosure of a patio within the existing footprint of the single detached dwelling within 15m of the High Water Mark of Okanagan Lake.

Note: Denial of the development variance permit application would restrict the development to meet the existing provisions of Zoning Bylaw 5000. This would restrict the proposed roof repairs, which could result in further water damage to the roof and its overall structural stability over time.

ANALYSIS:

A. Committee Recommendations:

At its meeting of July 18, 2023, the Advisory Planning Committee passed the following resolution:

“(That the Advisory Planning Committee recommends that Council...)”

B. Rationale:

1. The subject property is located at 8511 Okanagan Landing Road and has a total area of 4,449m². The property fronts Okanagan Lake to the north, is bound by lakeshore residential lots (R6) to the east and west and ALR to the south. The property is bisected by Okanagan Landing Road with the single detached dwelling located on the bisected portion of the property north of Okanagan Landing Road (Figures 1 and 2). The lot area for this portion of the property is 1,125m². The remaining portion of the lot south of Okanagan Landing Road remains undeveloped and is outside the scope of the proposed development.



Figure 1: Property Location Map

2. The subject property is Zoned R6 – Lakeshore Residential. The subject application proposes to vary the following section of Zoning Bylaw 5000 in order to allow for repair and replacement of the existing roof and to enclose an existing patio (Attachment 1 and 2):

- Section 4.13.2, to allow for development within 15m of the High Water Mark of Okanagan Lake.

3. The existing single detached dwelling is a legal non-conforming building, with respect to siting, located within 15m of the High Water Mark (HWM) of Okanagan Lake. The existing dwelling is within 9.44m of the HWM of Okanagan Lake. The proposed roof repair and patio enclosure would be contained within the existing footprint of the single detached dwelling, with no further encroachment into the riparian setback proposed.

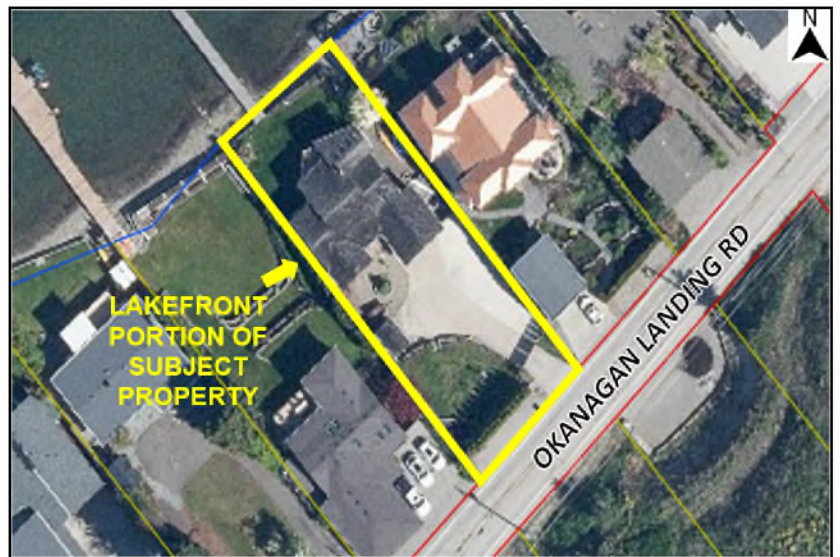


Figure 2: Aerial View of Property

4. The applicant proposes two exterior building renovations within 15m of the HWM of Okanagan Lake (Attachment 2). The first is to repair the existing water damaged roof by replacing a section of the roof trusses and replacing the cladding for the entire roof. The roof outline is proposed to remain the same however, the roof height is proposed to increase from 6.99m to 7.20m to accommodate the installation of windows in the main floor living space. The proposed height increase of the roof would remain in compliance with Section 9.7.6 of Zoning Bylaw 5000, with a maximum building height less than 10m.

The second renovation is to enclose a portion of the existing lower level concrete patio with glass and to add double doors to access the backyard from the proposed enclosure. No excavation would occur as the proposed enclosure would remain on the existing concrete patio within the existing building footprint.

5. A Riparian Areas Protection Regulation (RAPR) Assessment Report by Canyon Wren Consulting Inc. dated November 1, 2022 has been submitted for the proposed development (Attachment 3). In the report, the Qualified Environmental Professional (QEP) indicates that:
 - a) the Streamside Protection and Enhancement Area (SPEA) for the subject property is varied, ranging from 20.5m at the southeast corner of the dwelling to 25.7m at the southwest corner of the dwelling;
 - b) the only works proposed within the SPEA are contained within the existing building footprint with no ground disturbance being proposed within the SPEA;
 - c) the existing trees and shrubs within the SPEA are in a healthy condition and contribute to fish habitat and would not be impacted during redevelopment if the proponent follows the recommendations outlined in the Report; and
 - d) proposed measures to ensure the protection and maintenance of the SPEA and a post-development report to ensure reporting would meet legislative requirements.
6. Administration supports the requested development variance to repair and replace the existing roof and to enclose the lower level patio for the following reasons:
 - a) As noted in the letter by Deep Creek Construction (Attachment 3, Page 24), a windstorm in 2021 damaged the roof, which allowed water from subsequent storms to seep in resulting in water damage and compromising the roof trusses and general roof assembly. One section of the roof was also damaged from a falling tree during the windstorm, which tore a section of the roof, leaving it exposed to environmental elements. The proposed development would allow for the repair of the roof to ensure its proper functioning and eliminate further water damage;
 - b) The RAPR Assessment Report concluded that the proposed exterior building repairs and renovations within 15m of the HWM of Okanagan Lake would not negatively impact fish or fish habitat as all works are proposed on existing structures;
 - c) All development within 15m of the HWM of Okanagan Lake is contained within the existing building footprint and all proposed additions are outside of the SPEA;
 - d) The QEP has outlined measures to protect and maintain the SPEA, which include impact mitigation, best management practices and environmental monitoring (including monitoring frequency, erosion and sediment control BMP's, and post-development reporting); and
 - e) A QEP will be retained for post-development reporting to ensure compliance of the development with protection and mitigation measures and to submit the report to the province for review and acceptance of the proposed development.

C. Attachments:

Attachment 1: Applicant Rationale Letter

Attachment 2: Design Drawings
Attachment 3: RAPR Assessment Report

D. Council's Strategic Plan Alignment:

- Governance & Organizational Excellence
- Recreation, Parks & Natural Areas
- Environmental Leadership
- Livability
- Vibrancy
- Not Applicable

E. Relevant Policy/Bylaws/Resolutions:

1. Official Community Plan Bylaw 5470, Section 26.0 Development Permit Areas (All) and Section 29.0 Development Permit Area #3 (Hillside Residential and Heritage District):
 - Designated as having medium conservation value (yellow); and
 - Designated the property as Residential – Low Density (RLD).
2. The property is Zoned R6 – Lakeshore Residential which conforms to the OCP land use designation.
3. Zoning Bylaw 5000, Section 4.13.2:
 - No development shall take place within 15m of the High Water Mark of Okanagan Lake.
4. The *Local Government Act* provides Council with the authority to vary local bylaws based on specific considerations. The granting of such variances does not set precedence within the community for future variances to be based upon, as each variance application must be evaluated on its own merit and potential implications to the whole community and the specific neighbourhood.

BUDGET/RESOURCE IMPLICATIONS:

N/A

FINANCIAL IMPLICATIONS:

- None
- Budget Previously Approved
- New Budget Request
(Finance Review Required)

Prepared by:

Approved for submission to Council:

X _____
 Teresa Campbell
 Environmental Planning Assistant,
 Planning

 Patricia Bridal, CAO
 Date: _____

X _____
 Michelle Austin
 Planner, Planning

X _____
 Roy Nuriel

Acting General Manager, Planning

REVIEWED WITH

- | | | |
|--|---|---|
| <input type="checkbox"/> Corporate Services | <input type="checkbox"/> Operations | <input checked="" type="checkbox"/> Current Planning |
| <input type="checkbox"/> Bylaw Compliance | <input type="checkbox"/> Public Works/Airport | <input type="checkbox"/> Long Range Planning & Sustainability |
| <input type="checkbox"/> Real Estate | <input type="checkbox"/> Facilities | <input type="checkbox"/> Building & Licensing |
| <input type="checkbox"/> RCMP | <input type="checkbox"/> Utilities | <input type="checkbox"/> Engineering Development Services |
| <input type="checkbox"/> Fire & Rescue Services | <input type="checkbox"/> Recreation Services | <input type="checkbox"/> Infrastructure Management |
| <input type="checkbox"/> Human Resources | <input type="checkbox"/> Parks | <input type="checkbox"/> Transportation |
| <input type="checkbox"/> Financial Services | | <input type="checkbox"/> Economic Development & Tourism |
| <input type="checkbox"/> COMMITTEE: APC (Jul. 18/23) | | |
| <input type="checkbox"/> OTHER: | | |

G:\3000-3699 LAND ADMINISTRATION\3090 DEVELOPMENT VARIANCE PERMITS\20 APPLICATIONS\DVP00598\2 PROC\Rpt\APC Rpt\230710_tc_ma_APC_Rpt_DVP00598.docx

21653i: [REDACTED] Residential Renovation

8511 Okanagan Landing Road, Vernon BC V1H 1J6
Lot 2 DL 6 ODYD Plan 30747 Except Plan KAP63065
PID 003-853-381
OCPD – RLD Residential Low Density – Medium Conservation Value
Zoning – R6 Lakeshore Residential

**Development Description and Development Variance
Permit Rationale**

The subject site is located at 8511 Okanagan Landing Road in the Hillside Residential & Agricultural District, on Okanagan Lake to the north. The property is bisected by Okanagan Landing Road and backs onto ALR on the south with no direct neighbor to the south and to the east and west by neighboring R6 lots. This property is currently zoned R6: Lakeshore Residential.

The exterior building development proposal to renovate the existing residence is threefold.

- Part one is to address water damage to a portion of the north roof section which required replacement of the roof trusses and roof assembly. The intent is to simply revise the roof shape to stay within existing footprint however the reshape will increase the ceiling height over the living room area on the existing house, within the existing roofline footprint and structural foundations. This will create height to add windows to enhance the views from the living space and allow light to enter deeper into the existing house.
- Part two of the proposal is to renovate the south of the existing building by enclosing the existing carport area and create a double car garage and enclosing an existing area on north of building. All these works sited to enclose portions of the home within the existing roofline and structural foundations.
- Part three of the proposed renovations involves a small additional area to the existing south bedroom, and a new entrance created between the addition and the enclosed garage. This is to take place outside of the SPEA line to the south of the building and conforms to all Bylaws.

The building proposal is to follow the requirements of the current zoning with two exceptions for which as part of the application, a Development Variance Permit will be sought to allow for the following renovations:

To allow for a replacement roof to be built within existing footprint, on existing walls and structure within 9.44m of the High-Water Mark of Okanagan Lake revised from 15.0m (Zoning Bylaw 4.13.2 – Development Regulations).

MQN Interiors Ltd. has worked closely through the design process with Mark Piorecky, Qualified Environmental Professional from Canyon Wren Consulting Inc. to ensure that the design conforms with all environmental regulations and to ensure that the existing environmental conditions are maintained on this site. An Environmental Riparian Assessment Regulation report will be performed and submitted to the British Columbia ministry of Environment for approval. We believe that the existing environmental conditions will be preserved with the replacement roof design that will occur within the existing roofline, footings and build on existing wall structures and conform to the riparian assessment regulations.

The home is well below Okanagan Landing Road with no neighbors directly above and therefore the view corridor down to Okanagan Lake from above the site will be preserved. When contemplating potential solutions to comply with total height we explored the option for flat roof to reduce height but given the extensive use of sloped roof structures in the Cameron Point neighborhood we believe the architectural vocabulary presented fits best within the neighborhood building scheme.

We believe that the exterior design, building massing and scale presented are modest and appropriate size for the site, particularly when considering that many of the neighbouring properties have homes at a comparable distance to the lake with much higher building heights, as shown in the attached documents.

Should you have any questions or require further clarifications pls feel free to contact us.

Regards,



DORA ANDERSON, BID, DBA, LEED*AP, OSID, RID IDIBC, IDC
Partner
(she, her, hers)
Proud to live, work, play and design on the
ancestral, unceded territory of the syilx nation

3309 32nd Avenue, Vernon, BC V1T 2M7
P: 250-542-8085 Ext.#1 D: 778-760-2219

RESIDENCE RENOVATION

8511 OKANAGAN LANDING ROAD, VERNON, BC

MQN
INTERIORS

INTERIOR DESIGN

MQN INTERIORS LTD.
#100-31132 AVENUE
SUITE 100
VICTORIA, BC V8T 2M7
P: 250-684-8086
CONTACT: DOBA@MQN.COM

CONTRACTOR

DEEP CREEK CONSTRUCTION
#100, 116-5100 AKERS CREEK WAY
SUITE 100
VICTORIA, BC V8P 1G4
P: 250-681-4725
CONTACT: GIBSON@DCCLYK.COM

SURVEYORS

RUSSELL SHORT LAND SURVEYORS
2807-2807 STREET
COLUMBIA, VT V1S 1S9
P: 250-658-0811
CONTACT: JASON@RSLT.COM

ENVIRONMENTAL

CANYON WREN CONSULTING INC.
1580 HARTWELL ROAD
VICTORIA, BC V8S 1K6
P: 250-382-0208
CONTACT: TERRY@CWREN.COM

RESIDENCE RENOVATION

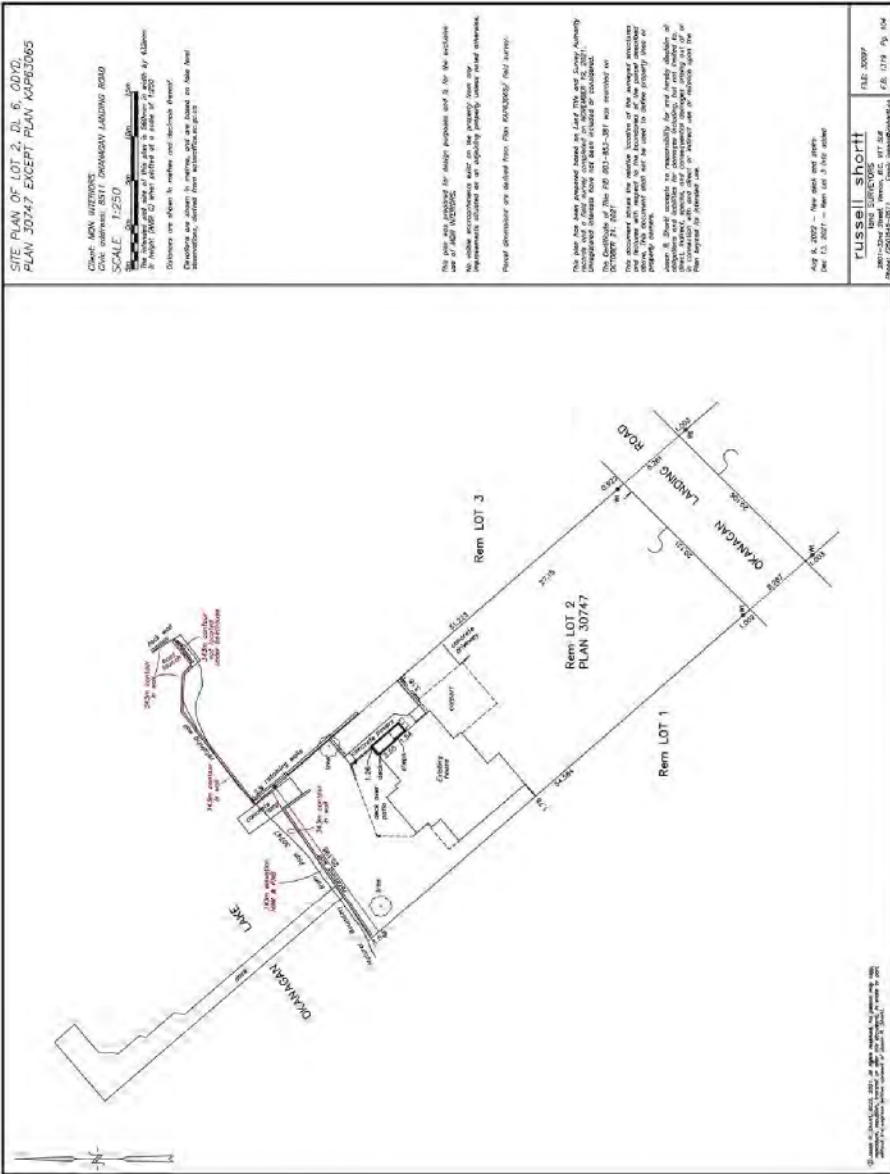
PROJECT: 218531
DATE: 2/20/2023
ISSUED FOR DEVELOPMENT PERMIT

INTERIORS DRAWING LIST

- DP 01 SITE PLAN SETBACK
- DP 02 SITE PLAN PROPOSED
- DP 03 FLOOR PLAN EXISTING
- DP 04 FLOOR PLAN PROPOSED
- DP 05 ROOF PLAN EXISTING PROPOSED
- DP 06 EXTERIOR ELEVATION WEST
- DP 07 EXTERIOR ELEVATION EAST
- DP 08 EXTERIOR ELEVATION SOUTH
- DP 09 EXTERIOR ELEVATION NORTH
- DP 10 CONCEPT PHOTO

SURVEYORS DRAWING LIST

- SRP 01 SITE PLAN



**SITE PLAN OF LOT 2, DL 6, ODYO,
PLAN 30747 EXCEPT PLAN M39B3065**

OWNER: M&N AIRWAYS
OWNER: 18011 OAKMORN LANDING ROAD
SCALE: 1/250

The accuracy of the data on this plan is based on a survey of the site by the owner. The owner is responsible for the accuracy of the data. The owner is not responsible for the accuracy of the data on any other plan. The owner is not responsible for the accuracy of the data on any other plan.

This plan is prepared for the purpose of showing the location of the structures and other improvements shown on the plan. It is not intended to show the location of any other structures or improvements. The owner is responsible for the accuracy of the data on this plan. The owner is not responsible for the accuracy of the data on any other plan.

The plan is not intended to show the location of any other structures or improvements. The owner is responsible for the accuracy of the data on this plan. The owner is not responsible for the accuracy of the data on any other plan.

Aug 8, 2022 - New plan and sheet
Jan 13, 2021 - New lot 2 first sheet

RUSSELL SHORT
18011 OAKMORN LANDING ROAD, WYOMING, WY 83915
PHONE: (307) 438-3333 FAX: (307) 438-3334

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CONSULTANT

NO	REV	DATE

PROJECT TITLE

8511 OKANAGAN LANDING ROAD, VERNON, BC
 RESIDENCE RENOVATION

DRAWING TITLE: SITE PLAN - EXISTING

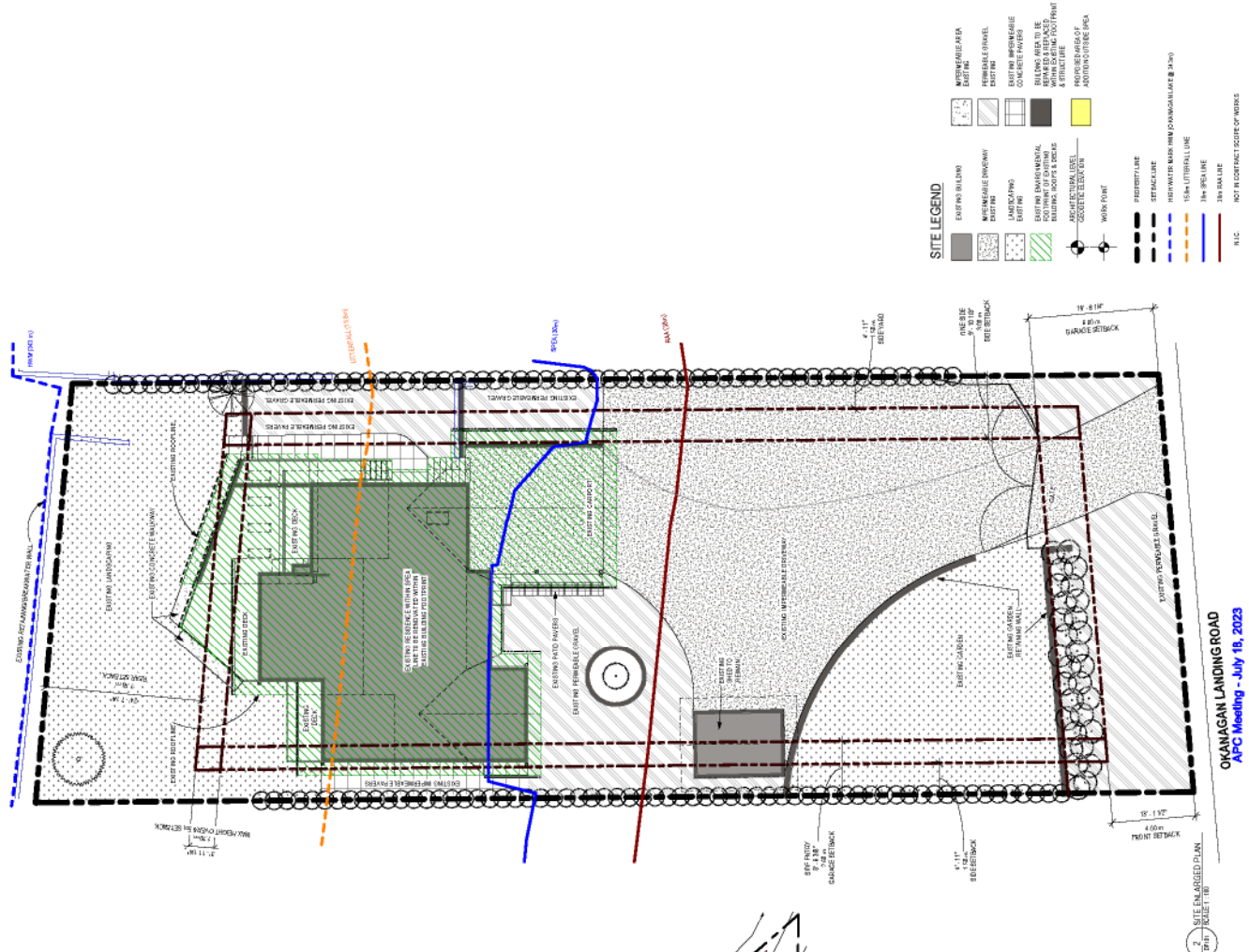
PROJECT: DP101

SCALE: AS SHOWN

DOWN BY: DA

CHECKED BY: DA

DATE: 2018.07.18




SITE LEGEND

	EXISTING BUILDING		PROPERTY LINE
	EXISTING DRIVEWAY		SETBACK LINE
	EXISTING LANDSCAPING		HYDRO WATER MARK (15M UTILITY LINE)
	EXISTING FOUNDATION		15M UTILITY LINE
	PROPOSED RENOVATION		3M SETBACK LINE
	PROPOSED ADDITION		3M BAR LINE
	PROPOSED FOUNDATION		N.C.

WORK POINT: A circle with a dot inside.

OKANAGAN LANDING ROAD
 APC Meeting - July 18, 2023

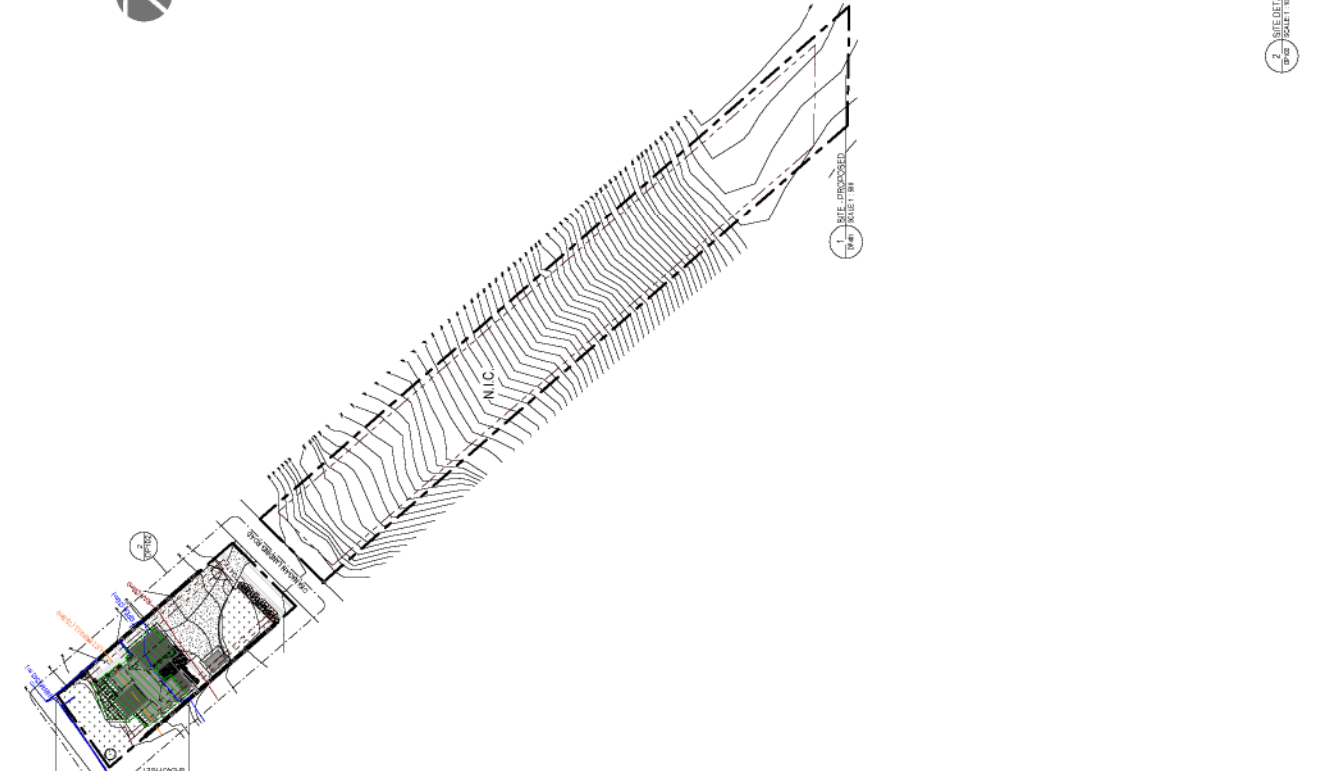
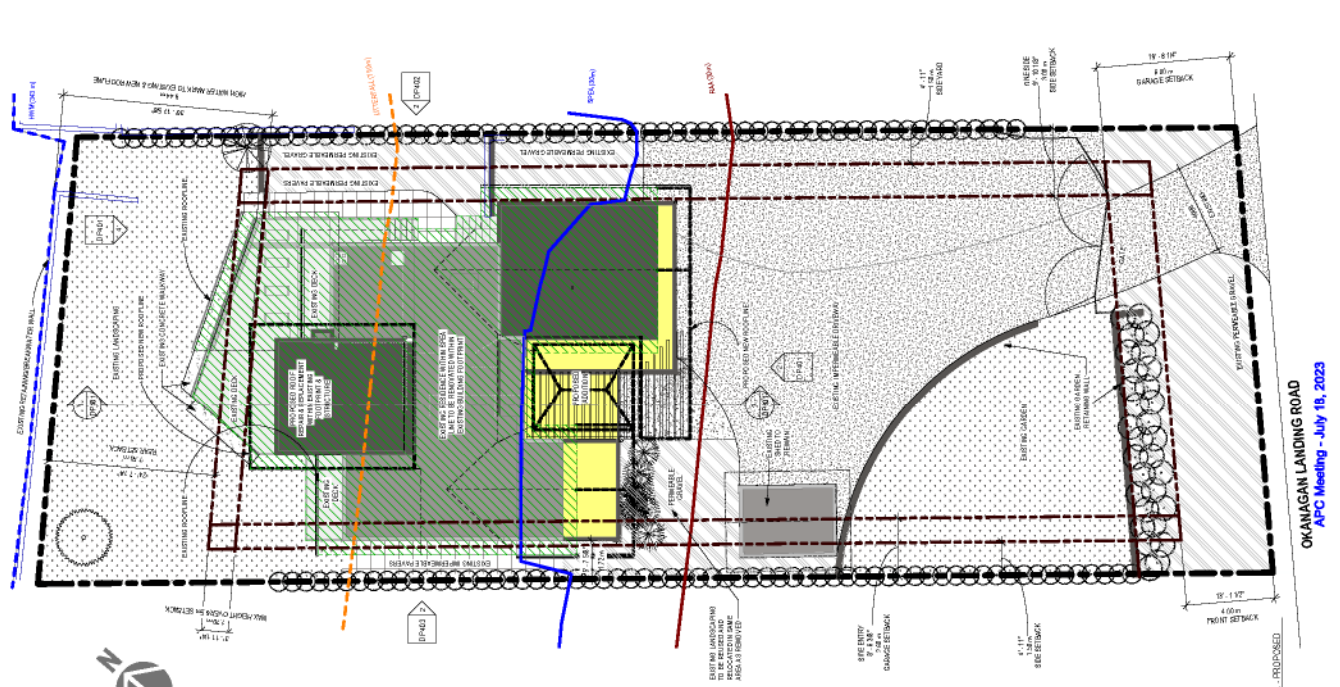
2. SITE ENLARGED PLAN, AUGUST 17, 2018

		8511 OKANAGAN LANDING ROAD, VERNON, BC RESIDENCE RENOVATION PROJECT TITLE	
2500 OKANAGAN LANDING ROAD VERNON, BC V1T 2V2 TEL: 250-553-1117 WWW.MONINTERIORS.COM	2500 OKANAGAN LANDING ROAD VERNON, BC V1T 2V2 TEL: 250-553-1117 WWW.MONINTERIORS.COM	PROJECT NO: [REDACTED] DRAWING NO: [REDACTED]	DATE: [REDACTED] SCALE: AS SHOWN DRAWN BY: [REDACTED] CHECKED BY: [REDACTED] DESIGNED BY: [REDACTED]

PROJECT STATISTICS

ADDRESS: 8511 OKANAGAN LANDING ROAD, VERNON, BC V1T 2V2
 PROJECT NO: [REDACTED]
 DRAWING NO: [REDACTED]
 DATE: [REDACTED]

ITEM	QUANTITY	UNIT	REMARKS
1. CONCRETE	1.50	CUM	CONCRETE FOR DRIVEWAY
2. ASPHALT	1.50	SQ	ASPHALT DRIVEWAY
3. GRAVEL	1.50	CUM	GRAVEL DRIVEWAY
4. SAND	1.50	CUM	SAND DRIVEWAY
5. BRICK	1.50	SQ	BRICK DRIVEWAY
6. STONE	1.50	SQ	STONE DRIVEWAY
7. PAVER	1.50	SQ	PAVER DRIVEWAY
8. CURB	1.50	M	CURB DRIVEWAY
9. GUTTER	1.50	M	GUTTER DRIVEWAY
10. DOWNSPOUT	1.50	EA	DOWNSPOUT DRIVEWAY
11. DRIVEWAY	1.50	SQ	DRIVEWAY DRIVEWAY
12. SIDEWALK	1.50	SQ	SIDEWALK DRIVEWAY
13. WALKWAY	1.50	SQ	WALKWAY DRIVEWAY
14. PATIO	1.50	SQ	PATIO DRIVEWAY
15. DECK	1.50	SQ	DECK DRIVEWAY
16. PORCH	1.50	SQ	PORCH DRIVEWAY
17. BALCONY	1.50	SQ	BALCONY DRIVEWAY
18. TERRACE	1.50	SQ	TERRACE DRIVEWAY
19. STAIR	1.50	SQ	STAIR DRIVEWAY
20. RAMP	1.50	SQ	RAMP DRIVEWAY
21. ROOF	1.50	SQ	ROOF DRIVEWAY
22. GROUND	1.50	SQ	GROUND DRIVEWAY
23. TOTAL	1.50	SQ	TOTAL DRIVEWAY



8511 OKWAGAN LANDING ROAD, VERNON, BC
RESIDENCE RENOVATION
DRAWING TITLE

FLOOR PLANS EXISTING

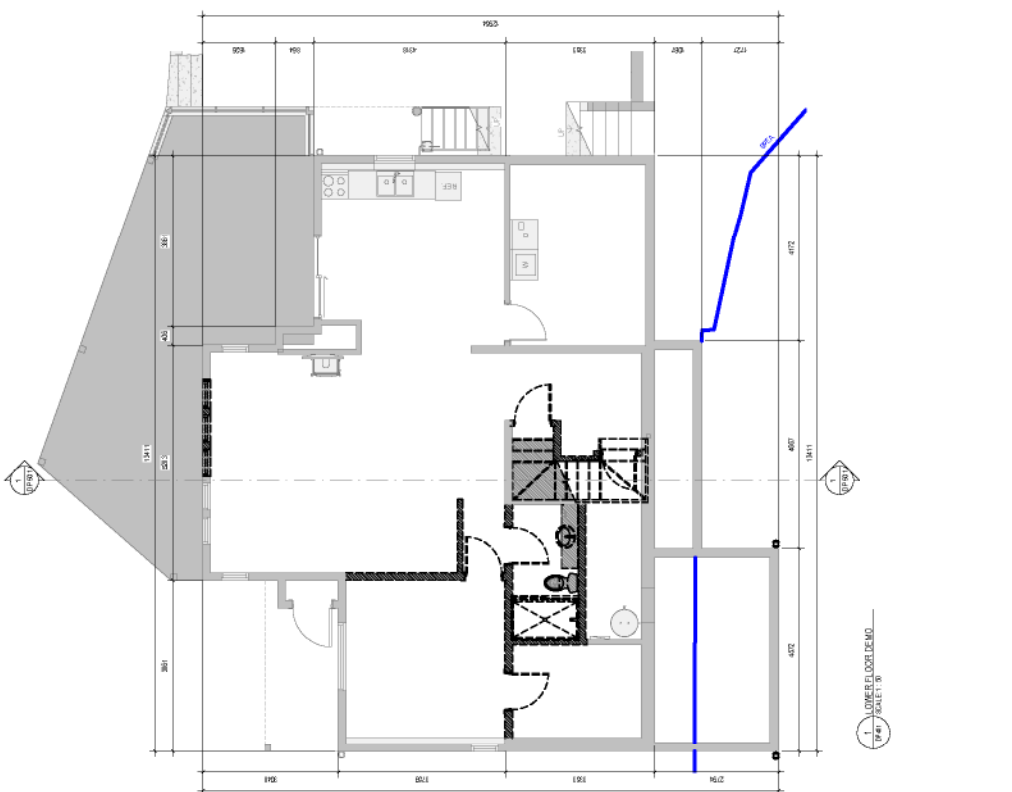
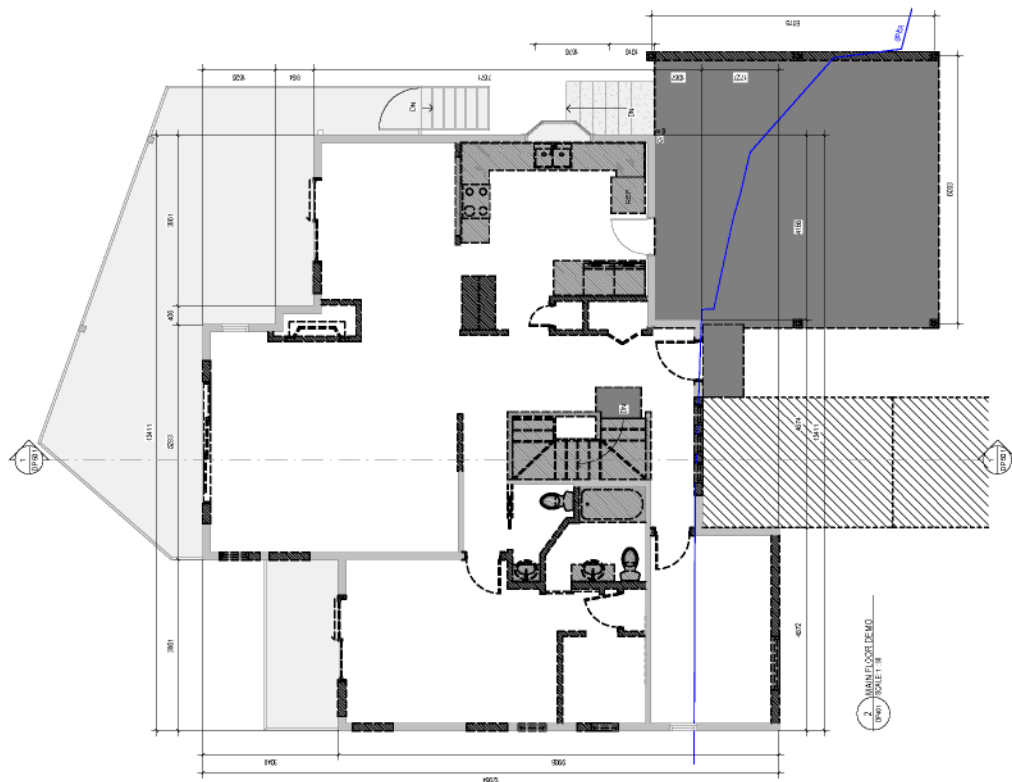
NO. REV. ISSUE
1 REVISIONS/CHANGES/REVISIONS/DATE

PROJECT TITLE
8511 OKWAGAN LANDING ROAD, VERNON, BC

CONSULTANT
M&N INTERIORS
400 - 2013 22nd Avenue, Vernon, BC V1T 2W7
1-250-940-0088
www.mn.ca

DESIGNED BY	DATE
DRAWN BY	1.30
CHECKED BY	LR
DATE	DA

DP201



NO	REV	DATE
1		

DATE	BY
10/10/2023	JW

PROJECT TITLE
RESIDENCE RENOVATION
 8511 OKWAGAN LANDING ROAD, VERNON, BC

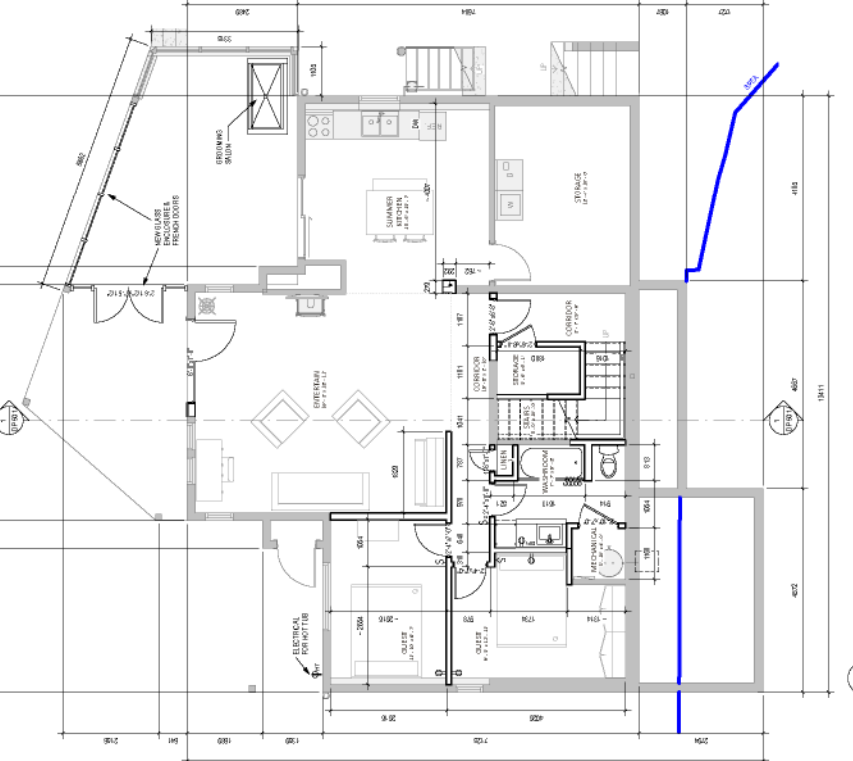
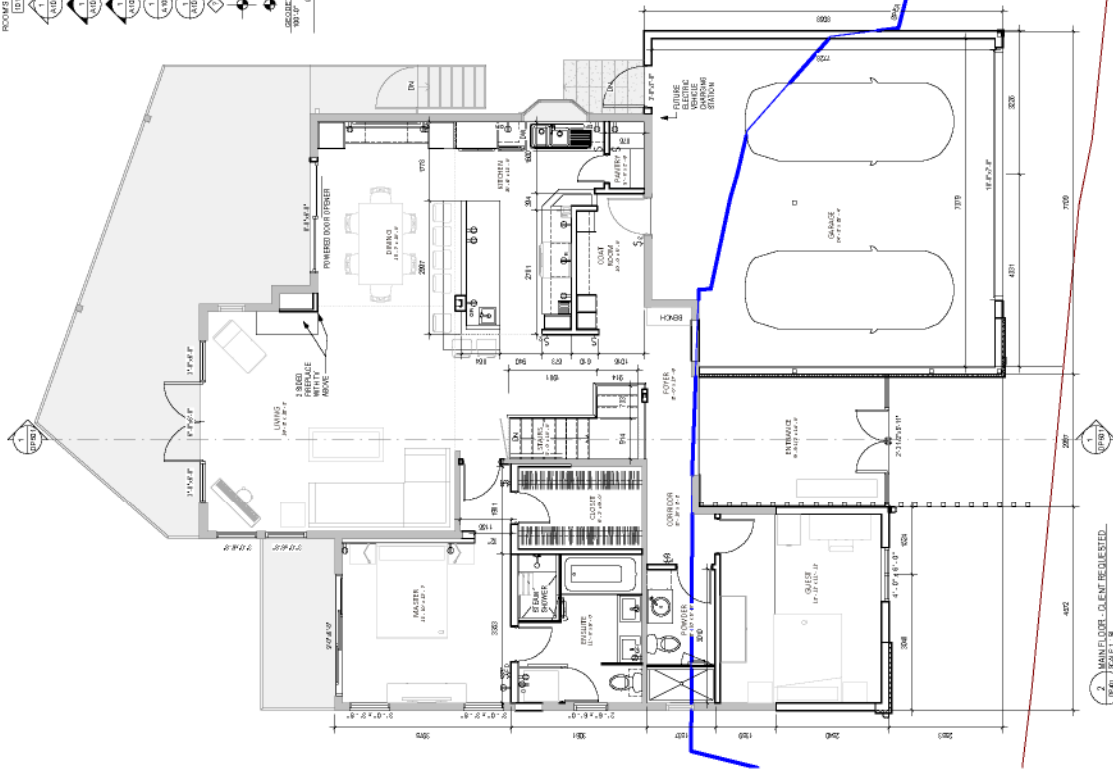
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LOWER & MAIN FLOOR PROPOSED

PROJECT NO.	2100
SCALE	AS SHOWN
DRAWN BY	LR
CHECKED BY	DK
DATE	

DP202

SYMBOL LEGEND

- NEW FLOOR WALL - SEE ASSEMBLY DRAWING
- NEW ARCHITECTURAL WALL - SEE ASSEMBLY DRAWING
- CONSTRUCTION WALL
- FLOOR TYPE - SEE ASSEMBLY DRAWING
- WALL TYPE - SEE ASSEMBLY DRAWING
- DOOR TYPE & SIZE - SEE DOOR LEAD
- WINDOW SET - SEE ELEVATIONS
- TO G.P.
- ROOM NAME
- ROOM NAME AND NUMBER
- BUILDING CODE SECTION NUMBER & SHEET NUMBER
- WALL SECTION NUMBER & SHEET NUMBER
- FLOOR SECTION NUMBER & SHEET NUMBER
- MULLION SECTION NUMBER & SHEET NUMBER
- CALCULATED METAL NUMBER & SHEET NUMBER
- NATURAL GAS
- WATERPOINT
- SPOT ELEVATION
- TOUR ELEVATION
- 90° TURN
- CEILING ELEVATION TYPE



1 LOWER FLOOR - CLIENT REQUESTED.
 1/4" = 1' SCALE 1/4"

1 MAIN FLOOR - CLIENT REQUESTED.
 1/4" = 1' SCALE 1/4"

APC Meeting - July 18, 2023



MON INTERIORS
 4100 - 2013 22nd Avenue, Vernon, BC V1T 2A7
 1 250-940-8888
 www.moninteriors.com

PROJECT TITLE
 RESIDENCE RENOVATION

PROJECT LOCATION
 8511 OKWAGAN LANDING ROAD, VERNON, BC

CONTRACTOR

NO	REV	ISSUE

DATE
 12/08/2013

NO	REV	ISSUE

PROJECT TITLE
 ROOF PLAN EXISTING & PROPOSED

PROJECT LOCATION
 8511 OKWAGAN LANDING ROAD, VERNON, BC

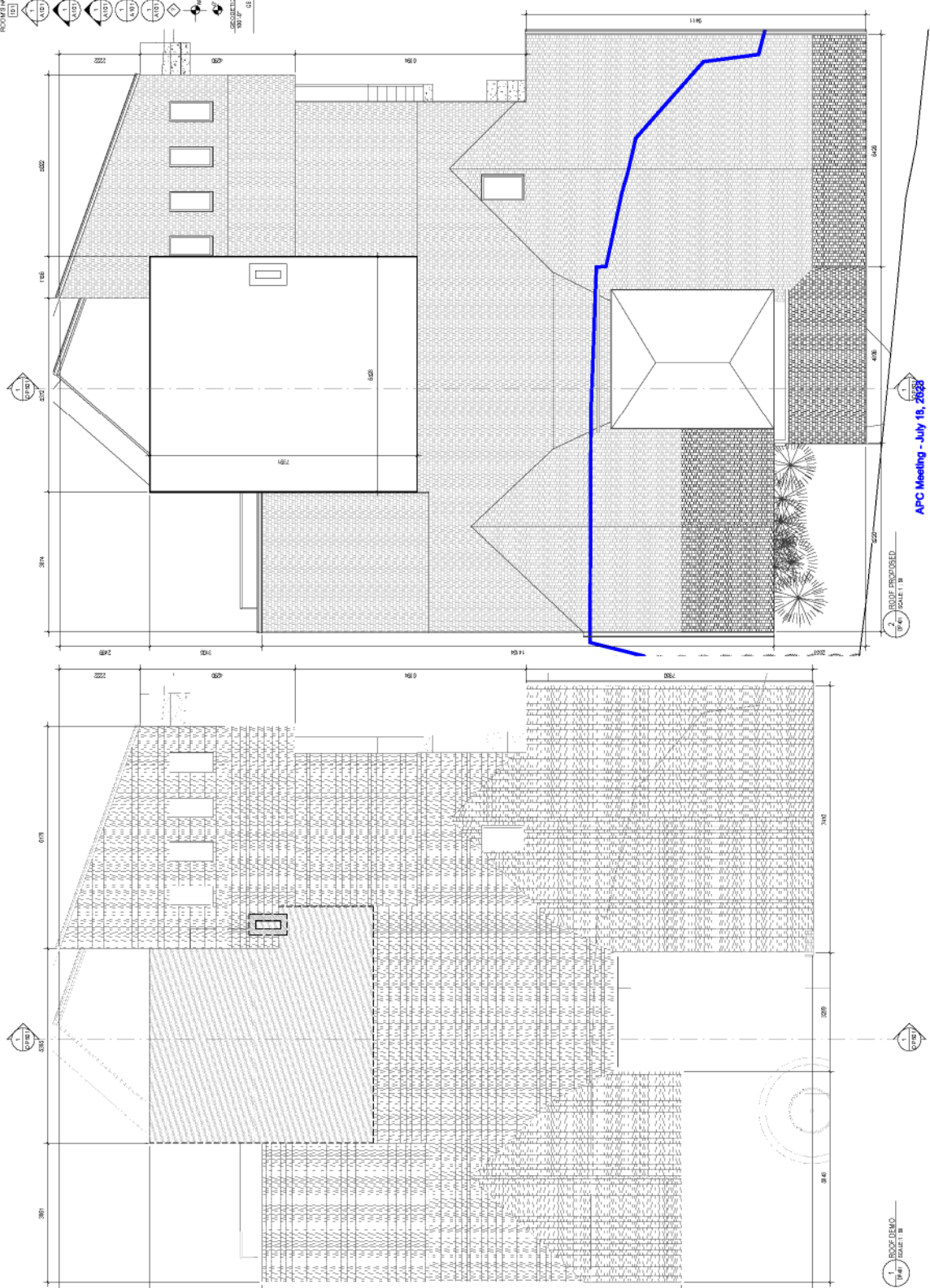
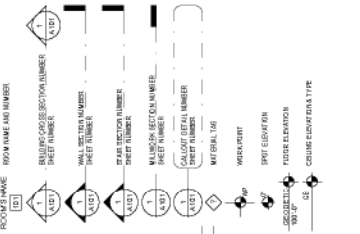
CONTRACTOR

NO	REV	ISSUE

DATE
 12/08/2013

DP203

SYMBOL LEGEND
 SH- STUD WALL - SEE ASSEMBLY DRAWING
 SHW- CONCRETE WALL - SEE ASSEMBLY DRAWING
 CH- CONCRETE CHIMNEY
 CH- CONCRETE CHIMNEY
 FLOOR TYPE - SEE ASSEMBLY DRAWING
 WALL TYPE - SEE ASSEMBLY DRAWING
 DOOR TYPE & SIZE - SEE DOOR LEGEND
 WINDOW SET - SEE ELEVATION
 TO 1/4" PLAN
 ROOM NAME AND NUMBER
 CEILING ELEVATION
 FINISH TYPE



1. ROOF PROPOSED
 1/8" = 1' SCALE
 1
 11/16

2. ROOF PROPOSED
 1/8" = 1' SCALE
 1
 11/16

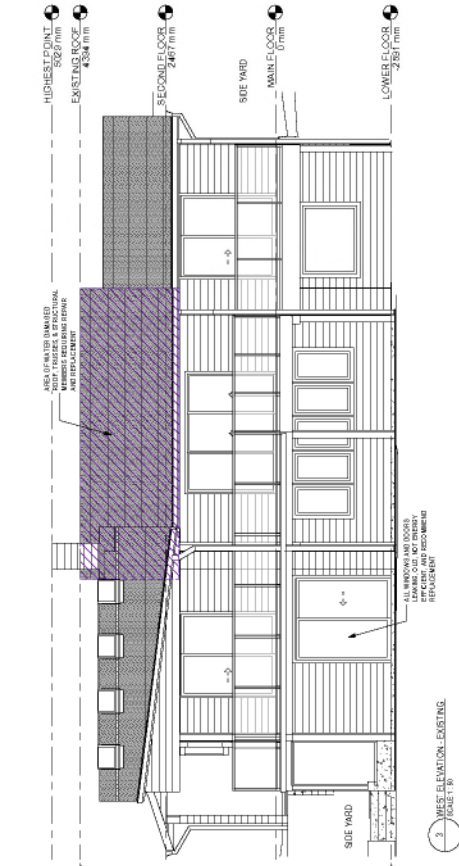
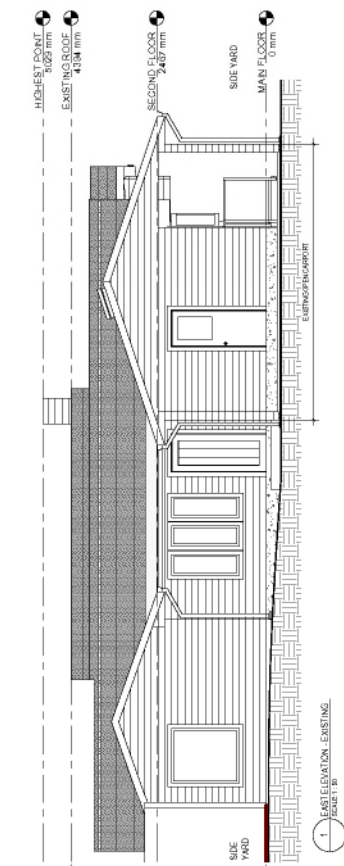
APC Meeting - July 18, 2013

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2			
3			
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5			
6			
7			
8			
9			
10			

CONSULTANT

8511 OKANAGAN LANDING ROAD, VERNON, BC
RESIDENCE RENOVATION
 DRAWING TITLE

COLOUR ELEVATIONS - EAST & WEST
 PROJECT: _____
 SCALE: 1:50
 DRAWN BY: _____
 CHECKED BY: _____
 DATE: _____
DP401



NO. REV. ISSUE

PROJECT TITLE
RESIDENCE RENOVATION

8511 OKWAGAN LANDING ROAD, VERNON, BC

DATE: 11/11/2024
DRAWN BY: [REDACTED]
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PROJECT TITLE

8511 OKWAGAN LANDING ROAD, VERNON, BC

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DATE: 11/11/2024

PROJECT TITLE

8511 OKWAGAN LANDING ROAD, VERNON, BC

DATE: 11/11/2024
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DATE: 11/11/2024

PROJECT TITLE

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DATE: 11/11/2024
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DATE: 11/11/2024

PROJECT TITLE

8511 OKWAGAN LANDING ROAD, VERNON, BC

DATE: 11/11/2024
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DATE: 11/11/2024

PROJECT TITLE

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DATE: 11/11/2024
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DATE: 11/11/2024

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DATE: 11/11/2024
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CHECKED BY: [REDACTED]
DATE: 11/11/2024

PROJECT TITLE

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DATE: 11/11/2024

PROJECT TITLE

8511 OKWAGAN LANDING ROAD, VERNON, BC

DATE: 11/11/2024
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CHECKED BY: [REDACTED]
DATE: 11/11/2024

PROJECT TITLE

8511 OKWAGAN LANDING ROAD, VERNON, BC

DATE: 11/11/2024
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CHECKED BY: [REDACTED]
DATE: 11/11/2024

PROJECT TITLE

8511 OKWAGAN LANDING ROAD, VERNON, BC

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CHECKED BY: [REDACTED]
DATE: 11/11/2024

PROJECT TITLE

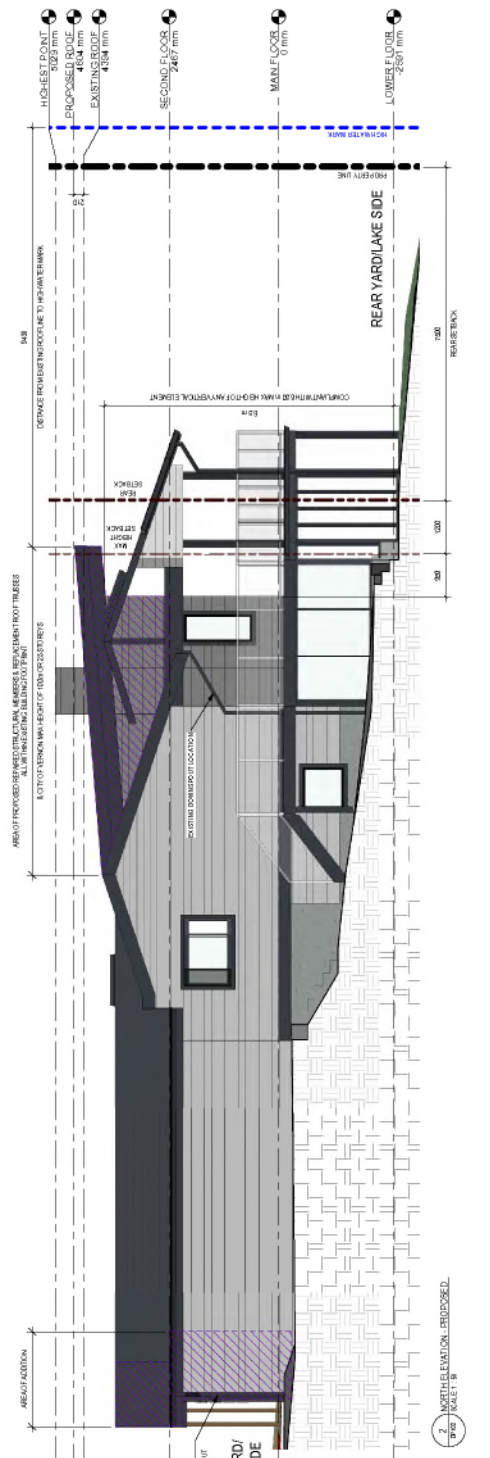
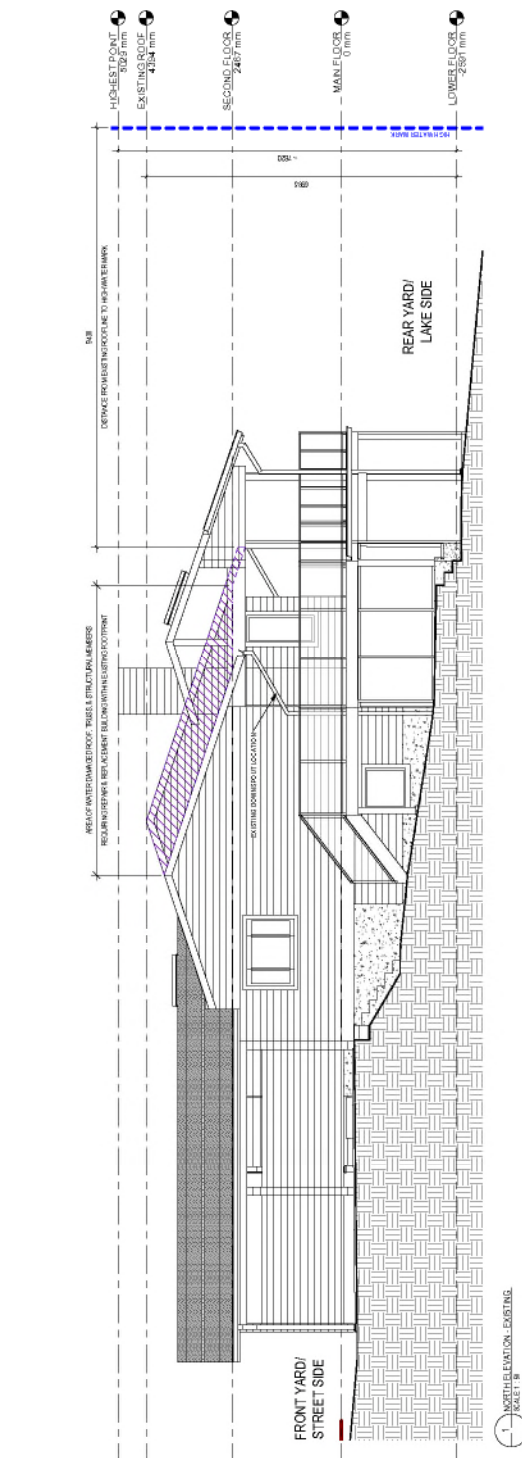
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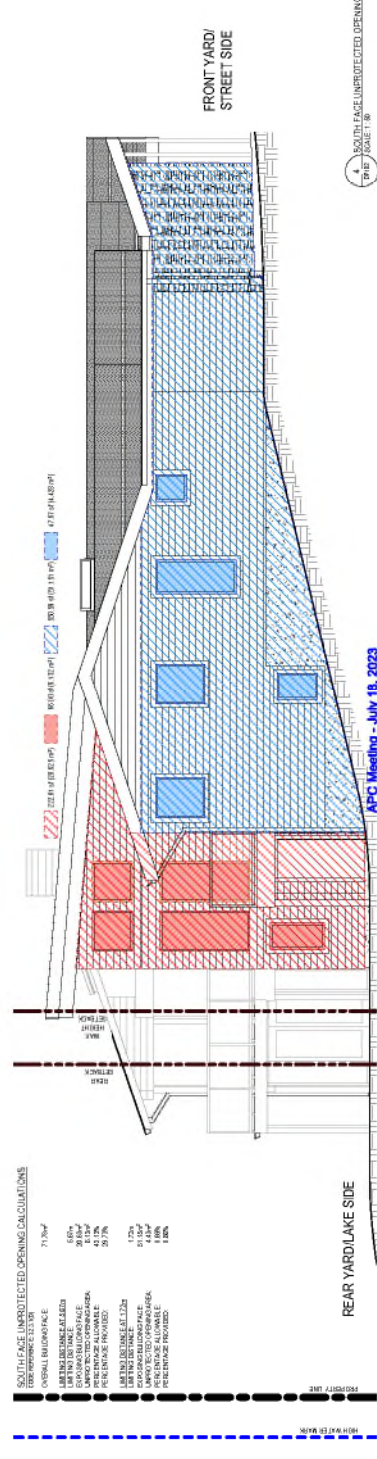
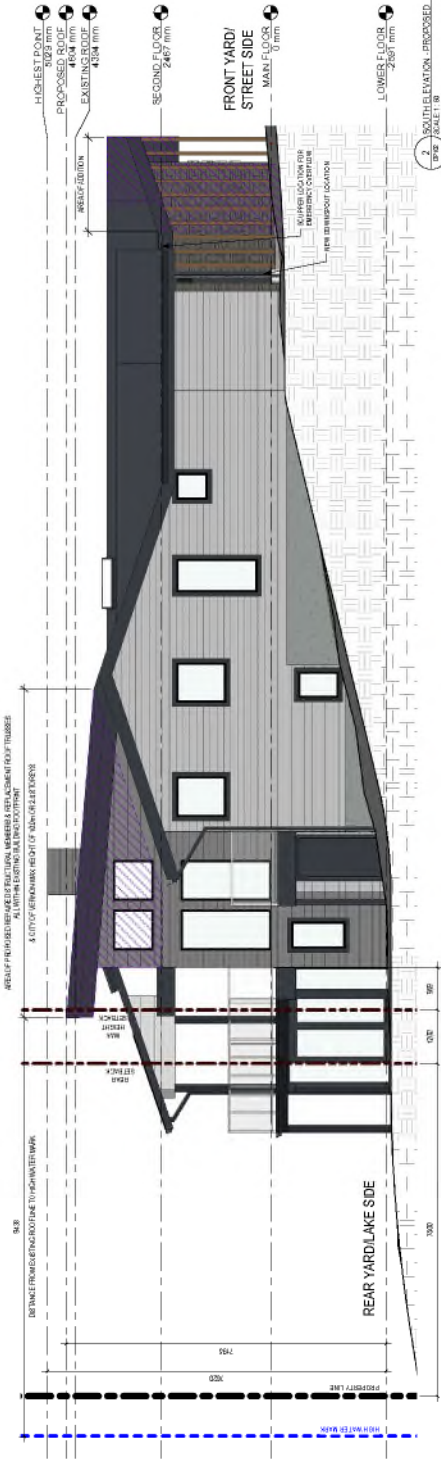
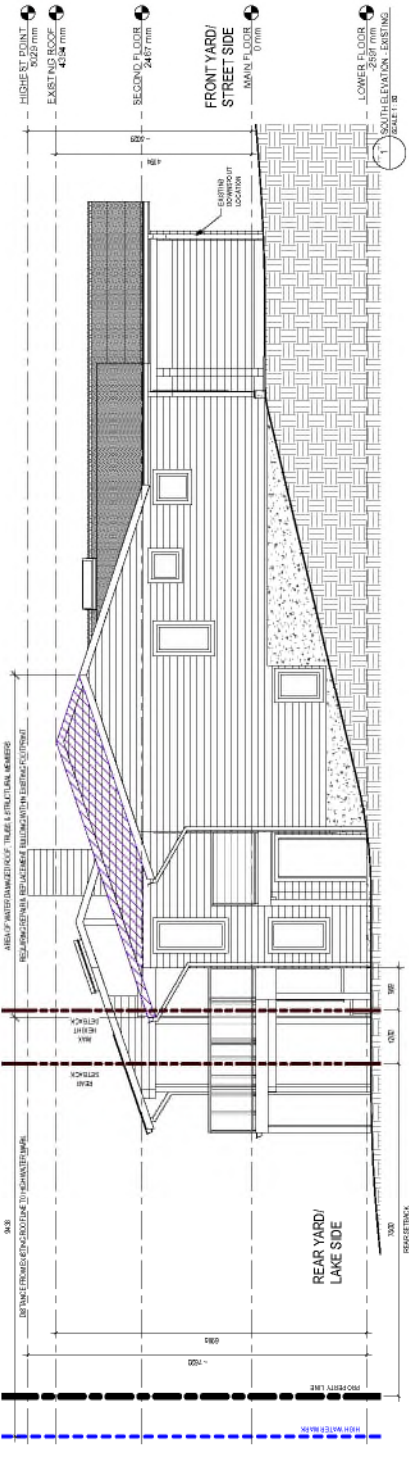
CONSULTANT

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2	1	PROJECT NO
3	1	DATE
4	1	SCALE
5	1	PROJECT NO
6	1	DATE
7	1	SCALE

PROJECT TITLE
 RESIDENCE RENOVATION
 8511 OKANAGAN LANDING ROAD, VERNON, BC

OWNER/CLIENT
COLOUR ELEVATIONS - SOUTH

PROJECT NO
 SCALE
 DRAWING
DP403



SOIL PLACEMENT UNDISTURBED OPENING CALCULATIONS

PARAMETER	VALUE
OVERALL BUILDING FACE	71.76m ²
OVERALL BUILDING FACE	100%
MINIMUM UNDISTURBED OPENING AREA	30.85m ²
MINIMUM UNDISTURBED OPENING AREA	43.15m ²
MINIMUM UNDISTURBED OPENING AREA	20.7%
MINIMUM UNDISTURBED OPENING AREA	1.72%
MINIMUM UNDISTURBED OPENING AREA	1.88%
MINIMUM UNDISTURBED OPENING AREA	1.88%

1 SOUTH ELEVATION - PROPOSED
 2 SOUTH ELEVATION - EXISTING
 3 SOUTH ELEVATION - EXISTING
 4 SOUTH ELEVATION - EXISTING

APC Meeting - July 18, 2023



CONSULTANT

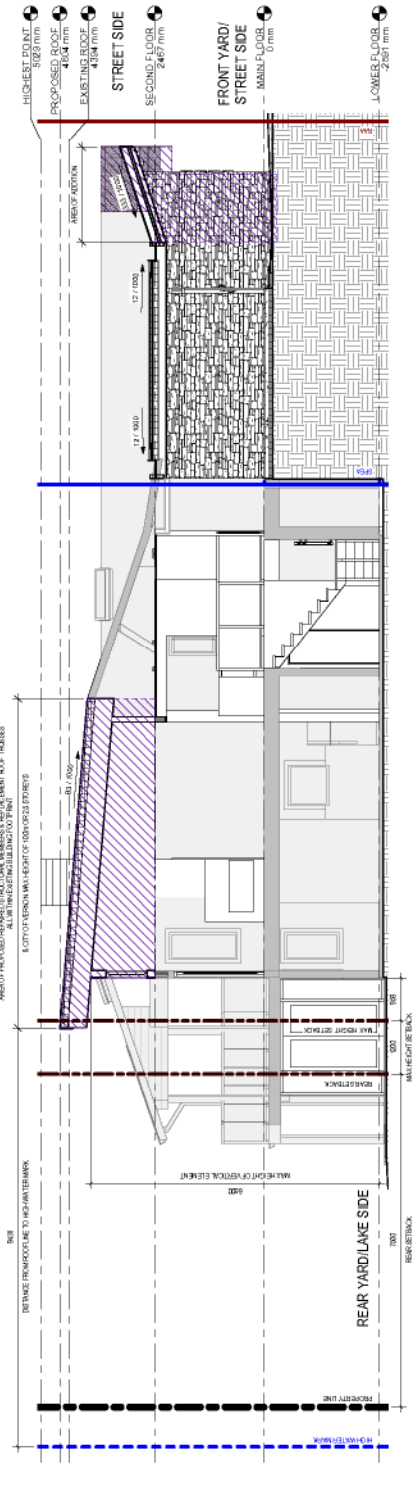
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9	1	1
10	1	1

PROJECT TITLE
RESIDENCE RENOVATION

DRAWING TITLE
BUILDING SECTION

PROJECT	3-23
SCALE	1:32
DRAWN BY	
ENGINEER	DA
DATE	

DP501



1 MAX HEIGHT OF VERTICAL ELEMENT SECTION

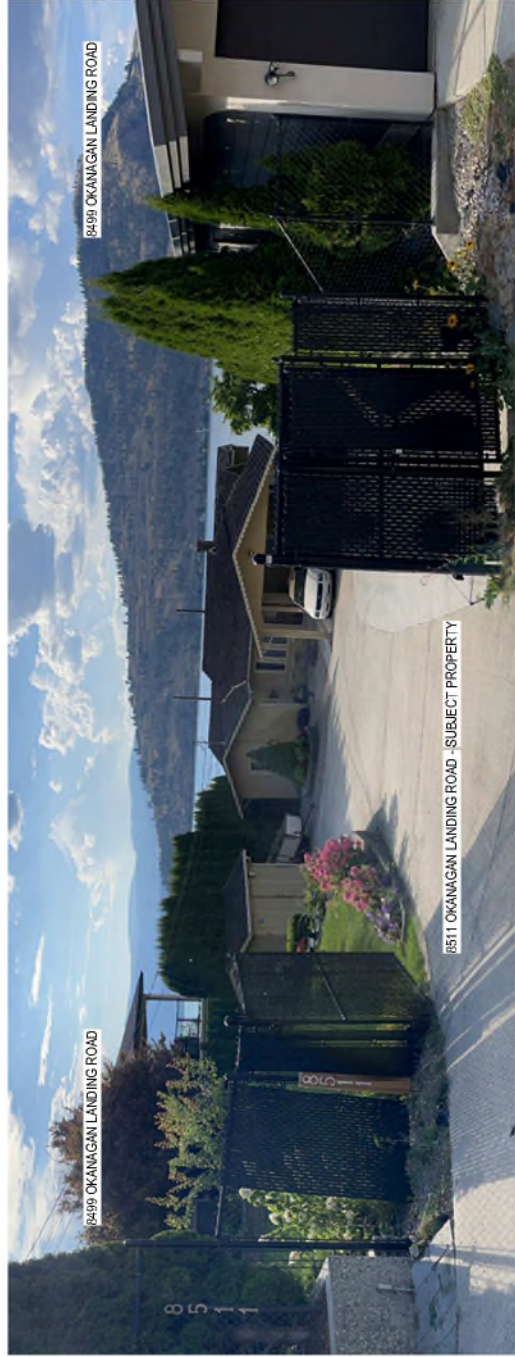
MON INTERIORS 4100 - 2013 22nd Avenue, Vernon, BC V1T 2W7 1 250-940-0888 www.mon.ca	
SCALE	3/8" = 1'
PROJECT	8511 OKANAGAN LANDING ROAD, VERNON, BC
DATE	2023.07.14
DESIGNED BY	MON INTERIORS
CHECKED BY	MON INTERIORS
DRAWING	CONTEXT PHOTOS
DRAWING	DP901



NOT TO SCALE
 SUBJECT ROUTINE

NOT TO SCALE
 SUBJECT ROUTINE

VIEW FROM OKANAGAN LAKE - SUBJECT PROPERTY IN MIDDLE SHOWING ADJACENT BUILDINGS ON EITHER SIDE



VIEW FROM OKANAGAN LANDING ROAD - SUBJECT PROPERTY IN MIDDLE SHOWING ADJACENT BUILDINGS ON EITHER SIDE

Riparian Area Regulation Assessment

**8511 OKANAGAN LANDING RD.
VERNON, BC**

Prepared for:



8511 Okanagan Landing Road
Vernon BC

Prepared by:



CANYON WREN
CONSULTING INC.

Riparian Areas Regulation: Assessment Report

Please refer to submission instructions and assessment report guidelines when completing this report.

Date **I. Primary QEP Information**

First Name	Mark	Middle Name	D	
Last Name	Piorecky			
Designation	R.P.Bio	Company: Canyon Wren Consulting Inc		
Registration #	1810	Email: mark@canyonwren.ca		
Address	5859 Hartnell Rd.			
City	Vernon	Postal/Zip	V1B 3J5	Phone # 250.307.2038
Prov/state	B.C.	Country	Canada	

II. Secondary QEP Information (use Form 2 for other QEPs)

First Name		Middle Name		
Last Name				
Designation		Company:		
Registration #		Email:		
Address				
City		Postal/Zip		Phone #
Prov/state		Country		

III. Developer Information

First Name		Middle Name		
Last Name	[REDACTED]			
Company				
Phone #		Email:	[REDACTED]	
Address	8511 Okanagan Landing Road			
City	Vernon	Postal/Zip	V1B 1KJ6	
Prov/state	BC	Country	Canada	

IV. Development Information

Development Type	Family Residential			
Area of Development (ha)	0.0454	Riparian Length (m)	20.1	
Lot Area (ha)	0.4437	Nature of Development	Re-development	
Proposed Start Date	March 2023	Proposed End Date	Oct. 2023	

V. Location of Proposed Development

Street Address (or nearest town)	8511 Okanagan Landing Rd.			
Local Government	City of Vernon	City	Vernon	
Stream Name	Okanagan Lake			
Legal Description (PID)	003 853 381	Region	Okanagan	
Stream/River Type	Lake	DFO Area	B.C. Interior	
Watershed Code	310			
Latitude	50°	13'	31.2"	Longitude 119° 22' 46.6"

Table of Contents for Assessment Report

	Page Number
1. Description of Fisheries Resources Values	4
2. Results of Riparian Assessment (SPEA width)	7
3. Site Plan	9
4. Measures to Protect and Maintain the SPEA (detailed methodology only).	
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2. Windthrow.....	12
3. Slope Stability.....	12
4. Protection of Trees.....	12
5. Encroachment	12
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Section 1. Description of Fisheries Resources Values and a Description of the Development Proposal

(Provide as a minimum: Species present, type of fish habitat present, description of current riparian vegetation condition, connectivity to downstream habitats, nature of development, specific activities proposed, timelines)

Fish and Fish Habitat

Okanagan Lake provides habitat for over 23 species of native and introduced fish. These include a variety of salmonids and coarse/non-game species. The table below provides a list of fish species present in Okanagan Lake.

Table 1. Fish species present in Okanagan Lake

Common Name	Scientific Name	Native (N) or Introduced (I)
brook trout	<i>Salvelinus fontinalis</i>	I
burbot	<i>Lota lota</i>	N
carp	<i>Cyprinus carpio</i>	I
chiselmouth	<i>Acrocheilus alutaceus</i>	N
cutthroat	<i>Oncorhynchus clarki lewisi</i>	N
kokanee	<i>Oncorhynchus nerka</i>	N
lake trout	<i>Salvelinus namaycush</i>	I
lake whitefish	<i>Coregonus clupeaformis</i>	I
largescale sucker	<i>Catostomus macrocheilus</i>	N
leopard dace	<i>Rhinichthys falcatus</i>	N
longnose dace	<i>Rhinichthys cataractae</i>	N
longnose sucker	<i>Catostomus catostomus</i>	N
mountain whitefish	<i>Prosopium williamsoni</i>	N
northern pikeminnow	<i>Ptychocheilus oregonesis</i>	N
peamouth chub	<i>Mylocheilus caurinus</i>	N
prickly sculpin	<i>Cottus asper</i>	N
pumpkinseed	<i>Lepomis gibbosus</i>	I
pygmy whitefish	<i>Prosopium coulteri</i>	N
rainbow trout	<i>Oncorhynchus mykiss</i>	N
redside shiner	<i>Richardsonius balteatus</i>	N
slimy sculpin	<i>Cottus cognatus</i>	N
steelhead	<i>Oncorhynchus mykiss</i>	N
yellow perch	<i>Perca flavescens</i>	I

Ministry of Environment Habitat Wizard website, 2022

On Nov. 2nd, 2022 the waters edge was approximately 7 m below the high water mark (HWM) which is identified by the 343 m elevation contour. The lakebed/substrate in the littoral zone in front of the subject property was categorized as:

- HWM to 4 m – 30% fines, 50% small gravel (<1 cm) and 20% gravel (<3 cm)
- 4 to 8.5 m – A narrow band of 70% rounded gravels (3-10 cm), 20% cobbles (10-25 cm), and 10% fines;
- Beyond 8.5 m – Mix of 90% fines and 10% round cobbles (10-25 cm) with scattered periphyton.

Existing fish habitat in Okanagan Lake in front of the subject property is characterized as low-value kokanee spawning habitat. This is based on the topography and lake substrate observed in the littoral zone in front of the property, as well as maps produced as part of the Okanagan Region Large Lakes Foreshore Protocol (Jan. 2018). This protocol identifies black, red, yellow and no colour zones associated with kokanee spawning importance. Shore spawning kokanee are known to occur in Okanagan Lake, and spawning habitat is generally associated with cliffs/bluffs and angular coarse substrates (which do not occur on the subject property, Photo 1). The foreshore in front of the subject property is a no colour zone. As such, fish habitat is suitable for juvenile rearing and general foraging and is comprised primarily of fines and small gravels. The nearshore topography is gently sloping, beyond more than 35 m into the lake.

Description of Current Riparian Vegetation Condition

Topographically the property slopes relatively gently, at about 11.8% or 6.7 degrees from Okanagan Landing Road to the HWM.

The entire subject property, north of Okanagan Landing Road, exists primarily as concrete driveway, lawn, residence or ornamental crushed gravel. Existing trees and shrubs are few. Columnar cedars form visual barriers along the NE and SW property lines. Existing structures within the 30 m Riparian Assessment Area (RAA), include: a concrete retaining wall forming the HWM / SB, several sidewalks, a concrete paver walkway along the NE side of the property, and nearly the entire residence (Figures 1A, 1B & 2; Photos 1-6).

Trees located within the SPEA include 2 flowering dogwoods (24 and 22 cm dbh), and 1 small peach (2 cm dbh, Figures 1A, 1BB & 2). Shrubs are limited to 21 boxwood's, planted relatively recently along the foreshore retaining wall. All trees and shrubs occur well within the SPEA. As such, there is very little chance they will be impacted during redevelopment.

These trees and shrubs serve to somewhat reduce erosion potential and provide important fish habitat in the form of leaf litter, insect drop, shade and potential for woody debris. The property currently provides low value riparian function.

Nature of Development and Proposed Activities

Field assessment of the subject property for this report was conducted on Nov. 2, 2022, by Mark Piorecky, M.Sc., R.P.Bio. The subject property consists of a large single parcel measuring approximately 21.1 m wide (street front), by 55 m deep (lakeside), and a total lakeside area of approximately 1082 m², or 4437 m² including the portion of the property S of Okanagan Landing Road. The residential portion of the property is bordered by developed residential lots to the northeast and southwest, Okanagan Landing Road to the southeast and Okanagan Lake to the northwest.

Within the SPEA, it is the intent of the proponents to redevelop the property within the confines of the existing structure. Outside of the SPEA, they propose to expand portions of the existing residence as identified in Figures 1A, 1B & 2. Specifically, the following actions are being pursued:

- 1) The existing carport within the SPEA will be retained upon its existing foundations. Full walls will be added on the NW and NE sides to close it in (Photo 5). Meanwhile outside of the SPEA, the SW wall will be moved in that direction, while the roof and walls will be extended to the SE, too make the garage longer. See Appendix 1 – DVP2.
- 2) Outside of the SPEA, the room in the SW corner of the residence will be extended by approximately 2.5 m (Photo 6). See Appendix 1 – DVP2.
- 3) Within the SPEA, a portion of water damaged roof will be repaired and replaced within its existing footprint (Photo 2). This will include the changing of roof trusses for a portion of the roof. See Appendix 2 (Contractor Letter Identifying need for roof replacement and repair). The entire roof will require new cladding. For roof change details see Appendix 1 – DVP2 to 5.
- 4) Within the SPEA, a portion of the lower level concrete patio located under the existing deck will be enclosed with glass (Photos 2 & 3). No excavation will occur as the lower

level concrete patio will be utilized. See Appendix 1 – DVP3 to 5.

- 5) Many, if not all windows and doors will be replaced with energy efficient ones.
- 6) Detailed design drawings of the proposed works are being submitted with this application. See Appendix 1 – uploaded separately.

Construction is anticipated to start **March 1, 2023** and be completed by **Oct. 31, 2023**.

Section 2. Results of Riparian Assessment (SPEA width)

2. Results of Detailed Riparian Assessment

Refer to Chapter 3 of Assessment Methodology

Date:

Description of Water bodies involved (number, type)

Stream	<input type="text"/>
Wetland	<input type="text"/>
Lake	<input checked="" type="checkbox"/>
Ditch	<input type="text"/>
No. of reaches	<input type="text"/>
Reach #	<input type="text"/>

Site Potential Vegetation Type (SPVT)

	Yes	No	
SPVT Polygons	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Tick yes only if multiple polygons, if No then fill in one set of SPVT data boxes
			I, <u>Mark Piorecky</u> , hereby certify that: a) I am a qualified environmental professional, as defined in the Riparian Areas Protection Regulation made under the <i>Riparian Areas Protection Act</i> ; b) I am qualified to carry out this part of the assessment of the development proposal made by the developer <input type="text"/> ; c) I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and d) In carrying out my assessment of the development proposal, I have followed the technical manual to the Riparian Areas Protection Regulation.
Polygon No:	<input type="text" value="1 of 1"/>		Method employed if other than TR
SPVT Type	<input type="text" value="LC"/>	<input type="text" value="SH"/>	<input checked="" type="text" value="TR"/>

Zone of Sensitivity (ZOS) and resultant SPEA

Segment No:	<input type="text" value="1 of 1"/>	If two sides of a stream involved, each side is a separate segment. For all water bodies multiple segments occur where there are multiple SPVT polygons			
LWD, Bank and Channel Stability ZOS (m)	<input type="text" value="15"/>				
Litter fall and insect drop ZOS (m)	<input type="text" value="15"/>				
Shade ZOS (m) max	<input type="text" value="30"/>	South bank	<input type="text" value="Yes"/>	<input checked="" type="text" value="X"/>	<input type="text" value="No"/>
Ditch	Justification description for classifying as a ditch (manmade, no significant headwaters or springs, seasonal flow)				
Ditch Fish Bearing	<input type="text" value="Yes"/>	<input type="text" value="No"/>	If non-fish bearing insert no fish bearing status report		
SPEA maximum	<input type="text" value="25.7"/>	(For ditch use table 3-7)			

I, <u>Mark Piorecky</u> , hereby certify that:			
a.	I am a qualified environmental professional, as defined in the Riparian Areas Protection Regulation made under the <i>Riparian Areas Protection Act</i> ;		
b.	I am qualified to carry out this part of the assessment of the development proposal made by the developer <input type="text"/> ;		
c.	I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and		
a.	In carrying out my assessment of the development proposal, I have followed the technical manual to the Riparian Areas Protection Regulation.		

Comments

The shoreline of the subject property faces northwest, thus is significantly influenced by the shade ZOS. As a result, the RAPR determined SPEA ranges from 20.5 to 25.7 m, measured horizontally from the HWM / SB of Okanagan Lake (343 m above sea level).

The existing property size is 4437 m² in size. The portion of development on the lot that requires new foundations, will occur entirely outside the RAPR Determined SPEA. The only works proposed within the SPEA, are those related to closing in existing structures, on their current foundations and within their current roof-lines. Along with repair and replacement of the existing roof and its cladding. The proponent is committed to carrying out development activities in accordance with this letter to ensure that the Riparian Protection Standard, is met.

Should vegetation enhancement be desired within the SPEA, it will adhere to the following:

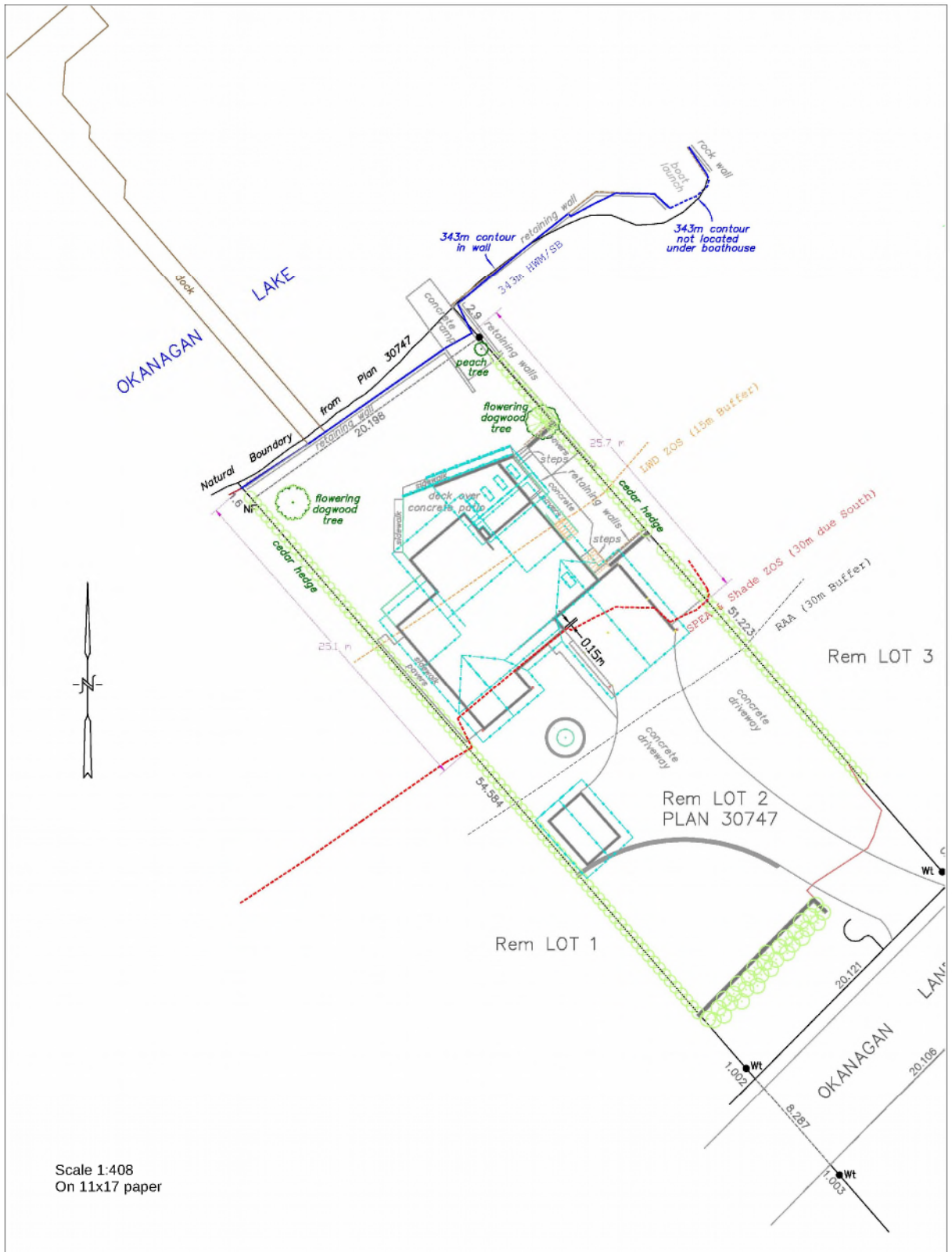
- Enhancement species will be chosen from the following:
 - Coniferous trees: ponderosa pine, Douglas-fir, western larch, western white pine, western red cedar.
 - Deciduous trees: aspen, birch, cottonwood, mountain ash, hawthorn or willow.
 - Shrubs: ceanothus, black twinberry, soopalallie, high/low bush cranberry, cascara, choke cherry, pin cherry, dogwood, Douglas maple, snowberry, rose, saskatoon, spirea, hazelnut, huckleberry, juniper, potentilla, mock-orange, elderberry, current (ribes) or Oregon grape.

Apart from the identified development plan, activities and features that are prohibited within the SPEA, include but are not limited to the following: removal, alteration, disruption or destruction of vegetation; disturbance of soils; construction or erection of additional buildings and structures; creation of non-structural impervious or semi-impervious surfaces; flood protection works; construction of roads, trails, additional retaining walls, docks, wharves or bridges; provision and maintenance of sewer and water services; development of drainage systems and development of utility corridors.

Section 3. Site Plan



Figure 1A: Site plan with existing structures (grey), existing roof-line (light blue), existing trees and hedge, aerial image and RAPR determined SPEA (red dashed).



Scale 1:408
On 11x17 paper

Figure 1B: Site plan with existing structures (grey), existing roof-line (light blue), existing trees and hedge and RAPR determined SPEA (red dashed) – Aerial Image removed for clarity.

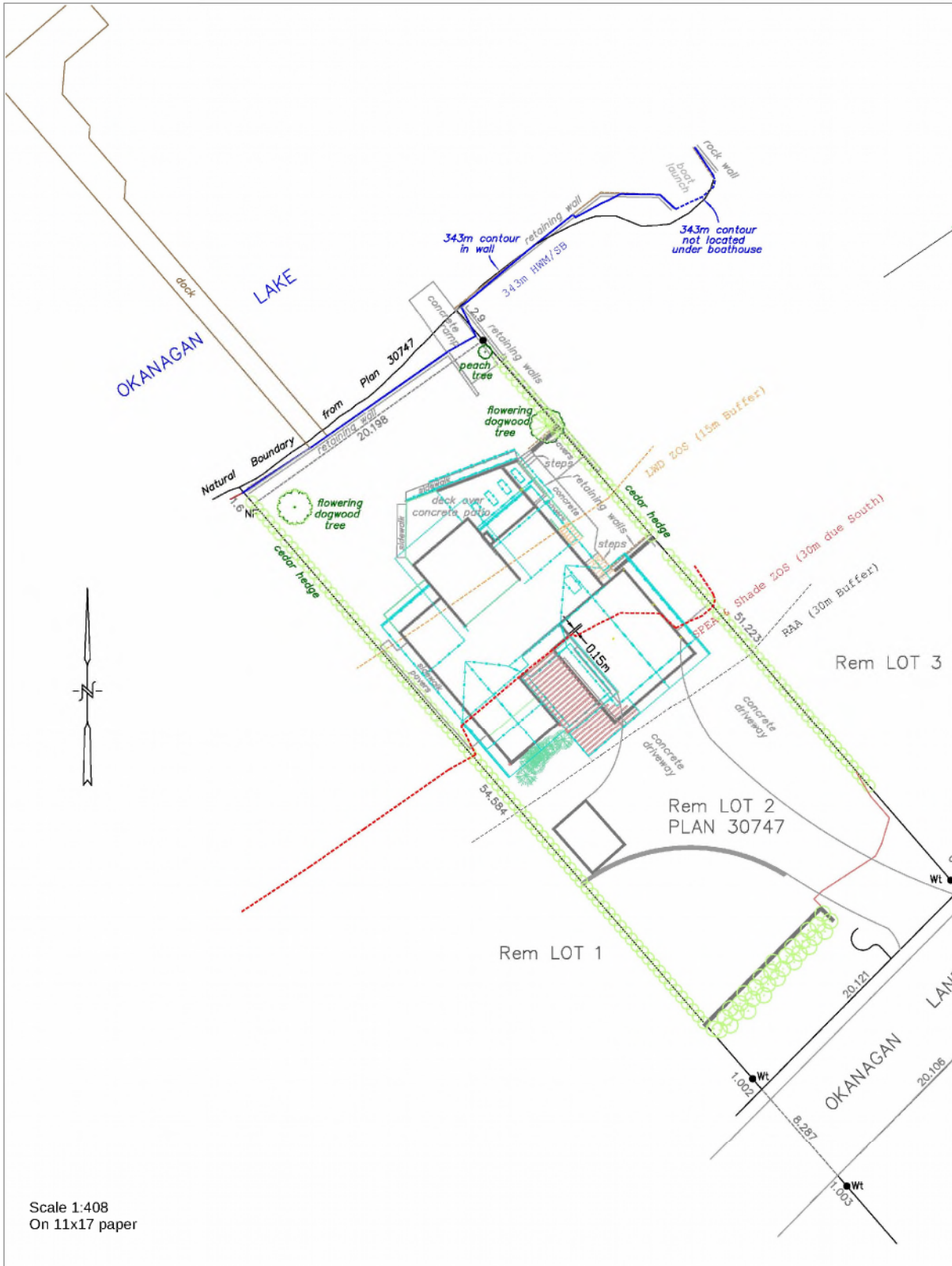


Figure 2: Site plan with proposed re-development structures (grey), proposed roof-line (light blue), existing trees and hedge and RAPR determined SPEA (red dashed) – Aerial Image removed for clarity.

Section 4. Measures to Protect and Maintain the SPEA

<p>1. Danger Trees</p>	<p>No danger trees were currently identified on the Subject Property. If trees within the SPEA are later identified as danger trees and need to be removed (i.e. as a result of natural aging, pine beetle, etc.), this will be done according to specifications outlined in the BC MOELP tree replacement criteria and those outlined in Section 2 – Comments, of this report.</p>
<p>I, <u>Mark Piorecky</u>, hereby certify that:</p> <p>a) I am a qualified environmental professional, as defined in the Riparian Areas Protection Regulation made under the <i>Riparian Areas Protection Act</i>;</p> <p>b) I am qualified to carry out this part of the assessment of the development proposal made by the developer [REDACTED];</p> <p>c) I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and In carrying out my assessment of the development proposal, I have followed the assessment methods set out in the Minister's technical manual to the Riparian Areas Protection Regulation.</p>	
<p>2. Windthrow</p>	<p>Windthrow is not anticipated to be an issue within the SPEA, since no forested areas are being altered, nor are existing areas of wind blocking structures, being removed.</p>
<p>I, <u>Mark Piorecky</u>, hereby certify that:</p> <p>a. I am a qualified environmental professional, as defined in the Riparian Areas Protection Regulation made under the <i>Riparian Areas Protection Act</i>;</p> <p>b. I am qualified to carry out this part of the assessment of the development proposal made by the developer [REDACTED];</p> <p>c. I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and In carrying out my assessment of the development proposal, I have followed the assessment methods set out in the Minister's technical manual to the Riparian Areas Protection Regulation.</p>	
<p>3. Slope Stability</p>	<p>Slope stability does not appear to be an issue within the SPEA or RAA, as the property is relatively level and none of the field indicators of slope instability were observed.</p>
<p>I, <u>Peter Hanenburg</u>, hereby certify that:</p> <p>a. I am a qualified professional, as defined in the Riparian Areas Protection Regulation made under the <i>Riparian Areas Protection Act</i>;</p> <p>b. I am qualified to carry out this part of the assessment of the development proposal made by the developer [REDACTED];</p> <p>c. I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and In carrying out my assessment of the development proposal, I have followed the assessment methods set out in the Minister's technical manual to the Riparian Areas Protection Regulation.</p>	
<p>4. Protection of Trees</p>	<p>No trees will be removed within the SPEA. Similarly, foundation development outside the SPEA, will NOT require trenching or excavation near any SPEA trees.</p>
<p>I, <u>Mark Piorecky</u>, hereby certify that:</p> <p>a. I am a qualified environmental professional, as defined in the Riparian Areas Protection Regulation made under the <i>Riparian Areas Protection Act</i>;</p> <p>b. I am qualified to carry out this part of the assessment of the development proposal made by the developer [REDACTED];</p> <p>c. I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and In carrying out my assessment of the development proposal, I have followed the assessment methods set out in the Minister's technical manual to the Riparian Areas Protection Regulation.</p>	
<p>5. Encroachment</p>	<p>As the proposed development is on lake front property, the owners will expect and require access to the waterfront. However, it is also noted that the intention of the SPEA is to provide natural, functioning undisturbed riparian habitat. As such, the owners have been made fully aware that encroachment into the SPEA is not a practice that is supported or permitted under the RAPR. Encroachment activities include: conversion of natural vegetation into lawn, dumping of yard waste, planting of non-native vegetation, and the creation of numerous access points and pathways.</p> <p>Encroachment onto the SPEA will be deterred by maintaining existing access paths, and encouraging additional tree and shrub vegetation</p>

	planting.
<p>I, <u>Mark Piorecky</u>, hereby certify that:</p> <p>a. I am a qualified environmental professional, as defined in the Riparian Areas Protection Regulation made under the <i>Riparian Areas Protection Act</i>;</p> <p>b. I am qualified to carry out this part of the assessment of the development proposal made by the developer [REDACTED];</p> <p>c. I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and In carrying out my assessment of the development proposal, I have followed the assessment methods set out in the Minister's technical manual to the Riparian Areas Protection Regulation.</p>	
<p>6. Sediment and Erosion Control</p>	<p>Sediment and erosion control will focus on minimizing disturbance and source-control to prevent sediment or sediment laden water from entering the SPEA during construction. Proposed sediment control will follow Best Management Practices (BMPs) for: works in and around a watercourse, sediment control, and urban and rural land development (MWLP 2004, LWBC 2005).</p> <p>Under the direction of the EM, erosion and sediment control activities will include but not be limited to the following:</p> <p>a. During foundation excavation, outside of the SPEA, excavated materials will be stockpiled in areas where there is negligible potential for sediment to be transported into the SPEA;</p> <p>b. In areas where soils are to be placed near the SPEA boundary (i.e. possibly during foundation excavation), silt fencing will form a final barrier to sediment transport. The silt fence should be installed according to manufacturer's instructions and be monitored periodically for tautness and effectiveness.</p>
<p>I, <u>Mark Piorecky</u>, hereby certify that:</p> <p>a. I am a qualified environmental professional, as defined in the Riparian Areas Protection Regulation made under the <i>Riparian Areas Protection Act</i>;</p> <p>b. I am qualified to carry out this part of the assessment of the development proposal made by the developer [REDACTED];</p> <p>c. I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and In carrying out my assessment of the development proposal, I have followed the assessment methods set out in the Minister's technical manual to the Riparian Areas Protection Regulation.</p>	
<p>7. Stormwater Management</p>	<p>Stormwater from the area of impervious surfaces outside the SPEA, will not be discharged directly into the lake or SPEA. Roof and driveway run-off will be directed, as they currently are, into connected City storm drains (see Figure 2).</p>
<p>I, <u>Mark Piorecky</u>, hereby certify that:</p> <p>a. I am a qualified environmental professional, as defined in the Riparian Areas Protection Regulation made under the <i>Riparian Areas Protection Act</i>;</p> <p>b. I am qualified to carry out this part of the assessment of the development proposal made by the developer [REDACTED];</p> <p>c. I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and In carrying out my assessment of the development proposal, I have followed the assessment methods set out in the Minister's technical manual to the Riparian Areas Protection Regulation.</p>	
<p>8. Floodplain Concerns (highly mobile channel)</p>	<p>The subject property is not located in an active floodplain, therefore flooding of the SPEA will not be an issue.</p>
<p>I, <u>Mark Piorecky</u>, hereby certify that:</p> <p>a. I am a qualified environmental professional, as defined in the Riparian Areas Protection Regulation made under the <i>Riparian Areas Protection Act</i>;</p> <p>b. I am qualified to carry out this part of the assessment of the development proposal made by the developer [REDACTED];</p> <p>c. I have carried out an assessment of the development proposal and my assessment is set out in this Assessment Report; and In carrying out my assessment of the development proposal, I have followed the assessment methods set out in the Minister's technical manual to the Riparian Areas Protection Regulation.</p>	

Section 5. Environmental Monitoring

A Qualified Environmental Professional (QEP) will be retained as project environmental monitor by the proponent. The focus of monitoring will be the protection of the SPEA and tree replacement planting. There will be a pre-construction meeting to communicate the importance of SPEA protection, along with tree protection and the erosion and sediment control plans with site personnel. Site inspection frequency will be timed to key construction activities in areas adjacent to and/or within the SPEA, and based on weather events (e.g. after periods of intense rainfall). The QEP will ensure that sediment and erosion control measures are functioning properly and protecting the SPEA. The monitor has the authority to halt construction activities if impacts to sensitive habitats are likely to occur.

A post-development report, outlining the degree of compliance with the above measures and reviewing the success of measures implemented during construction will also be produced and submitted on the RAPR database.

Section 6. Photos

Photo 1. Foreshore substrate and SPEA vegetation (looking SE) – Nov. 2, 2022.



Photo 2. Existing residence and access along SW side of property (looking E) – Nov. 2, 2022.



Photo 3. Close-up of existing residence and structures (looking SE) – Nov. 2, 2022.



Photo 4. Access along NE side of property (looking SE) – Nov. 2, 2022.



Photo 5. View of existing residence, carport and driveway from road side of house (looking NW) – Nov. 2, 2022.



Photo 6. Second view of existing residence, edge of carport and gravelled yard from road side of house (looking W) – Nov. 2, 2022.



Section 7. Professional Opinion**Assessment Report Professional Opinion on the Development Proposal's riparian area.**Date 1. I/We Mark Piorecky, R.P.Bio.

hereby certify that:

- a) I am/We are qualified environmental professional(s), as defined in the Riparian Areas Protection Regulation made under the *Riparian Areas Protection Act*;
- b) I am/We are qualified to carry out the assessment of the proposal made by the developer [REDACTED], which proposal is described in section 3 of this Assessment Report (the "development proposal"),
- c) I have/We have carried out an assessment of the development proposal and my/our assessment is set out in this Assessment Report; and
- d) In carrying out my/our assessment of the development proposal, I have/We have followed the specifications of the Riparian Areas Protection Regulation and assessment methodology set out in the minister's manual; AND

2. As qualified environmental professional(s), I/we hereby provide my/our professional opinion that:

- a) **N/A** the site of the proposed development is subject to undue hardship, (if applicable, indicate **N/A otherwise**) AND
- b) **X** the proposed development will meet the **riparian protection standard** if the development proceeds as proposed in the report and complies with the measures, if any, recommended in the report.

[NOTE: "Qualified Environmental Professional" means an individual as described in section 21 of the Riparian Areas Protection Regulation.]

Section 8. References

- Land and Water BC (LWBC). 2005. A Users Guide to Working in and Around Water. Regulation under British Columbia's Water Act. Revised May 2005.
<http://www.agf.gov.bc.ca/resmgmt/publist/500series/502000-1.pdf>
- Ministry of Environment Habitat Wizard website. 2018. Habitat Wizard. Accessed May 18, 2018.
<http://www.env.gov.bc.ca/habwiz/>
- Ministry of Environment, Lands and Parks (MOELP). 1996. Tree Replacement Criteria. B.C. Environment, Lower Mainland Region, Surrey, B.C. Pp. 1.
- Ministry of Water, Land and Air Protection (MWLAP). 2004. Standards and Best Practices for In Stream Works. WLAP BMP Series. 167 pp._
<http://wlapwww.gov.bc.ca/wld/documents/bmp/iswstdsbpsmarch2004.pdf>
- Okanagan Large Lakes Foreshore Protocol. 2018. BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Penticton, BC. Jan. 2018. 11 pp.
https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/standards-guidelines/best-management-practices/okanagan/okanagan_large_lakes_foreshore_protocol.pdf

Section 9. Appendices

Appendix 1 - Detailed Design Drawings (uploaded separately).

Appendix 2 – Contractor Letter Identifying Need for Roof Replacement and Repair.



Deep Creek Construction

#204, 116-5100 Anderson Way, Vernon, BC, V1T 0C4
250-241-4723
graham.deepcreek@gmail.com

Nov 24, 2022

Attention: Dora Anderson, Partner MQN Interiors Ltd.

Dear Mrs. Anderson,

As per your request, the following outlines our crew's review of roof damages observed at the subject property located on 8511 Okanagan Landing Road here in Vernon BC. We were engaged by property owners, [REDACTED] to explore & quote repair works required for their home. The owners noted to our crew that following a massive wind storm on or about January 12th 2021 that they woke to a loud bang and wind storm noises subsequently they noticed roofing materials had been pulled from the roof and were strewn on the yard. In the following week the Owners installed a tarp to avoid further damage but the tarps did not stay in place and further winds and water have resulted in extensive water damages to the roof trusses and the general roof assembly has been compromised. There was one section of the roof that appears to have had experienced a drop load which may have been from a falling tree limb as shown in the photo below. (figure 1.0) As one can see from figure 1.0 the existing roof was already well beyond its expected life and needed surface repair. Furthermore, deeper exploration has exposed that much further repair to roof trusses and structural members is required in order to return the roof to it's original state.

Our crews also noted that the existing roof shape and connecting design may have also led to some of the water damage as a result of pooling due to inadequate slopes and poor connections. The Owners mentioned that they had engaged MQN to explore alternative roof designs that could aid with this and our findings also support that this would be beneficial for the owners to explore since they need to replace the roof regardless so best to replace it with the most effective solution to avoid similar damages in future.



Figure 1.0

Thank you for your time,

Graham Kozlyk

Owner of Deep Creek Construction



THE CORPORATION OF THE CITY OF VERNON REPORT TO COUNCIL

SUBMITTED BY: Michael Olubiyi
Planner, Current Planning

COUNCIL MEETING: REG COW I/C
COUNCIL MEETING DATE: August 14, 2023
REPORT DATE: July 13, 2023
FILE: 3360-20 (ZON00394) / 3090-20 (DVP00597)

**SUBJECT: REZONING AND DEVELOPMENT VARIANCE PERMIT APPLICATIONS FOR 5311
20th STREET**

PURPOSE:

To review the applications to rezone the property at 5311 20th Street from A3: Rural Small Holdings to RH2: Stacked Row Housing Residential and to vary section of Zoning Bylaw 5000 in order to develop a 12-unit row houses in the Harwood Neighbourhood.

RECOMMENDATION:

THAT Council support Zoning Application 00394 (ZON00394) to rezone Lot 1, Plan 14021, Sec 11, TWP 8, ODYD, (5311 20th Street) from A3: Rural Small Holdings to RH2: Stacked Row Housing Residential as outlined in the report titled "Rezoning and Development Variance Permit Applications for 5311 20th Street" dated July 13, 2023 and respectfully submitted by the Current Planner;

AND FURTHER, that Council's support of ZON00394 is subject to the following:

- a) That prior to final adoption of the zoning amendment bylaw, the Development Permit be ready for issuance;

AND FURTHER, that Council hold a public hearing, pursuant to 464(2) of the *Local Government Act*, on a proposed bylaw to rezone Lot 1, Plan 14021, Sec 11, TWP 8, ODYD, (5311 20th Street) from A3: Rural Small Holdings to RH2: Stacked Row Housing Residential;

AND FURTHER, that Council be advised that Development Variance Permit Application 00597 (DVP00597) will be brought forward for Council's consideration and public input on the same date as the public hearing, to vary Zoning Bylaw 5000 for Lot 1, Plan 14021, Sec 11, TWP 8, ODYD (5311 20th Street), as follows:

- a) Section 9.13.6, by decreasing minimum side yard setback for portions of a building in excess of 2.5 storeys, from 6m to 2m on the subject property;

AND FURTHER, that issuance of DVP00597 is subject to the following:

- a) That the site plan, floor plan, building elevations and renderings illustrating the general siting, layout and dimensions of the proposed development (Attachment 1) in the report titled "Rezoning and Development Variance Permit Applications for 5311 20th Street" dated July 13, 2023 and respectfully submitted by the Current Planner, be attached to and form part of DVP00597 as Schedule 'A'.

Note: This allows the public to make representations to Council on the proposed bylaw.

ALTERNATIVES & IMPLICATIONS:

1. THAT Council support Zoning Application 00394 (ZON00394) to rezone Lot 1, Plan 14021, Sec 11, TWP 8, ODYD, (5311 20th Street) from A3: Rural Small Holdings to RH2: Stacked Row Housing Residential as outlined in the report titled “Rezoning and Development Variance Permit Applications for 5311 20th Street” dated July 13, 2023 and respectfully submitted by the Current Planner;

AND FURTHER, that Council’s support of ZON00394 is subject to the following:

- a) That prior to final adoption of the zoning amendment bylaw, the Development Permit be ready for issuance;

AND FURTHER, that Council not hold a public hearing, pursuant to 464(1) of the *Local Government Act*, on a proposed bylaw to rezone Lot 1, Plan 14021, Sec 11, TWP 8, ODYD, (5311 20th Street) from A3: Rural Small Holdings to RH2: Stacked Row Housing Residential;

AND FURTHER, that Council direct Administration to issue a public notice of initial readings and prepare a proposed bylaw to be brought forward for Council’s consideration at its Regular Meeting of XXXX, 2023 to rezone Lot 1, Plan 14021, Sec 11, TWP 8, ODYD, (5311 20th Street) from A3: Rural Small Holdings to RH2: Stacked Row Housing Residential;

AND FURTHER, that Council be advised that Development Variance Permit Application 00597 (DVP00597) will be brought forward for Council’s consideration and public input at its Regular Meeting of XXXX, 2023 to vary Zoning Bylaw 5000 for Lot 1, Plan 14021, Sec 11, TWP 8, ODYD, (5311 20th Street), as follows:

- a) Section 9.13.6, by decreasing minimum side yard setback for portions of a building in excess of 2.5 storeys, from 6m to 2m on the subject property;

AND FURTHER, that issuance of DVP00597 is subject to the following:

- a) That the site plan, floor plan, building elevations and renderings illustrating the general siting, layout and dimensions of the proposed development (Attachment 1) in the report titled “Rezoning and Development Variance Permit Applications for 5311 20th Street” dated July 13, 2023 and respectfully submitted by the Current Planner, be attached to and form part of DVP00597 as Schedule ‘A’.

2. THAT Council not support Zoning Application 00394 (ZON00394) to rezone to rezone Lot 1, Plan 14021, Sec 11, TWP 8, ODYD, (5311 20th Street) from A3: Rural Small Holdings to RH2: Stacked Row Housing Residential as outlined in the report titled “Rezoning and Development Variance Permit Applications for 5311 20th Street” dated July 13, 2023 and respectfully submitted by the Current Planner.

Note: This alternative does not support the rezoning and therefore, the development variance permit requests would not be applicable. This alternative would prevent the 12 units proposed development from moving ahead. Denial of the rezoning application inconsistent with the Official Community Plan designation for this land and would result in a significantly lower density of development on the property.

ANALYSIS:

A. Committee Recommendations:

At its meeting of July 18, 2023, the Advisory Planning Committee passed the following resolution:

“The Advisory Planning Committee recommends that Council.....”

B. Rationale:

1. The subject property is located at 5311 20th Street (Figures 1 and 2) and is approximately 1,821.15m² in area. The land is currently developed with a single family detached dwelling.
2. The application proposes to rezone the property from A3: Rural - Small Holdings (Attachment 1) to RH2: Stacked Row Housing Residential (Attachment 2) and to vary section of the Zoning Bylaw 5000 (minimum side yard setback for portions of the building > 2.5 storeys, from 6m to 2m) in order to construct a 12-unit row house development (Attachment 3).



Figure 1: Location Map

3. The land has been designated as Residential Medium Density (RMD) within the Official Community Plan (OCP), which could allow up to a maximum of 110 units per hectare (44.5 units/acre). The proposed RH2 zoning district complies with the RMD designation.

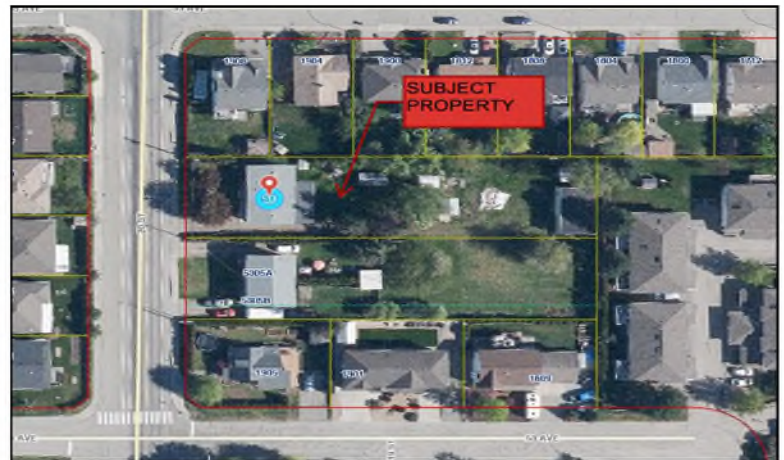


Figure 2: Aerial Photo

4. The existing zoning designation A3: Rural - Small Holdings only permits single detached housing as a form of residential use, while the proposed RH2 zoning district permits apartment housing, stacked row housing, major group home, care centre, and several types of seniors housing to be developed. Density within the RH2 zoning district is regulated using the unit per acre and allows up to a maximum density of 100 units per gross hectare (40.5 units/ acre) and 125 units per gross hectare (51 units/ acre) where parking spaces are provided completely beneath habitable space of a primary building or usable common amenity areas. Given the size of the subject property (1821.15m²), this site could be developed between 18 and 23 units with a parking density bonusing.

Table 1: Zoning Comparison – Residential Uses

	Existing A3	Proposed RH2
Housing Form	<ul style="list-style-type: none"> • Single detached housing 	<ul style="list-style-type: none"> • Apartment Housing • Row Housing • Stacked Row Housing • Group Home, Major • Seniors Housing • Seniors Assisted and Supportive Housing • Care Centres, Major

Max. Density	<ul style="list-style-type: none"> One (1) single detached house per lot 	<ul style="list-style-type: none"> 48 units/ha = 2 units/acre (40.5 units/ acre) 125 units/ha (51 units/acre) (Parking in Units) = 23 units
Proposed Density		<ul style="list-style-type: none"> 12 units

5. The table 2 below shows the surrounding land uses adjacent to the subject property.

Table 2: Surrounding Land Uses – Zoning & Actual Use

	Zoning	Actual Use
North	R3: Medium Lot Residential	Single Detached Housing, Lakefront
East	R5: Fourplex Housing Residential	Row Housing
South	A3: Rural Small Holdings	Single Detached Housing
West	R3: Medium Lot Residential	Single Detached Housing

6. The applicant intends to construct three 3-storey rowhouses on the subject property. Each rowhouse would contain four units (one 4-bedroom and three 3-bedroom), making a total of 12 units on the proposed zone. The development as proposed satisfy the minimum Zoning Bylaw 5000 development regulations, except for the side yard setback towards the north boundary of the property. Given the property width (21.34m), requiring a setback of 6m from both side yards, would make the proposed development impossible. Without approval of the variance, the lot would need to maintain a significantly lower density than what the OCP anticipated for the area.
7. The proposed variance would not excessively impact on the enjoyment of adjacent properties (north, east and south), or the essential character of the surrounding neighbourhood. The proposed 12 unit building would be fully fire sprinkler protected, there would be no parking and snow loading allowed on the south side of the drive aisle, and at the building permit stage, appropriate spatial separation would be determined as fire protection options.
8. The applicant has provided an engineer stamped turning radius drawing at the end of drive-aisle to allow for a smaller garbage truck to access the property for solid waste collection without backing out onto 20th Street (Attachment 4).
9. In support of the rezoning and variance applications, the applicant has provided a letter of rationale (Attachment 5).
10. Administration supports the proposed rezoning and variance requests for the following reasons:
 - a) The proposed rezoning to RH2 complies with the OCP land use of Residential Medium Density.
 - b) Rezoning to RH2 would allow development potential to a level that is envisioned for the area in the OCP. Without rezoning the property, the lot would have to maintain a significantly lower density than intended for the property.

- c) The proposed building would comprise of 12 units, consisting of three 4-bedroom units and nine 3-bedroom units which would add to the existing residential housing stock.
- d) The proposed rezoning to construct 12-unit rowhouses would promote infill development as a sustainable land use strategy and maximize the use of existing infrastructure within the neighbourhood district.
- e) The proposed minimum side yard setback from 6m to 2m would not negatively impact neighbours.
- f) The lot dimensions make it impractical to develop in strict conformity with the bylaw standards. Without approval of the variances, the lot would need to maintain a significantly lower density than what the OCP anticipated for the area

C. Attachments:

- Attachment 1 – A3: Rural Small Holdings
- Attachment 2 – RH2: Stacked Row Housing Residential
- Attachment 3 – Site Plan, Floor Plans and Building Elevations
- Attachment 4 – Turning Radius
- Attachment 5 – Rationale Letter
- Attachment 6 – Official Community Plan Map
- Attachment 7 – Current Zoning Map

D. Council's Strategic Plan Alignment:

- | | |
|---|--|
| <input type="checkbox"/> Governance & Organizational Excellence | <input checked="" type="checkbox"/> Livability |
| <input type="checkbox"/> Recreation, Parks & Natural Areas | <input checked="" type="checkbox"/> Vibrancy |
| <input type="checkbox"/> Environmental Leadership | <input type="checkbox"/> Not Applicable |

E. Relevant Policy/Bylaws/Resolutions:

1. The Official Community Plan (OCP) Bylaw 5470 designates the property as Residential Medium Density and the requested RH2: Stacked Row Housing Residential zoning district conforms to this OCP designation.
 - Supporting OCP policies include:
 - Policy 7.3 Support the development of designated multiple family areas to the densities outlined in the OCP to build compact, complete neighbourhood areas within the community and to achieve the maximum use of municipal infrastructure.
 - Development District – 2 Neighbourhood
2. Zoning Bylaw 5000:
 - Sec. 9.13 RH2: Stacked Row Housing Residential
3. *Local Government Act:*
 - Division 3 – Public Hearings on Planning and Land Use Bylaws
 - Sec. 464 – Requirement for public hearing before adopting bylaw

A local government is not required to hold a public hearing on a proposed rezoning bylaw if an OCP is in effect for the area that is the subject of the zoning bylaw and the bylaw is consistent with the OCP.

BUDGET/RESOURCE IMPLICATIONS:

N/A

FINANCIAL IMPLICATIONS:

- None
- Budget Previously Approved
- New Budget Request
(Finance Review Required)

Prepared by:

Approved for submission to Council:

X _____
 Michael Olubiya
 Current Planner

 Patricia Bridal, CAO

Date: _____

X _____
 Roy Nuriel
 Acting General Manager, Planning

REVIEWED WITH

- | | | |
|--|---|---|
| <input type="checkbox"/> Corporate Services | <input type="checkbox"/> Operations | <input checked="" type="checkbox"/> Current Planning |
| <input type="checkbox"/> Bylaw Compliance | <input type="checkbox"/> Public Works/Airport | <input type="checkbox"/> Long Range Planning & Sustainability |
| <input type="checkbox"/> Real Estate | <input type="checkbox"/> Facilities | <input type="checkbox"/> Building & Licensing |
| <input type="checkbox"/> RCMP | <input type="checkbox"/> Utilities | <input type="checkbox"/> Engineering Development Services |
| <input type="checkbox"/> Fire & Rescue Services | <input type="checkbox"/> Recreation Services | <input type="checkbox"/> Infrastructure Management |
| <input type="checkbox"/> Human Resources | <input type="checkbox"/> Parks | <input type="checkbox"/> Transportation |
| <input type="checkbox"/> Financial Services | | <input type="checkbox"/> Economic Development & Tourism |
| <input checked="" type="checkbox"/> COMMITTEE: APC (Jul.18/23) | | |
| <input type="checkbox"/> OTHER: | | |

G:\3000-3699 LAND ADMINISTRATION\3360 ZONING AND REZONING\20 Applications\ZON00394\2 PROC\Rpt\APC Report\230713_mo_APC Rpt_ZON00394_DVP00597.docx

A3**8.3 A3 : Rural – Small Holdings****8.3.1 Purpose**

The purpose is to provide a **zone** for rural areas and agricultural **uses**, as well as other complementary **uses** suitable in a rural setting. The A3c sub-zoning district allows for **care centre, major** as an additional use. *(Bylaw 5467)*

8.3.2 Primary Uses

- **agriculture**
- **animal clinics, major**
- **animal clinics, minor**
- **aquaculture**
- **campsites, tourist**
- **care centre, major** *(use is only permitted with the A3c sub-zoning district)*
- **emergency protective services**
- **farmers' market**
- **golf courses**
- **greenhouses and plant nurseries**
- **guide and tour services**
- **single detached housing**
- **stables and riding academies**
- **utility services, minor impact**
- **zoo or botanical gardens**

8.3.3 Secondary Uses

- **agricultural or garden stands**
- **agricultural dwellings, additional**
- **bed and breakfast homes** (in single detached housing only) **or agri-tourist accommodation**
- **boarding rooms** *(Bylaw 5440)*
- **brewing or distilling, Class A**
- **care centres, minor**
- **home based businesses, rural**
- **home based businesses, minor**
- **home based businesses, major**
- **kennels**
- **second kitchens**
- **secondary suites** *(Bylaw 5715)*
- **wineries and cideries**

8.3.4 Subdivision Regulations

- Minimum **lot width** is 24.0m
- Minimum **lot area** is 2.0ha (5 acres)

8.3.5 Development Regulations

- The maximum **site coverage** is 10% for residential **development**, and it is 35% for agricultural **structures** except it may be increased to 75% for greenhouses with closed wastewater and storm water management systems.
- The maximum **height** is 9.5m, except it is 13.0m for **secondary buildings** and 16.0m for agricultural **structures**.

- The minimum **front yard** is 6.0m.
- The minimum **side yard** is 3.0m, except it is 6.0m from a **flanking street**.
- The minimum **rear yard** is 10.0m, except it is 3.0m for **secondary buildings**.
- No more than one residential unit per lot.
- **Buildings** housing more than 4 animals, used for **processing animal products** or for **agriculture** and **garden stands** shall be located no closer than 15.0m to any **lot line**, except no closer than 30.0m to a **lot** in **residential zones**.

8.3.6 Other Regulations

- Farm and **animal products processing** is allowed provided that a minimum of 50% of the products are produced on-site.
- When a **home based business** of any type involves the cutting and wrapping of wild game and/or the butchering of domestic meat, the **lot** must have a minimum **lot area** greater than 0.33ha (0.6 acre).
- Single wide **mobile homes** shall not be located on **lots** smaller than 2.0ha (5 acres) and double wide **mobile homes** shall not be located on **lots** smaller than 0.8ha (2 acres).
- **Major animal clinics** or **kennels** as well as **stables** and **riding academies** shall not be located on parcels less than 2.0ha (5 acres).
- **Agricultural and garden stands** selling produce grown on the **site** or another **site** operated by the same producer do not have a maximum area. The maximum **gross floor area** of stands selling produce that is produced off-site shall be 50.0m². For **sites** within the **Agricultural Land Reserve**, the maximum **gross floor area** of **agricultural and garden sales** for produce off-site shall be lesser of 33% of the total floor area of the **agricultural or garden stand** or 50.0m².
- Retail sales and other **uses** are subject to the *BC Agricultural Land Commission Act* and regulations where in the **ALR**.
- **Agri-tourist accommodation** shall not be located on **lots** smaller than 2.0ha (5 acres) and shall not exceed 10 bedrooms, campsites or recreational **vehicle** pads.
- In addition to the regulations listed above, other regulations may apply. These include the general **development** regulations of Section 4 (secondary **development**, **yards**, projections into **yards**, lighting, agricultural setbacks, etc.); the specific **use** regulations of Section 5; the **landscaping** and fencing provisions of Section 6; and, the parking and loading regulations of Section 7. Lands within the **ALR** may also be affected by additional regulations of the *Agricultural Land Commission*.
- As per Section 4.10.2 - All **buildings** and **structures**, excluding **perimeter fencing (garden walls and fences)** on **lots abutting** City Roads as identified on Schedule "B" shall not be sited closer to the City Road than the setback as per the appropriate zone measured from the offset Rights of Way as illustrated on Schedule "B".
(Bylaw 5440)

RH2

9.13 RH2 : Stacked Row Housing Residential

9.13.1 Purpose

The purpose is to provide a **zone** primarily for medium **density row housing** on urban services to front major **streets** and civic spaces.

9.13.2 Primary Uses

- **apartment housing**
- **care centres, major**
- **group home, major**
- **row housing**
- **seniors assisted housing**
- **seniors housing**
- **seniors supportive housing**
- **stacked row housing**

9.13.3 Secondary Uses

- **health services**
- **home based businesses, minor**
- **personal services**
- **real estate sales centres** (in apartment and stacked row housing only)
- **retail, convenience** *(Bylaw 5332)*

9.13.4 Subdivision Regulations

- Minimum **lot width** is 30.0m. For fee simple **row housing**, the minimum **lot width** is 7.5m for **interior lots** and 12.0m for **corner lots**.
- Minimum **lot area** is 1400m², or 10,000m² if not serviced by a **community sewer system**.

9.13.5 Party Wall Subdivision Regulations

Lot Type	Minimum Lot area		Minimum Lot width	
	interior	corner	interior	corner
Row Housing	135m ²	185m ²	6.5m	7.8m

9.13.6 Development Regulations

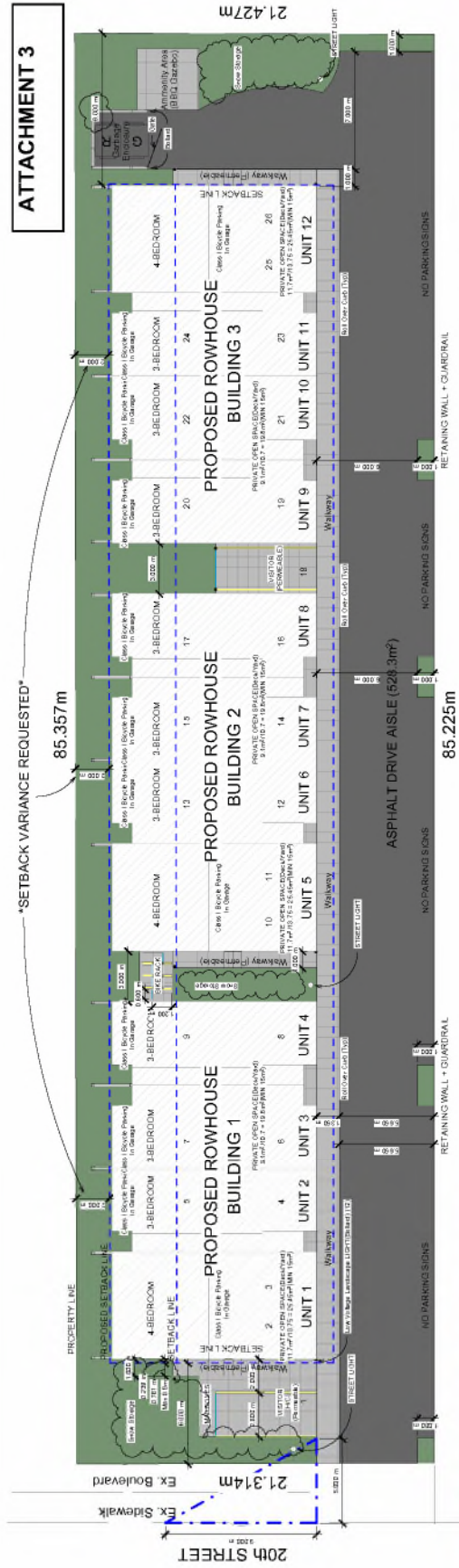
- With a housing agreement pursuant to Section 4.9, the maximum **density** shall be 110.0 units per gross hectare (44.5 units/gross acre).
- Where **parking spaces** are provided completely beneath habitable space of a primary **building** or beneath useable common amenity areas, providing that in all cases the **parking spaces** are screened from view, the maximum **density** shall be 125.0 units per gross hectare (51 units/gross acre). Where all the required parking is not accommodated completely beneath the habitable space of a primary **building** or useable common amenity areas, the additional density permitted shall be determined through multiplying the additional 25.0 units per gross hectare (10 units/gross acre) by the percentage of parking proposed to be provided beneath habitable space of a primary **building** or useable common amenity areas.
- Maximum **site coverage** is 65% and together with driveways, parking areas and **impermeable surfaces** shall not exceed 75%. *(Bylaw 5332)*

- Maximum **height** is 16.5m, except it is 4.5m for **secondary buildings** and **secondary structures**.
- Minimum **front yard** is 6.0m, except it is 4.5m for any portion **2 storeys** or less.
- Minimum **side yard** is 3.0m for a **building** not over **2.5 storeys**, and 6.0m for portions of a **building** in excess of **2.5 storeys**, and 6.0m from a **flanking street**. The minimum **side yard** is 0.0m for shared interior **party walls**.
- Minimum **rear yard** is 7.5m for a **building** not over **2.0 storeys** and it is 9.0m for any part of a **building** over **2 storeys**. It is 1.0m for **secondary buildings**.
- Maximum **density** is 100.0 units per gross hectare (40.5 units/gross acre).

9.13.7 Other Regulations

- **Convenience retail services, health services and personal services** are limited to a maximum floor area of 300m² total or 50% of the gross floor area of the ground storey of the primary building, whichever is the lesser, and only permitted when developed as an integral component of and within the primary **building**. These uses are not permitted above the ground **storey**. *(Bylaw 5332)*
- In order for bareland strata **development** to be consistent with the character of the surrounding neighborhood, the strata plan shall be considered as one **site** for defining the overall use, **density** and **site coverage**.
- For multi-unit residential housing, one **office** may be operated for the sole purpose of the management and operation of the multi-unit residential **development**. *(Bylaw 5440)*
- Vehicular access to the **development** is only permitted through either a driveway shared by at least 3 units or a rear **lane**.
- A minimum area of 5,0m² of private open space shall be provided per **bachelor dwelling, congregate housing bedroom** or group home **bedroom**, 10.0m² of private open space shall be provided per 1 **bedroom dwelling**, and 15.0m² of private open space shall be provided per **dwelling** with more than 1 **bedroom**.
- No continuous **building frontage** shall exceed 45.0m for a 2 to 4 **storey building**. The **building** must be designed so as to be within one **storey** to neighbouring **development**.
- Parking shall not be constructed in the **front yard** of the property. Where the **development** has access to a rear **lane**, vehicular access to the **development** is only permitted from the rear **lane**.
- For **seniors assisted housing, seniors housing and seniors supportive housing**, a safe drop-off area for patrons shall be provided on the **site**.
- In addition to the regulations listed above, other regulations may apply. These include the general **development** regulations of Section 4 (secondary **development, yards**, projections into **yards**, lighting, agricultural setbacks, etc.); the specific use regulations of Section 5; the **landscaping** and fencing provisions of Section 6; and, the parking and loading regulations of Section 7. *(Bylaw 5339)*
- As per Section 4.10.2 - All **buildings and structures, excluding perimeter fencing (garden walls and fences)** on **lots abutting** City Roads as identified on Schedule "B" shall not be sited closer to the City Road than the setback as per the appropriate zone measured from the offset Rights of Way as illustrated on Schedule "B". *(Bylaw 5440)*

ATTACHMENT 3



** PROJECT to adhere to CPTED Standards where at all possible. Refer to CPTED Guide: www.BCHousing.org



**CURRENT ZONING - A3 - VERNON
PROPOSED ZONING - RH2 - VERNON**

RH2 Setbacks:
Front: 6.0m
Side: 6.0m (<2.5 Storey)
Rear: 9.0m (<2 Storey)
 Variance Requested on North Setback from 6m to 2m

Density Allowed: 51 Units/Acre (Parking in Units)
 1821.15m² = 0.45 Acres = 23 Units
Density Proposed: 12 Units

Coverage:
 Site Area: 19619.33sf (1822.69m²)
 Buildings: 3 @ 2770sf = 8310sf (772.02m²) = **42.4% (65% Max.)**
 Driveway: 5686sf (528.3m²) = **29.0%**
Total Coverage: 13996sf (1300.3m²) = 71.3% (75% Max.)
 Landscaping: 5623.33(522.4m²) = 28.7%

Building Designation: Row Housing 3-Storey

Parking Required:
 3 - Four Bedroom Units + 9 - Three Bedroom Units = 12 Units @ 2 Parking Spaces/Unit = **24 Spaces**
 100% in Garages

Visitor Parking: 1 Space/7 Units = **2 Spaces**
Parking Required: 26 Spaces
Parking Provided: 26 Spaces = 100%

Bicycle Parking (Type II): 0.5 Spaces/Unit = 12 Units X 0.5 = 6 Spaces Provided
 Bicycle Parking (Type I) 1 Space/Unit (in Garage) = 12 Spaces Provided

Date	Jan 1, 2022
Drawn By	9/20/2021
Project No.	11-1012
Scale	A1





250.507.0819 - 925Rdesign.com
 925R Design Inc.
 1000 Burrhead Blvd, Suite 200
 Richmond, BC V6V 2Y2
 DEVELOPMENT PERMIT: DCC 512022
 PRELIMINARY PLAN: 10411-1002

5311 20th Street
 Vernon
 ROWHOUSE

Cover Sheet

Date	Jan 1, 2022
Drawn By	ML
Project No.	925R-D-21113
Scale	1/4" = 1'-0"
	A0

GENERAL NOTES:

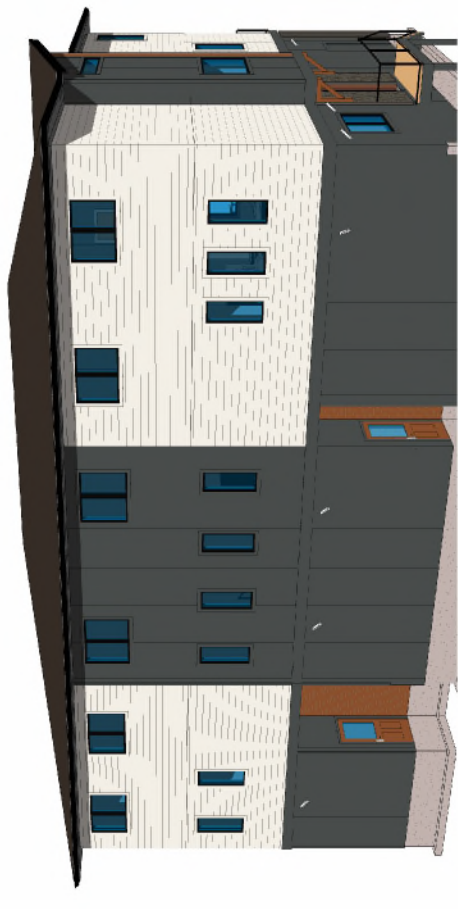
1. Review the site plan, floor plans, and all other documents for compliance with the BC Building Code, 2024 Edition. Check all dimensions and details for accuracy.
2. All work shall be done in accordance with the BC Building Code, 2024 Edition.
3. All materials shall be of the highest quality and approved by the BC Building Code, 2024 Edition.
4. All work shall be done in accordance with the BC Building Code, 2024 Edition.
5. All work shall be done in accordance with the BC Building Code, 2024 Edition.
6. All work shall be done in accordance with the BC Building Code, 2024 Edition.
7. All work shall be done in accordance with the BC Building Code, 2024 Edition.
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11. All work shall be done in accordance with the BC Building Code, 2024 Edition.
12. All work shall be done in accordance with the BC Building Code, 2024 Edition.
13. All work shall be done in accordance with the BC Building Code, 2024 Edition.
14. All work shall be done in accordance with the BC Building Code, 2024 Edition.
15. All work shall be done in accordance with the BC Building Code, 2024 Edition.
16. All work shall be done in accordance with the BC Building Code, 2024 Edition.
17. All work shall be done in accordance with the BC Building Code, 2024 Edition.
18. All work shall be done in accordance with the BC Building Code, 2024 Edition.
19. All work shall be done in accordance with the BC Building Code, 2024 Edition.
20. All work shall be done in accordance with the BC Building Code, 2024 Edition.

Type Mark	Family	Door Schedule	Type	Count
1	Door-Exterior-Single-Entry-Half-Fill	30" x 80"	4	
2	Door-Exterior-Double-Entry-Half-Fill	32" x 80"	3	
3	Overhead-Benchmarks w/windows	16" x 110"	3	
4	Overhead-Benchmarks w/windows	16" x 110"	3	
5	Single-Flush	30" x 80"	4	
6	Single-Flush	30" x 80"	4	
7	Double-Flush	48" x 80"	3	
8	Double-Flush	48" x 80"	3	
9	Single-Flush	30" x 80"	4	
10	Panel Door	30" x 80"	1	
11	Panel Door	30" x 80"	1	
12	Panel Door	30" x 80"	1	
13	Panel Door	30" x 80"	1	
14	Panel Door	30" x 80"	1	
15	Panel Door	30" x 80"	1	
16	Panel Door	30" x 80"	1	
17	Panel Door	30" x 80"	1	
18	Panel Door	30" x 80"	1	
19	Panel Door	30" x 80"	1	
20	Panel Door	30" x 80"	1	

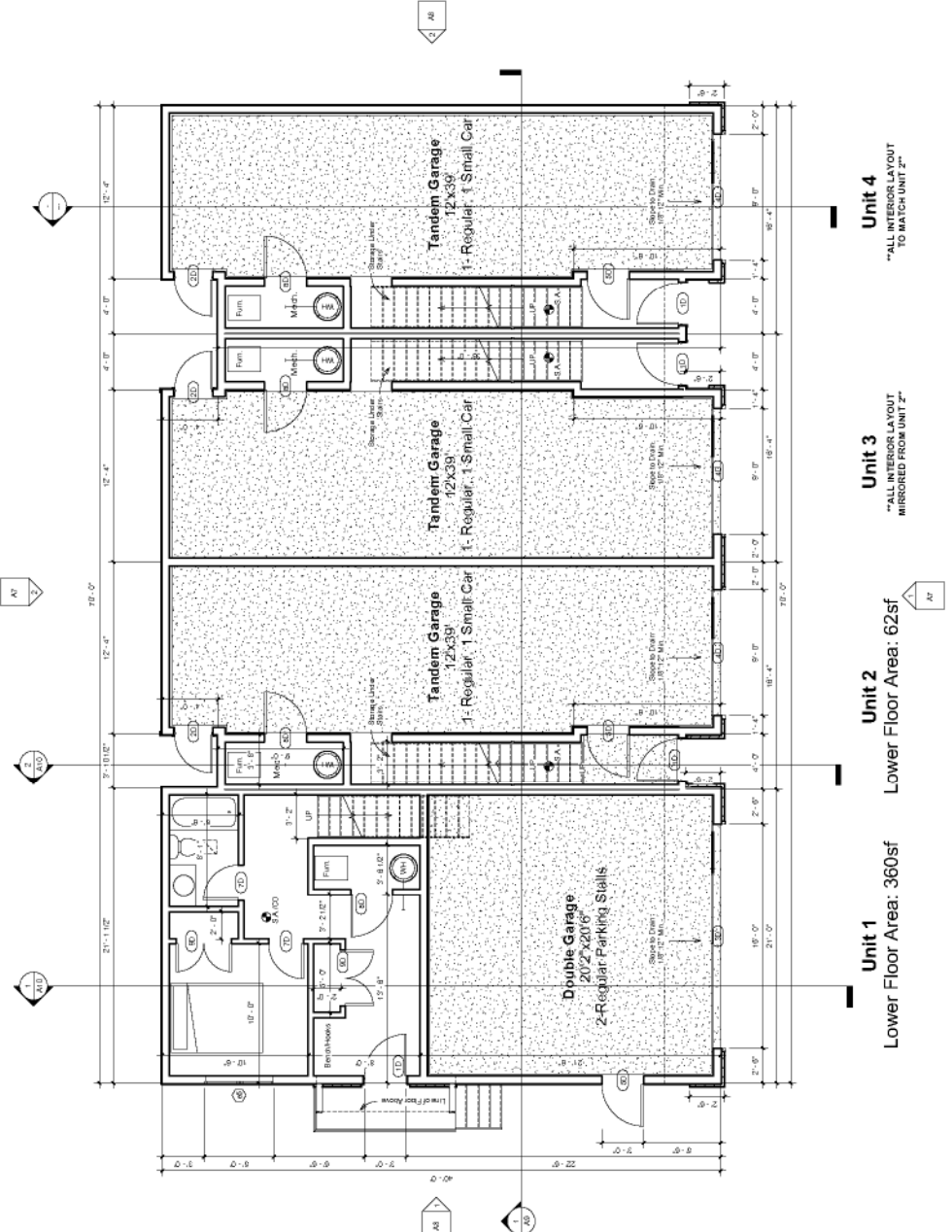
Type Mark	Family and Type	Count
1	Picture-Slide-Casement w Trim - Special - 108" x 80"	1
2	Picture-Slide-Casement w Trim - Special - 72" x 80"	1
3	Picture-Slide-Casement w Trim - Special - 72" x 80"	1
4	Picture-Slide-Casement w Trim - Special - 72" x 80"	1
5	Picture-Slide-Casement w Trim - Special - 72" x 80"	1
6	Picture-Slide-Casement w Trim - Special - 72" x 80"	1
7	Picture-Slide-Casement w Trim - Special - 72" x 80"	1
8	Picture-Slide-Casement w Trim - Special - 72" x 80"	1
9	Picture-Slide-Casement w Trim - Special - 72" x 80"	1
10	Picture-Slide-Casement w Trim - Special - 72" x 80"	1
11	Picture-Slide-Casement w Trim - Special - 72" x 80"	1
12	Picture-Slide-Casement w Trim - Special - 72" x 80"	1
13	Picture-Slide-Casement w Trim - Special - 72" x 80"	1
14	Picture-Slide-Casement w Trim - Special - 72" x 80"	1
15	Picture-Slide-Casement w Trim - Special - 72" x 80"	1
16	Picture-Slide-Casement w Trim - Special - 72" x 80"	1
17	Picture-Slide-Casement w Trim - Special - 72" x 80"	1
18	Picture-Slide-Casement w Trim - Special - 72" x 80"	1
19	Picture-Slide-Casement w Trim - Special - 72" x 80"	1
20	Picture-Slide-Casement w Trim - Special - 72" x 80"	1



① South West View



② North East View



Unit 4

**ALL INTERIOR LAYOUT
TO MATCH UNIT 2**

Unit 3

**ALL INTERIOR LAYOUT
MIRRORED FROM UNIT 2**

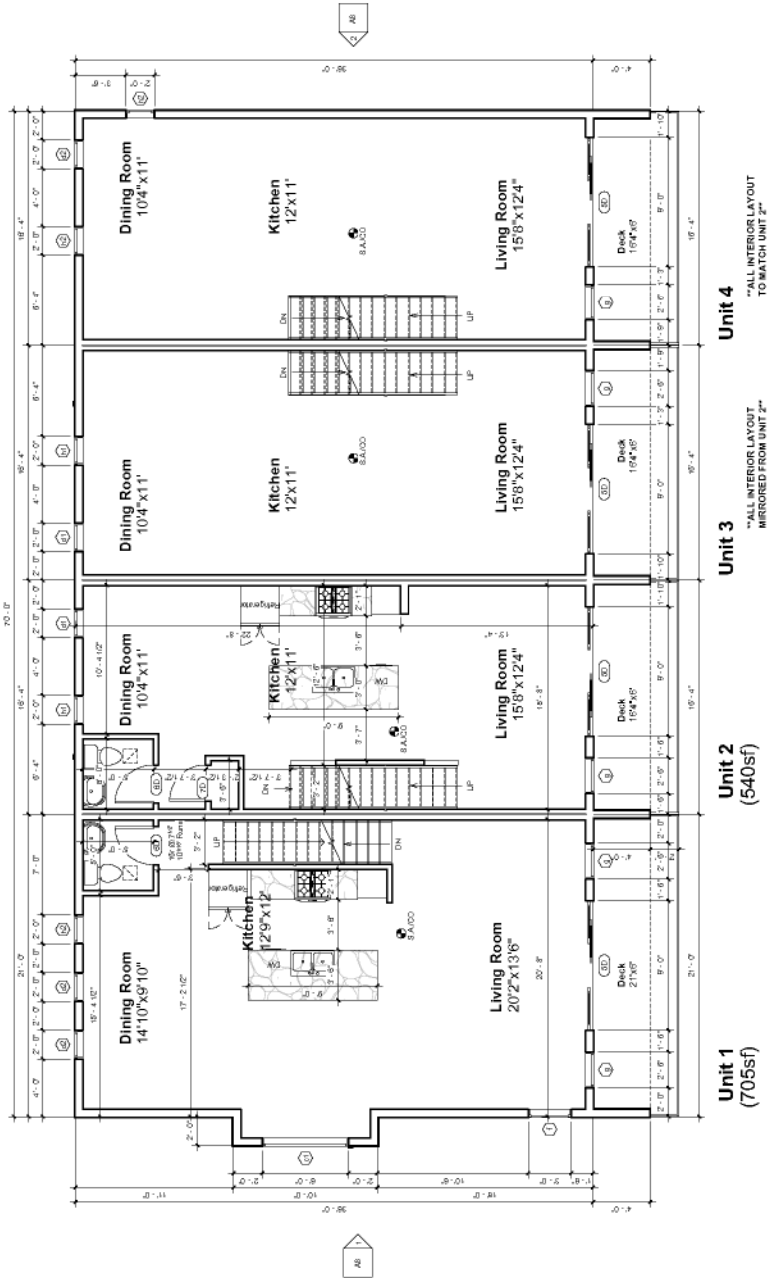
Unit 2

Lower Floor Area: 622sf

Unit 1

Lower Floor Area: 360sf

TOTAL FOOTPRINT: 2770sf

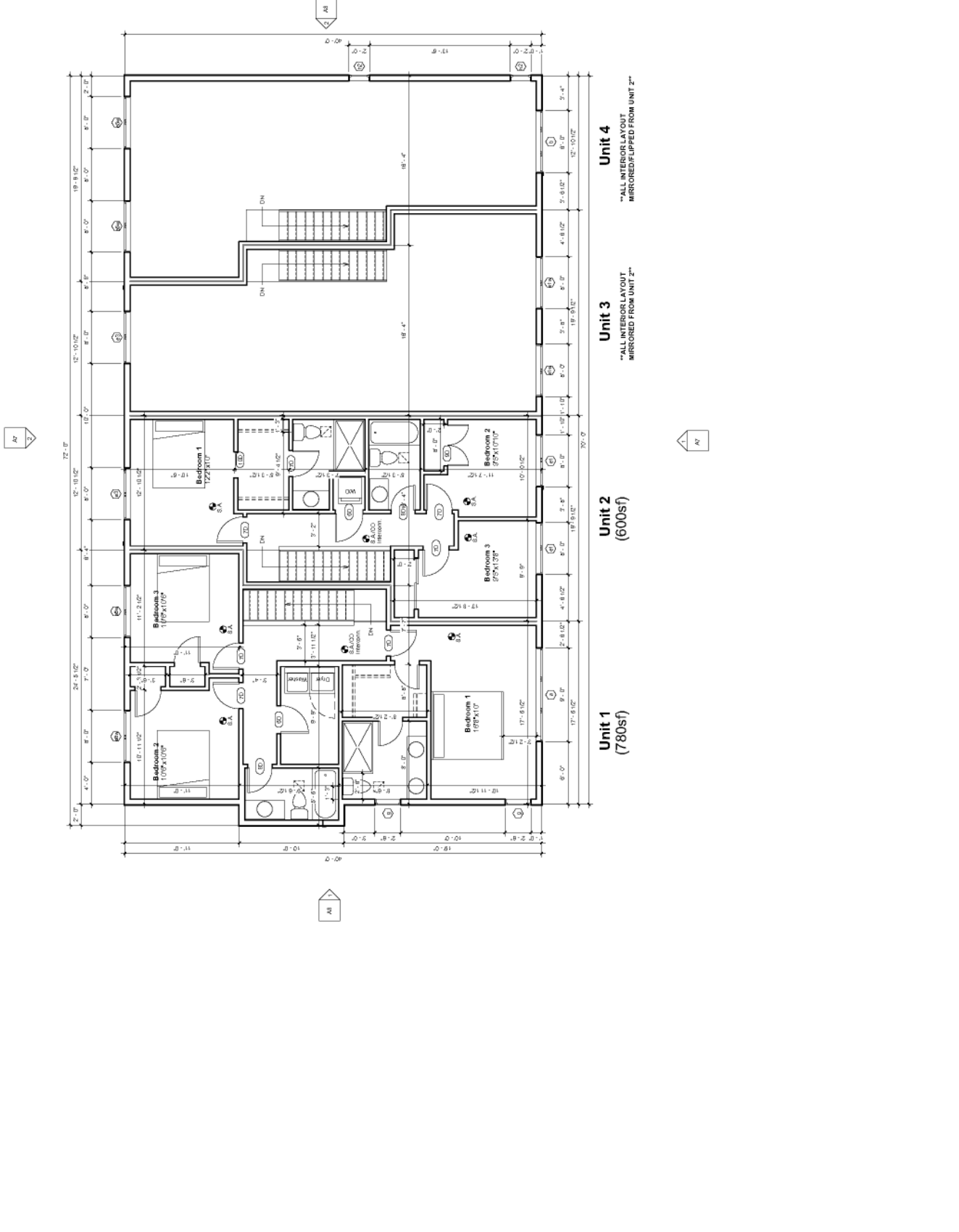


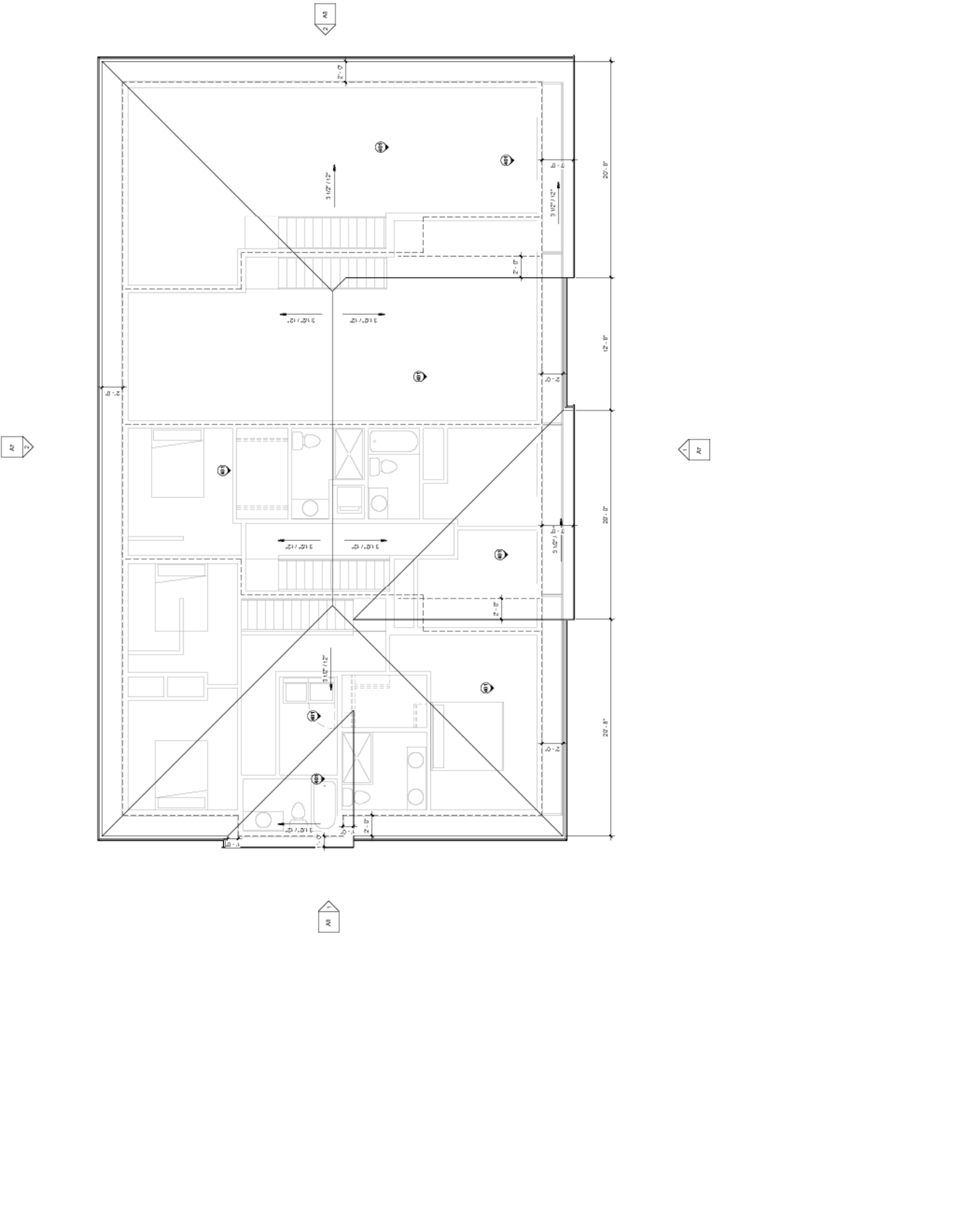
Unit 4
"ALL INTERIOR LAYOUT
TO MATCH UNIT 2"

Unit 3
"ALL INTERIOR LAYOUT
MIRRORED FROM UNIT 2"

Unit 2
(540sf)

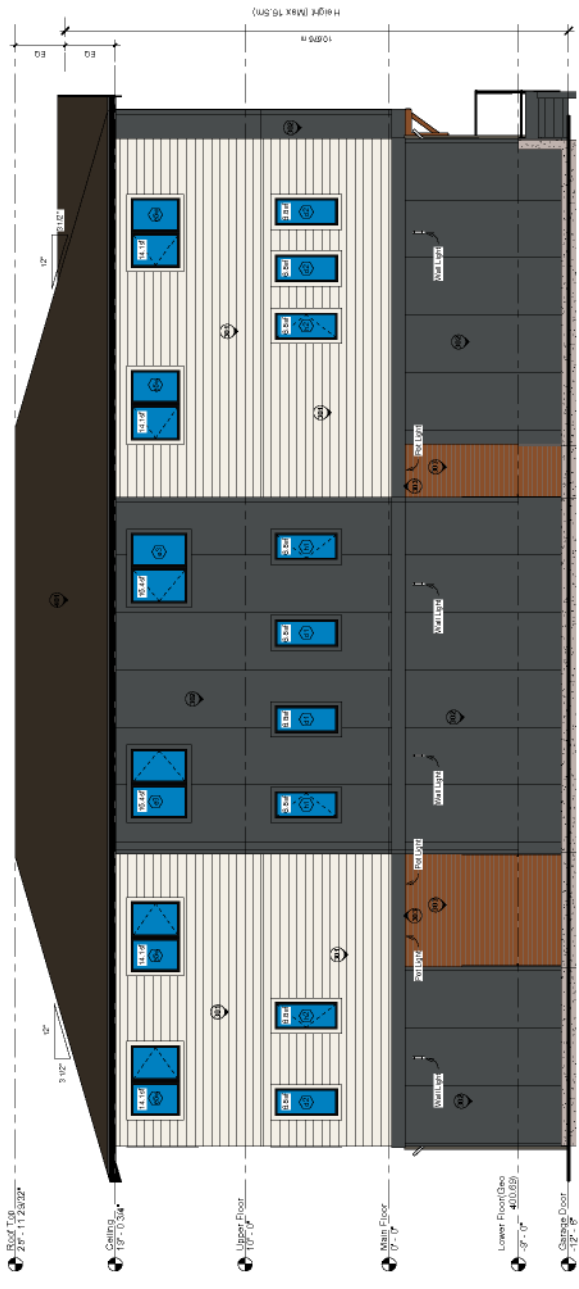
Unit 1
(705sf)







① South
 1/4" = 1'-0"



② North
 1/4" = 1'-0"

Door Schedule

Type Mark	Family	Type	Count
1	Door-Exterior-Single-Entry-Half Flat	30" x 8'0"	4
2	Door-Exterior-Single-Entry-Half Flat	32" x 8'0"	3
3	Overhead Sectional w windows	16" x 1'0"	1
4	Overhead Sectional w windows	9" x 1'0"	3
5	Single Flush	30" x 8'0"	11
6	Single Flush	32" x 8'0"	4
7	Single Flush	30" x 8'0"	12
8	Double Flush	26" x 8'0"	4
9	Double Flush	46" x 8'0"	3
10	Pocket Door	30" x 8'0"	1
11	Sliding-Glass	60" x 8'0"	1
12	Opening - Square	30" x 8'0"	3
Grand Total: 50			

Window Schedule

Type Mark	Family and Types	Count	
a	Picture Sides Casements w Trim - Sashes	10'0" x 6'0"	1
b	Picture Sides Casements w Trim - Sashes	22" x 6'0"	1
c1	Fixed with Trim: 22" x 4'6"	2	
c2	Fixed with Trim: 22" x 4'6"	1	
d1	Fixed with Trim: 24" x 5'4"	2	
d2	Fixed with Trim: 24" x 5'4"	3	
e4	Fixed with Trim: 30" x 2'4"	3	
f4	Fixed with Trim: 30" x 2'4"	6	
g1	Casement Double w Trim: 6'0" x 6'0" White Trim	2	
g2	Casement Double w Trim: 6'0" x 6'0" White Trim	2	
h5	Casement Double w Trim: 6'0" x 4'2"	1	
i	Casement with Trim: 20" x 6'0"	1	
j	Casement with Trim: 20" x 6'0"	2	
k	Casement with Trim: 24" x 5'4"	2	
l2	Casement with Trim: 24" x 5'4"	5	
Grand Total: 38			

Spacial Separation Calculation:
 Wall Area: 8744ft² (774 ft²)
 Area of Openings: 1483sf = 8%
 Allowable Openings: 1483sf = 8%
 Proposed Openings: 1477sf = 7.88%

COLOUR BOARD

(301) James Hardie Arctic White - Plank



*BLACK - Aluminium & Glass Guardrail, Gutters/Downspouts, Windows and Doors, Fascia

(302) James Hardie Iron Gray - Panel



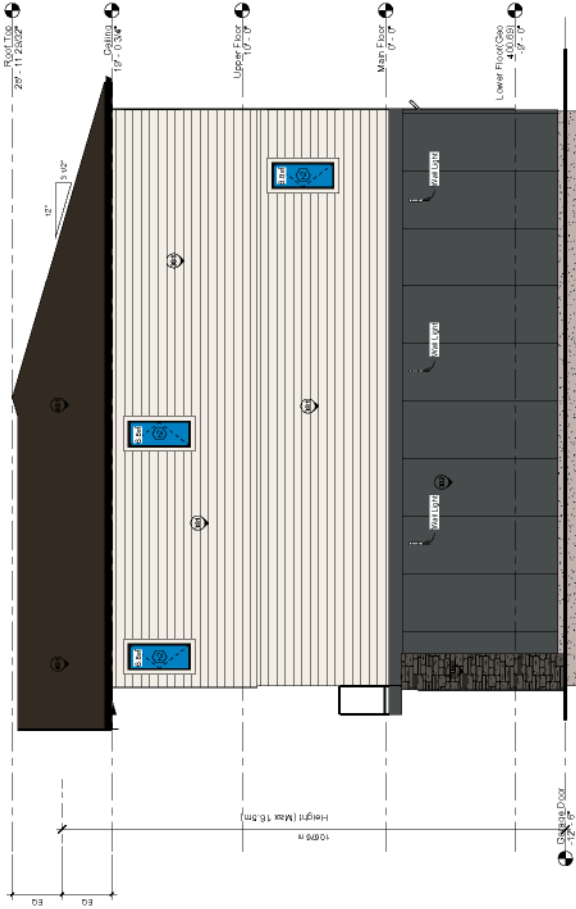
(303) Lux Siding Knotty Teak - V-Groove Plank



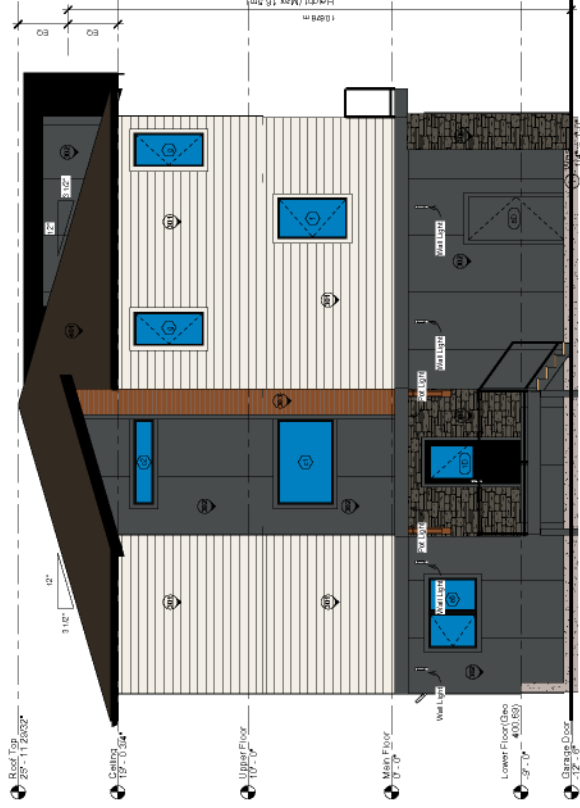
(306) Cultured Stone Umber Creek - Country Ledgestone



(401) IKO - Asphalt Roof Shingles Charcoal Grey - Cambridge



Spacial Separation Calc. (See Note 1)
 Max. Spacing: 14" = 1'-0"
 Allowable Opening: 8% = 30.00ft
 Proposed Opening: 13.6ft = 1.7%



Type Mark	Family and Type	Count
a	Porous-Side Casements w Trim - spacial: 108" x 60"	1
b	Porous-Side Casements w Trim - spacial: 12" x 60"	1
c1	Fixed with Trim: 72" x 48"	1
c2	Fixed with Trim: 72" x 18"	2
d1	Fixed with Trim: 24" x 54"	3
d2	Fixed with Trim: 24" x 54"	3
e1	Fixed with Trim: 36" x 24" x 60"	3
e2	Fixed with Trim: 36" x 24" x 60"	3
f1	Casement DB w Trim: 60" x 60"	2
f2	Casement DB w Trim: 60" x 48"	2
f3	Casement DB w Trim: 60" x 48"	1
f4	Casement DB w Trim: 36" x 60"	1
f5	Casement with Trim: 36" x 60"	1
f6	Casement with Trim: 36" x 60"	1
f7	Casement with Trim: 24" x 54"	2
Grand total: 38		

Type Mark	Family	Type	Count
1	Door Exterior Single-Entry-Half Flat	108" x 60"	4
2	Glass-Wood_Grad	108" x 60"	3
3	Door-Exterior-Single-Entry-Half Flat	108" x 108"	1
4	Door-Exterior-Single-Entry-Half Flat	108" x 108"	1
5	Double-Flush	60" x 60"	11
6	Double-Flush	60" x 60"	12
7	Double-Flush	60" x 60"	3
8	Double-Flush	60" x 60"	3
9	Double-Flush	60" x 60"	1
10	Double-Flush	60" x 60"	1
11	Double-Flush	60" x 60"	3
12	Double-Flush	60" x 60"	3
Grand total: 50			

5311 20th Street
 Vernon
 ROWHOUSE

East/West
 Elevations

Date: Jun 1, 2022
 Drawn by: [Name]
 Project No.: 22RHOJ21113
 Scale: 1/4" = 1'-0"

A8



To: The City of Vernon

Design Rationale for 5311 20th Street.

-5311 20th Street, Vernon BC is in a prime location for redevelopment. The current City of Vernon Zoning is A3 but NOT in the ALR. We're requesting the Zoning to be changed from A3 - RH2 (similar to the zoning of 4602 20th Street) to allow for the construction of Three 3-Storey Rowhouses - Each Rowhouse having 4 Units/Building for a Total of 12 Units. RH2 Zoning would allow for 23 Units, we are proposing 12.

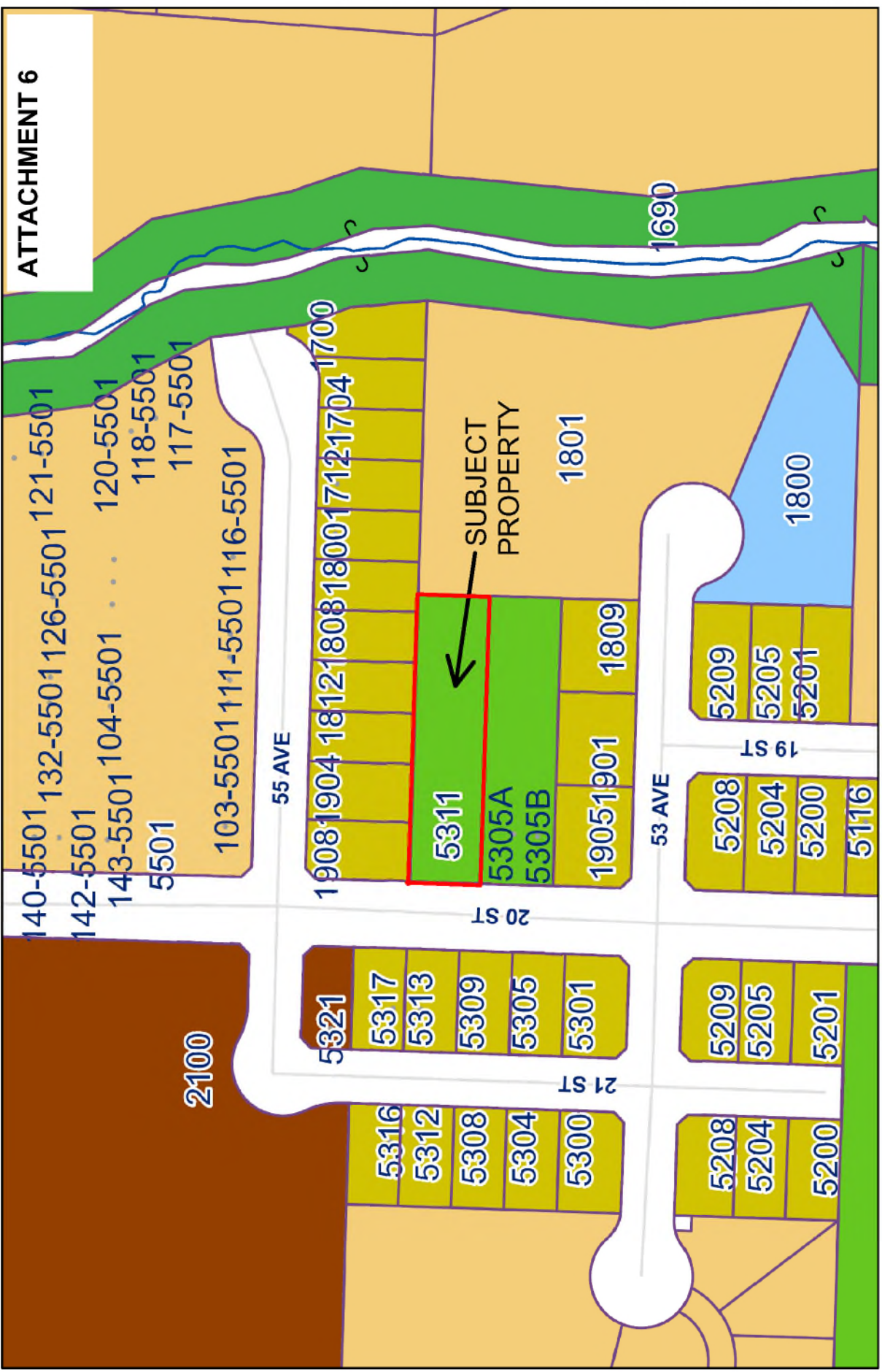
-We are requesting ONE Variance to the Zoning bylaw which is the North Side setback (Side Yard) from 6m to 2m to allow for the buildings to be well designed. The Property is 21.34m Wide, so if we lost 6m from both side yards, the building would only be 9.34m(30') Wide. Which would NOT be feasible.

- The Project consists of Three - 4 Unit Rowhouses. Each Rowhouse has ONE 4 Bedroom / 3.5 Bathroom Unit and THREE - 3 Bedroom / 2.5 Bathroom Units.

Please feel free to contact me for any additional information.

Matt Lunde
925R Design Inc.
www.925rdesign.com
matt@925rdesign.com
p.250.503.3000
c.250.307.6818

ATTACHMENT 6



Zoning Legend

Zoning Polygons

- RESIDENTIAL
- COMMERCIAL
- INDUSTRIAL
- AGRICULTURAL
- PARKS & OPEN SPACE
- UTILITY
- PRIVATE INSTITUTIONAL
- OUTDOOR
- PRIVATE PARK
- RECREATIONAL WATER USE
- CAROL USE CONTRACTS

0 25 50
Meters





Photo 1: Taken from Peregrine Way between Proposed Units 7 & 13, facing north



Photo 2: Proposed site for Units 16 & 17, taken from Peregrine Way facing west



Photo 3: Taken from Kestrel Place between Proposed Units 1 & 8, facing south



Photo 4: Proposed site for Units 14 & 15, taken from Kestrel Place facing north

SITE SPECIFIC INFORMATION

ZONE: RS
 CITY: VERNON
 LEGAL DESCRIPTION: Lot B Proj: 6495598 District Lot: 2971 Land District: 41
 NOT IN ALR

LOT AREA = 6170sf (0.56629 ha)
 SITE COVERAGE BUILDINGS PERMITTED = 40% (24,448 sf)
 SITE COVERAGE PROVIDED = 35.5% (20,918 sf)
 SITE COVERAGE REMAINING = 6.5% (3,956 sf)
 SITE COVERAGE AVAILABLE FOR PERMISSIBLE DRIVEWAYS, VISITOR PARKING, BIKE PARKING TO USE PERMISSIBLE PAVERS.
 *** UNIT 1/2/4/7 DRIVEWAYS, VISITOR PARKING, BIKE PARKING TO USE PERMISSIBLE PAVERS.

FLOOR SPACE 94700 = 0.61 NET FLOOR AREA / LOT AREA
 MAX NET FLOOR AREA = 56,709 sf
 PROVIDED FLOOR SPACE 16110 = 0.40945
 PROVIDED NET FLOOR AREA = 30,258 sf

MAXIMUM HEIGHT = 10m - VARIANCE REQUESTED

HEIGHT PROVIDED:
 UNITS 1-15: 10.70m FROM GRADE TO 1.0 ROOF (TOP PARAPET)
 UNITS 16-17: 10.70m FROM GRADE TO 1.0 ROOF (TOP PARAPET)
 UNITS 18-19: 10.70m FROM GRADE TO 1.0 ROOF (TOP PARAPET)
 UNITS 20-21: 10.70m FROM GRADE TO 1.0 ROOF (TOP PARAPET)
 UNITS 22-23: 10.70m FROM GRADE TO 1.0 ROOF (TOP PARAPET)
 UNITS 24-25: 10.70m FROM GRADE TO 1.0 ROOF (TOP PARAPET)

NOTE: AT THE BEGINNING OF THE PROJECT WE WERE PROVIDED FEEDBACK FROM CITY PLANNING THAT IN THAT CASE, UNITS 1-15 WOULD NOT REQUIRE A HEIGHT VARIANCE. THE CONSENSUS ON INTERPRETATION HAS SINCE CHANGED TO COUNT TO 1.0 GLASS BALCONY UNITS NOT ARE ON A STEEP LOT AND HEIGHT IS COUNTED TO GRADE. ALL UNITS ARE THE SAME HEIGHT AND VARIETY WITH GRADE.

MIN FRONT YARD = 4.0m (6.0m - GARAGE TO BACK OF CURB OR SIDEWALK, 0.0m TO SIDE OF GARAGE OR 2.6m TO THE FRONT BUILDING FACADE FOR SIDE-ENTRY GARAGE)
 MIN REAR YARD = 6.0m FOR 1 OR 1.5 STOREY PORTION OF A BUILDING AND 7.5m FOR A 2 OR 2.5 STOREY PORTION OF A BUILDING. - VARIANCE REQUESTED FOR 2.5m SETBACK ON SOUTH END OF PROPERTY.

MIN SIDE YARD = 2.0m FOR 1 OR 1.5 STOREY PORTION, 2.5m FOR A 2 OR 2.5 STOREY PORTION, 4.0m FROM A FLANKING STREET
 THE MAXIMUM HEIGHT OF ANY VERTICAL WALL ELEMENT FACING A FRONT, FLANKING OR REAR YARD INCLUDING WALKOUT BASEMENTS IS THE LESSER OF: 4.5m OR 2.5 STOREYS, ABOVE WHICH THE BUILDING MUST BE SET BACK AT LEAST 1.2m - VARIANCE REQUESTED FOR NO SETBACK.

MAXIMUM DENSITY = 30 UNITS PER HECTARE = 17.05 UNITS (17 UNITS PROVIDED)

A MINIMUM AREA OF 25m² OF PRIVATE OPEN SPACE SHALL BE PROVIDED PER DWELLING UNIT WITH A ROOF TOP FINISH AS WELL AS OTHER DECKS THAT EXCEED THE MIN. REQUIRED 25m².

PROPERTY IS OUTSIDE OF 30 MIN. FIRE RESPONSE ZONE. UNITS TO BE SPRINKLERED.

PARKING:

VEHICLES:
 DUPLEX: 2 PER DWELLING UNIT (PROVIDING 2 PARKING STALLS IN GARAGE)
 THREE PLEX & FOUR-PLEX: 2.0 PER 3-OR-MORE BEDROOM DWELLING UNIT (PROVIDING 2 PARKING STALLS IN GARAGE + 2 PARKING STALLS ON DRIVEWAY - PER DWELLING UNIT)

BYLAW 7.12 LIMITS THE MAXIMUM AMOUNT OF PARKING SPACES TO 25% OF THE MINIMUM NUMBER OF REQUIRED PARKING SPACES. - VARIANCE
 100% OF MINIMUM (2 PER UNIT) = 42 STALLS
 PROPOSED PARKING STALLS = 56 STALLS

VISITOR PARKING REQUIRED: 1 PARKING SPACE FOR EVERY 7 DWELLING UNITS (177 = 242)
 VISITOR PARKING PROVIDED: 2 STALLS (ROUND DOWN AS PER 7.1.3)

BIKE PARKING:

CLASS 1: 0.5 PER DWELLING (PROVIDED 34 THROUGH GARAGE SPACE)
 CLASS 2: 0.5 PER DWELLING (PROVIDED 34 THROUGH GARAGE SPACE)
 PROVIDE 4 STALLS (ROUND DOWN AS PER 7.1.3)
 BIKE STALLS ARE: 0.6m x 1.8m



#202 - 3704 32nd St. Vernon, BC
 +1(250) 540-3449
 philipp@primebuildingdesign.com
 primebuildingdesign.com

No.	Description	Date
01	Issued for I/P	2022-09-28
02	Text Revision	2022-03-16
03	Revision	2022-04-13

Aurora Heights

69 Kestrel Place,
 Vernon, B.C.

ATTACHMENT 2

SITE PLAN

Project Number: 21
 Date: 2022-0
 Designed By:

A01

Scale: 1" = 20'-0"

1.0 SITE PLAN 1" = 20'-0"

9.6 R5 : Four-plex Housing Residential

9.6.1 Purpose

The purpose is to provide a **zone** for the **development** of a maximum of four ground oriented **dwelling** units in the form of **single detached, semi-detached, duplex, three-plex** or **four-plex housing** on urban services. The R5c sub-zoning district allows for **care centre, major** as an additional use. The R5h sub-zoning district allows for **home based business, major** as an additional use. *(Bylaw 5467)*

9.6.2 Primary Uses⁴

- **care centre, major** *(use is only permitted with the R5c sub-zoning district)*
- **duplex housing**
- **four-plex housing**
- **group home, major**
- **semi-detached housing**
- **single detached housing**
- **three-plex housing**
- **seniors housing**

9.6.3 Secondary Uses

- **boarding rooms**
- **care centres, minor**
- **home based businesses, minor**
- **home based businesses, major** *(in single detached housing only) (use is only permitted with the R5h sub-zoning district)*
- **secondary suites (in single detached housing only)**
- **seniors assisted housing**
- **seniors supportive housing**

9.6.4 Subdivision Regulations

- Minimum **lot width** is 20.0m, except it is 22.0m for a **corner lot**.
- Minimum **lot depth** is 30.0m.
- Minimum **lot width** for single detached housing is 14.0m, except it is 16.0m for a **corner lot**.
- Minimum **lot area** for single detached housing is 450m².
- Minimum **lot area** is 700m², except it is 800m² for a **corner lot**, or 10,000m² if not serviced by a **community sewer system**. *(Bylaw 5339)*

9.6.5 Party Wall Subdivision Regulations

Lot Type	Minimum Lot area		Minimum Lot Width	
	interior	corner	interior	corner
Semi-Detached Housing	350m ²	400m ²	10.0m	12.0m
Three-Plex Housing	235m ²	285m ²	7.0m	9.0m
Four-Plex Housing	175m ²	225m ²	7.0m	9.0m

9.6.6 Development Regulations

- Maximum **site coverage** is 40% and together with driveways, parking areas and **impermeable surfaces** shall not exceed 50%.

- Maximum **floor space ratio** is 0.6.
- **Maximum height is the lesser of 10.0m or 2.5 storeys**, except it is 4.5m for **secondary buildings** and **secondary structures**.
- Minimum **front yard** is 4.0m, except it is 6.0m for a garage or **carport** to the back of curb or sidewalk for a front entry garage, or it is 0.6m to the side of the garage and 2.6m to the front building façade for side-entry garage and driveway layouts.
- Minimum **side yard** is 2.0m for a 1 or 1.5 **storey** portion of a **building** or a **secondary building or structure** and 2.5m for a 2 or 2.5 **storey** portion of a **building**, except it is 4.0m from a **flanking street** unless there is a garage accessed from the **flanking street**, it is 4.0m or it is 2.6m to the building for a side-entry garage and driveway from a flanking street and at least 6.0m from the back of curb or sidewalk. Where there is no direct vehicular access to the **rear yard** or to an attached garage or **carport**, one **side yard** shall be at least 3.0m. The minimum **side yard** setback for shared interior **party walls** shall be 0.0m. The minimum **side yard** setback for **single detached housing** is 1.5m, except it is 4.0m from a **flanking street** unless there is a garage accessed from the **flanking street**, it is 4.0m or it is 2.6m to the building for a side-entry garage and driveway from a **flanking street** and at least 6.0m from the back of curb or sidewalk.
- **Minimum rear yard is 6.0m for a 1 or 1.5 storey portion of a building and 7.5m for a 2 or 2.5 storey portion of a building**, except it is 1.0m for **secondary buildings**.
- **The maximum height of any vertical wall element facing a front, flanking or rear yard (including walkout basements) is the lesser of 6.5m or 2.5 storeys, above which the building must be set back at least 1.2m.**
- Maximum **density** is 30 units per gross hectare (12 units/gross acre).
- Maximum four **dwelling** units located in a **building**, with each unit having a minimum width of 6.5m. (*Bylaw 5339*)

9.6.7 Other Regulations

- In order for bareland strata **developments** to be consistent with the character of the surrounding neighborhood, the strata plan shall be considered as one **site** for defining the overall use, **density** and **site coverage**.
- The above noted **subdivision** and **development** regulations shall be applied to each strata **lot** within the strata plan.
- A minimum area of 25m² of **private open space** shall be provided per **dwelling**.
- Where **development** has access to a rear **lane**, vehicular access to the **development** is only permitted from the rear **lane**.
- For **seniors assisted housing, seniors housing and seniors supportive housing**, a safe drop-off area for patrons shall be provided on the **site**.
- For strata developments, common recreation buildings, facilities and amenities may be included in the strata plan. Recreational buildings shall be treated as **secondary buildings** for the purpose of determining the **height** and **setbacks** of the **building** as specified in each **zone**.
- For multi-unit residential housing, one **office** may be operated for the sole purpose of the management and operation of the multi-unit residential **development**.
- In addition to the regulations listed above, other regulations may apply. These include the general **development** regulations of Section 4 (secondary **development, yards**, projections into **yards**, lighting, agricultural setbacks, etc.); the specific use regulations of Section 5; the **landscaping** and fencing provisions of Section 6; and, the parking and loading regulations of Section 7.
- As per Section 4.10.2 - All **buildings** and **structures, excluding perimeter fencing (garden walls and fences)** on **lots abutting** City Roads as identified on Schedule "B" shall not be sited closer to the City Road than the setback as per the appropriate zone measured from the offset Rights of Way as illustrated on Schedule "B". (*Bylaw 5440*)

April 13th, 2023 (Updated revision from September 28th, 2022)
Attn: City of Vernon

Re: Variances and Rationale for the Proposed Development at 69 Kestral Place, Vernon BC

Variance and Rationale:

There are four requested variances for the proposed residential development.

1. Vary “The maximum height is 10.0m” to 10.62m to 13.61m.

The subject site has a limited development footprint due to its natural hillside topography. It is our intent to provide an efficient, yet functional site design while developing quality homes. This means adapting our building designs to the natural topography of the land. The proposed development permit building designs reflect our intent.

When we started the design of this project in early 2021, we had been provided feedback from City of Vernon staff that height would be counted from grade to the top of roof parapets. The guard rail would not be counted if it's glass railing rather than a solid wall. With this in mind we designed our units to a maximum height of 9.70m. This resulted in 9ft ceilings on all 3 levels. We designed all of our units within these parameters, understanding that units 16/17 would require a height variance due to it being on a steep slope. During the development permit review process, we were informed that the new consensus among planning staff was that height is now measured from grade to the top of glass railings. This resulted in the requirement of a height variance for units 1-15 which otherwise would not be required. The only way of working around this is to remove the roof top patio, or to reduce the ceiling heights to 8ft on all three levels. We feel that both these options aren't feasible. We want to provide quality outdoor living space that is suited for this lake front and active outdoor lifestyle community. Additional outdoor living space enhances the quality of life and health of the community. We are limited to outdoor living space due to the challenging hillside topography of the land and want to provide more, rather than less outdoor living space. Reducing the ceiling heights to 8ft would not make the units feasible for selling, as the expected standards are to have 9ft ceilings for new construction. Additionally, we will also need bulkheads to accommodate ductworks. This will already reduce the ceiling height to less than 8ft in some areas. Reducing the ceilings to lower than 7ft will not work.

The proposed height variance will not negatively impact other neighbouring residences. The subject site sits significantly lower than properties above this site. The neighbouring properties south of our site all face the lake and sit lower than our site.

Units 1-7 are walk-up types. The unit entrance and garage are located on ground level. The second level accommodates the kitchen/dining/living space, and the third level provides bedrooms and laundry space. We propose side entrances for Units 1/3/4/7 and front entrances for Units 2/5/6. The front entrance unit types are wider, allowing all walk-up

units to have a double bay garage as well as parking in front of each unit for an additional 2 vehicles. The rear of these units are backfilled to the second level like a common walk-up unit. The maximum height from grade to top of roof top parapet is 9.70m. The maximum height from grade to roof top glass railing is 10.77m.

Units 8-13 are walk-out types. The double bay garage, entrance, kitchen/dining/living space are located on ground level. The basement is used for additional living space and storage, and the upper floor provides bedrooms and laundry space. Both buildings are triplex types. The end units have side entrances and the middle units are accessed from the front. The maximum height from grade to top of roof top parapet is 9.55m. The maximum height from grade to roof top glass railing is 10.62m.

Units 14-15 are designed into a steep rock hillside where we are working with the natural topography of the land. These are walk-up type units. The maximum height from grade to top of roof top parapet is 9.70m. The maximum height from grade to roof top glass railing is 10.77m.

Units 16-17 are also designed on a steep rock hillside that follows a natural slope along Peregrine Way. This double walk-out style duplex will have 3 storeys on the rear side and one storey at the front. The neighbouring lot to the south was originally approved for a triplex, three storey walkout design (similar to Unit 16-17), but was not yet built. The neighbouring 34 units along Peregrine Way are placed on the same slope and are all 3 storey designs. It therefore seems logical to work with the natural topography of the land and to adapt to the neighbouring 3 storey concepts. The rear portion of the units have to be supported on stilts in order to follow the natural topography of the land. This is also why this duplex is higher than all the other units in the development. The additional height does not obstruct any neighbours views. The duplex has less presence on Peregrine Way than all other 34 units – due to only 1 storey being visible from the road. The neighbours directly below us (west) also constructed their property with stilt construction to accommodate the steep slope of the property. Their house is mostly on stilts as the slope is steeper than our property's slope. Our foundation will mostly bear on soil via conventional strip footings and foundation walls, but will have some portion of the house and the deck be supported on stilts. Please see design drawings and images 1-4 for reference. The maximum height from grade to top of roof top parapet is 12.54m. The maximum height from grade to roof top glass railing is 13.61m.

We have tried to work within the context of 10m as possibly, but feel that it would be reasonable and rational to request a height variance in order to adapt to the natural topography that we are working with, and to provide functional designs.

2. Vary “The maximum height of any vertical wall element facing a front, flanking or rear yard (including walkout basement) is the lesser of 6.5m or 2.5 storeys above which the building must be set back at least 1.2m”.

The front and rear yards of this property effectively function as side yards due to the central drive aisle orientation of units 1-13. Please see the proposed site plan. Setting back the side walls for units 1/7/8/13 by 1.2m beyond 6.5m in height, would result in poor aesthetics, complications in framing, and yielding the set back storey (most upper floor) as unfunctional for living. Our proposed designs feature attractive depth variations by

implementing build-outs and roof overhangs while keeping the structural design rational and functional. We are also utilizing a variety of siding materials and windows to create interest from a street and pedestrian views. The intent of this bylaw was to avoid tall, unattractive walls without depth perceptions that are unpleasant for the eye. We believe our creative design alternative addresses the original intent, while providing a better solution for our specific application.

As can be seen in Image 1, the neighbouring units follow the same rational and are not set back by 1.2m beyond the 6.5m height point.

3. Vary “ Minimum rear yard is 6.0m for a 1 or 1.5 storey portion of a building and 7.5m for a 2 or 2.5 storey portion of a building, except it is 1.0m for secondary buildings” to 2.5m rear yard setback on south property setback.

The most southern corner of the property is only accessed via Peregrine Way, unlike the rest of the property which is only accessed via Kestrel Drive. Since the property is one, and Kestrel Place defines the front yard, the most southern property line offset is rear yard by bylaw definition. From a practical point of view, since units 16-17 are accessed by and orientate towards Peregrine Way, the rear yard is practically a side yard and should be treated as such. As can be seen in Image 2, the units toward the south of this property all have an approximate setback of 2.5m. All these units are orientated towards Peregrine Way in a similar fashion. We feel that allowing for a 2.5m rear yard setback for units 16-17 will encourage more fancuality and consisten aesthetic along Peregrine Way. Please see image 1 and 2 for reference.

4. Vary the slope for construction on slope $\geq 30\%$.

Much of this area and the neighbouring properties are built over a 30% slope. We have completed a geotechnical investigation that confirms this site to be suitable for the inteded development. The hillside generally consists of stable bedrock that is suitable to be built on with minimal excavation required. We have considered the natural topography of the bedrock within the design of our effected units and have adapted accordingly.

5. Vary the maximum parking stalls from 43 to 58 stalls

The Canadian Lakeview Estates neighbourhood is not in close proximity of the Vernon City Centre and as such is not connected to public transportation. For reference, Polson Park is approximately 14.7 kms from the subject property. That results in about a 21 minute car drive. As such, home owners and their families rely on cars as their primary source of transportation. This is typical for the entire neighbourhood. Restricting parking to 125% of the minimum required parking stalls seems rational when public transportation is available and a development is in the heart of the city where other modes of transportation are possible. Most households own at least 2 vehicles. When visitors come, they will have to drive. The bylaws require 2 visitor parking stalls for 17 residential units which we have been provided. Yet, we understand that often there will be more than 2 visitors visiting the site. It can be safely assumed, that if parking stalls are limited as per the bylaws, visitors and residents will be incentivised to park along the streets. As an example, the development

south of the subject property along Peregrine Way has a total of 34 residential units. The minimum bylaw requirements have been addressed for parking, but yet parking occurs along Peregrine Way. A vehicle count on google maps showed 15 vehicles parked along Peregrine Way (See Image 1,5-7). That exludes other vehicles such as boats and RV's that are parked on other private non developed property. We believe that practically, the extra parking spots provided via driveways are a benefit and will enhance the experience of the homeowners and the neighbourhood. Too little parking is an issue that can't be fixed once the site is developed. Some extra parking spots as proposed ensures that noone parks their vehicles along the road, or on other adjacent vacant land.



Image 1

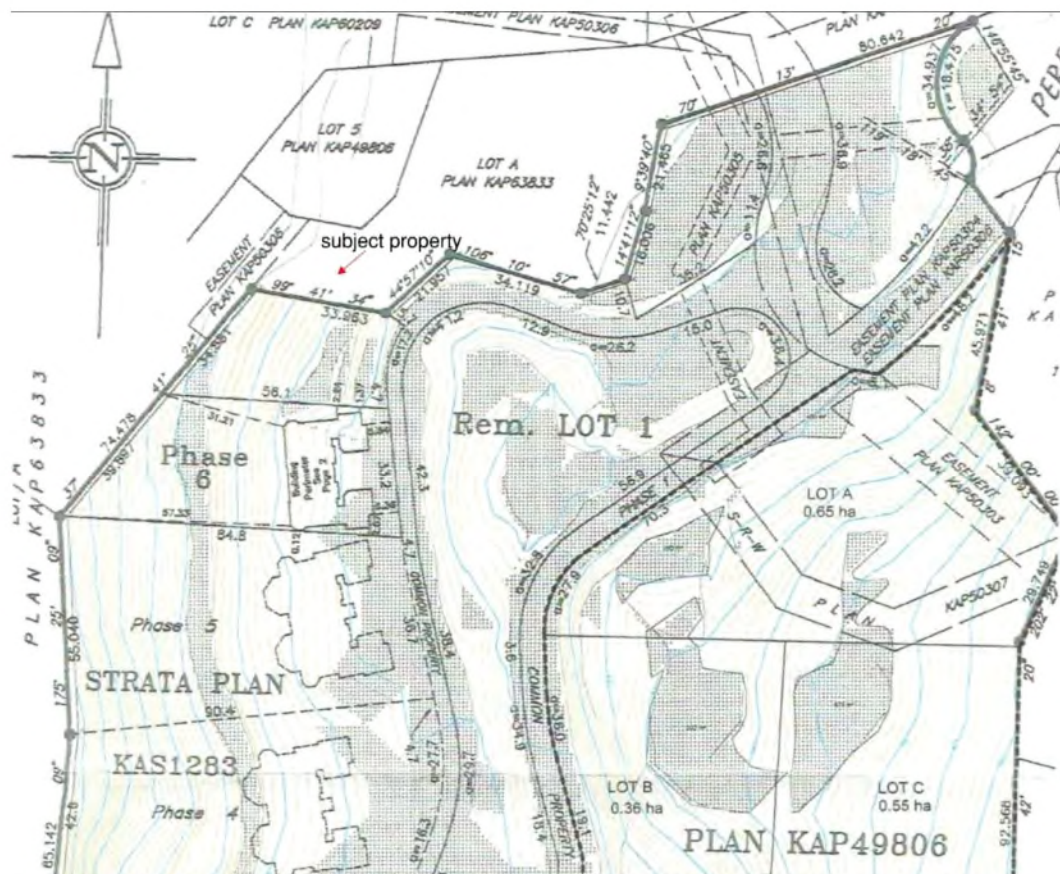


Image 2



Image 3



Image 4



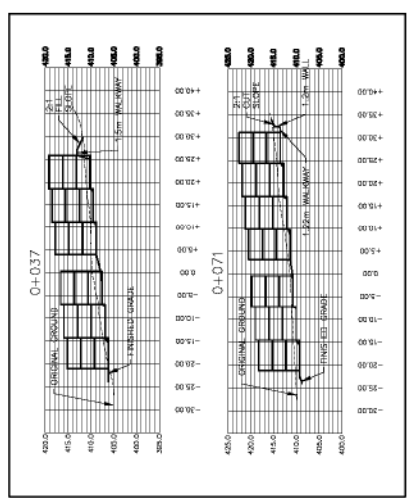
Image 5



Image 6

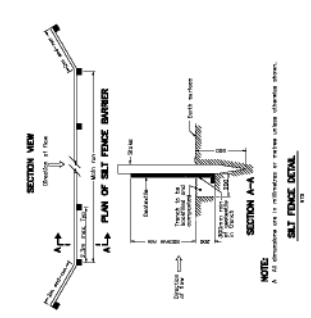
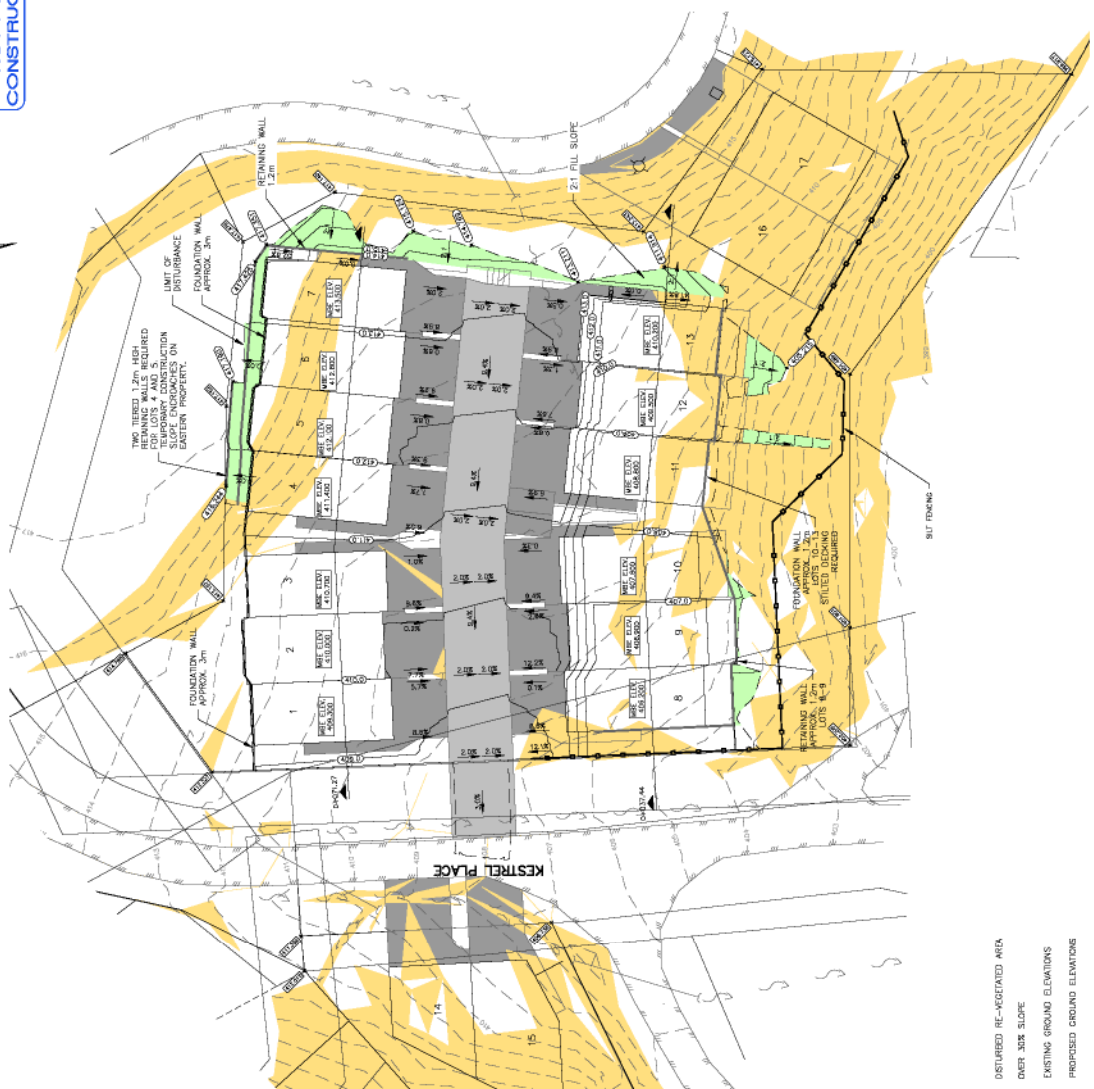


Image 7



Area of Embankment on 20% or Above
Slope: 1:2.5

Site Roadway	171,000
West Roadway	181,500
North Driveway	190,750
South Driveway	227,714
Building Platform	208,500
Total	980,464



- EXISTING GROUND CONTOURS
- FINISHED GROUND CONTOURS
- 100 YR STORM ROUTING IN PIPE AND MANHOLES
- MAJOR OVERLAND FLOW BEYOND 1:100 YEAR
- TOP/TOE OF PROPOSED GRADING
- RETAINING WALL
- SILT FENCE
- 100 YR STORM ROUTING IN PIPE AND MANHOLES
- MAJOR OVERLAND FLOW BEYOND 1:100 YEAR
- DISTURBED RE-CREATED AREA OVER 30% SLOPE
- EXISTING GROUND ELEVATIONS
- PROPOSED GROUND ELEVATIONS

LEGEND

- WATER
- SEWER
- STORM SEWER
- UPC UTILITY (ALUMINUM)
- 3" MANHOLE
- PROP. MANHOLE
- POWER POLE
- LAME STRONG IDA
- STEEL STRONG IDA
- HYDRANT
- SURVEY MONUMENT
- WATER CLASS STOP
- SAFETY INSPECTION CHAMBER
- STORM INSPECTION CHAMBER
- TRANSFORMER - POWER
- SERVICE BOX

PROTECH CONSULTING
 200 - 3275 Louisa Ave. Kelowna B.C. Phone 866-1771
 PERMIT TO PRACTICE NO. 1201463

NO.	DATE	BY	REASON
1	2022-07-28	KTM	FOR REVIEW
2	2022-10-11	DJP	CLIENT REVIEW
3	2022-10-27	DWS	ISSUED FOR DEVELOPMENT PERMIT

THE CITY OF VERNON
 ENGINEERING DEPARTMENT

PRIME BUILDING DESIGN LTD.
 KESTREL PLACE
 GRADING PLAN

DATE: JUNE 2022
 SCALE: 1:250
 MET.

ISSUED FOR DEVELOPMENT PERMIT

21016-00

Prime Building Design Ltd.
202-3704 32nd Street
Vernon, BC V1T 5N6

December 5, 2022
Project # 20986
Rev. 1

Attention: Mr. Philipp Wambold

**Re: Geotechnical Investigation Report – Revision 1 – Residential Development
69 Kestrel Place, Vernon, B.C – Lot B KAP85198**

1.0 INTRODUCTION

As requested, GeoPacific Consultants Ltd. (GeoPacific) has carried out a geotechnical investigation for the proposed residential development at the location referenced above. We understand that the proposed development consists of 17-unit townhome development at the above noted location. We understand that the townhomes will consist of 2 storeys of light wood frame construction over 1 storey of below grade walkout basement. Our understanding of the proposed site grades is based on the Building Sections drawing prepared by Protech Consulting, dated 2022-10-25. The development will also include approximately 100 m of new road construction and the associated civil works.

This report presents the results of our field investigation and provides geotechnical recommendations for the design and construction of the proposed commercial development. This report has been prepared exclusively for Prime Building Design, for their use, and for the use of others within their design and construction team. We also anticipate that this report will be used by the City of Vernon during their development review process.

2.0 SITE DESCRIPTION

The site is located in the Peregrine Point Estates area of Vernon, and is comprised of 1 parcel (Lot B) bisected by Kestrel Place. The larger portion of Lot B is south of Kestrel Place and is bounded by Kestrel Place to the west, north, and east, and Peregrine Way and hillside residential development to the south. The smaller portion of Lot B is across Kestrel Place to the north of the larger portion and is bounded by Kestrel Place to the south and west and residential hillside development to the north and east. For clarity, in the context of this report, the smaller northern portion of Lot B will be known as Lot B-North, and the larger southern portion will be known as Lot B-South.

The Lot B-North is triangular in shape and measures approximately 57 m long north-south and 27 m wide east-west. The Lot B-North exists on a slope that descends from the northeast to the southwest and is located below a large bedrock outcrop to the north and a large rock retaining wall to the east. It was observed that several civil service infrastructure lines were routed through this part of the property including storm and sanitary sewer mains.

The Lot B-South is irregular in shape with several panhandle extrusions and has a maximum width of approximately 100 m east-west and a maximum length of approximate length of 80 m north-south. Lot B-South is situated on a slope that descends at varying grade from east or southeast to west or northwest.

Lot B-South is generally comprised by two distinct areas characterized by their grades and ground conditions. The east third of the site is characterized by a flatter bench and predominately underlain by silts whereas the west two-thirds are more sloped and are characterized by exposed or near-surface bedrock.

At time of initial investigation, the site was undeveloped and was moderated to very heavily vegetated by mature trees, undergrowth, and deadfall.

The location of the site and surrounding lands are shown on the attached Drawing 20986-01.

3.0 FIELD INVESTIGATION

GeoPacific Consultants were on site on Lot B-South on April 4th, June 9th, and June 29th, 2022 to complete a geotechnical investigation for the proposed development. In April six test pits were excavated to a maximum depth of 3.9 m below existing site surface grades. The test pits were excavated by a rubber track excavator, supplied by and operated by On The Mark Locates (OTM) of Kelowna, BC. Prior to the commencement of digging, all underground utilities were located via a BC One Call locate request and by a private utility locate performed by OTM to clear all test hole locations. All test pits were backfilled and the site was left clean.

On June 6 auger test hole were advanced in the eastern third of the site (marshy area) to a maximum depth of 6.1 m below existing site surface grades. The boreholes were supplemented by four Cone Penetration Test (CPT) soundings that were advanced to a maximum of 4.1 m below site surface grades.

The CPT is an in-situ device which is pushed into the ground by a hydraulic ram on the drill rig. The cone penetrometer records measurements of tip resistance, sleeve resistance, dynamic pore water pressure, temperature, and inclination in 50 mm increments. The data obtained may be correlated to estimate engineering parameters such as shear strength, relative density, soil behavior type, and consolidation coefficients. The stratigraphic interpretation was verified with the auger test holes near these locations.

The field investigation was supervised, and the soils encountered were logged in the field by one of our technical staff and selected samples were taken to our lab for analysis. The test holes were backfilled with auger cuttings and the sealed with bentonite upon completion of the logging in accordance with provincial abandonment requirements.

Test pits and test holes were not performed on Lot B-North as the ground conditions were either comprised of near-surface bedrock or were in conflict by the buried civil infrastructure.

The test pit and test hole logs are shown in Appendix A. The CPT sounding data is presented in Appendix B. Interpreted Soil Parameters are presented in Appendix C. The approximate location of the test pits and holes are shown on our Drawing 20986-01, following the text of this report.

4.0 SUBSURFACE SOIL AND GROUNDWATER CONDITIONS

4.1 Soil Conditions

The general surficial geology of the region under investigation, according to the Map 1245A Surficial Geology Vernon, BC, is described as, “Rock outcrop and areas of near-surface rock”.

According to the British Columbia Geological Survey Geology of British Columbia Geoscience Map 2005-3, the bedrock geology underlying the site is comprised of “Middle Jurassic: granodiorite”.

The Lot B-North is characterized by exposed or near surface bedrock overlain by less than 1.0 m of topsoil and silt, or by fill covering the sanitary and storm sewer lines traveling northeast to southwest at the east corner of the lot.

The soils consisted of a thin veneer of surficial vegetation and silty topsoil overlying shallow bedrock in the locations of test pits TP22-02, 03, 04, & 05. The bedrock was generally fractured or weathered where at the surface, transitioning to unweathered and intact at an estimated depth ranging from 500 mm to 1000 mm below existing site grades. Excavator refusal was encountered within each test pit in this area within 600 mm of the surface. This area was generally present on the slopes and is estimated to be approximately 65% of the Lot B-South area.

The soils encountered in test pits TP22-01&06 as well as auger boreholes TH22-01 to 06 were comprised primarily of stiff silt overlying dense sand and gravel or bedrock at depths 3.0 m to 4.4 m below existing site surface grades. The silt generally included some sand above a depth of approximately 2.0 m and was generally clayey below that depth. Interbedded sequences of soft silty clay to clayey silt were observed throughout the test pit depths within TP22-01&06. Organics, roots, and rootlets were observed throughout the depth of soils overlying the dense sand and gravel and bedrock but were concentrated within the upper 1.5 m. Based on the test pits and holes, surface topography, and vegetation, it is considered likely that the bedrock below the soil forms a bowl or trough-like shape such that the depth to bedrock is lesser at the edges and deeper in the middle. This subsurface low area is then replete by the fine-grained soils and confined perched water table.

Detailed descriptions of the soil conditions encountered within each test pit and hole is provided in the soil logs, included in Appendix A of this report.

4.2 Groundwater Conditions

Groundwater was encountered within the area of the auger boreholes and test pits TP22-01 and TP22-06 on Lot B-South. The perched groundwater table was encountered at a depth of 2.0 m to 3.0 m below existing site surface grades and is expected to be confined within a low area within the bedrock sub-surface. The static water table for the overall region is expected to be well below site grades, correlating to the elevation of the nearby Okanagan Lake. Additional perched water flows within excavations could be encountered during the spring freshet.

5.0 DISCUSSION

5.1 General Comments

Based on site drawings prepared by Prime Building Design dated 2022-03-03 and Building Sections prepared by Protech, last revised 2022-10-25, we understand that a total of 17 residential townhome units are proposed for the site complete with approximately 100 m of new onsite road construction. 15 of the units along with the new road are proposed for Lot B-South while the remainder 2 units are proposed for Lot B-North. We expect that the townhomes will be up to 3 storeys tall including 1 or 2 levels of walkout or walk-in basements with the structures set into the existing hillsides.

It is expected that the proposed structures could be placed on conventional pad and strip foundations bearing on the stiff silt below depths of 600 mm, on solid or fractured bedrock, or on engineered fill. Lowering of footings could be required to ensure adequate factors of safety for slope stability in areas where buildings are to be located adjacent to slopes.

Based on the site sections, it is understood that the buildings will need to retain 1 or 2 floors (3 to 6 m) of unbalanced lateral soil pressure where they are set into the slope. Keying into the bearing soils or bedrock may be required to develop adequate sliding resistance for the buildings. Alternatively, stress relief walls can be considered.

Based on the development plans, the construction within and on the sloped terrain will be a critical design and construction feature of this project, both from a temporary construction access perspective and a long-term stability perspective. A plan for construction sequence that accounts for safe and stable temporary cut and fill slopes should be developed well in advance of construction. In general, it is recommended that the development be built bottom-up, starting with the lower structures, in order to minimize undermining and accessibility risks. It is anticipated that temporary cuts exceeding 1H:1V will be required to access building foundations and ground floor elevations. Depending on the construction sequence and the overall desired grades, temporary to permanent shoring may be required to safely allow for temporary excavations to access footing elevations with cuts steeper than 1H:1V. The shoring measures could also be designed as permanent retaining or pressure relief walls to allow site grading.

We confirm, from a geotechnical perspective, that the proposed development is feasible provided the recommendations outlined in section 6.0 are incorporated in the overall design. This report must be updated should the development scope or grading plans change.

5.2 Slope Stability

GeoPacific has reviewed the proposed grades, building, and site geometry presented by the civil site sections and performed detailed slope stability modelling analyses using GeoStudio 2021 Slope/W. The site and region were also reviewed using publicly available lidar point cloud data provided by the Province of British Columbia, with processing and analysis performed with Global Mapper

Global stability analyses were completed at three critical sections on the site, using the site grades provided by Protech Consulting, drawing number 21016-003, dated May 2022, last updated 2022-10-25. Based on our geotechnical investigation, buildings shown on sections identified as Lot 15 and Lot 16 are expected to be founded entirely on bedrock and are assessed to have large factors of safety against deep seated global stability failure, well exceeding 1.5 static and 1.3 seismic.

Slope stability modeling analysis completed for the buildings shown on the section identified as Lot 11 & 5 determined the calculated factors of safety for the static and seismic condition exceeded 1.5 and 1.4 respectively. The 2475-year return period (2%/50 years) earthquake peak acceleration value of 0.07g, as determined by BCBC 2018, was used in the seismic analysis.

As a part of this assessment GeoPacific has considered climate change and determined that it will not meaningfully affect the static or seismic slope stability impacting the development as the site is not sensitive to temperature or precipitation changes and is not influenced by changing groundwater elevation.

Based on our assessment of the local soil conditions, topography, and hydrogeomorphology, we consider the site area to meet the minimum factors of safety for slope stability under static and seismic conditions, 1.5 and 1.0 respectively, for the proposed development, as stated by the Professional Practice Guidelines – Landslide Assessments in British Columbia, and free of any other credible geohazards.

GeoPacific has completed a cursory visual review of the adjacent properties and confirm the proposed development will have no slope stability related impacts on the adjoining properties based on the current topography beyond the property. GeoPacific accepts no responsibility for slope stability related impacts on the development property as a result of activities conducted on adjoining lands.

6.0 RECOMMENDATIONS

6.1 Site Preparation

Prior to placement of new engineered fill, construction of new buildings, and roads, the site should be stripped of all loose or otherwise unsuitable fill, vegetation, topsoil, organics, and loose or otherwise disturbed soils to expose a subgrade of stiff silt or bedrock.

Within Lot B-North and the area west of TP22-02 on Lot B-South, it is expected that stripping will be controlled by the removal of topsoil and silt overburden from the near surface-bedrock, at an approximate depth of 300 to 900 mm below existing site surface.

Within the area east of TP22-02 on Lot B-South, it is expected that for the majority of this area the stripping depth will be controlled by the removal of surficial soft silt and organics, generally not exceeding a depth of 1.2 m. It should be understood that this area was characterized predominantly by stiff silt at the foundation elevations, but the soils conditions are somewhat variable across the horizontal plane and across depth such that localized areas of over-excavation exceeding a depth of 1.2 m could be required where soft and/or high organics content soils are encountered.

The stripped subgrade must be reviewed by a geotechnical engineer prior the placement of any engineered fill or footings. Grade reinstatement or grade increases can be achieved using Engineered fill. Engineered Fill is defined as clean sand to sand and gravel compacted in 300 mm loose lifts to a minimum dry density of 95% Modified Proctor (ASTM D1557). The placement and compaction of engineered fill should be reviewed by the geotechnical engineer.

Site stripping and corresponding subgrades must be reviewed by the geotechnical engineer prior to placement of grading fills.

6.2 Temporary Excavations

Temporary excavations should not exceed a maximum slope of 1H:1V when in the stiff silt and 1H:2V when in fractured bedrock. Intact bedrock can be graded no steeper than vertical temporarily. The noted temporary excavation slopes may need to be reduced in areas of very tall cuts or if loose or clean granular soils are encountered. Temporary cut slopes in areas with open graded gravels or clean running sands will need to be reduced to a slope between 1.5H:1V and 2H:1V. All temporary cut slopes should be covered in poly sheeting to prevent erosion of the slope face. It is recommended that all desired temporary slope cuts be reviewed in advance of construction to determine feasibility. If site constraints and soil conditions do not allow for sloping, vertical shoring methods such as shotcrete with anchor tie backs may be required, as discussed in Section 6.3.

Temporary cut slopes in excess of 1.2 metres in height require inspection by a professional engineer in accordance with Work Safe BC guidelines. GeoPacific may provide further recommendations on slope cuts once the excavation is underway.

It is expected that the perched water table as note in Section 4.0 will be below development grades; however, light seepage during the wetter months should be expected due to the formation of perched water tables. We expect that inflows may be handled with conventional sumps and sump pumps.

The geotechnical engineer shall be contacted for the review of temporary excavations.

6.3 Temporary and Permanent Shoring Walls / Pressure Relief Walls

Should the use of temporary slope cuts not adequately reach the desire grades at the noted angles, shoring may be required to safely excavate to the desired elevations at steep or vertical cuts. It is expected that shotcrete with tie-back anchors or soil nails shoring would be the most cost-effective means of achieving vertical cuts.

Shotcrete and soil anchor or soil nail walls can also be utilized to create permanent exposed vertical grading in lieu of cast-in-place or MSE retaining walls or to relieve pressure from building foundation walls.

Temporary cut slopes in intact bedrock can be left as encountered or as steep as vertical, subject to review by the geotechnical engineer. Temporary cutslopes in fractured or weathered bedrock should not exceed a grade of 3H:4V, subject to review by the geotechnical engineer.

The geotechnical engineer must be contacted for design and review of all shoring or vertical cut reinforcement.

6.4 Permanent Cut Slopes

Permanent cut slopes made in the stiff silt should be made no steeper than 2.5H:1V. Permanent cut slopes in intact bedrock can be left as encountered or as steep as 1H:4V, subject to review by the geotechnical engineer. All cut within soils slopes should be vegetated or rock armoured to mitigate erosion. Culverts, ditches, or other runoff water conveyance structures should not be allowed to discharge directly onto the cut slopes without additional protective measures. Cut slopes may need to be flattened depending on the encountered ground conditions on location-to-location basis at the discretion of the geotechnical engineer.

All slopes should be left clear of all debris and surficial loose soils, cobbles, or boulders to prevent sliding or rolling.

All cut slopes must be reviewed by the geotechnical engineer prior to worker entry.

6.5 Grading Fills

It is of our opinion that the bedrock found on site would be suitable for reuse once reprocessed, dependent on the following conditions being met. Final approval from GeoPacific on the suitability of fill materials for the various intended purposes must be completed during site grading works.

While performing site stripping and cutting, care should be taken to keep the different onsite materials separate and should not mix or stockpile varying native or import materials together. The fine-grained soils stripped from the area east of TP22-02 are not expected to be suitable for reuse as engineered fill due to the high organics content.

All completed fill slopes should be vegetated or rock armoured to mitigate erosion. Culverts, ditches, or other runoff water conveyance structures should not be allowed to discharge directly onto the fill slopes without additional protective measures.

Where the noted allowable slope grades are not adequate to achieve the overall desired grades, retaining walls can be used to achieve design grades. GeoPacific can provide MSE retaining or soil nail wall designs as needed.

All grading fills must be placed to an engineered fill standard, as described in Section 6.1.

The geotechnical engineer must review all fill materials prior to use. The geotechnical engineer must review all fill slopes.

6.6 Shallow Foundations

Following the recommended site preparation, outlined in Section 6.1, footings which are founded on undisturbed native firm to stiff silt or on new engineered fill may be designed on the basis of a serviceability limit state (SLS) bearing pressure of 100 kPa and a factored Ultimate Limit State (ULS) bearing pressure of 150 kPa. Footings which are founded on fractured or intact bedrock may be designed on the basis of a SLS bearing pressure of 700 kPa and a factored ULS bearing pressure of 1 MPa. Irrespective of the allowable bearing pressures given, pad footings should not be less than 600 mm by 600 mm and strip footings should not be less than 450 mm in width.

We estimate for foundations designed as recommended founded on stiff silt, fractured bedrock, or engineered fill, settlements will not exceed 25 mm total and 1:500 differential. We estimate for foundations designed as recommended founded on intact bedrock, settlements will not exceed 12.5 mm total and 1:1000 differential.

There may be the possibility that some footings are to be placed over areas that transition from soil to bedrock. We recommend that in these areas, foundations be placed on engineered fill (i.e. avoid cut / fill transition pads, or footings half on bedrock and half on soil). Footings that are founded on bedrock and on soil may experience differential settlement, which may cause cracking of foundation or interior walls. Therefore, if a portion of a building is to be situated over bedrock and soil, it is recommended that the bedrock be hammered / blasted a minimum of 1.0 m below the bottom of footing elevation and replaced with compacted engineered fill. This will reduce differential settlement across the building structure.

Footings placed on soil should also be buried a minimum of 750 mm below the surface for frost protection. Footings within interior heated areas not subject to the following can be buried only nominally. Footings may need to be buried deeper to ensure adequate slope stability where placed at or near the crest of slopes. It is recommended that for footings placed near slopes, they be lowered to reside on intact bedrock, below a 1H:1V line drawn up from the toe of the adjacent slope. Footings placed entirely on bedrock, intact or fractured, do not need to be buried for frost protection.

We recommend that the subgrades that consist of silty soils should be blinded with 100 mm of 19 mm clear crush gravel to provide a suitable working surface and to prevent the moisture sensitive material from softening and disturbance.

Foundation subgrades must be reviewed by a geotechnical engineer prior to footing construction.

6.7 Slab-On-Grade Floors

Floor slabs should be underlain by a minimum of 150 mm of a free draining granular material such as 19 mm clear crushed gravel which is hydraulically connected to the foundation drainage system. A moisture barrier should underlie the slab directly above the free draining granular material.

Compaction of the slab-on-grade fill should be reviewed by the geotechnical engineer.

The geotechnical engineer must review all slab-on-grade subgrades and preparation prior to placement of concrete.

6.8 Radon Protection

We recommend that site preparation for the floor slabs include a rough-in for a subfloor depressurization system to protect from soil gas ingress (radon) unless the associated testing is provided and indicates a radon abatement system is not required. Should radon testing not be completed or an abatement system is required, the abatement system is described in detail in Section 9.13.4. of the 2018 BCBC.

6.9 Foundation Drainage

Any structures and foundation walls with below grade construction must be designed with a perimeter drainage system. The under-slab gravel should be hydraulically connected to the drainage system. To ensure the absence of water pressure build up against foundation walls any backfill placed against the foundation walls should be effectively clean and free draining. In lieu of free draining backfill, a conventional chimney drain or Mira Drain type system can be employed to relieve water pressures from the foundation walls.

The geotechnical engineer should review all perimeter drains and water pressure relief measures prior to placement of backfill.

6.10 Seismic Site Class

Where buildings are to be placed over bedrock; the development property can be classified as “Site Class B” as defined in Section 4.1.8.4 of the 2018 BC Building Code.

Where buildings are to be placed over stiff silt; the development property can be classified as “Site Class D” as defined in Section 4.1.8.4 of the 2018 BC Building Code.

Peak ground accelerations on firm ground for the approximate site location is 0.063g (National Resource Canada, Site Coordinates: 50°15'01"N 119°25'06"W).

6.11 Earth Pressures on Foundation Walls

Earth pressures against the foundation walls are dependent on factors such as lateral restraint along the wall, surcharge loads, backfill materials, compaction of the backfill and drainage conditions. The foundation walls are expected to be partially yielding and fully restrained between the basement floor and backfilled with a free draining granular soil.

The below lateral soil pressures may be used in the design of foundation walls.

Static: Where the back slope is sloped down away from the building or flat: Triangular soil pressure distribution of 5.4 H kPa, where H is equal to the total wall height in metres.
Where the back slope is sloped up away from the building, max 2H:1V: Triangular Soil pressure distribution of 7.6 H kPa, where H is equal to the total wall height in metres.

Seismic: Where the back slope is sloped down away from the building or flat: Inverted triangular soil pressure distribution of 1.0 H kPa, where H is equal to the total wall height in metres.
Where the back slope is sloped up away from the building, max 2H:1V: Triangular Soil pressure distribution of 2.5 H kPa, where H is equal to the total wall height in metres.

The structural designer may assume a friction angle of 34 degrees between the base of the foundation and the underlying soils.

A service passive resistance of no more than 50H (kPa) can be employed with the expectation that at least 15 to 25 mm of lateral movement may be required to mobilize the resistance. Given the above design parameters and considering the structural stress distribution at the foundation level, the structural engineer should confirm that the new structure and slabs will resist our recommended earth lateral pressure without excessive lateral displacement. If lateral displacements of the structure exceed the structural design criteria, GeoPacific can design a pressure relief system to control the earth lateral pressure.

The geotechnical engineer should be contacted for the review of all backfill materials and procedures

6.12 Pavement Recommendations

Following the above referenced site preparation, it is our opinion that our recommended pavement section, given in Table 2, is sufficient to carry the anticipated vehicle loads on-site.

All base and subbase fills should be compacted to a minimum of 95% Modified Proctor dry density with a moisture content within 2% of optimum for compaction. A minimum of 2 m setback is recommended from the edge of the proposed roads to the crest of slopes.

Table 2: Recommended <u>Minimum</u> Pavement Structure For On-Site Private Roads & Parking Areas	
Material	Thickness (mm)
Asphaltic Concrete	75
19 mm minus crushed gravel base course	100
75 mm minus, well graded, clean, sand and gravel subbase course	300

The thickness of asphalt may be decreased to 65 mm in parking areas to be occupied solely by automobiles and light trucks. Where roads are placed directly over bedrock, the subbase course can be eliminated.

7.0 DESIGN REVIEWS AND CONSTRUCTION REVIEWS

The preceding sections make preliminary recommendations for the design and construction of the proposed industrial development at the above referenced property. We have recommended the review of certain aspects of the design and construction. It is important that these reviews are carried out to ensure that our intentions have been adequately communicated. It is also important that any contractor(s) working on the site review this document prior to commencing their work.

The required reviews are summarized below:

- Review of site stripping operations
- Review of temporary cut slopes
- Review of shoring
- Review of grading fills
- Review of retaining wall construction
- Review of foundation subgrade prior to footing construction
- Review of slab-on-grade fill compaction prior to slab construction
- Review of perimeter drainage and water pressure relief systems
- Review of the compaction of engineered fill
- Review of the compaction of on-site road base and sub-base fills

Review of excavations in excess of 1.2 metres in depth requiring worker entry
Review of any excavations encountering seepage

8.0 CLOSURE

This report has been prepared exclusively for Prime Building Design Ltd. for the purpose of providing geotechnical recommendations for the design and construction of the proposed development. The report remains the property of GeoPacific Consultants Ltd. and unauthorized use of, or duplication of, this report is prohibited.

We are pleased to be of assistance to you on this project and we trust that our recommendations are both helpful and sufficient for your current purposes. If you would like further details or require clarification of the above, please do not hesitate to contact the undersigned.

Sincerely,
GeoPacific Consultants Ltd.

EGBC Permit to Practice # 1000782



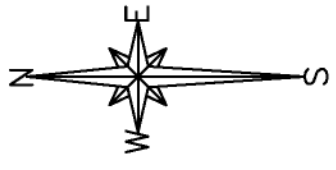
2022-12-13

Wyatt Park, B.A.Sc., P.Eng.,
Project Engineer

Reviewed by:

Roberto Avendano, B.A.Sc., P.Eng.,
Principal

Aaron Trenn, B.A.Sc., EIT,
Geotechnical Engineer-in-Training



LEGEND:

- TP22 - TEST PIT
- TH - TEST HOLE

REFERENCE: SITE AND CONTOUR PLAN CITY OF VERNON	 GEOPACIFIC VANCOUVER LANDSCAPE ARCHITECTURE	DATE: JUNE 09TH 2022 DRAWN BY: [blank] APPROVED BY: [blank]	FILE NO.: WP DRAWING NO.: 20886-01	REVISIONS: A. B. C.
		SCALE: NOT TO SCALE	PROPOSED RESIDENTIAL DEVELOPMENT 60 KESTREL PLACE, VERNON, BC APPROXIMATE TEST HOLE LOCATIONS	
		DATE: JUNE 09TH 2022 DRAWN BY: [blank] APPROVED BY: [blank]		



PRIME BUILDING
DESIGN

#202 - 3704 32nd St., Vernon, BC
+1(250) 540-3449
philipp@primebuildingdesign.com

primebuildingdesign.com

No.	Description	Date
01	Issued for Review	2022-03-03

Canadian Town Building

69 Kestrel Place

SITE PLAN

Project Number	21-027
Date	2022-03-03
Designed By	PW

A01

Scale 1" = 20'-0"

ZONE R5
DISTRICT CITY OF VERNON
NOT IN PLAN

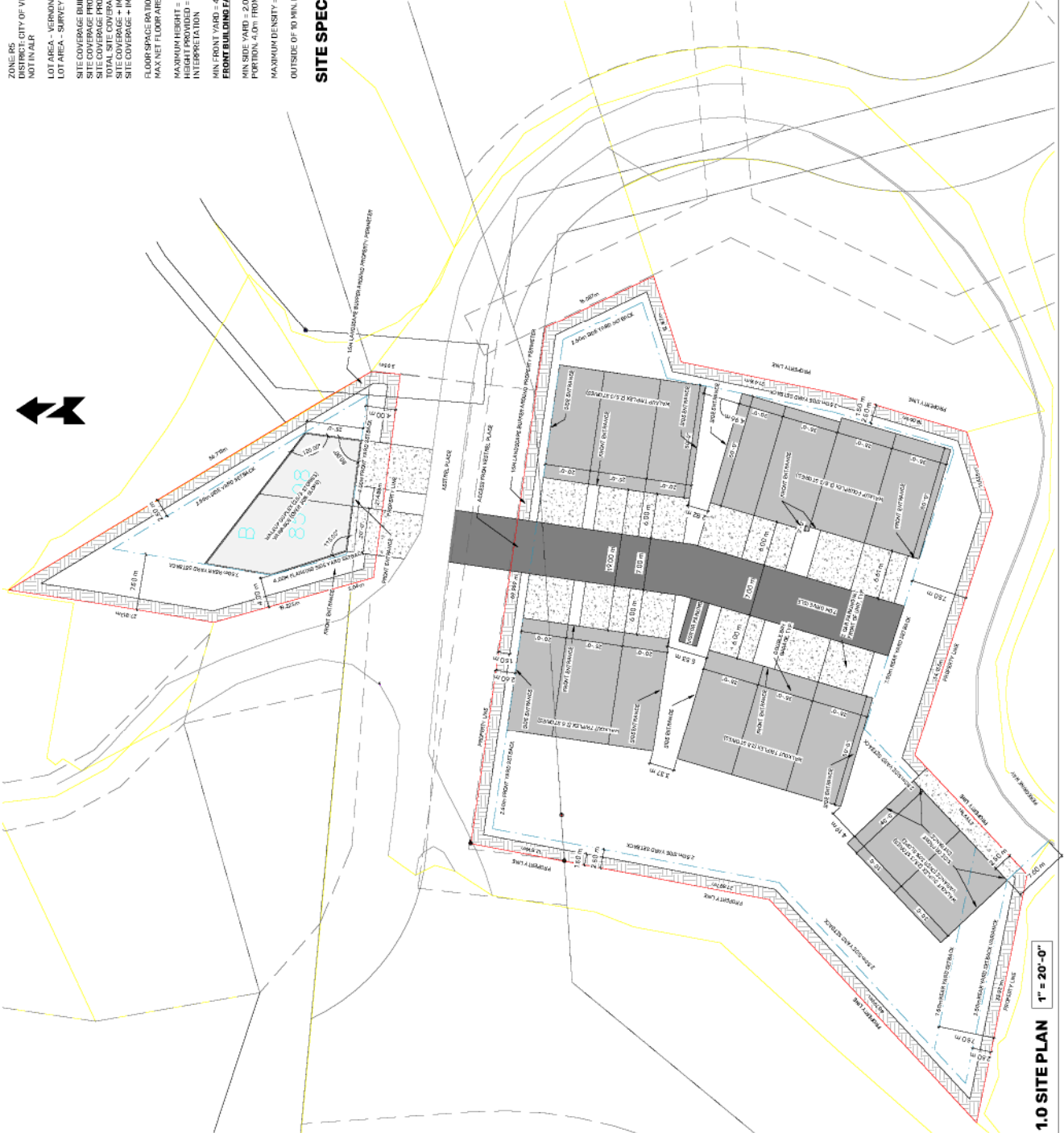
LOT AREA - VERNON GIS = 5461183 m² (4156853 sq ft - 0.5668B ha)
LOT AREA - SURVEYED = 6170 sq ft (0.56629 ha)

SITE COVERAGE BUILDINGS PERMITTED = 40% (24,468 sq ft)
SITE COVERAGE PROVIDED UNITS UNDER 50% = 15,000 sq ft (13 UNITS)
SITE COVERAGE PROVIDED UNITS OVER 50% = 4956 sq ft (4 UNITS)
SITE COVERAGE = IMPERMEABLE PERMITTED = 50% (20,565 sq ft)
SITE COVERAGE = IMPERMEABLE SHOWN = 19256 + 10342 = 30098 sq ft (49.5%)

FLOOR SPACE RATIO = 0.4 (NET FLOOR AREA / LOT AREA)
MAX NET FLOOR AREA = 36702 sq ft (2859 sq ft/UNIT)

MAXIMUM HEIGHT = 10m OR 2.5 STOREYS - VARIANCE REQUIRED BASED ON INTERPRETATION
MIN FRONT YARD = 4.0m (GARAGE) 0.6m TO SIDE OF GARAGE OR 2.6m TO THE FRONT BUILDING FACADE FOR SIDE-ENTRY GARAGE
MIN SIDE YARD = 2.0m FOR 1 OR 1.5 STOREY PORTION, 2.5m FOR 2 OR 2.5 STOREY PORTION, 4.0m FROM A LANDING STREET
MAXIMUM DENSITY = 30 UNITS PER HECTARE = 17.06 UNITS (MAX 17 UNITS)
OUTSIDE OF 10 MIN. FIRE RESPONSE ZONE SPRINKLER UNITS.

SITE SPECIFIC INFORMATION



1.0 SITE PLAN 1" = 20'-0"

APPENDIX A – TEST HOLE LOGS

Test Hole Log: TH22-01

File: 20986

Project: Townhome Development

Client: Prime Building Design Ltd

Site Location: 69 Kestrel Place, Vernon, BC



1340 St. Paul Street, Kelowna, BC, V1Y 2E1
Tel: 604-439-0922 Fax: 604-439-9189

INFERRED PROFILE				Moisture Content (%)	DCPT (blows per foot)	Groundwater / Well	Remarks
Depth	Symbol	SOIL DESCRIPTION	Depth (m)/Elev (m)				
0		Ground Surface	0.0				
0 to 1		Sandy Silt firm-stiff sandy SILT, some gravel fill, roots and organics, brown-tan, moist-dry	0.0	23.4			
1 to 2		Silt stiff SILT, some sand, chalky, tan-beige, dry	1.2				
2 to 3		Clayey Silt stiff clayey SILT, trace sand (fine grained), beige-tan, moist	2.1	31.5			
3 to 4		wet @ 3.2 m					Estimated water table depth @ 3.2 m
4 to 5		Sand and Gravel dense SAND and GRAVEL (till like), some silt, brown-tan, wet	3.5	31.2			
5 to 6		End of Borehole	4.0	11.7			Auger refusal @ 4.0 m due to dense sand and gravel

Logged: KM
Method: Track Mounted Drill Rig
Date: 09-June-2022

Datum: Ground Elevation
Figure Number: A.01
Page: 1 of 1

Test Hole Log: TH22-02 (CPT22-01)

File: 20986

Project: Townhome Development

Client: Prime Building Design Ltd

Site Location: 69 Kestrel Place, Vernon, BC



1340 St. Paul Street, Kelowna, BC, V1Y 2E1
Tel: 604-439-0922 Fax: 604-439-9189

INFERRED PROFILE				Moisture Content (%)	DCPT (blows per foot)	Groundwater / Well	Remarks
Depth	Symbol	SOIL DESCRIPTION	Depth (m)/Elev (m)				
0		Ground Surface	0.0				
1		Silt stiff-firm SILT, reworked, some organics, roots, gravel and cobbles, brown-beige, moist	0.9				
2		Silt stiff sandy SILT, beige, moist	1.2				
3		Sand compact SAND, some gravel, brown, slightly moist	1.7	39.4			
4		Silt stiff clayey SILT, beige-brown, moist trace sand until 2.1 m	2.1				
5		wet @ 2.7 m	2.7				Estimated water table depth @ 2.7 m
6		Sand and Gravel dense silty SAND and GRAVEL (glacial till like), grey-beige, wet	3.2	37.6			
7		End of Borehole	4.0	20.4			Auger refusal @ 4.0 m due to dense sand and gravel

Logged: KM
Method: Track Mounted Drill Rig
Date: 09-June-2022

Datum: Ground Elevation
Figure Number: A.02
Page: 1 of 1

Test Hole Log: TH22-03 (TH22-02)

File: 20986

Project: Townhome Development

Client: Prime Building Design Ltd

Site Location: 69 Kestrel Place, Vernon, BC



1340 St. Paul Street, Kelowna, BC, V1Y 2E1
Tel: 604-439-0922 Fax: 604-439-9189

INFERRED PROFILE				Moisture Content (%)	DCPT (blows per foot)	Groundwater / Well	Remarks
Depth	Symbol	SOIL DESCRIPTION	Depth (m)/Elev (m)				
0		Ground Surface	0.0				
1		Silt firm SILT, reworked, some organics, roots, brown-beige, moist	0.3				
2		Silt stiff SILT, some sand, beige, slightly moist		41.4			
3		organic lenses until 1.5 m					
4		clayey after 2.1 m		36.7			
5							
6							
7							
8							
9							
10		clayey SILT @ 2.7 m	3.0				
11		Silt and Gravel dense sandy SILT and GRAVEL (glacial till like), beige-brown, wet		34.4			
12		End of Borehole	3.7				Auger refusal @ 3.7 m due to dense sand and gravel
13							Unable to determine water table depth
14							
15							

Logged: KM
Method: Track Mounted Drill Rig
Date: 29-June-2022

Datum: Ground Elevation
Figure Number: A.03
Page: 1 of 1

Test Hole Log: TH22-04 (CPT22-03)

File: 20986

Project: Townhome Development

Client: Prime Building Design Ltd

Site Location: 69 Kestrel Place, Vernon, BC



1340 St. Paul Street, Kelowna, BC, V1Y 2E1
Tel: 604-439-0922 Fax: 604-439-9189

INFERRED PROFILE				Moisture Content (%)	DCPT (blows per foot)	Groundwater / Well	Remarks
Depth	Symbol	SOIL DESCRIPTION	Depth (m)/Elev (m)				
0		Ground Surface	0.0				
1		Silt firm SILT, reworked, some organics, roots, brown-beige, moist	0.3				
2		Silt stiff SILT, some sand, beige, slightly moist					
3							
4							
5							
6		organic lenses until 1.5 m					
7							
8				28.1			
9		clayey after 2.1 m					
10		clayey SILT @ 2.7 m	3.0				Estimated water table depth @ 3 m
11		Silt and Gravel dense sandy SILT and GRAVEL (glacial till like), beige-brown, wet					
12		End of Borehole	3.7				Auger refusal @ 3.7 m due to dense sand and gravel
13							
14							
15							

Logged: KM
Method: Track Mounted Drill Rig
Date: 29-June-2022

Datum: Ground Elevation
Figure Number: A.04
Page: 1 of 1

Test Hole Log: TH22-05 (CPT22-04)

File: 20986

Project: Townhome Development

Client: Prime Building Design Ltd

Site Location: 69 Kestrel Place, Vernon, BC



1340 St. Paul Street, Kelowna, BC, V1Y 2E1
Tel: 604-439-0922 Fax: 604-439-9189

INFERRED PROFILE				Moisture Content (%)	DCPT (blows per foot)	Groundwater / Well	Remarks
Depth	Symbol	SOIL DESCRIPTION	Depth (m)/Elev (m)				
0		Ground Surface	0.0				
1		Silt stiff organic SILT, reworked, some roots, brown-beige, moist	0.5				
2		Silt stiff SILT, some sand and clay, beige-tan, dry					
3							
4		very stiff after 1.2 m		28.1			
5							
6							
7							
8		End of Borehole	2.4				Auger refusal @ 2.4 m due to very stiff Silt
9							Unable to determine water table depth
10							
11							
12							
13							
14							
15							

Logged: KM
Method: Track Mounted Drill Rig
Date: 29-June-2022

Datum: Ground Elevation
Figure Number: A.05
Page: 1 of 1

Test Hole Log: TH22-06

File: 20986

Project: Townhome Development

Client: Prime Building Design Ltd

Site Location: 69 Kestrel Place, Vernon, BC



1340 St. Paul Street, Kelowna, BC, V1Y 2E1
Tel: 604-439-0922 Fax: 604-439-9189

INFERRED PROFILE				Moisture Content (%)	DCPT (blows per foot)	Groundwater / Well	Remarks
Depth	Symbol	SOIL DESCRIPTION	Depth (m)/Elev (m)				
0		Ground Surface	0.0				
1		Silt firm-stiff sandy SILT, some organics and roots, black-brown, slightly moist	0.5				
2		Silt stiff SILT, some sand, beige, dry					
3		very stiff after 1.2 m trace concretions					
4		lens of sand and gravel @ 2.6 m					
5		Silt stiff clayey SILT, trace sand, tan-beige, moist	2.7				
6		wet @ 3.0 m		38.9			Estimated water table depth @ 3.0 m
7		Sand and Gravel compact SAND and GRAVEL, trace silt, brown, wet	4.4				
8				22.6			
9		End of Borehole	6.1				

Logged: KM
Method: Track Mounted Drill Rig
Date: 29-June-2022

Datum: Ground Elevation
Figure Number: A.06
Page: 1 of 1

Test Pit Log: TP22-01
File: 20986
Project: Residential Development
Client: Prime Building Design Ltd.
Site Location: 69 Kestrel Place, Vernon, BC



INFERRED PROFILE		SOIL DESCRIPTION	Depth/Elev (m)	Moisture Content (%)	Groundwater	REMARKS
ft	m					
0	0	GROUND SURFACE				
		TOPSOIL & SILT Topsoil, Silt, Organics. Heavily Vegetated Surface - Trees & Undergrowth. Dark Brown or Black. Wet. Soft.	0.0			
1						
2		SAND AND SILT Silty Sand to Sandy Silt, Tan, Moist to Wet, Firm	0.6			
3	1	@0.9 m: Trace Organics, Firm/Compact to Stiff/Compact		31.3		@ 0.9 m: Fines Content = 38.5% @ 0.9 m: Atterberg Soils Class = CH
4						
5		SILT AND CLAY Silt and Clay, Some Sand, Trace Gravel, Brown, Moist, Soft to Firm. High Plastic. Intermittent Organics & Rootlets. Intermittent Sandy Gravelly Pockets.	1.5			
6	2	@ 1.7 m: Horizontal Sand Seam Observed, 10 mm Thick, Fine Grained				
7		@ 2.1 m: Stiff to Hard		31.2		@ 0.9 m: Fines Content = 76.9%
8		@ 3.0 m: Very Soft to Soft, Wet, Perched Water Table, Blueish				@ 3.0 m: Atterberg Soils Class = CH
9						
10	3					
11						
12		EXCAVATOR REFUSAL ON BEDROCK @ 3.6 METRES Bedrock, Intact, Unweathered	3.6	47.1		@ 0.9 m: Fines Content = 86.4%
13	4					
14						
15						

Logged: WP
 Method: EXCAVATOR
 Date: 04/04/2022

Datum: EXISTING SURFACE GRADE
 Figure Number: 20986-TP22-01
 Page: 1 OF 1

Test Pit Log: TP22-02

File: 20986
 Project: Residential Development
 Client: Prime Building Design Ltd.
 Site Location: 69 Kestrel Place, Vernon, BC



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INFERRED PROFILE		SOIL DESCRIPTION	Depth/Elev (m)	Moisture Content (%)	Groundwater	REMARKS
ft	m					
0	0	GROUND SURFACE				
		TOPSOIL & SILT Topsoil, Silt, Organics. Heavily Vegetated Surface - Trees & Undergrowth. Dark Brown or Black. Wet. Soft.	0.0			
1		SILT Silt, Tan, Dry to Damp, Soft	0.3			
2						
3	1	EXCAVATOR REFUSAL ON BEDROCK @ 0.9 METRES Bedrock, Intact, Unweathered, Encountered @ 0.6 to 0.9 m (Sloped Rock Surface)	0.9			
4						
5						
6						
7	2					
8						
9						
10	3					
11						
12						
13						
14	4					
15						

Logged: WP
 Method: EXCAVATOR
 Date: 04/04/2022

Datum: EXISTING SURFACE GRADE
 Figure Number: 20986-TP22-02
 Page: 1 OF 1

Test Pit Log: TP22-03
File: 20986
Project: Residential Development
Client: Prime Building Design Ltd.
Site Location: 69 Kestrel Place, Vernon, BC



INFERRED PROFILE		SOIL DESCRIPTION	Depth/Elev (m)	Moisture Content (%)	Groundwater	REMARKS
Symbol						
		GROUND SURFACE				
		TOPSOIL & SILT Topsoil, Silt, Organics. Heavily Vegetated Surface - Trees & Undergrowth. Dark Brown or Black. Wet. Soft.	0.0			
		SILT Silt, Tan, Dry to Damp, Soft	0.3			
		EXCAVATOR REFUSAL ON BEDROCK @ 0.6 METRES Bedrock, Intact, Unweathered, Encountered @ 0.3 to 0.6 m (Sloped Rock Surface)	0.6			

Logged: WP Method: EXCAVATOR Date: 04/04/2022	Datum: EXISTING SURFACE GRADE Figure Number: 20986-TP22-03 Page: 1 OF 1
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Test Pit Log: TP22-04
File: 20986
Project: Residential Development
Client: Prime Building Design Ltd.
Site Location: 69 Kestrel Place, Vernon, BC



INFERRED PROFILE		SOIL DESCRIPTION	Depth/Elev (m)	Moisture Content (%)	Groundwater	REMARKS
Symbol						
0	ft m 0	GROUND SURFACE				
		TOPSOIL & SILT	0.0			
1		Topsoil, Silt, Brown, Moist, Soft				
		EXCAVATOR REFUSAL ON BEDROCK @ 0.3 METRES	0.3			
2		Bedrock, Weathered/Fractured, Encountered @ 0.15 to 0.3 m (Sloped Rock Surface)				
3	1					
4						
5						
6						
7	2					
8						
9						
10	3					
11						
12						
13						
14	4					
15						

Logged: WP
 Method: EXCAVATOR
 Date: 04/04/2022

Datum: EXISTING SURFACE GRADE
 Figure Number: 20986-TP22-04
 Page: 1 OF 1

Test Pit Log: TP22-06
File: 20986
Project: Residential Development
Client: Prime Building Design Ltd.
Site Location: 69 Kestrel Place, Vernon, BC



INFERRED PROFILE		SOIL DESCRIPTION	Depth/Elev (m)	Moisture Content (%)	Groundwater	REMARKS
Symbol						
0 ft m 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15		GROUND SURFACE				
		TOPSOIL & SILT Topsoil, Silt, Organics. Heavily Vegetated Surface - Trees & Undergrowth. Dark Brown or Black. Wet. Soft.	0.0			
		SILT AND CLAY Silty Clay to Clayey Silt, Trace to Some Sand, Trace Gravel, Organics, Rootlets, Moist to Wet, Soft to Firm. Some Stiff Sequences ~300 mm to 500 mm Thick. @ 1.8-2.4 m: Perched Water Table, ~1 l/s Inflow, Very Soft	0.6			
		EXCAVATOR REFUSAL ON BEDROCK @ 3.9 METRES Bedrock, Intact, Unweathered	3.9			

Logged: WP
 Method: EXCAVATOR
 Date: 04/04/2022

Datum: EXISTING SURFACE GRADE
 Figure Number: 20986-TP22-06
 Page: 1 OF 1

Test Hole Log: TH22-01

File: 20986

Project: Townhome Development

Client: Prime Building Design Ltd

Site Location: 69 Kestrel Place, Vernon, BC



1340 St. Paul Street, Kelowna, BC, V1Y 2E1
Tel: 604-439-0922 Fax: 604-439-9189

INFERRED PROFILE				Moisture Content (%)	DCPT (blows per foot)	Groundwater / Well	Remarks
Depth	Symbol	SOIL DESCRIPTION	Depth (m)/Elev (m)				
0		Ground Surface	0.0				
0 to 1		Sandy Silt firm-stiff sandy SILT, some gravel fill, roots and organics, brown-tan, moist-dry	0.0	23.4			
1 to 2		Silt stiff SILT, some sand, chalky, tan-beige, dry	1.2				
2 to 3		Clayey Silt stiff clayey SILT, trace sand (fine grained), beige-tan, moist	2.1	31.5			
3 to 4		wet @ 3.2 m					Estimated water table depth @ 3.2 m
4 to 5		Sand and Gravel dense SAND and GRAVEL (till like), some silt, brown-tan, wet	3.5	31.2			
5 to 6				11.7			
6		End of Borehole	4.0				Auger refusal @ 4.0 m due to dense sand and gravel

Logged: KM
Method: Track Mounted Drill Rig
Date: 09-June-2022

Datum: Ground Elevation
Figure Number: A.01
Page: 1 of 1

Test Hole Log: TH22-02 (CPT22-01)

File: 20986

Project: Townhome Development

Client: Prime Building Design Ltd

Site Location: 69 Kestrel Place, Vernon, BC



1340 St. Paul Street, Kelowna, BC, V1Y 2E1
Tel: 604-439-0922 Fax: 604-439-9189

INFERRED PROFILE				Moisture Content (%)	DCPT (blows per foot)	Groundwater / Well	Remarks
Depth	Symbol	SOIL DESCRIPTION	Depth (m)/Elev (m)				
0		Ground Surface	0.0				
1		Silt stiff-firm SILT, reworked, some organics, roots, gravel and cobbles, brown-beige, moist	0.9				
2		Silt stiff sandy SILT, beige, moist	1.2				
3		Sand compact SAND, some gravel, brown, slightly moist	1.7	39.4			
4		Silt stiff clayey SILT, beige-brown, moist trace sand until 2.1 m wet @ 2.7 m	3.2	37.6			Estimated water table depth @ 2.7 m
5		Sand and Gravel dense silty SAND and GRAVEL (glacial till like), grey-beige, wet	4.0	20.4			Auger refusal @ 4.0 m due to dense sand and gravel
6		End of Borehole					

Logged: KM
Method: Track Mounted Drill Rig
Date: 09-June-2022

Datum: Ground Elevation
Figure Number: A.02
Page: 1 of 1

Test Hole Log: TH22-03 (TH22-02)

File: 20986

Project: Townhome Development

Client: Prime Building Design Ltd

Site Location: 69 Kestrel Place, Vernon, BC



1340 St. Paul Street, Kelowna, BC, V1Y 2E1
Tel: 604-439-0922 Fax: 604-439-9189

INFERRED PROFILE				Moisture Content (%)	DCPT (blows per foot)	Groundwater / Well	Remarks
Depth	Symbol	SOIL DESCRIPTION	Depth (m)/Elev (m)				
0		Ground Surface	0.0				
1		Silt firm SILT, reworked, some organics, roots, brown-beige, moist	0.3				
2		Silt stiff SILT, some sand, beige, slightly moist		41.4			
3		organic lenses until 1.5 m					
4		clayey after 2.1 m		36.7			
5							
6							
7							
8							
9							
10		clayey SILT @ 2.7 m	3.0				
11		Silt and Gravel dense sandy SILT and GRAVEL (glacial till like), beige-brown, wet		34.4			
12		End of Borehole	3.7				Auger refusal @ 3.7 m due to dense sand and gravel
13							Unable to determine water table depth
14							
15							

Logged: KM
Method: Track Mounted Drill Rig
Date: 29-June-2022

Datum: Ground Elevation
Figure Number: A.03
Page: 1 of 1

Test Hole Log: TH22-04 (CPT22-03)

File: 20986

Project: Townhome Development

Client: Prime Building Design Ltd

Site Location: 69 Kestrel Place, Vernon, BC



1340 St. Paul Street, Kelowna, BC, V1Y 2E1
Tel: 604-439-0922 Fax: 604-439-9189

INFERRED PROFILE				Moisture Content (%)	DCPT (blows per foot)	Groundwater / Well	Remarks
Depth	Symbol	SOIL DESCRIPTION	Depth (m)/Elev (m)				
0		Ground Surface	0.0				
1		Silt firm SILT, reworked, some organics, roots, brown-beige, moist	0.3				
2		Silt stiff SILT, some sand, beige, slightly moist					
3							
4							
5							
6		organic lenses until 1.5 m					
7							
8				28.1			
9		clayey after 2.1 m					
10		clayey SILT @ 2.7 m	3.0				Estimated water table depth @ 3 m
11		Silt and Gravel dense sandy SILT and GRAVEL (glacial till like), beige-brown, wet					
12		End of Borehole	3.7				Auger refusal @ 3.7 m due to dense sand and gravel
13							
14							
15							

Logged: KM
Method: Track Mounted Drill Rig
Date: 29-June-2022

Datum: Ground Elevation
Figure Number: A.04
Page: 1 of 1

Test Hole Log: TH22-05 (CPT22-04)

File: 20986

Project: Townhome Development

Client: Prime Building Design Ltd

Site Location: 69 Kestrel Place, Vernon, BC



1340 St. Paul Street, Kelowna, BC, V1Y 2E1
Tel: 604-439-0922 Fax: 604-439-9189

INFERRED PROFILE				Moisture Content (%)	DCPT (blows per foot)	Groundwater / Well	Remarks
Depth	Symbol	SOIL DESCRIPTION	Depth (m)/Elev (m)				
0		Ground Surface	0.0				
1		Silt stiff organic SILT, reworked, some roots, brown-beige, moist	0.5				
2		Silt stiff SILT, some sand and clay, beige-tan, dry					
3							
4		very stiff after 1.2 m		28.1			
5							
6							
7							
8		End of Borehole	2.4				Auger refusal @ 2.4 m due to very stiff Silt
9							Unable to determine water table depth
10							
11							
12							
13							
14							
15							

Logged: KM
Method: Track Mounted Drill Rig
Date: 29-June-2022

Datum: Ground Elevation
Figure Number: A.05
Page: 1 of 1

Test Hole Log: TH22-06

File: 20986

Project: Townhome Development

Client: Prime Building Design Ltd

Site Location: 69 Kestrel Place, Vernon, BC



1340 St. Paul Street, Kelowna, BC, V1Y 2E1
Tel: 604-439-0922 Fax: 604-439-9189

INFERRED PROFILE				Moisture Content (%)	DCPT (blows per foot)	Groundwater / Well	Remarks
Depth	Symbol	SOIL DESCRIPTION	Depth (m)/Elev (m)				
0		Ground Surface	0.0				
1		Silt firm-stiff sandy SILT, some organics and roots, black-brown, slightly moist	0.5				
2		Silt stiff SILT, some sand, beige, dry					
3		very stiff after 1.2 m trace concretions					
4		lens of sand and gravel @ 2.6 m					
5		Silt stiff clayey SILT, trace sand, tan-beige, moist	2.7				
6		wet @ 3.0 m		38.9			Estimated water table depth @ 3.0 m
7		Sand and Gravel compact SAND and GRAVEL, trace silt, brown, wet	4.4				
8				22.6			
9		End of Borehole	6.1				

Logged: KM
Method: Track Mounted Drill Rig
Date: 29-June-2022

Datum: Ground Elevation
Figure Number: A.06
Page: 1 of 1

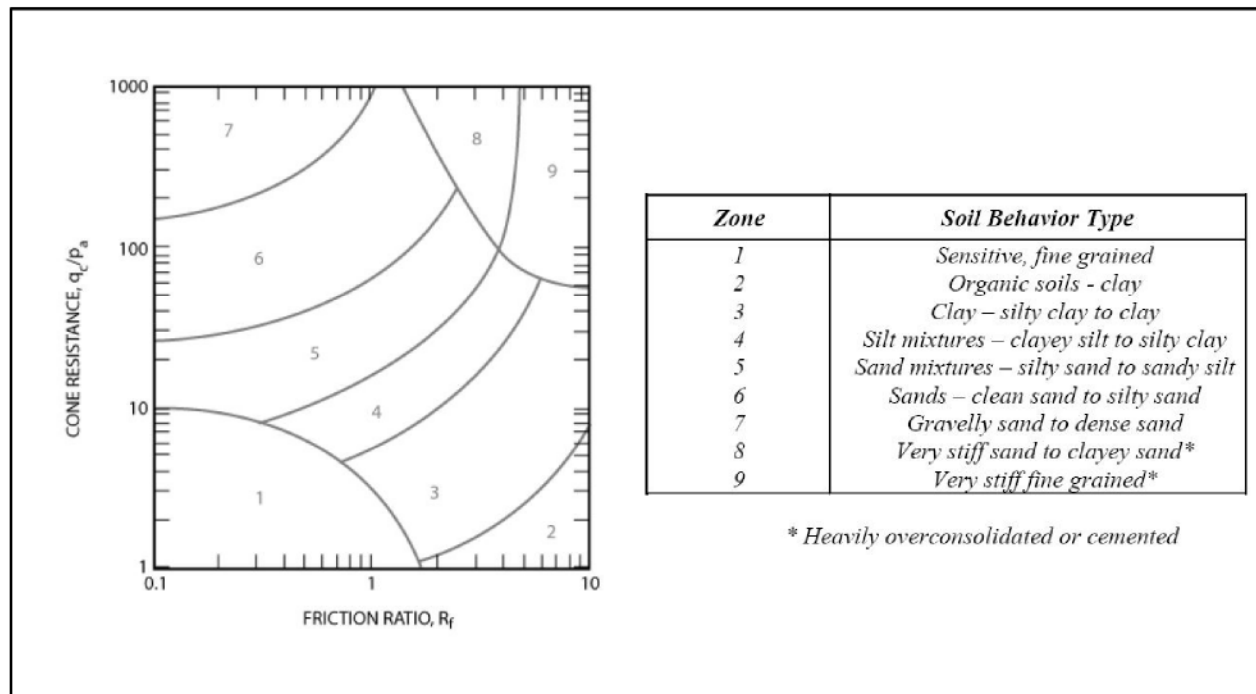
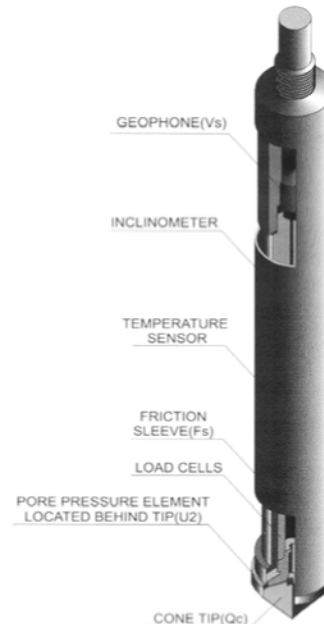
APPENDIX B - ELECTRONIC CONE PENETRATION RESULTS

The system used is owned and operated by GeoPacific and employs a 35.7 mm diameter cone that records tip resistance, sleeve friction, dynamic pore pressure, inclination and temperature at 5 cm intervals on a digital computer system. The system is a Hogentogler electronic cone system and the cone used was a 10 ton cone with pore pressure element located behind the tip and in front of the sleeve as shown on the adjacent figure.

In addition to the capabilities described above, the cone can be stopped at specified depths and dissipation tests carried out. These dissipation tests can be used to determine the groundwater pressures at the specified depth. This is very useful for identifying artesian pressures within specific layers below the ground surface.

Interpretation of the cone penetration test results are carried out by computer using the interpretation chart presented below by Robertson¹. Raw data collected by the field computer includes tip resistance, sleeve friction and pore pressure. The tip resistance is corrected for water pressure and the friction ratio is calculated as the ratio of the sleeve friction on the side of the cone to the corrected tip resistance expressed as a percent. These two parameters are used to determine the soil behaviour type as shown in the chart below. The interpreted soil type may be different from other classification systems such as the Unified Soil Classification that is based upon grain size and plasticity.

Electronic Cone Penetrometer



¹ Robertson, P.K., 2010, "Soil behaviour type from the CPT: an update.", 2nd International Symposium on Cone Penetration Testing, CPT'10, Huntington Beach, CA, USA.



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2022-Jun-29

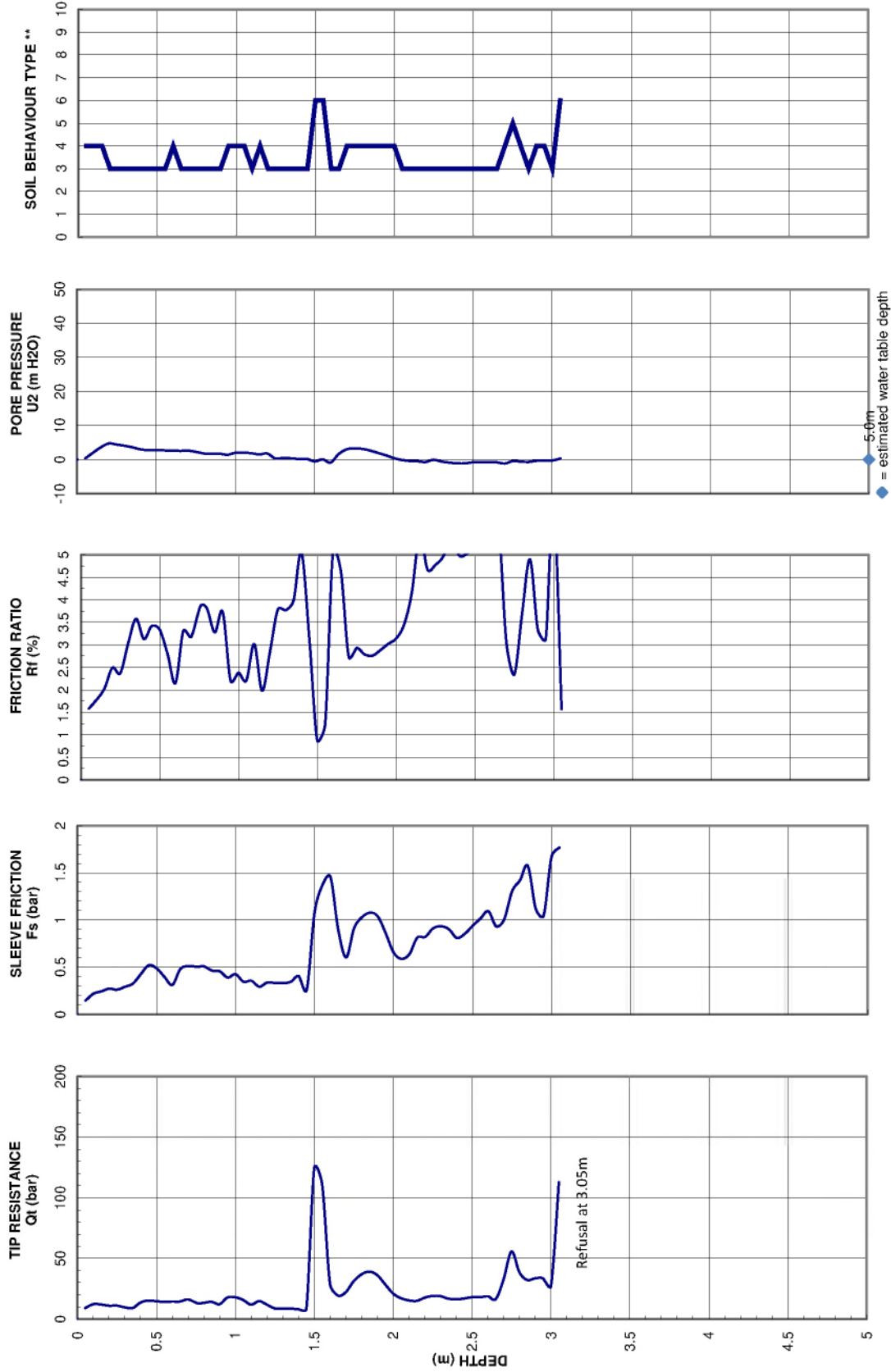
PRIME BUILDING DESIGN LTD

GeoPacific Project #: 20986

Sounding: CPT22-01

69 KESTREL PLACE, VERNON

Figure: B.01



** Based on Robertson et. al 1990

- 1 Sensitive Fine Grained
- 2 Organic Material
- 3 Clay to Silty Clay

- 4 Clayey Silt to Silty Clay
- 5 Silty Sand to Sandy Silt
- 6 Clean Sand to Silty Sand

- 7 Gravely Sand to Sand
- 8 Very Stiff Sand to Clayey Sand
- 9 Very Stiff Fine Grained



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2022-Jun-29

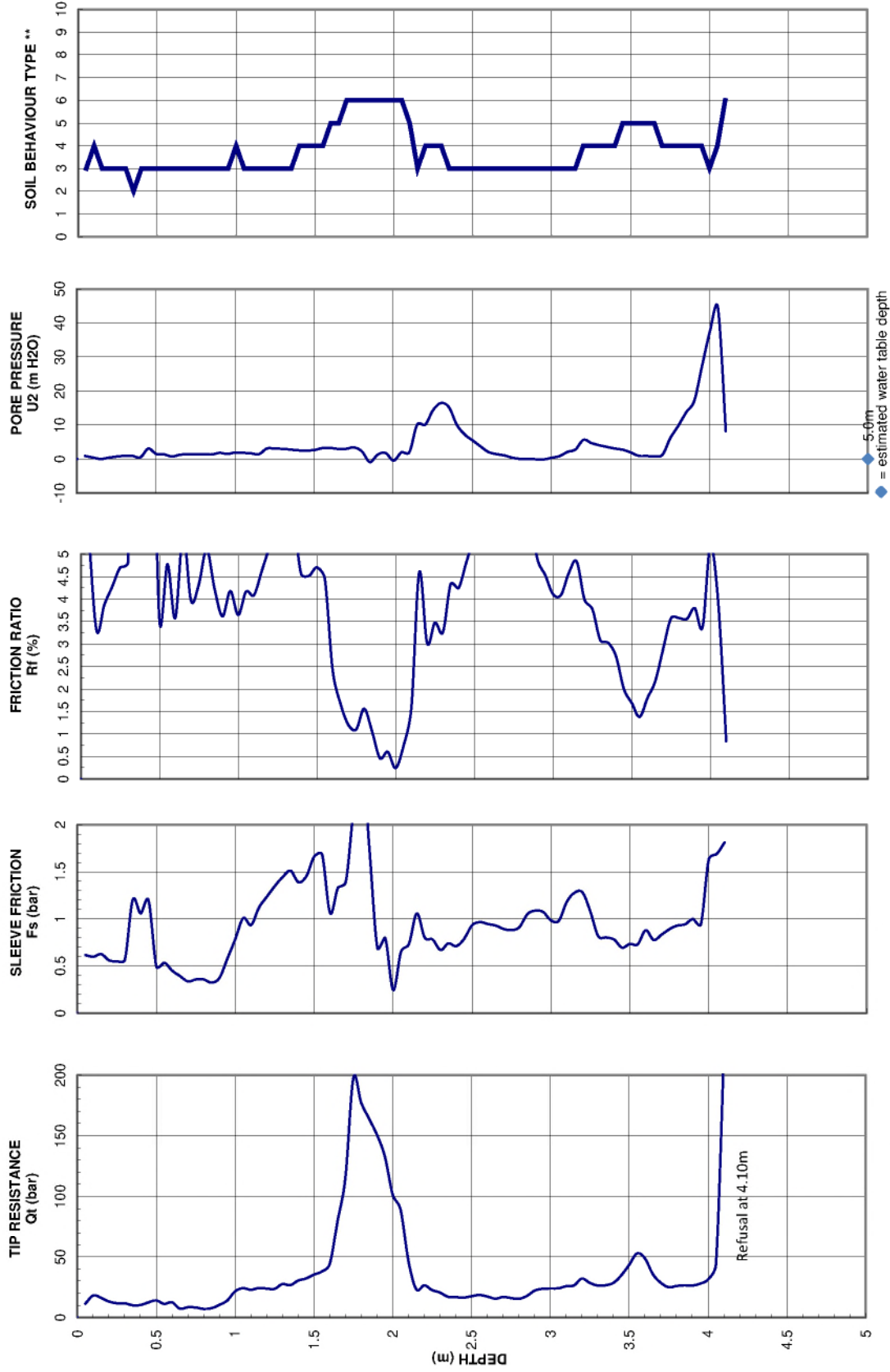
PRIME BUILDING DESIGN LTD

GeoPacific Project #: 20986

Sounding: CPT22-02

69 KESTREL PLACE, VERNON

Figure: B.02



** Based on Robertson et. al 1990

- 1 Sensitive Fine Grained
- 2 Organic Material
- 3 Clay to Silty Clay

- 4 Clayey Silt to Silty Clay
- 5 Silty Sand to Sandy Silt
- 6 Clean Sand to Silty Sand

- 7 Gravely Sand to Sand
- 8 Very Stiff Sand to Clayey Sand
- 9 Very Stiff Fine Grained



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2022-Jun-29

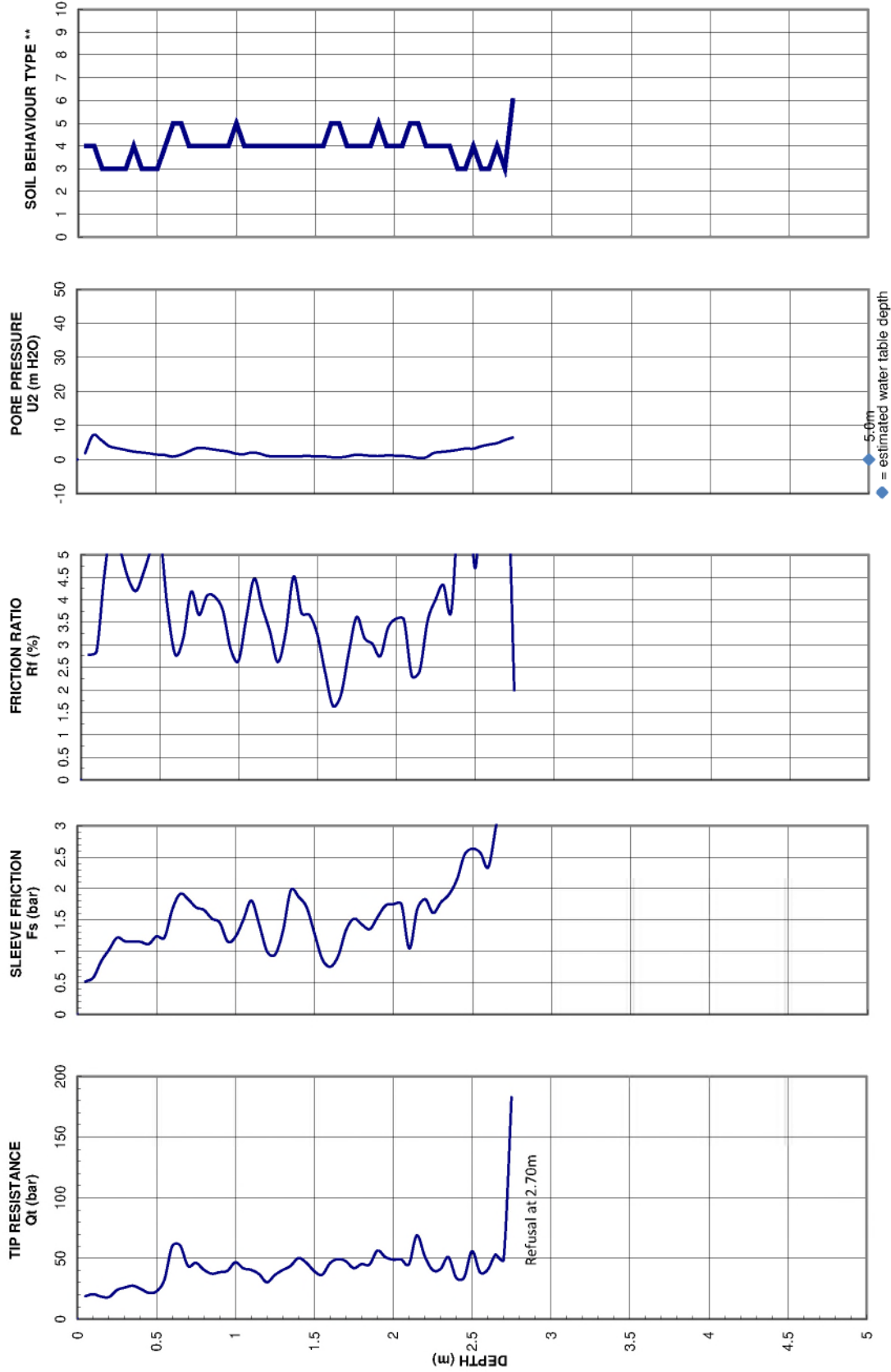
PRIME BUILDING DESIGN LTD

GeoPacific Project #: 20986

Sounding: CPT22-03

69 KESTREL PLACE, VERNON

Figure: B.03



** Based on Robertson et. al 1990

- 1 Sensitive Fine Grained
- 2 Organic Material
- 3 Clay to Silty Clay

- 4 Clayey Silt to Silty Clay
- 5 Silty Sand to Sandy Silt
- 6 Clean Sand to Silty Sand

- 7 Gravely Sand to Sand
- 8 Very Stiff Sand to Clayey Sand
- 9 Very Stiff Fine Grained



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2022-Jun-29

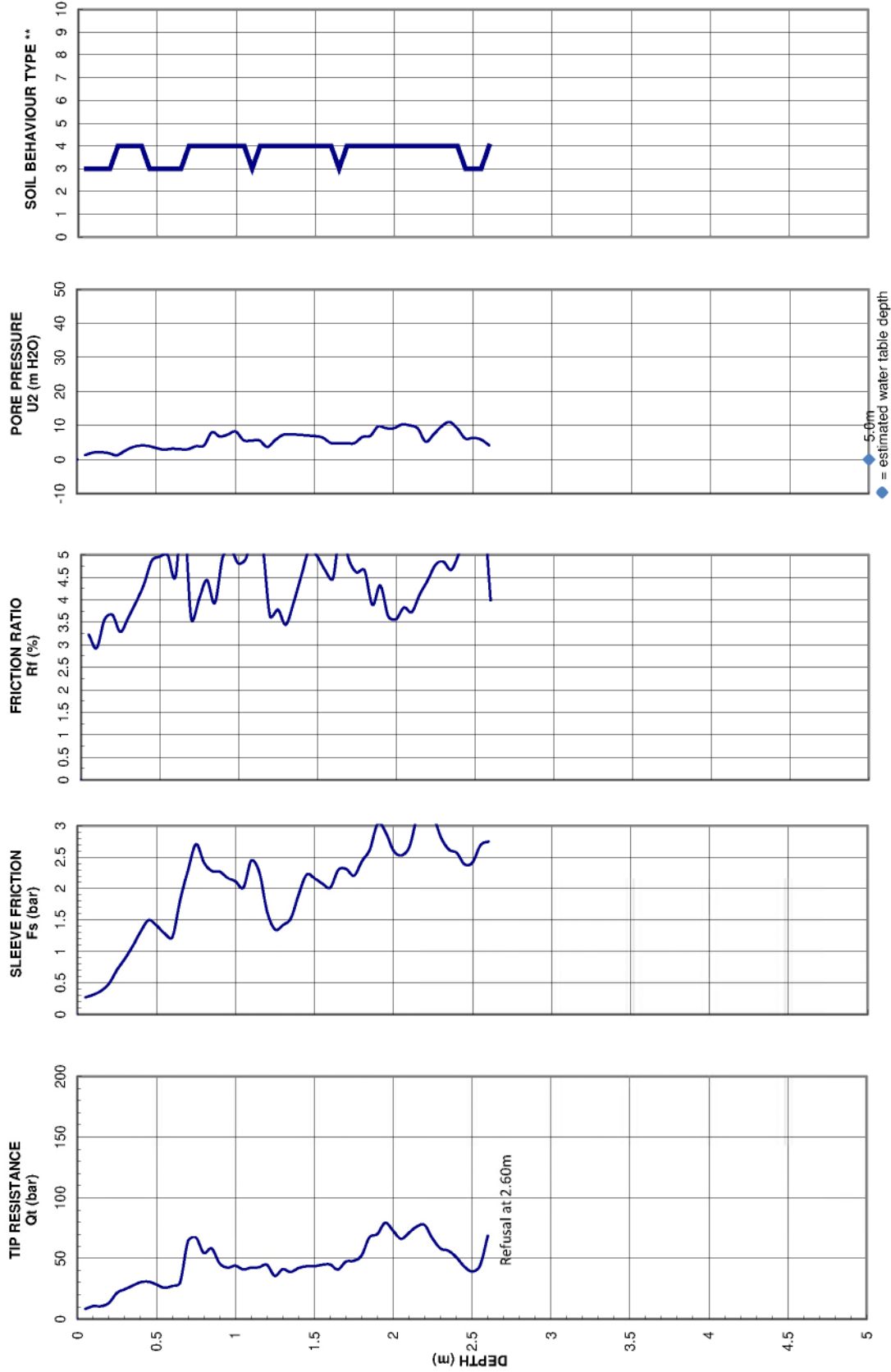
PRIME BUILDING DESIGN LTD

GeoPacific Project #: 20986

Sounding: CPT22-04

69 KESTREL PLACE, VERNON

Figure: B.04



** Based on Robertson et. al 1990

- 1 Sensitive Fine Grained
- 2 Organic Material
- 3 Clay to Silty Clay

- 4 Clayey Silt to Silty Clay
- 5 Silty Sand to Sandy Silt
- 6 Clean Sand to Silty Sand

- 7 Gravely Sand to Sand
- 8 Very Stiff Sand to Clayey Sand
- 9 Very Stiff Fine Grained

APPENDIX C - INTERPRETED PARAMETERS

The following charts plot the Standard Penetration Test (SPT) values and the undrained strength of fine grained soils based upon generally accepted correlations. The methods of correlation are presented below.

STANDARD PENETRATION TEST CORRELATION

The Standard Penetration Test $N_{1(60)}$ value is related to the cone tip resistance through a Q_c/N ratio that depends upon the mean grain size of the soil particles. The soil type is determined from the interpretation described in Appendix B and the data of Table C.1 below is used to calculate the value of $N_{(60)}$.

Table C.1. Tabulated $Q_c/N_{1(60)}$ Ratios for Interpreted Soil Types

Soil Type	Qc/N Ratio
Organic soil - Peat	1.0
Sensitive Fine Grained	2.0
Clay	1.0
Silty Clay to Clay	1.5
Clayey Silt to Silty Clay	2.0
Silt	2.5
Silty Sand to Sandy Silt	3.0
Clean Sand to Silty Sand	4.0
Clean Sand	5.0
Gravelly Sand to Sand	6.0
Very Stiff Fine Grained	1.0
Sand to Clayey Sand	2.0

The $Q_c/N_{1(60)}$ ratio is based upon the published work of Robertson (1985)². The values of N are corrected for overburden pressure in accordance with the correction suggested by Liao and Whitman using a factor of 0.5. Where the correction is of the form:

$$N_1 = \sigma^{0.5} * N$$

All calculations are carried out by computer using the software program CPTint.exe developed by UBC Civil Engineering Department. The results of the interpretation are presented on the following Figures.

UNDRAINED SHEAR STRENGTH CORRELATION

It is generally accepted that there is a correlation between undrained shear strength of clay and the tip resistance as

$$S_u = \frac{(q_c - \sigma_v)}{N_k}$$

determined from the cone penetration testing. Generally the correlation is of the form:

where q_c = cone tip resistance, σ = in situ total stress, N_k = cone constant

The undrained shear strength of the clay has been calculated using the cone tip resistance and an N_k factor of 12.5. All calculations have been carried out automatically using the program CPTeT-IT2. The results are presented on the figures following.

² Robertson, P.K., 1985, "In-Situ Testing and Its Application to Foundation Engineering", 1985 Canadian Geotechnical Colloquium, Canadian Geotechnical Journal, Vol. 23, No. 23, 1986

APPENDIX C - OVER CONSOLIDATION RATIO ANALYSIS

The over consolidation ratio (OCR) is defined as the ratio between the maximum past vertical pressure on the soil versus the current in-situ vertical pressure. The maximum past vertical pressure is typically caused by the presence of excess overburden which is removed by either natural or man-made reasons. Soil ageing and other chemical precipitation affects can also cause a soil to behave as if it has a higher maximum past pressure, which is sometimes described as pseudo-overconsolidation.

Research by Schmertmann (1974) showed the following equation reasonably approximates the OCR of medium plastic to clayey soils:

$$OCR = \left(\frac{\left(\frac{Su / p'_{oc}}{Su / p'_{nc}} \right)^{5/3} + 0.82}{1.82} \right)$$

Su/p'_{oc} = The undrained shear strength to effective stress ratio of the over consolidated soil

Su/p'_{nc} = The undrained shear strength to effective stress ratio of a normally consolidated soil
(OCR = 1). Typically = ~0.2

Soils which are subject to loads less than the maximum past pressure of the soil are typically subject to relatively small elastic settlements. Loads which exceed the maximum past pressure on the soil typically cause consolidation which is the gradual settlement of the ground as a result of expulsion of water from the pores of the soil. The rate of settlement and the time to complete consolidation is a function of the permeability of the soil.

The Schmertman equation has been employed to estimate the OCR of the soils with depth employing the CPT data provided in Appendix B and C.



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2022-Jun-29

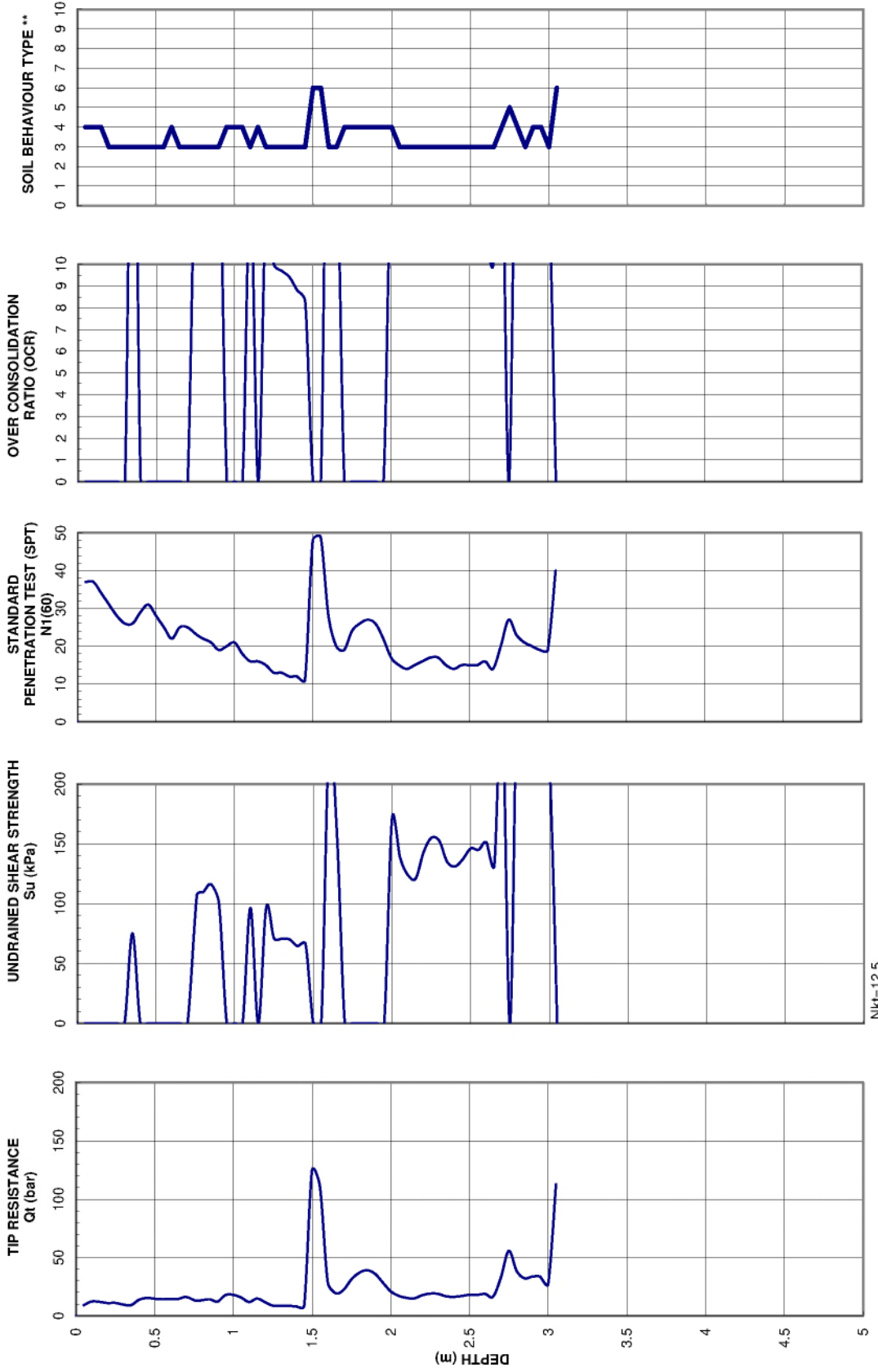
PRIME BUILDING DESIGN LTD

GeoPacific Project #: 20986

Sounding: CPT22-01

69 KESTREL PLACE, VERNON

Figure: C.01



Nkt=12.5

- ** Based on Robertson et. al 1990
- 1 Sensitive Fine Grained
 - 2 Organic Material
 - 3 Clay to Silty Clay

- 4 Clayey Silt to Silty Clay
- 5 Silty Sand to Sandy Silt
- 6 Clean Sand to Silty Sand
- 7 Gravely Sand to Sand
- 8 Very Stiff Sand to Clayey Sand
- 9 Very Stiff Fine Grained



GEO PACIFIC
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2022-Jun-29

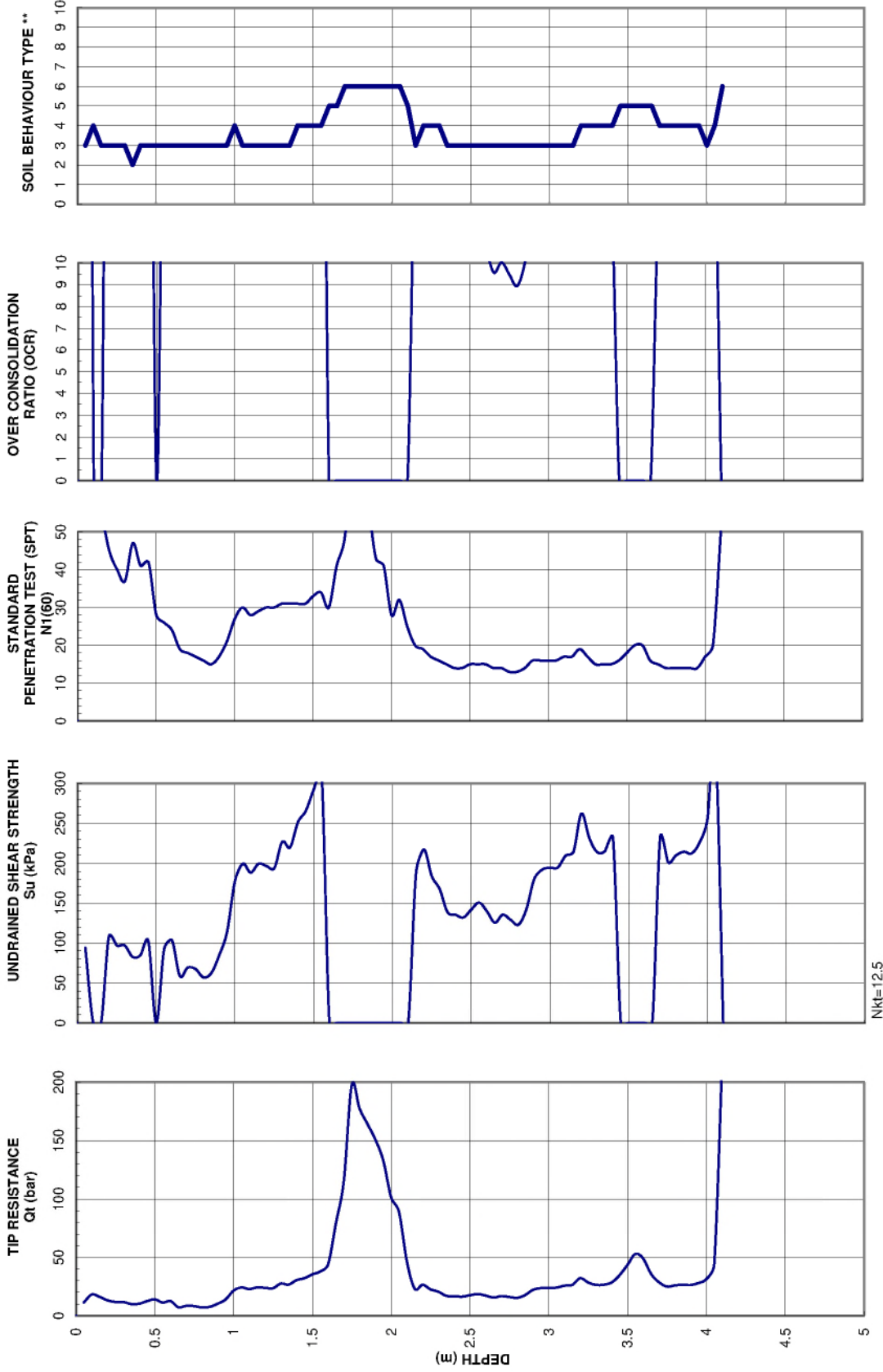
PRIME BUILDING DESIGN LTD

GeoPacific Project #: 20986

Sounding: CPT22-02

69 KESTREL PLACE, VERNON

Figure: C.02



Nk=12.5

- ** Based on Robertson et. al 1990
- 1 Sensitive Fine Grained
 - 2 Organic Material
 - 3 Clay to Silty Clay

- 4 Clayey Silt to Silty Clay
- 5 Silty Sand to Sandy Silt
- 6 Clean Sand to Silty Sand
- 7 Gravely Sand to Sand
- 8 Very Stiff Sand to Clayey Sand
- 9 Very Stiff Fine Grained



GEO PACIFIC
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2022-Jun-29

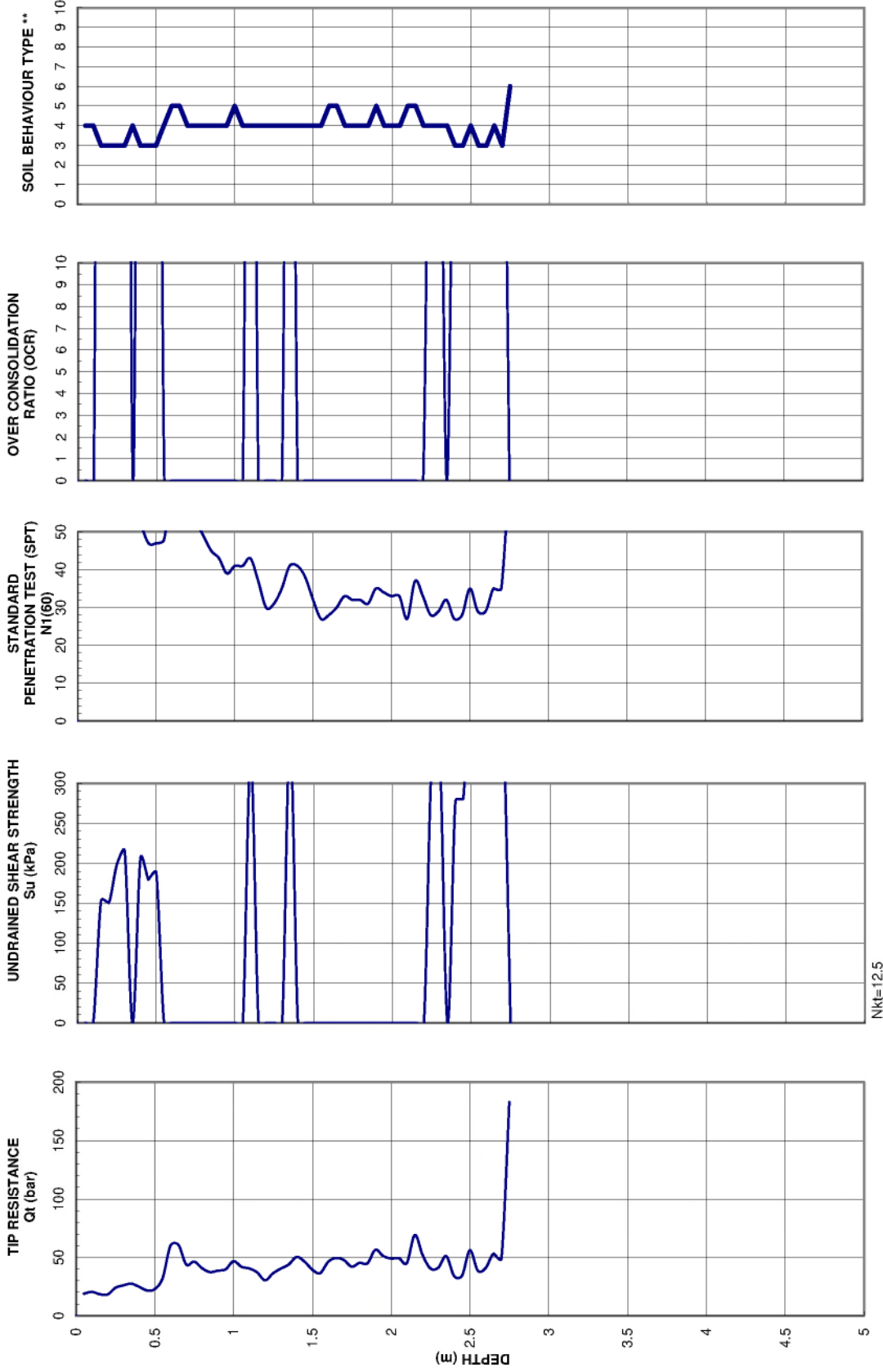
PRIME BUILDING DESIGN LTD

GeoPacific Project #: 20986

Sounding: CPT22-03

69 KESTREL PLACE, VERNON

Figure: C.03



Nkt=12.5

- ** Based on Robertson et. al 1990
- 1 Sensitive Fine Grained
 - 2 Organic Material
 - 3 Clay to Silty Clay

- 4 Clayey Silt to Silty Clay
- 5 Silty Sand to Sandy Silt
- 6 Clean Sand to Silty Sand
- 7 Gravely Sand to Sand
- 8 Very Stiff Sand to Clayey Sand
- 9 Very Stiff Fine Grained



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2022-Jun-29

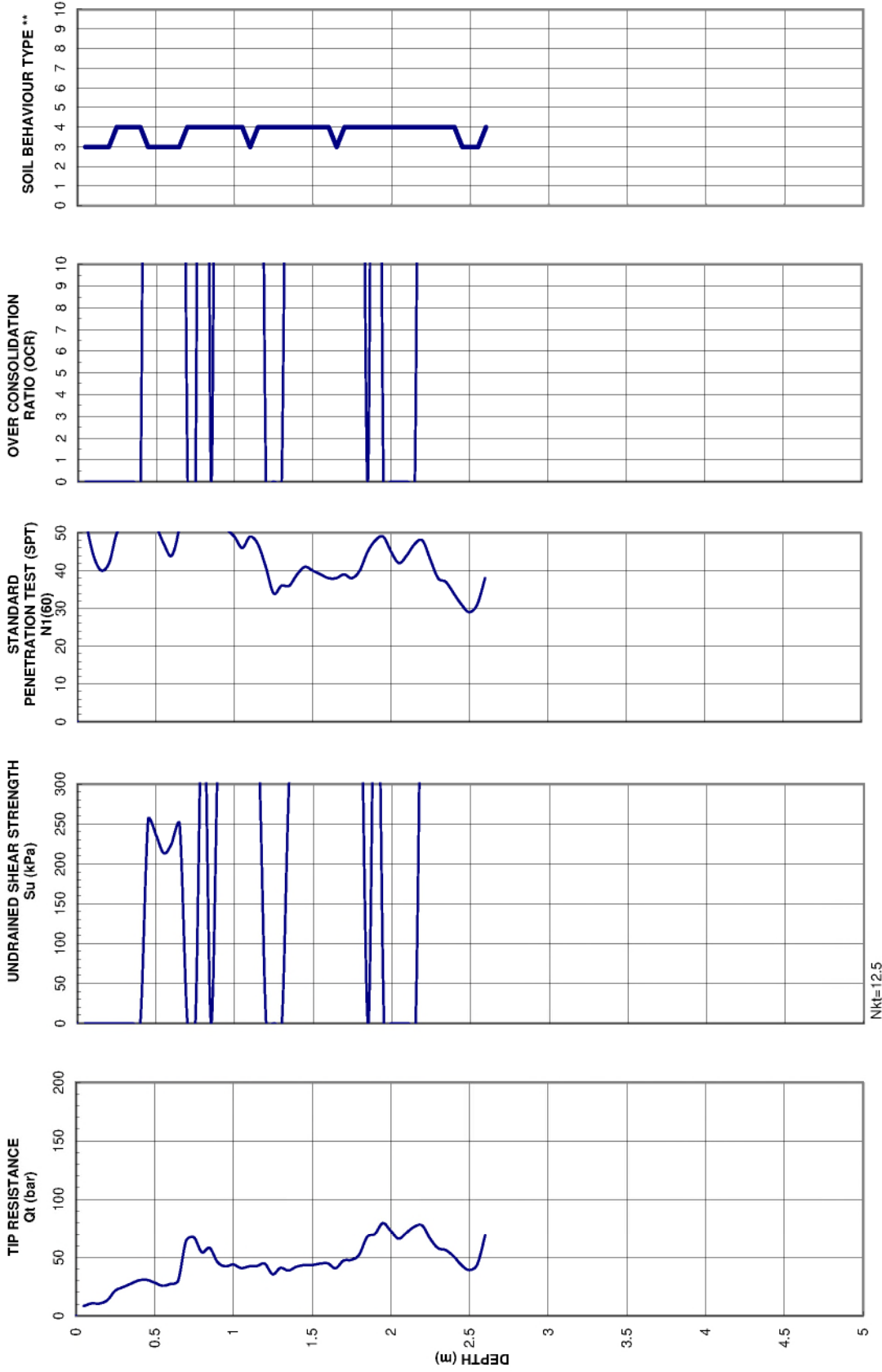
PRIME BUILDING DESIGN LTD

GeoPacific Project #: 20986

Sounding: CPT22-04

69 KESTREL PLACE, VERNON

Figure: C.04



Nk=12.5

** Based on Robertson et. al 1990

- 1 Sensitive Fine Grained
- 2 Organic Material
- 3 Clay to Silty Clay

- 4 Clayey Silt to Silty Clay
- 5 Silty Sand to Sandy Silt
- 6 Clean Sand to Silty Sand

- 7 Gravely Sand to Sand
- 8 Very Stiff Sand to Clayey Sand
- 9 Very Stiff Fine Grained

APPENDIX D - LIQUEFACTION ANALYSIS

Assessment of the liquefaction potential of the ground has been determined by the Cone Penetration Test (CPT). The method of analysis is presented in the following sections.

FACTOR OF SAFETY AGAINST LIQUEFACTION

The factor of safety against liquefaction calculated here is the ratio of the cyclic resistance of the soil (CRR) to the cyclic stresses induced by the design earthquake (CSR). Where the ratio of CRR/CSR is greater than unity the soils ability to resist cyclic stresses is greater than the cyclic stresses induced by the earthquake and liquefaction will be unlikely. Where the CRR/CSR is less than unity then liquefaction could occur. This ratio is presented as the FOS against Liquefaction on the following charts. Calculation of the factor of safety is based on NCEER (1998)¹ which evaluates the CRR directly from cone penetration test sounding data. The value of the cyclic stress ratio has been calculated based on peak horizontal ground acceleration of the 2018 National Building Code interpolated seismic hazard value.

SEISMIC INDUCED SETTLEMENT

In the event of a significant earthquake, settlement of the ground surface could occur as a result of densification of the looser soil layers as a result of liquefaction or due to the expulsion of sand in the form of sand dykes or sills from beneath the site. Tokimatsu and Seed (1987)² suggest a method of analysis for estimating vertical settlements as a result of earthquake induced accelerations. In this method the normalized standard penetration blow counts ($N_{1(60)}$) is compared with the cyclic stress ratio for the induced earthquake to determine the volumetric strain resulting from the earthquake shaking. The volumetric strain is assumed to result in only vertical settlement. The vertical settlement is summed for each depth at which settlement is predicted to occur and accumulated from the bottom of the test hole. The results are presented on the following charts labelled as Settlement.

HORIZONTAL DISPLACEMENT

Horizontal ground displacements known as "free field" displacements occur as a result of liquefaction of the ground and are assumed to occur without the influence of any structures. The horizontal displacements presented in our report are generally based upon the lateral spread method by of Youd, Bartlett, & Hansen (2002). Displacements are calculated based on an empirical relationship developed from observations from other earthquake sites on sloping ground or near a free face, such as an abrupt slope. The presence of the proposed embankment on-site is expected to induce a static bias within the soils at the margin of the embankment making the soils and embankment in this area subject to lateral spread induced movements. In the event of a real earthquake of significant magnitude to cause limited liquefaction, actual movements will be influenced by a wide variety of factors including the characteristics of the earthquake including duration, number of significant cycles, variations in peak particle velocity, wavelength, amplitude and frequencies as well as soil damping and variations in density and continuity of the soil layers.

- 1 Youd, T. L., Idriss, I. M. (2001). "Liquefaction Resistance of Soils: Summary Report from the 1996 and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils", Journal of Geotechnical and Geoenvironmental Engineering, Vol 127, 10, pp. 817-833
- 2 Tokimatsu, K.A.M. and Seed, H.B., 1987. "Evaluation of Settlement in Sands Due to Earthquake Shaking", Journal of Geotechnical Engineering, ASCE, Vol. 113, No. 8, pp. 861-878.
- 3 Youd, T.L., Bartlett, S.F., Hansen, C.M. (2002), "Revised MultiLinear Regression Equations for Prediction of Lateral Spread Displacements", Journal of Geotechnical and GeoEnvironmental Engineering, Vol. 128, No. 12, pp. 1007-1017



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2022-Jun-29

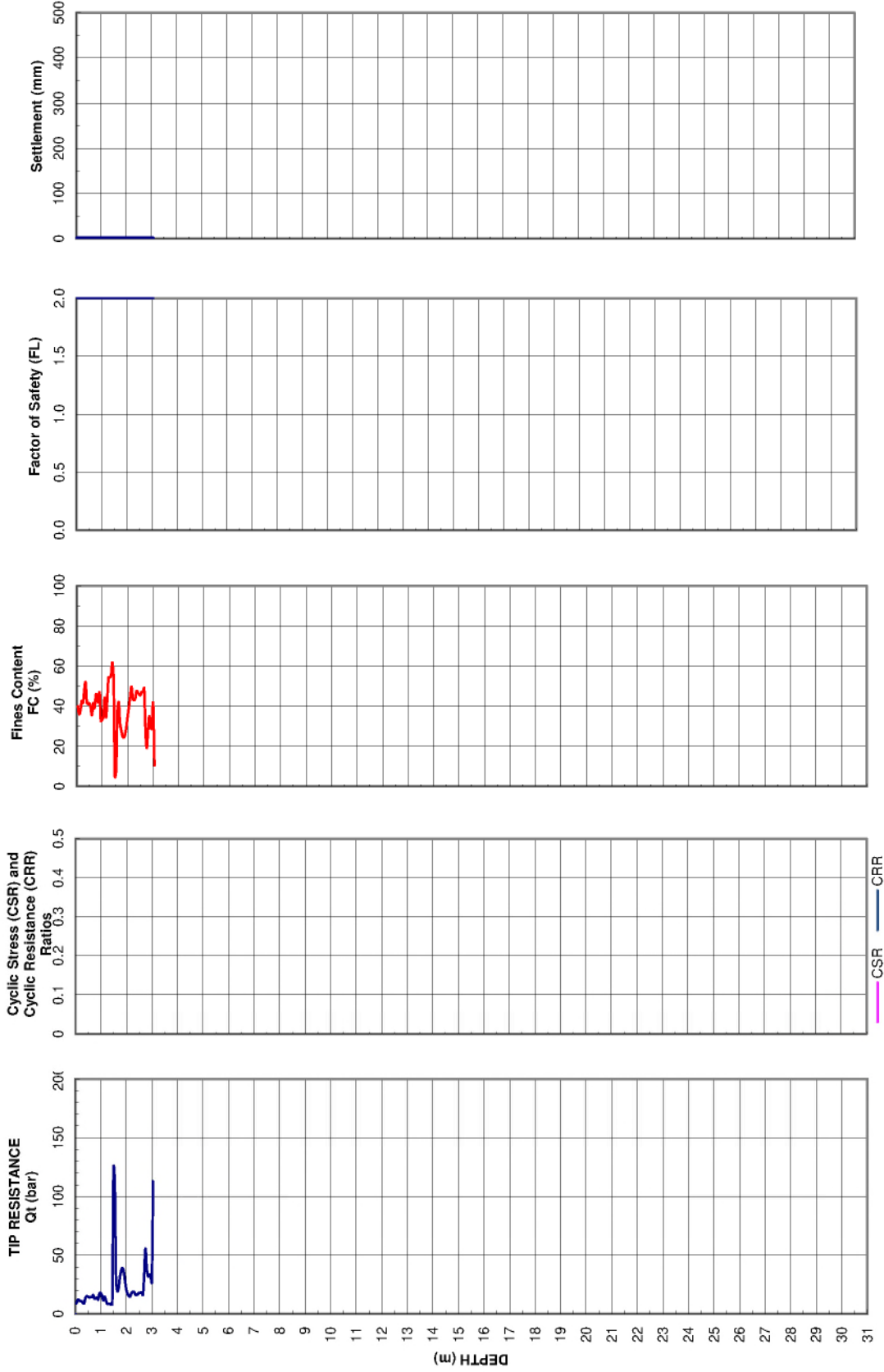
PRIME BUILDING DESIGN LTD

GeoPacific Project #: 20986

Sounding: CPT22-01

69 KESTREL PLACE, VERNON

Figure: D.01



Liquefaction interpretation:
PGA = 0.06
magnitude = 7.0
settlement accumulation max depth = 15m



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2022-Jun-29

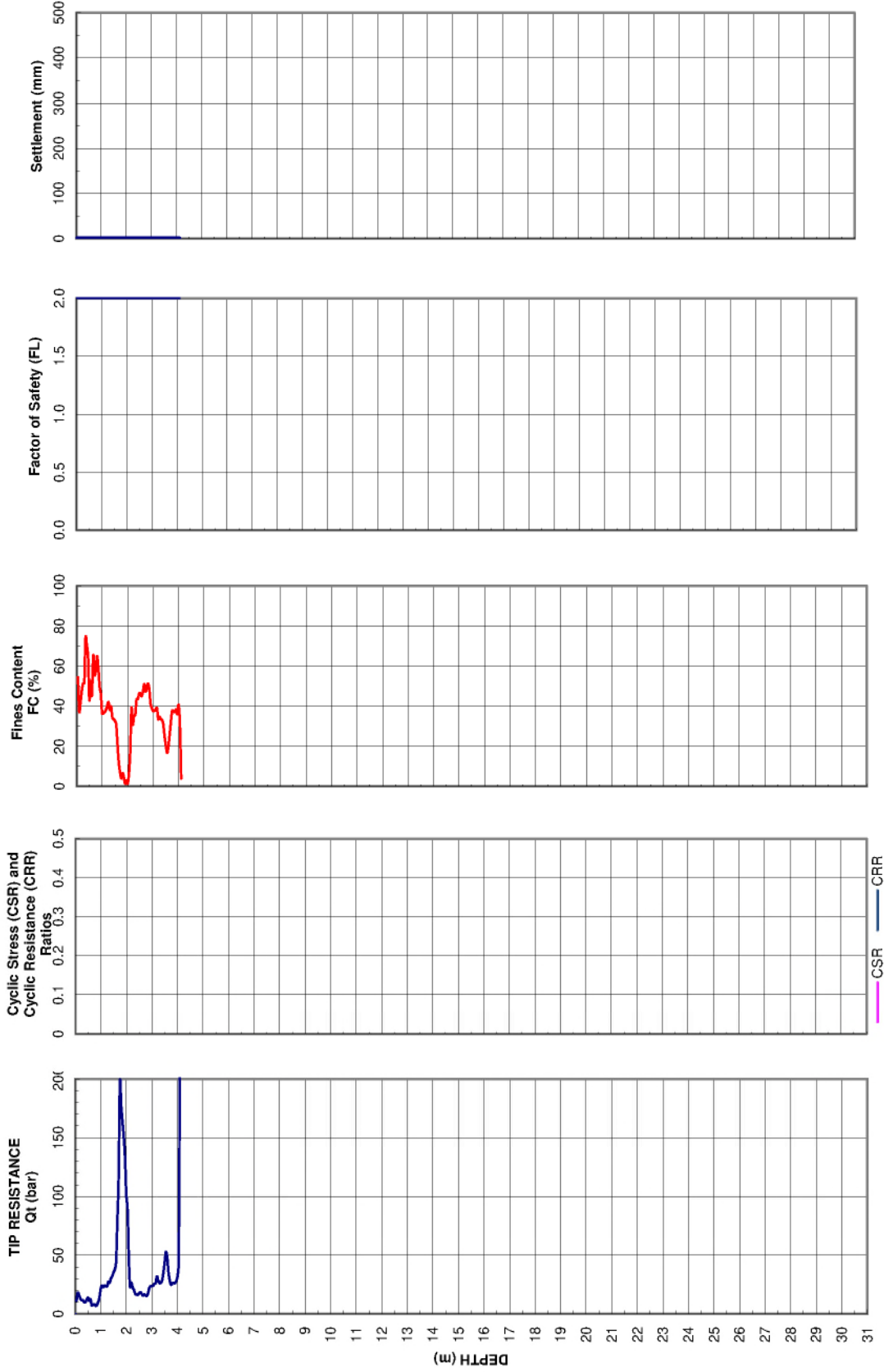
PRIME BUILDING DESIGN LTD

GeoPacific Project #: 20986

Sounding: CPT22-02

69 KESTREL PLACE, VERNON

Figure: D.02



Liquefaction interpretation:
PGA = 0.06
magnitude = 7.0
settlement accumulation max depth = 15m



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2022-Jun-29

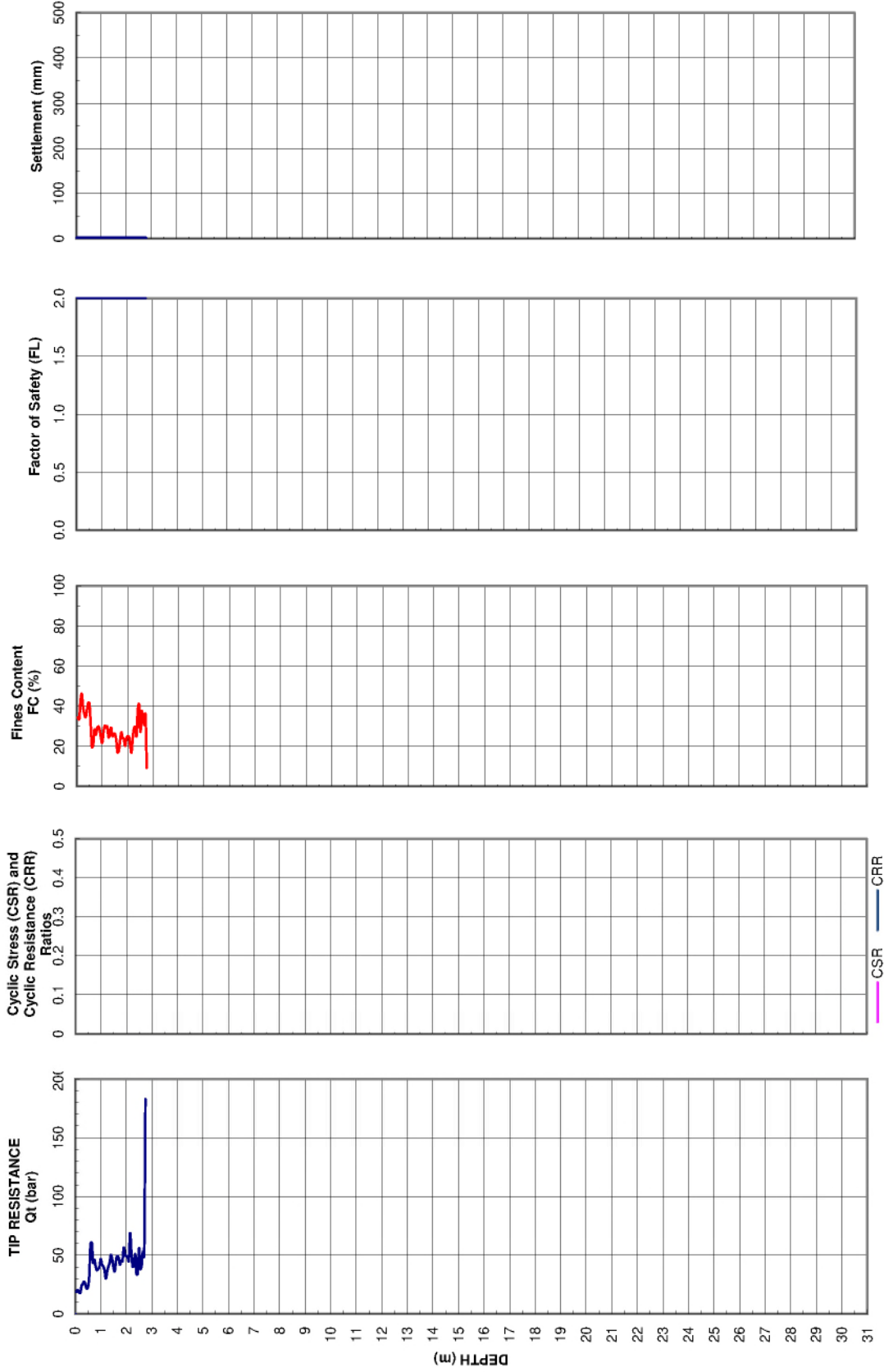
PRIME BUILDING DESIGN LTD

GeoPacific Project #: 20986

Sounding: CPT22-03

69 KESTREL PLACE, VERNON

Figure: D.03



Liquefaction interpretation:
PGA = 0.06
magnitude = 7.0
settlement accumulation max depth = 15m



GEO PACIFIC
CONSULTANTS

2022-Jun-29

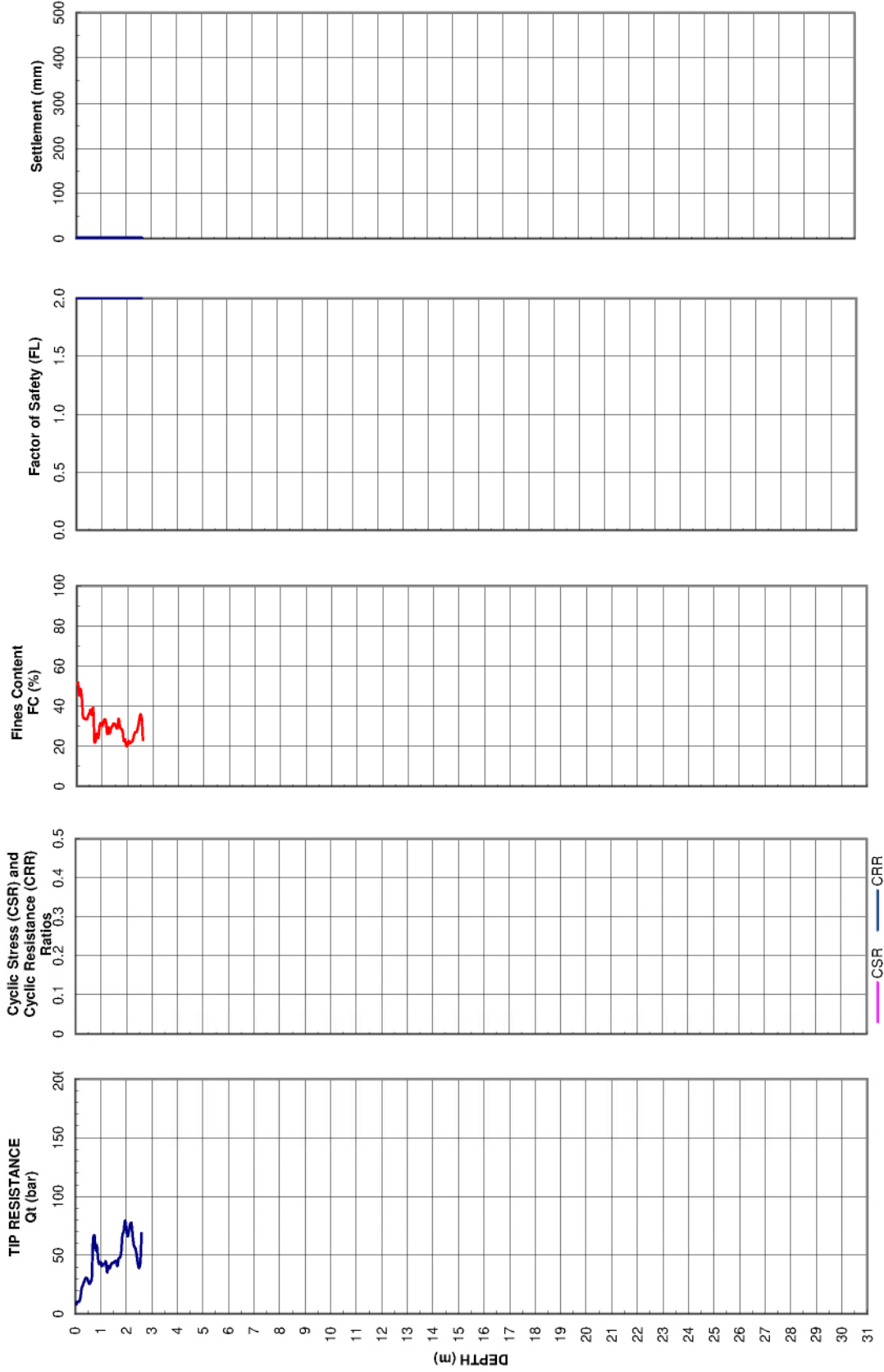
PRIME BUILDING DESIGN LTD

GeoPacific Project #: 20986

Sounding: CPT22-04

69 KESTREL PLACE, VERNON

Figure: D.04



Liquefaction interpretation:
PGA = 0.06
magnitude = 7.0
settlement accumulation max depth = 15m

APPENDIX B – LAB TESTING REPORTS



Moisture Content Determination

Project:	69 Kestrel	Date Sampled:	June 29th, 2022
Client:		Job No.:	20986
Boring No.:		Method:	ASTM
Tested By:	AO	Date Tested:	JUNE 30TH

Hole No.	TH22-02	TH22-02	TH22-02	TH22-03	TH22-03
Depth (ft)	6.5'	10'	13'	3'	8'
Sample No.					
Container No.	A5	22	15	L	J6
Mass of Wet Sample + Tare	271.9	263.4	256.5	239.2	263.4
Mass of Dry Sample + Tare	196.5	193.0	214.0	170.4	194.0
Tare of Container	5.0	5.8	5.5	4.2	4.9
Mass of Water	75.4	70.4	42.5	68.8	69.4
Mass of Dry Soil	191.5	187.2	208.5	166.2	189.1
MOISTURE CONTENT	39.4%	37.6%	20.4%	41.4%	36.7%

Hole No.	TH22-03	TH22-04	TH22-05	TH22-06	TH22-06
Depth (ft)	11'	8'	4'	11'	17'
Sample No.					
Container No.	P2	B10	23	13	21A
Mass of Wet Sample + Tare	292.6	270.5	304.2	245.1	285
Mass of Dry Sample + Tare	218.8	212.4	227.5	177.9	233.3
Tare of Container	4.3	5.7	4.3	5.0	4.3
Mass of Water	73.8	58.1	76.7	67.2	51.7
Mass of Dry Soil	214.5	206.7	223.2	172.9	229.0
MOISTURE CONTENT	34.4%	28.1%	34.4%	38.9%	22.6%

Hole No.					
Depth (ft)					
Sample No.					
Container No.					
Mass of Wet Sample + Tare					
Mass of Dry Sample + Tare					
Tare of Container					
Mass of Water					
Mass of Dry Soil					
MOISTURE CONTENT					



Project:	69 Kestral, Vernon	Date Sampled:	June 9, 2022
Client:		Job No.:	20986
Boring No.:		Method:	ASTM
Tested By:	AO	Date Tested:	June 9, 2022

Hole No.	TH22-01	TH22-01	TH22-01	TH22-01	
Depth (ft)	3'	9'	11'	13'	
Sample No.					
Container No.	20	18	5	9	
Mass of Wet Sample + Tare	295.6	251.7	312.4	273.8	
Mass of Dry Sample + Tare	240.4	192.8	239.0	245.5	
Tare of Container	4.7	5.6	4.1	4.0	
Mass of Water	55.2	58.9	73.4	28.3	
Mass of Dry Soil	235.7	187.2	234.9	241.5	
MOISTURE CONTENT	23.4%	31.5%	31.2%	11.7%	

Hole No.					
Depth (ft)					
Sample No.					
Container No.					
Mass of Wet Sample + Tare					
Mass of Dry Sample + Tare					
Tare of Container					
Mass of Water					
Mass of Dry Soil					
MOISTURE CONTENT					

Hole No.					
Depth (ft)					
Sample No.					
Container No.					
Mass of Wet Sample + Tare					
Mass of Dry Sample + Tare					
Tare of Container					
Mass of Water					
Mass of Dry Soil					
MOISTURE CONTENT					



Fines Content (ASTM C117)

Project:	Townhome Development	Insite Job No.:	20986
Client:	Prime Building Design Ltd	Date Sampled:	2022-04-04
Tested By:	JD	Date Tested:	April 13, 2022

Hole No.	TP-01	TP-01	TP-01		
Depth	3'	8'	12'		
Sample No.					
Container No.	EE	21	XY		
Mass of Wet Sample + Tare	1169.8	1020.6	1377.9		
Mass of Dry Sample + Tare	992.3	882.6	1078.1		
Tare of Container	425.6	440.0	442.0		
Mass of Dry Washed Sample + Tare	774.2	542.2	528.4		
MOISTURE CONTENT	31.3%	31.2%	47.1%		
FINES CONTENT	38.5%	76.9%	86.4%		

Hole No.					
Depth					
Sample No.					
Container No.					
Mass of Wet Sample + Tare					
Mass of Dry Sample + Tare					
Tare of Container					
Mass of Dry Washed Sample + Tare					
MOISTURE CONTENT					
FINES CONTENT					

Hole No.					
Depth					
Sample No.					
Container No.					
Mass of Wet Sample + Tare					
Mass of Dry Sample + Tare					
Tare of Container					
Mass of Dry Washed Sample + Tare					
MOISTURE CONTENT					
FINES CONTENT					

ATTERBERG LIMIT ANALYSIS

Project: Townhome Development
 Location: 69 Kestrel Place, Vernon

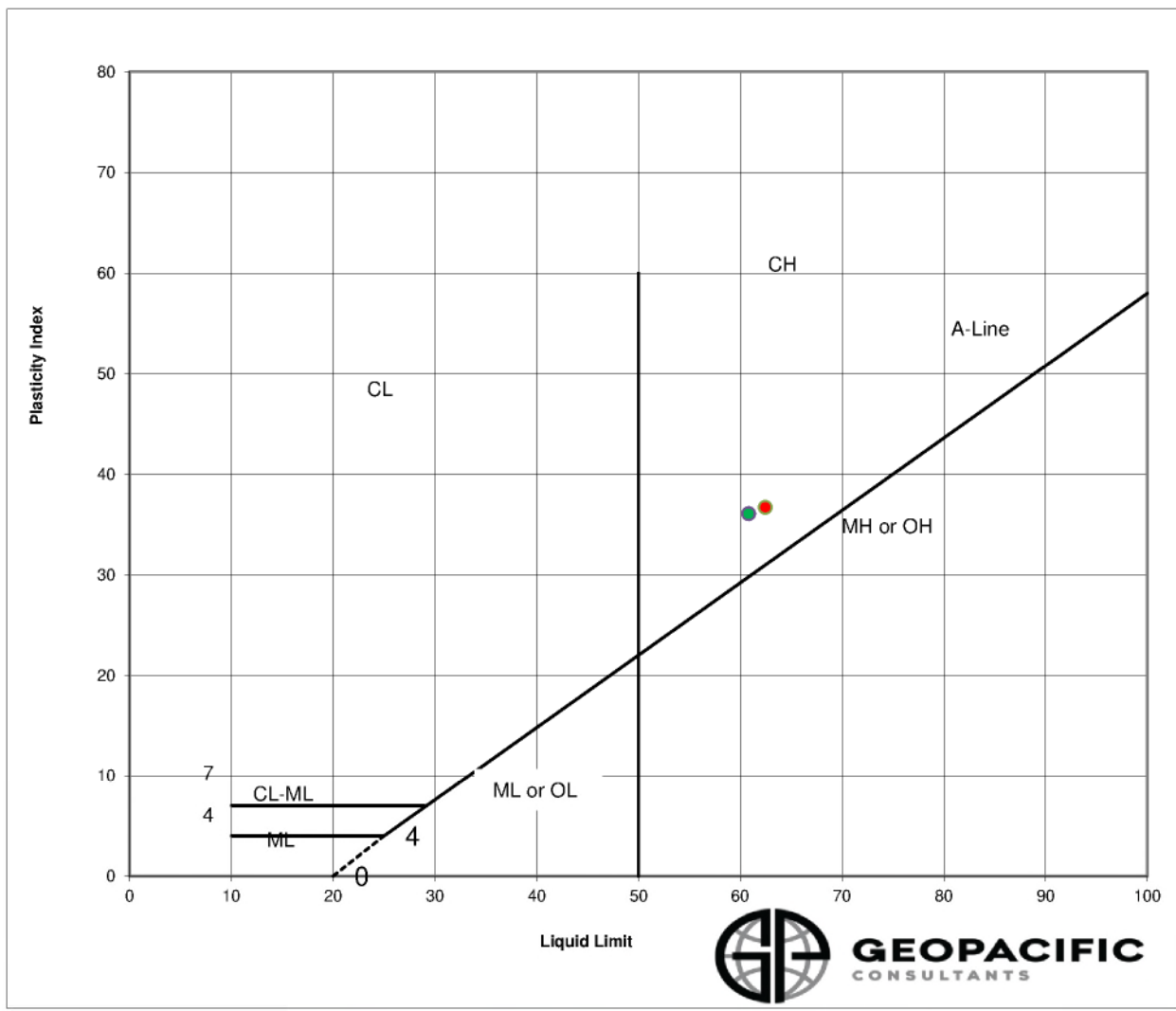
InSite File No: 20986

Client: Prime Building Design Ltd
 202 - 3704 32St
 Vernon, BC

cc:

Attention: Phillipp Wambold

Sample ID	Depth (M)	Source	Natural Moisture Content	Plastic Limit	Liquid Limit	Plasticity Index	USCS
	5'	TH1	30.45	24.75	60.82	36.07	CH
	10'	TP1	33.10	25.74	62.45	36.71	CH

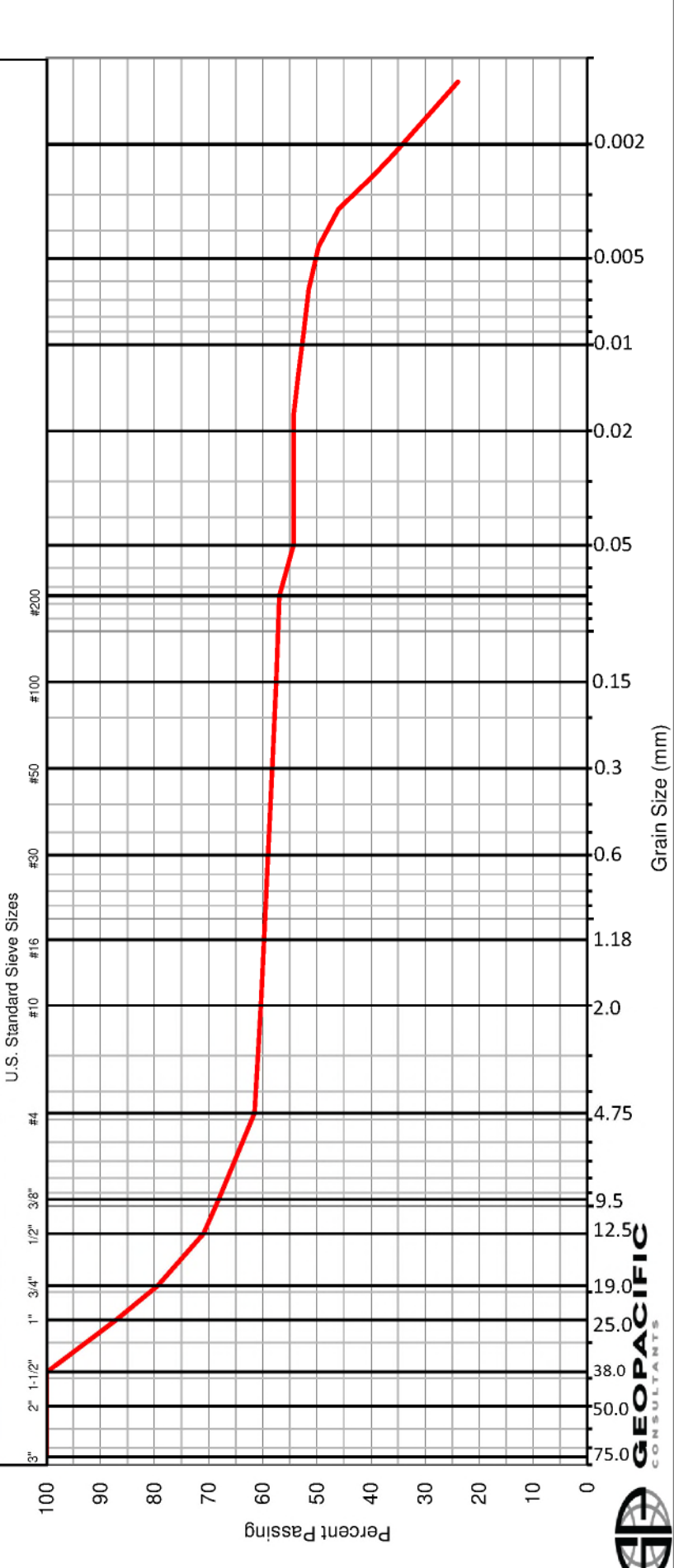


GRAIN SIZE ANALYSIS RESULTS (ASTM D422-63)

Project: Townhome Development
 Location: 69 Kestrel Place, Vernon
 Source: TH01
 Sample ID: 10'
 Depth: 10'
 Client: PrimeBuilding Design Ltd
 P.O.
 Attention: Phillip Wambold
 Date Sampled: 2022-04-04
 Date Received: 2022-04-08
 Sampled By: WP
 Date Tested: 2022-04-14
 Tested By: JD
 Insite File: 20986
 Figure:

Gravel			Sand			Silt and Clay			
Sieve Size	Percent Passing	Sieve Size	Percent Passing	Sieve Size	Percent Passing	Particle Size (mm)	Percent Passing	Particle Size (mm)	Percent Passing
3"	100.00	3"	100.00	2.00	60.35	0.0498	54.28	0.0064	51.52
2"	100.00	3/8"	68.18	1.18	59.78	0.0352	54.28	0.0045	49.68
1-1/2"	100.00	#4	61.49	0.60	59.01	0.0249	54.28	0.0034	46.00
1"	87.16			0.30	58.23	0.0176	54.28	0.0026	39.56
3/4"	79.44			0.15	57.53	0.0125	53.36	0.0022	35.88
1/2"	70.95			0.075	56.91	0.0091	52.44	0.0012	23.92

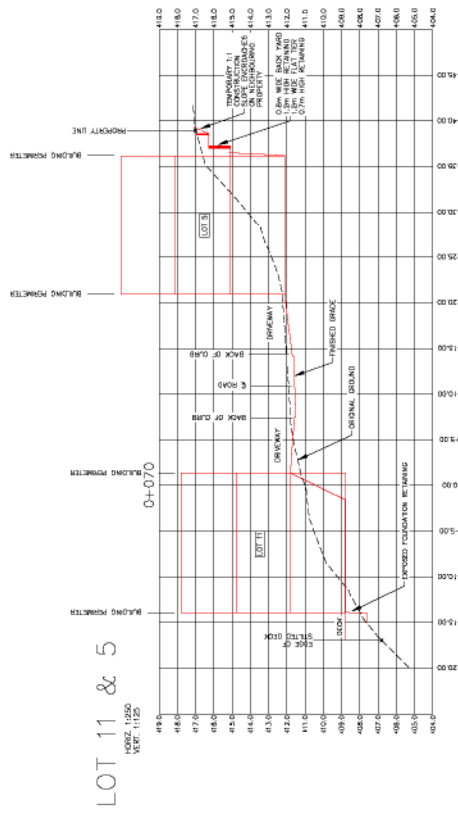
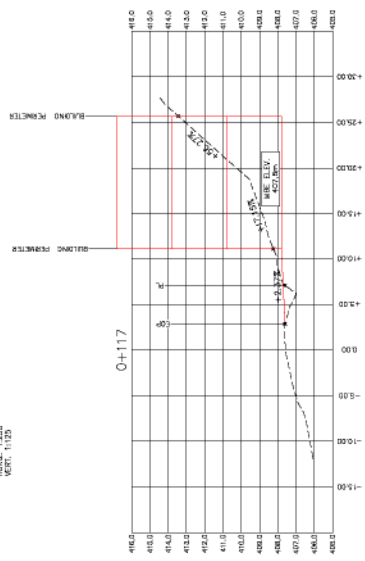
Sieve Analysis		Hydrometer Analysis	
GRAVEL	31.82%	SILT	23.80%
SAND	10.65%	CLAY	33.72%



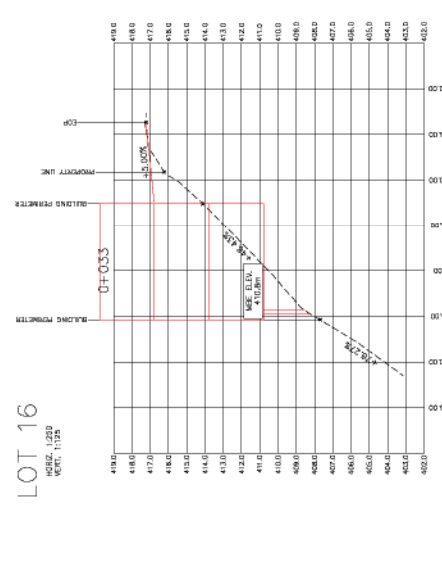
APPENDIX C – SITE SETCTIONS & SLOPE STABILITY MODELS



LOT 15



LOT 11 & 5



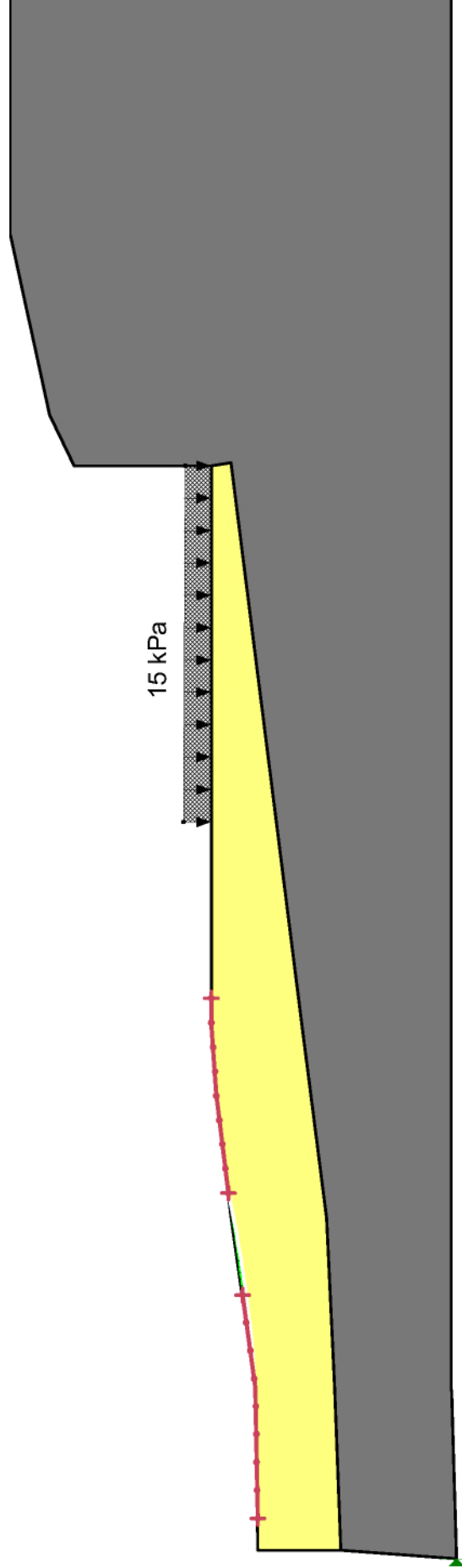
LOT 16

ISSUED FOR COORDINATION

<p>PROTECH CONSULTING 3010 - 3373, Lakeshore Rd. Kelowna B.C. Phone 860-1771 PERMIT TO PRACTICE NO. 1001423</p>		<p>THE CITY OF VERNON ENGINEERING DEPARTMENT PRIME BUILDING DESIGN LTD. KESTREL PLACE BUILDING SECTIONS</p>	
<p>DATE: 2022-10-11 FOR COORDINATION</p>	<p>DATE: 2022-10-11 CLIENT REVIEW</p>	<p>DATE: 2022-10-11 FOR COORDINATION</p>	<p>DATE: 2022-10-11 FOR COORDINATION</p>
NO.	DATE	BY	DESCRIPTION
1	2022-10-11	JM	FOR COORDINATION
2	2022-10-11	JM	CLIENT REVIEW
3	2022-10-25	JM	FOR COORDINATION
4	2022-11-01	JM	FOR COORDINATION

Color	Name	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
■	Bedrock	24	50	50
■	Silt	20	0	34

4.735



Project: Proposed Townhouse Development - Lot 15

Model: SLOPE/W Analysis - Lower - Static

Method: Morgenstern-Price

Site Address : 69 Kestrel Place, Vernon

Job No.: 20986

Date: November 10, 2022

Scale : 1:249

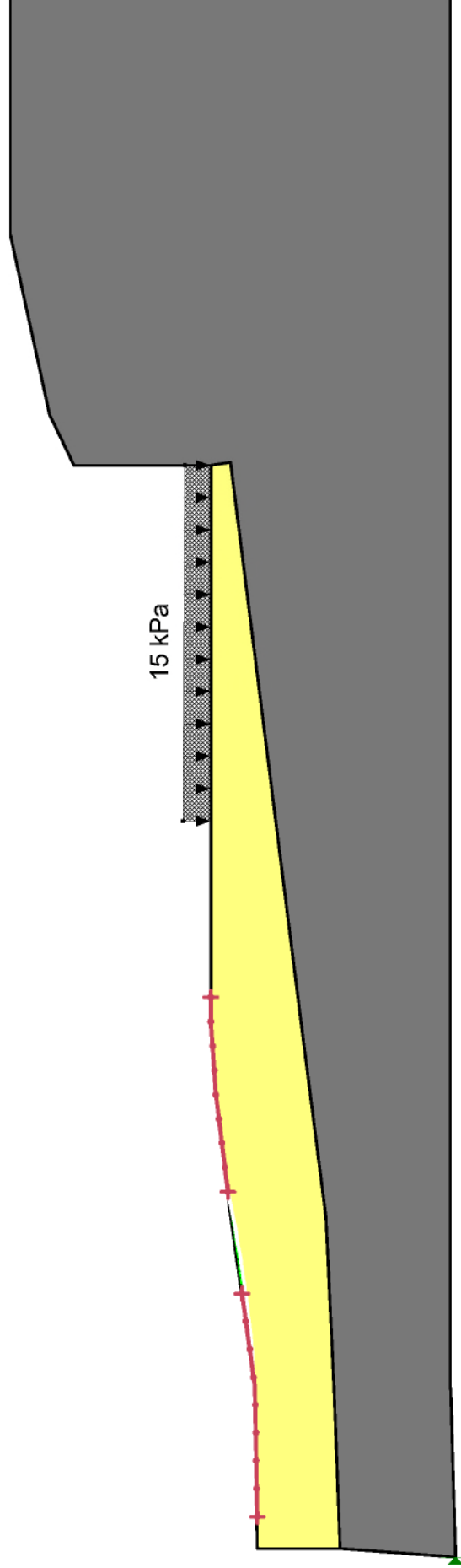
Analysis by: AT



GEO PACIFIC
CONSULTANTS

Color	Name	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
■	Bedrock	24	50	50
■	Silt	20	0	34

3.146 ●



Project: Proposed Townhouse Development - Lot 15

Model: SLOPE/W Analysis - Lower - Seismic

Method: Morgenstern-Price

Site Address : 69 Kestrel Place, Vernon

Job No.: 20986

Date: November 10, 2022

Horz Seismic Coef.: 0.07

Scale : 1:249

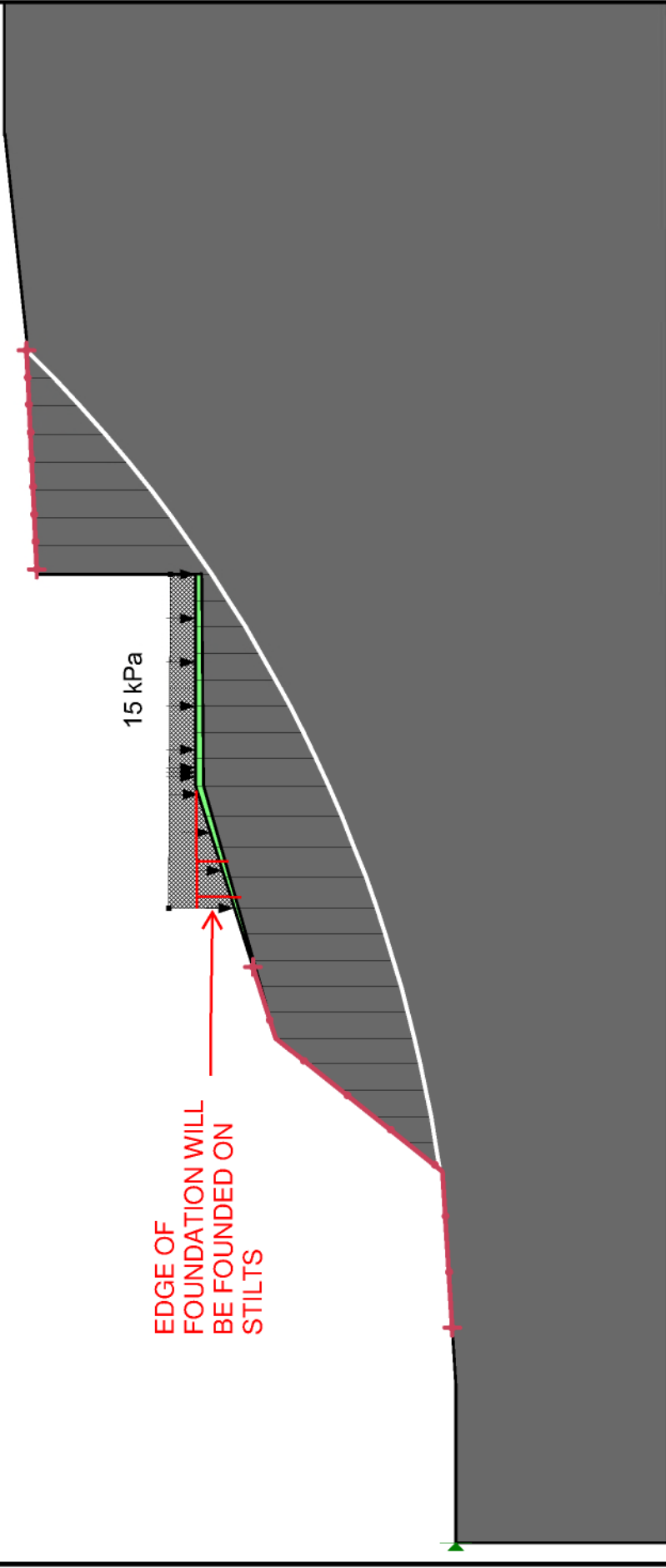
Analysis by: AT



GEO PACIFIC
CONSULTANTS

Color	Name	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
■	Bedrock	24	50	50
■	Blast Rock Fill	20	0	38

4.1 ●



Project: Proposed Townhouse Development - Lot 16

Model: SLOPE/W Analysis

Method: Morgenstern-Price

Site Address : 69 Kestrel Place, Vernon

Job No.: 20986

Date: November 9, 2022

Scale : 1:227

Analysis by: AT



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CONSULTANTS

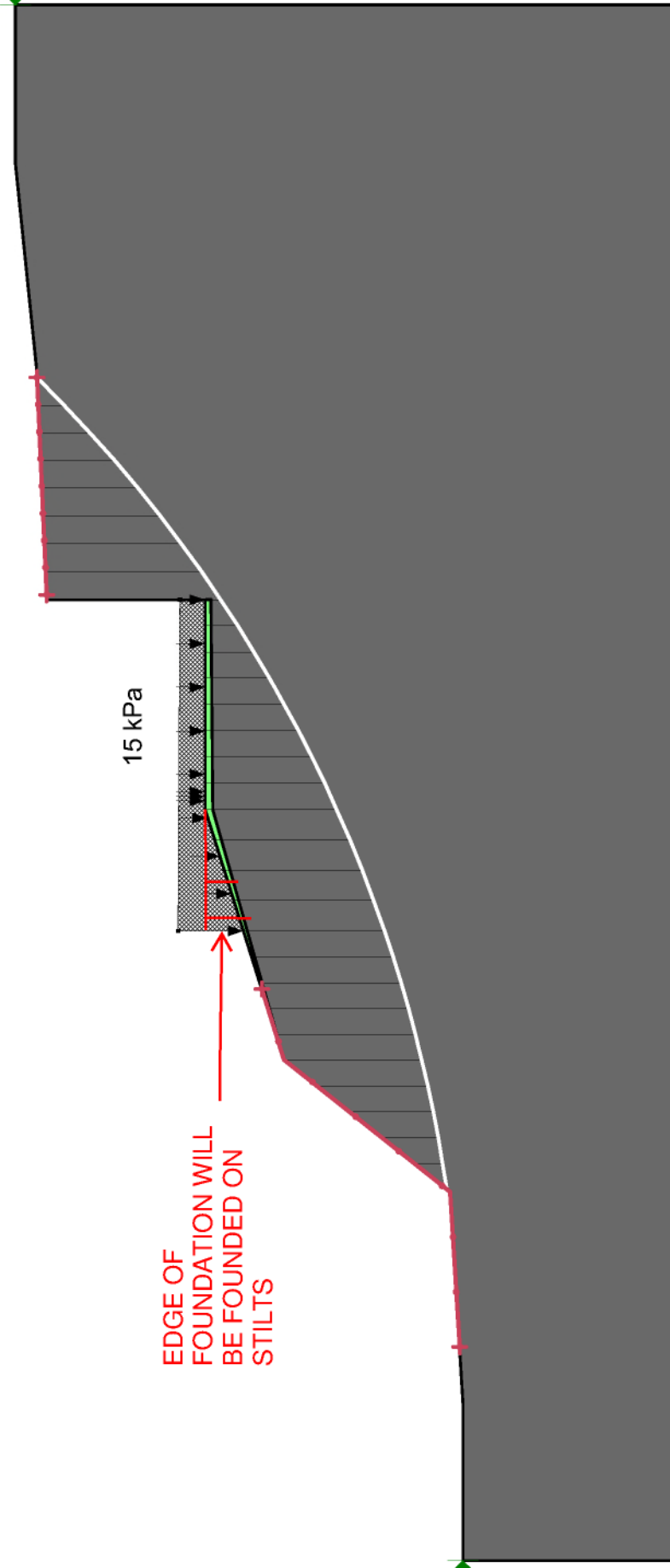
J:\Jobs\20000 FILES\209000\20986 - 69 Kestrel Place, Vernon BC\Analysis\20986 - 69 Kestrel Place - Section Lot 16.gsz

Color	Name	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
■	Bedrock	24	50	50
■	Blast Rock Fill	20	0	38

3.5

15 kPa

EDGE OF FOUNDATION WILL BE FOUNDED ON STILTS



Project: Proposed Townhouse Development - Lot 16

Model: SLOPE/W Analysis - Seismic

Method: Morgenstern-Price

Site Address : 69 Kestrel Place, Vernon

Job No.: 20986

Date: November 9, 2022

Horz Seismic Coef.: 0.07

Scale : 1:234

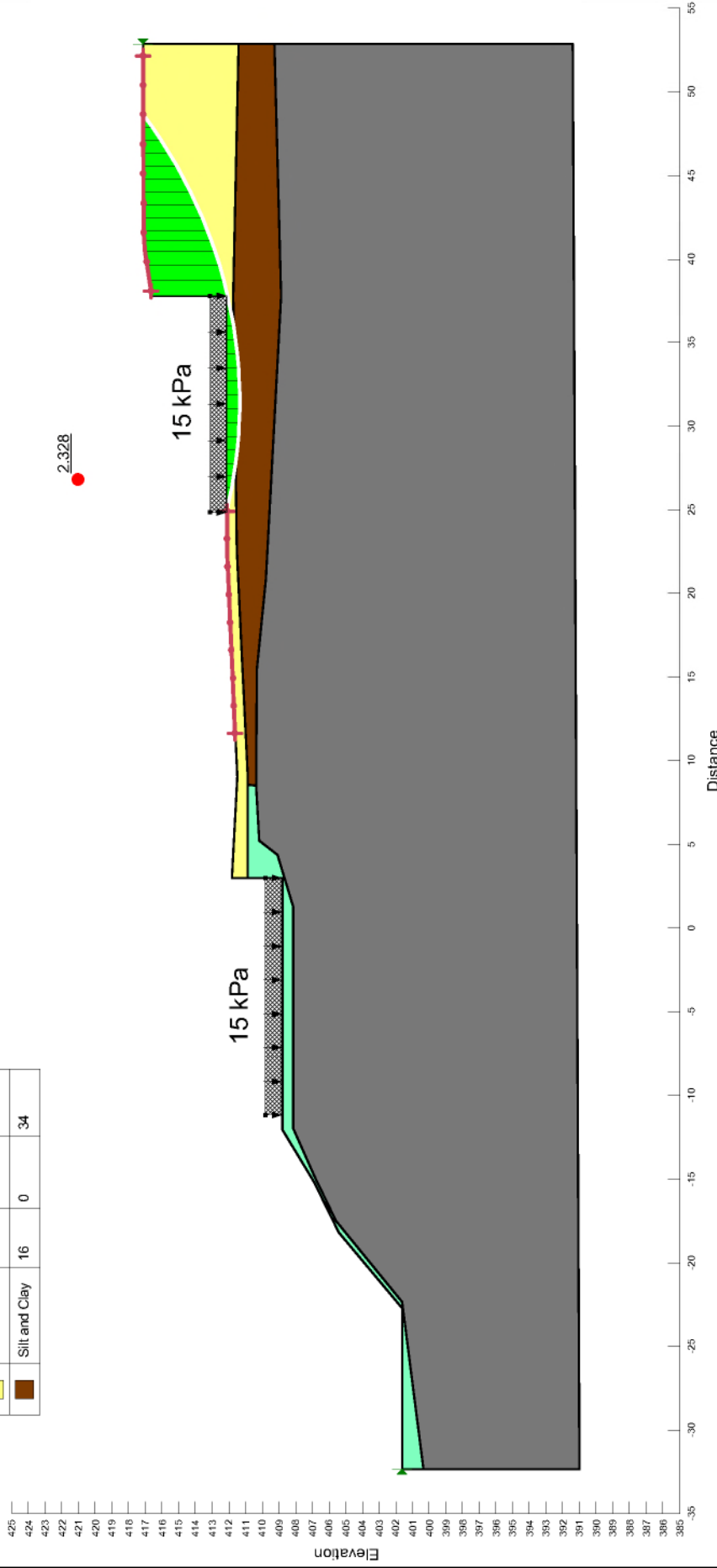
Analysis by: AT



GEO PACIFIC
CONSULTANTS

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Color	Name	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
Grey	Bedrock	24	50	50
Light Green	Blast Rock Fill	20	0	40
Yellow	Sand and Silt	19	0	34
Brown	Silt and Clay	16	0	34



Project: Proposed Townhouse Development - Lots 11 and 5

Job No.: 20986

Model: SLOPE/W Analysis - Upper - Seismic

Date: November 9, 2022

Method: Morgenstern-Price

Horz Seismic Coef.: 0.07

Scale : 1:364

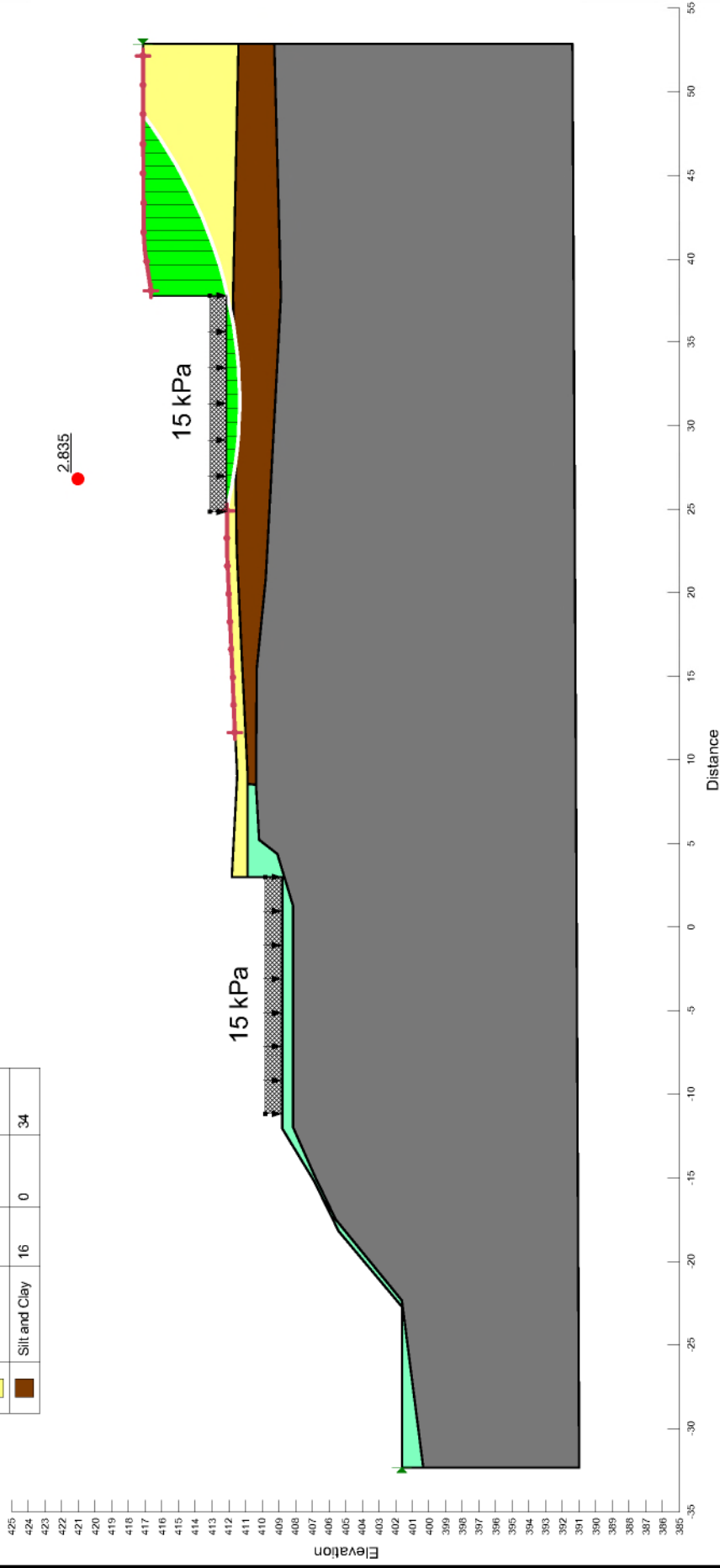
Site Address : 69 Kestrel Place, Vernon

Analysis by: AT



GEO PACIFIC
CONSULTANTS

Color	Name	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
Grey	Bedrock	24	50	50
Light Green	Blast Rock Fill	20	0	40
Yellow	Sand and Silt	19	0	34
Brown	Silt and Clay	16	0	34



Project: Proposed Townhouse Development - Lots 11 and 5

Job No.: 20986

Model: SLOPE/W Analysis - Upper - Static

Date: November 9, 2022

Method: Morgenstern-Price

Horz Seismic Coef.: 0

Scale : 1:364

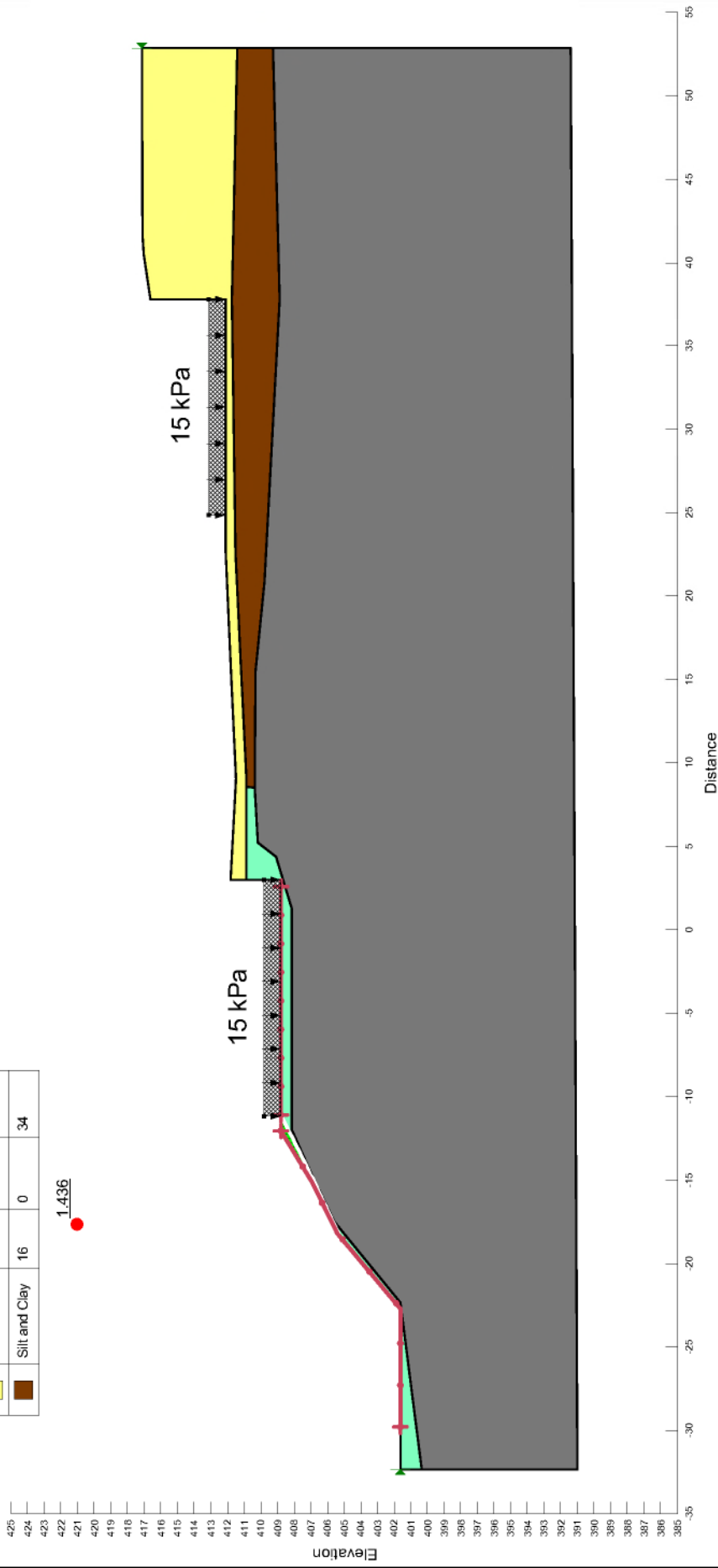
Site Address : 69 Kestrel Place, Vernon

Analysis by: AT



GEO PACIFIC
CONSULTANTS

Color	Name	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
Grey	Bedrock	24	50	50
Light Green	Blast Rock Fill	20	0	40
Yellow	Sand and Silt	19	0	34
Brown	Silt and Clay	16	0	34



Project: Proposed Townhouse Development - Lots 11 and 5

Model: SLOPE/W Analysis - Lower - Seismic

Method: Morgenstern-Price

Site Address : 69 Kestrel Place, Vernon

Job No.: 20986

Date: November 9, 2022

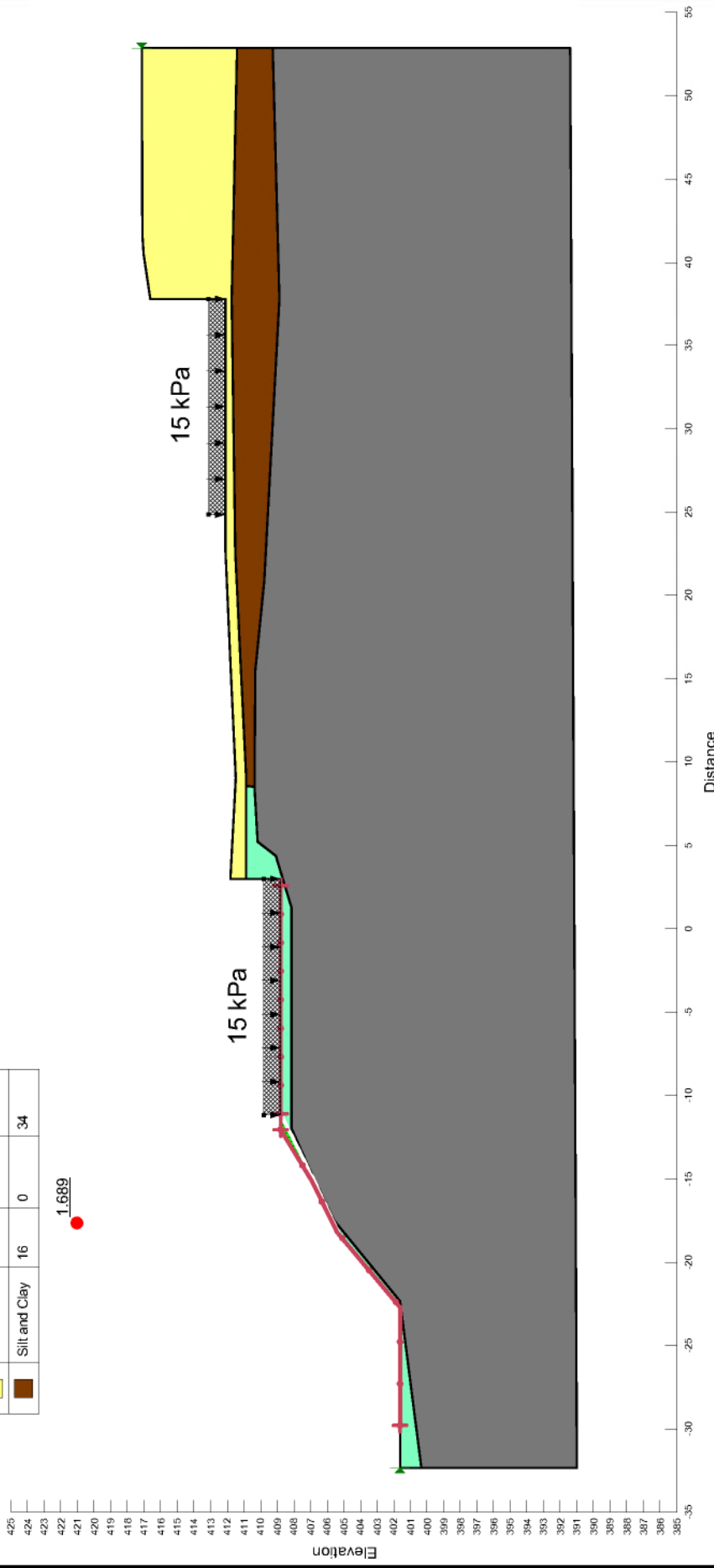
Scale : 1:364

Analysis by: AT



GEO PACIFIC
CONSULTANTS

Color	Name	Unit Weight (kN/m ³)	Effective Cohesion (kPa)	Effective Friction Angle (°)
Grey	Bedrock	24	50	50
Light Green	Blast Rock Fill	20	0	40
Yellow	Sand and Silt	19	0	34
Brown	Silt and Clay	16	0	34



Project: Proposed Townhouse Development - Lots 11 and 5

Model: SLOPE/W Analysis - Lower - Static

Method: Morgenstern-Price

Site Address : 69 Kestrel Place, Vernon

Job No.: 20986

Date: November 9, 2022

Scale : 1:364

Analysis by: AT



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**PRIME BUILDING
DESIGN**

#202 - 3704 32nd St. Vernon, BC
+1(250) 540-3449
philipp@primebuildingdesign.com

primebuildingdesign.com

No.	Description	Date
01	Issued for IPR	2022-02-28
02	Text Revision	2022-03-16
03	Revision	2022-04-13

Aurora Heights

69 Kestrel Place,
Vernon, B.C.

ATTACHMENT 8

LANDSCAPE PLAN

Project Number: 27
Date: 2022-1
Designed By:

A03

Scale: 1" = 2'

CITY OF VERNON LANDSCAPING REQUIREMENTS

ZONING: R5 - Vernon
MIN. FRONT YARD BUFFER = 15 M
MIN. SIDE YARD LANDSCAPE BUFFER = 15 M
MIN. REAR YARD SETBACK BUFFER = 15 M
SITE AREA: 6170 SQ (0.56629 ha OR 5662.88 M²)

MIN. REQUIRED AREA FOR LANDSCAPE BUFFER = 600.69 M²
PROVIDED AREA WITH REDISTRIBUTED LANDSCAPE = 279.39 M²
AREA LEFT UNTOUCHED-NATURAL VEGETATION = 3669.28 M²

**PROPERTY IS ON INTERFACE AREA 3 OF THE FIRE INTERFACES.

LANDSCAPING CONSIDERATIONS HAVE BEEN MADE WITH XERISCAPING AND A 15m FIRESMART BUFFER AROUND ALL STRUCTURES. ALL PLANTED TREES ARE OVER 3m AWAY FROM ALL STRUCTURES AND WILL BE MAINTAINED TO ADHERE TO FIRESAFE STANDARDS.

ALL PLANTS HAVE BEEN SELECTED FROM THE FIRESMART BC PLANT CHART PG 24-45 OF THE FIRESMART BC LANDSCAPING GUIDE. ALL PLANTS/TREES ARE DECIDUOUS AND WITHIN THE 3-CHAGRINNESS ZONE OF THIS AREA.

PLANT TYPES:	QTY	SIZE
SMOKE TREE	5	5m cal.
BLUEHIST SPREA	22	#02 CONT
ALPINE CURRANT	62	#02 CONT
SNOW IN SUMMER	502	#01 CONT
LAVANDER	32	#01 CONT
NATURAL VEGETATION		

LEGEND:
15 m FIRESMART BUFFER
GRASS



1:2 LANDSCAPE PLAN

1" = 20'-0"

APC Meeting - July 18, 2023



**PRIME BUILDING
DESIGN**

#202 - 3704 32nd St., Vernon, BC
+1(250) 540-3449
philippe@primebuildingdesign.com

primebuildingdesign.com

No.	Description	Date
01	Issued for IPR	2022-07-28
02	Test Revision	2023-03-16
03	Revision	2023-04-13
04	Revision	2023-07-13

Aurora Heights

69 Kestrel Place,
Vernon, B.C.

ATTACHMENT 9

TREE REMOVAL PL

Project Number: **2**

Date: **2022**

Designed By:

A04

Scale: **1" = 1'**





THE CORPORATION OF THE CITY OF VERNON REPORT TO COUNCIL

SUBMITTED BY: Michelle Austin
Planner, Planning

COUNCIL MEETING: REG COW I/C
COUNCIL MEETING DATE: August 14, 2023
REPORT DATE: July 14, 2023
FILE: 3090-20 (DVP00599)

SUBJECT: DEVELOPMENT VARIANCE PERMIT APPLICATION FOR 69 KESTREL PLACE

PURPOSE:

To present for Council's consideration a development variance permit application for the property located at 69 Kestrel Place in preparation for a multi-family development.

RECOMMENDATION:

THAT Council support Development Variance Permit Application 00599 (DVP00599) to vary Zoning Bylaw 5000 for Lot B, DL 297, ODYD, Plan KAP85198 (69 Kestrel Place) as outlined in the report titled "Development Variance Permit Application for 69 Kestrel Place" dated July 14, 2023 and respectfully submitted by the Planner, as follows:

- a) Section 4.15.1, to allow construction of buildings, structures or swimming pools on a slope of 30% or greater;
- b) Section 7.1.2, to increase the maximum number of residential parking spaces from 42 to 60 (from 125% to 176% of the minimum number of required parking spaces);
- c) Section 9.6.6, to increase maximum height from 10m to 10.77m for Units 1 – 7, 14 and 15;
- d) Section 9.6.6, to increase maximum height from 10m to 10.62m for Units 8 - 13;
- e) Section 9.6.6, to increase maximum height from 10m to 13.61m for Units 16 and 17;
- f) Section 9.6.6, to decrease minimum rear yard from 6m to 2.5m for a 1 or 1.5 storey portion of a building for Unit 17;
- g) Section 9.6.6, to decrease minimum rear yard from 7.5m to 2.5m for a 2 or 2.5 storey portion of a building for Unit 17; and
- h) Section 9.6.6, to decrease building setback for any vertical wall element above the lesser of 6.5m or 2.5 storeys from 1.2m to 0m for Units 1, 7, 8 and 13.

AND FURTHER, that Council's support of DVP00599 is subject to the following:

- a) That the development complies with the Geotechnical Investigation Report, prepared by Geopacific Consultants, dated December 5, 2022 (Attachment 7) to be attached to and form part of DVP00599;

- b) That the development generally complies with the Site Plan, prepared by Prime Building Design, dated April 13, 2023 (Attachment 2) to be attached to and form part of DVP00599; and
- c) That the development generally complies with the Elevation Drawings, prepared by Prime Building Design, dated February 8, 2023, February 9, 2023, February 13, 2023 and April 12, 2023 (Attachment 3) to be attached to and form part of DVP00599.

ALTERNATIVES & IMPLICATIONS:

- 1. THAT Council not support Development Variance Permit Application 00599 (DVP00599) to vary Zoning Bylaw 5000 for Lot B, DL 297, ODYD, Plan KAP85198 (69 Kestrel Place) as outlined in the report titled “Development Variance Permit Application for 69 Kestrel Place” dated July 14, 2023 and respectfully submitted by the Planner, as follows:
 - a) Section 4.15.1, to allow construction of buildings, structures or swimming pools on a slope of 30% or greater;
 - b) Section 7.1.2, to increase the maximum number of residential parking spaces from 42 to 60 (from 125% to 176% of the minimum number of required parking spaces);
 - c) Section 9.6.6, to increase maximum height from 10m to 10.77m for Units 1 – 7, 14 and 15;
 - d) Section 9.6.6, to increase maximum height from 10m to 10.62m for Units 8 - 13;
 - e) Section 9.6.6, to increase maximum height from 10m to 13.61m for Units 16 and 17;
 - f) Section 9.6.6, to decrease minimum rear yard from 6m to 2.5m for a 1 or 1.5 storey portion of a building for Unit 17;
 - g) Section 9.6.6, to decrease minimum rear yard from 7.5m to 2.5m for a 2 or 2.5 storey portion of a building for Unit 17; and
 - h) Section 9.6.6, to decrease building setback for any vertical wall element above the lesser of 6.5m or 2.5 storeys from 1.2m to 0m for Units 1, 7, 8 and 13.

Note: This alternative does not support the variance requests and the 17-unit multi-family development would not move ahead as proposed. The site layout and building design would likely have to be redesigned.

ANALYSIS:

A. Committee Recommendations:

At its meeting of July 18, 2023, the Advisory Planning Committee passed the following resolution:

“(That the Advisory Planning Committee recommends that Council...)”

B. Rationale:

- 1. The subject property is located at 69 Kestrel Place within Canadian Lakeview Estates at the north end of Tronson Road, as shown in Figures 1 and 2. It is bisected by Kestrel Place. The larger portion is south of Kestrel Place and the smaller portion north.

2. The subject property is vacant undeveloped land (Attachment 1). The applicant proposes to develop the property with 17 multi-family housing units (Attachments 2 and 3).
3. The property is zoned R5 – Four-plex Housing Residential (Attachment 4). The intent of the variance application is to request Council support to:

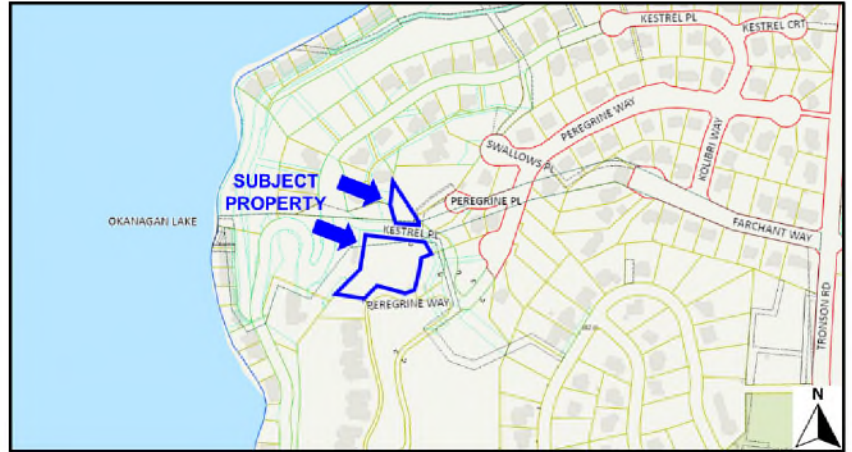


Figure 1 – Location Map

- allow construction of buildings, structures or swimming pools on a slope of 30% or greater;
- increase the maximum number of residential parking spaces from 42 to 60 (from 125% to 176% of the minimum number of required parking spaces);
- increase maximum height from 10m to 10.77m for Units 1 – 7, 14 and 15;
- increase maximum height from 10m to 10.62m for Units 8 - 13;
- increase maximum height from 10m to 13.61m for Units 16 and 17;
- decrease minimum rear yard from 6m to 2.5m for a 1 or 1.5 storey portion of a building for Unit 17;
- decrease minimum rear yard from 7.5m to 2.5m for a 2 or 2.5 storey portion of a building for Unit 17; and
- decrease building setback for any vertical wall element above the lesser of 6.5m or 2.5 storeys from 1.2m to 0m for Units 1, 7, 8 and 13.



Figure 2 – Aerial Photo

4. The applicant has provided a letter rationalizing the requested variances (Attachment 5).
5. Fifteen of the proposed 17 units would be located on the south portion of the lot with the remaining two units on the north portion. The building arrangement consists of two semi-detached buildings, three triplexes and one four-plex. Units 1-10, 14 and 15 would be 2.5 storey walk-ups and Units 11-12, 15 and 16 would be 2.5 storey walk-outs. Each unit would have three bedrooms and at least 2.5 bathrooms as well as elevator access to a rooftop patio. The size of the elevator housing and stairway accesses have been reduced to lessen the visual impact on surrounding neighbours.
6. Access to most of the units would be from Kestrel Place. Units 14 and 15 to the north would have separate driveways and Units 1-13 to the south would be accessed by a common driveway. Units 16 and 17 would have direct access from Peregrine Way. Garbage, recycling and organics collection would be through a private contractor.

7. Slopes for portions of the subject property exceed 30%. Figure 3 shows a 3D representation of the property elevations (in grey) overlaid with slopes $\geq 30\%$ (in orange). The applicant has provided a slope analysis (Attachment 6) which shows that most of the building construction would take place off slopes $\geq 30\%$; however, portions of all units, with the exception of Units 1-3, would be constructed on slopes $\geq 30\%$. A Geotechnical Investigation Report (Attachment 7) has been provided and states that *“Based on our assessment of the local soil conditions, topography, and hydrogeomorphology, we consider the site area to meet the minimum factors of safety for slope stability under static and seismic conditions”*.

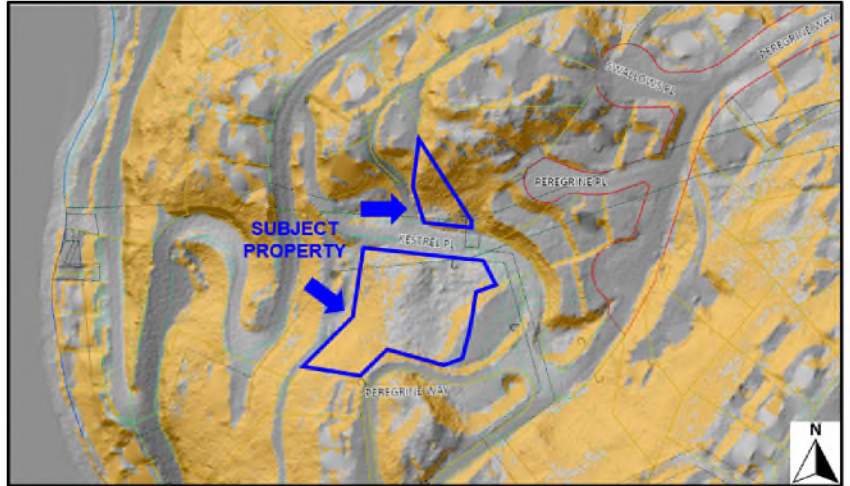


Figure 3 – Hillshade and $\geq 30\%$ Slopes

8. The maximum number of residential parking spaces permitted for the project is 42. Each dwelling unit would have a two-car garage with driveways that can accommodate another two vehicles, for a total of 60 parking spaces. This may be warranted given the location of the subject property and that it is not serviced by transit or easily accessible via active transportation.
9. In accordance with Zoning Bylaw 5000, building height is measured from the building grade to the highest point of the structure of a non-sloping roof. Elevator housings and roof stairway entrances are exempt from the maximum height requirement. For the proposed buildings, the maximum height is measured from the building grade to the top of the glass railings attached to the roof. Without including the glass railings in the height measurement, Units 1-15 would be below 10m and a variance would not be required. Given that the glass railings are transparent, the height increase would not impact neighbouring views. Units 16 and 17 are designed on a steep rock hillside with 3 storeys at the rear and a single storey at the front. The rear portion of these units would be supported on stilts. As height is measured from the outer stilt below the exterior wall (not including the stilt that supports the open decks) (Attachment 3 – Drawings A10 and A11), this semi-detached building would be higher than all the other units in the development. The additional height would not impact neighbouring views.
10. Unit 17 requires a reduction to the minimum rear yard from 6m/7.5m to 2.5m for a portion of the unit. Given that this building accesses Peregrine Way directly, the rear yard functions more like a side yard. This reduction would have little to no impact.
11. In addition to this variance application (DVP00599), the following applications are concurrently in process with the City for the subject property:
- DP001008 – A Development Permit (DP) is required in order to subdivide, alter land or construct a building or structure. Administration has the authority to issue development permits under Delegation of Authority Bylaw 5727. The development proposal triggers form and character, environmental, hillside and fire interface DP requirements of Official Community Plan (OCP) Bylaw 5470 as follows:
 - The subject property is designated as having mostly a low conservation value with some high conservation value. No development is being proposed within the high value conservation area; and

- The subject property is within Fire Interface Area 3, the highest risk area within the City. The applicant has provided a landscape plan (Attachment 8) designed in accordance with FireSmart. A condition of the DP would be that building and landscaping design and materials are FireSmart compliant.
- TRE00273 – A Tree Cutting Permit is required to remove any tree within the R5 zone, the stem of which exceeds eight centimetres at one metre above the average ground level at the base of the tree. Administration has the authority to issue tree cutting permits under Tree Protection Bylaw 4152. Tree clearing would be required to accommodate the development. Trees proposed for clearing are shown on Attachment 9 as grey circles.

C. Attachments:

Attachment 1 – Photos
Attachment 2 – Site Plan
Attachment 3 – Elevations
Attachment 4 – R5 Zoning Regulations
Attachment 5 – Applicant Rationale Letter
Attachment 6 – Slope Analysis
Attachment 7 – Geotechnical Investigation Report
Attachment 8 – Landscape Plan
Attachment 9 – Tree Removal Plan

D. Council's Strategic Plan Alignment:

- | | |
|---|--|
| <input type="checkbox"/> Governance & Organizational Excellence | <input type="checkbox"/> Livability |
| <input type="checkbox"/> Recreation, Parks & Natural Areas | <input type="checkbox"/> Vibrancy |
| <input type="checkbox"/> Environmental Leadership | <input checked="" type="checkbox"/> Not Applicable |

E. Relevant Policy/Bylaws/Resolutions:

1. Official Community Plan (OCP) Bylaw 5470:
 - OCP Designation – Residential Low Density (RLD)
 - Development District – 3 – Hillside Residential & AG
 - Adopted Neighbourhood Plan Area – Bella Vista West Neighbourhood Plan Area
 - Multiple Family Residential Development Permit Area (DPA) – the project exceeds three dwelling units
 - EMA Strategy DPA – subject property has mostly a low conservation value with some high conservation value
 - Hillside DPA – >10% of property has slopes \geq 12%
 - Fire Interface DPA – subject property is within Fire Interface Area 3 (highest risk)
2. Zoning Bylaw 5000, Section 9.6 R5: Four-plex Housing Residential
3. *Local Government Act*, Division 9 – Development Variance Permits

BUDGET/RESOURCE IMPLICATIONS:

N/A

FINANCIAL IMPLICATIONS:

- None
- Budget Previously Approved
- New Budget Request
(Finance Review Required)

Prepared by:

Approved for submission to Council:

X

 Michelle Austin
 Planner, Planning

 Patricia Bridal, CAO

Date: _____

X

 Roy Nuriel
 Acting General Manager, Planning

REVIEWED WITH

- | | | |
|--|---|---|
| <input type="checkbox"/> Corporate Services | <input type="checkbox"/> Operations | <input type="checkbox"/> Current Planning |
| <input type="checkbox"/> Bylaw Compliance | <input type="checkbox"/> Public Works/Airport | <input type="checkbox"/> Long Range Planning & Sustainability |
| <input type="checkbox"/> Real Estate | <input type="checkbox"/> Facilities | <input type="checkbox"/> Building & Licensing |
| <input type="checkbox"/> RCMP | <input type="checkbox"/> Utilities | <input type="checkbox"/> Engineering Development Services |
| <input type="checkbox"/> Fire & Rescue Services | <input type="checkbox"/> Recreation Services | <input type="checkbox"/> Infrastructure Management |
| <input type="checkbox"/> Human Resources | <input type="checkbox"/> Parks | <input type="checkbox"/> Transportation |
| <input type="checkbox"/> Financial Services | | <input type="checkbox"/> Economic Development & Tourism |
| <input checked="" type="checkbox"/> COMMITTEE: APC (Jul.18/23) | | |
| <input type="checkbox"/> OTHER: | | |

G:\3000-3699 LAND ADMINISTRATION\3090 DEVELOPMENT VARIANCE PERMITS\20 APPLICATIONS\DVP00599\2 PROC\Rpt\APC Rpt\230714_ma_Rpt_APC_69 Kestrel PI_DVP00599.docx



PRIME BUILDING
DESIGN

#202 - 3704 29th St. Vernon, BC
+1 (250) 540-3349
philipp@primebuildingdesign.com
primebuildingdesign.com

No	Description	Date
01	Issued for IEP	2022-09-28
02	Revisions	2023-08-28

AURORA HEIGHTS
WALKUP TRIPLEX
UNITS 1/2/3

69 KESTREL PLACE,
VERNON, BC

ATTACHMENT 3

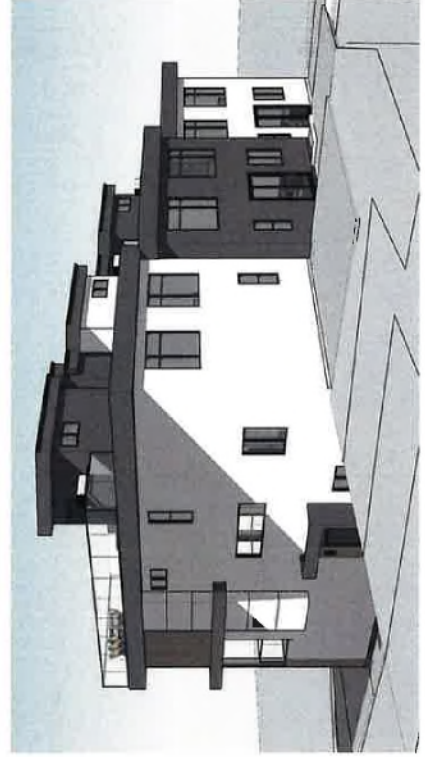
TITLE PAGE

Project Number: 22-
Date: 2022-0

Designed By:

A01

Scale:





#202 - 3704, 5704 St. Verdon, BC
 #1 (250) 540-3469
 philip@primebuildingdesign.com
 primebuildingdesign.com

No.	Description	Date
01	Issued for GP	2022-03-29
02	Revised	2023-03-29

AURORA HEIGHTS
 WALKUP TRIPLEX
 UNITS 1/2/3

69 KESTREL PLACE,
 VERNON, BC

FRONT ELEVATION

Project Number: 22-030
 Date: 2022-03-29
 Drawn By: PW

A08

Scale: 1/8" = 1'-0"



FRONT ELEVATION 1/8" = 1'-0"



PRIME BUILDING DESIGN

#202 - 3704 32nd St, Vernon, BC
 +1(250)540-3449
 philipp@primebuilddesign.com
primebuildingdesign.com

NO	Description	DATE
01	Issued for IPR	2022-03-28
02	Revisions	2022-03-28

**AURORA HEIGHTS
 WALKUP TRIPLEX
 UNITS 1/2/3**

**69 KESTREL PLACE,
 VERNON, BC**

REAR ELEVATION

Project Number	22-030
Date	2022-03-28
Designer	PW

A09

Scale: 1/4" = 1'-0"



ELEVATION 1/4" = 1'-0"



PRIME BUILDING
DESIGN

#202 - 3704 12th St. Vernon, BC
+1 (250) 540-3449
philip@primebuildingdesign.com
primebuildingdesign.com

NO	DESCRIPTION	DATE
01	Issued for O.P.	2022-03-29
02	Revision	2023-03-05

AURORA HEIGHTS
WALKUP TRIPLEX
UNITS 1/2/3

69 KESTREL PLACE,
VERNON, BC

LEFT ELEVATION

Project Number	22-030
Date	2022-03-29
Designer	PW

A10

Scale 1/4" = 1'-0"

REPLACE WITH AN OVERHANGING GARMENT RACK

REPLACE WITH AN OVERHANGING GARMENT RACK

REPLACE WITH AN OVERHANGING GARMENT RACK



ELEVATION 1/4" = 1'-0"



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DESIGN

#202 - 3704 32nd St, Vernon, BC
V1T 2S7 | 250.549.5449
philipp@primebuildingdesign.com
primebuildingdesign.com

No	Description	Date
01	Issued for O.P.	2022-03-29
02	Revision	2022-03-29

**AURORA HEIGHTS
WALKUP TRIPLEX
UNITS 1/2/3**

**69 KESTREL PLACE,
VERNON, BC**

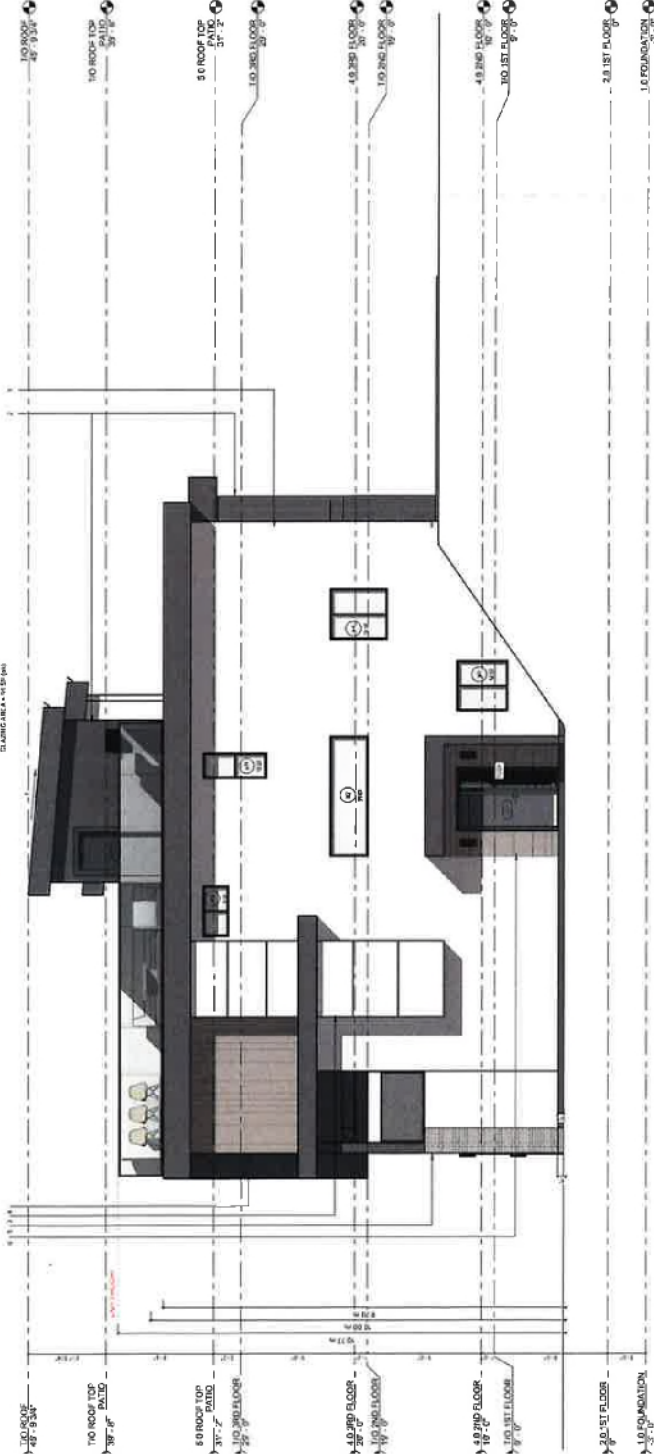
RIGHT ELEVATION

Project Number	22-030
Date	2022-03-29
Designed by	PW

A11

Scale: 1/4" = 1'-0"

10' ROOF - 11.5' HIGH (CONCRETE ON 10' FINISH)
(10' - 1.175)
10' ROOF - 11.5' HIGH (CONCRETE ON 10' FINISH)
(10' - 1.175)
PANEL AREA: 50.00' x 142.24'
WALKUP AREA: 10.00' x 142.24'
ALUMINUM CLADDING AREA: 10.00' x 142.24'
CLADDING AREA: 10.00' x 142.24'



- 1 WHITE BRICK
- 2 GRAY CLAUDED
- 3 WHITE PANELS
- 4 BRICKS
- 5 BRICKS
- 6 BRICKS
- 7 BRICKS
- 8 BRICKS

T ELEVATION 1/4" = 1'-0"



PRIME BUILDING
DESIGN

#202 - 3704 5th St. Vernon, BC
+1(250)360-3449
philip@primebuildingdesign.com
primebuildingdesign.com



No.	Description	Date
01	Issued for O.P.	2022-03-29
02	Revised	2023-03-29

AURORA HEIGHTS
WALKUP FOURPLEX
UNITS 4/5/6/7

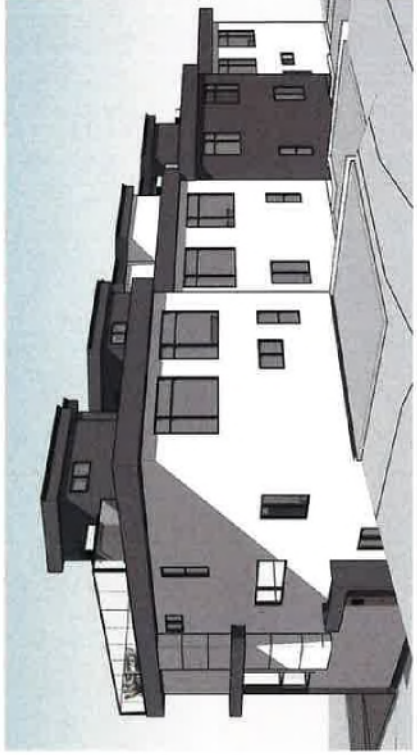
69 KESTREL PLACE,
VERNON, BC

TITLE PAGE

Project Number: 22-031
Date: 2022-03-29
Designed By: PW

A01

Scale





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PRIME BUILDING
DESIGN

202 - 3704 32nd St, Vernon, BC
V1P 5A9
1 (250) 540-1459
philipp@primebuildingdesign.com
primebuildingdesign.com

No.	Description	Date
01	Issued for ICP	2022-03-29
02	Revisions	2023-02-07

AURORA HEIGHTS
WALKUP FOURPLEX
UNITS 4/5/6/7

69 KESTREL PLACE,
VERNON, BC

FRONT ELEVATION

Project Number	22-031
Date	2022-03-29
Designed By	PW

A09

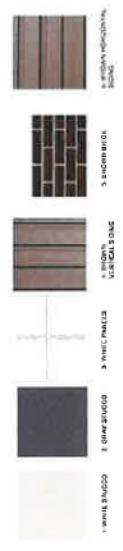
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THE COMPANIES OF THE PROVINCE - THE COMPANIES OF BRITAIN
SECTION 138
REGISTERED ARCHITECT
PHILIPP WILHELM
1100-1100 STREET
VANCOUVER, BC V6E 2K9
PH: 604-273-1234
WWW.PHILIPPWILHELM.COM

THE COMPANIES OF THE PROVINCE - THE COMPANIES OF BRITAIN
SECTION 138
REGISTERED ARCHITECT
PHILIPP WILHELM
1100-1100 STREET
VANCOUVER, BC V6E 2K9
PH: 604-273-1234
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THE COMPANIES OF THE PROVINCE - THE COMPANIES OF BRITAIN
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PHILIPP WILHELM
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PHILIPP WILHELM
1100-1100 STREET
VANCOUVER, BC V6E 2K9
PH: 604-273-1234
WWW.PHILIPPWILHELM.COM



FRONT ELEVATION 1/4" = 1'-0"



PRIME BUILDING DESIGN

202 - 5704 32nd St, Vernon, BC
+1 (250) 540-5449
philipp@primebuildingdesign.com

primebuildingdesign.com

No.	Description	Date
01	Issued for DP	2022-09-28
02	Revised	2023-02-28

**AURORA HEIGHTS
WALKUP FOURPLEX
UNITS 4/5/6/7**

**69 KESTREL PLACE,
VERNON, BC**

REAR ELEVATION

Project Number	22-031
Date	2022-09-28
Designed By	PW

A10

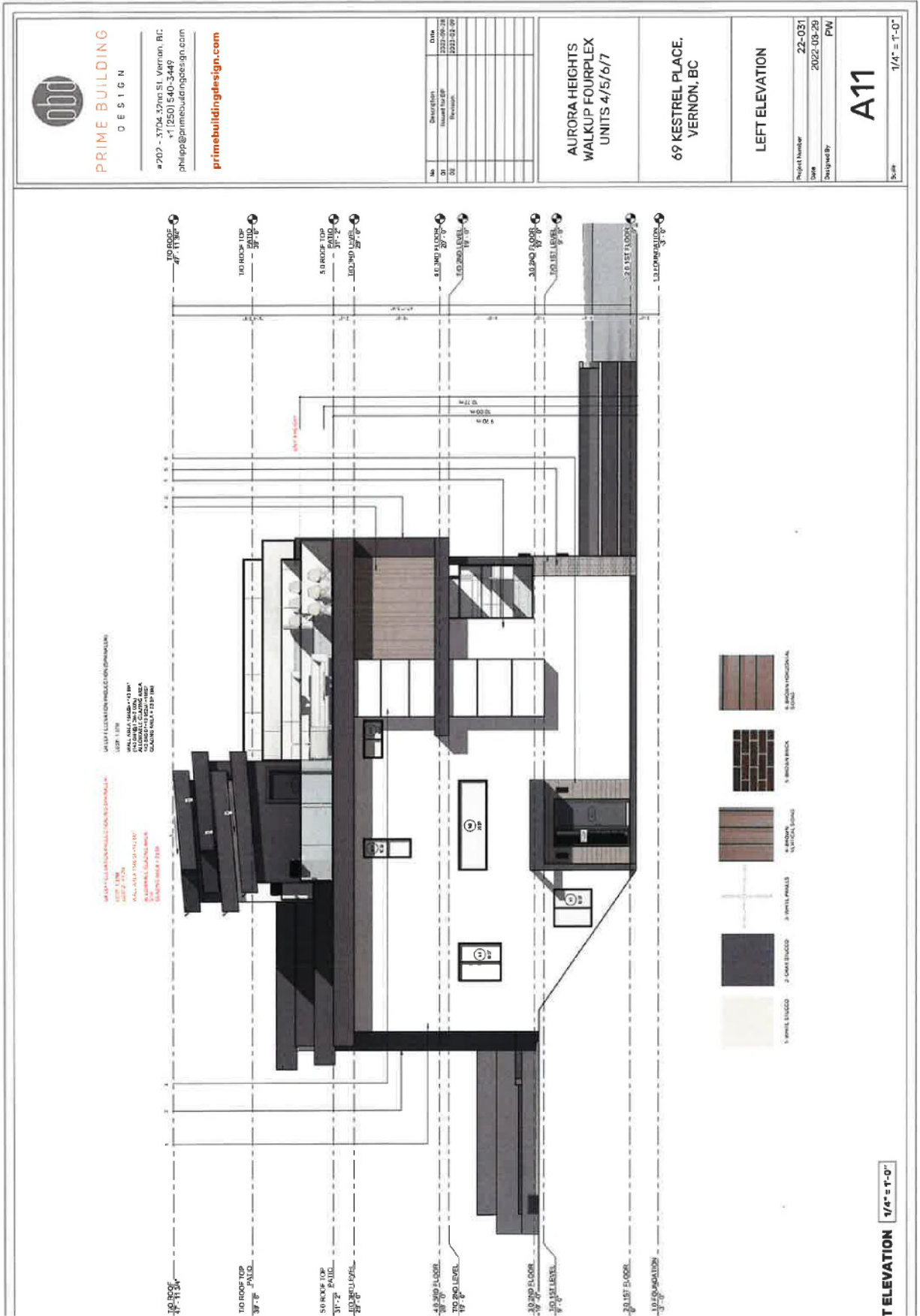
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LEGEND

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- 99. BRICK
- 100. BRICK

REAR ELEVATION 1/4" = 1'-0"





PRIME BUILDING DESIGN

#202 - 5704 32nd St., Vernon, BC
 +1 (250) 540-5449
 philipp@primebuildingdesign.com
 primebuildingdesign.com

No.	Description	Date
01	Issued for DP	2022-09-28
02	Revised	2023-02-08

**AURORA HEIGHTS
 WALKUP FOURPLEX
 UNITS 4/5/6/7**

**69 KESTREL PLACE,
 VERNON, BC**

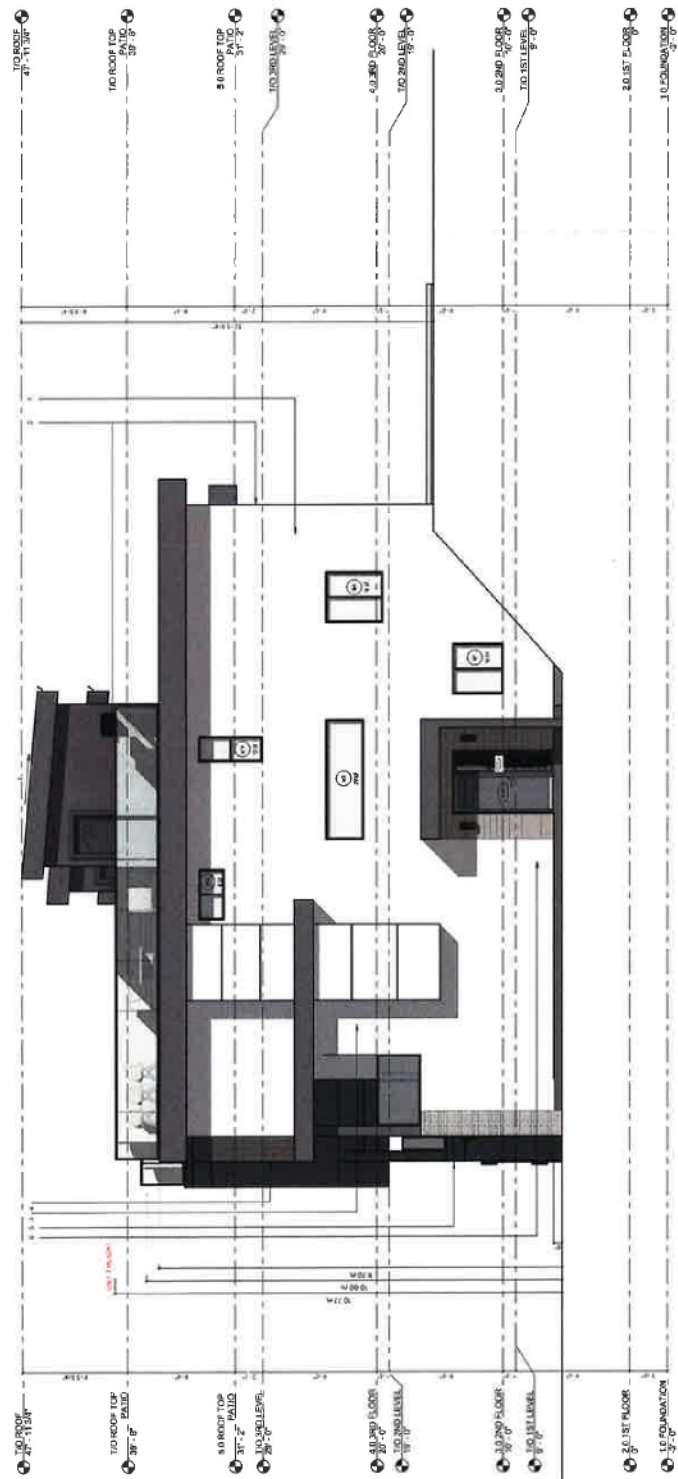
RIGHT ELEVATION

Project Number	22-031
Date	2022-09-28
Designed By	PW

A12

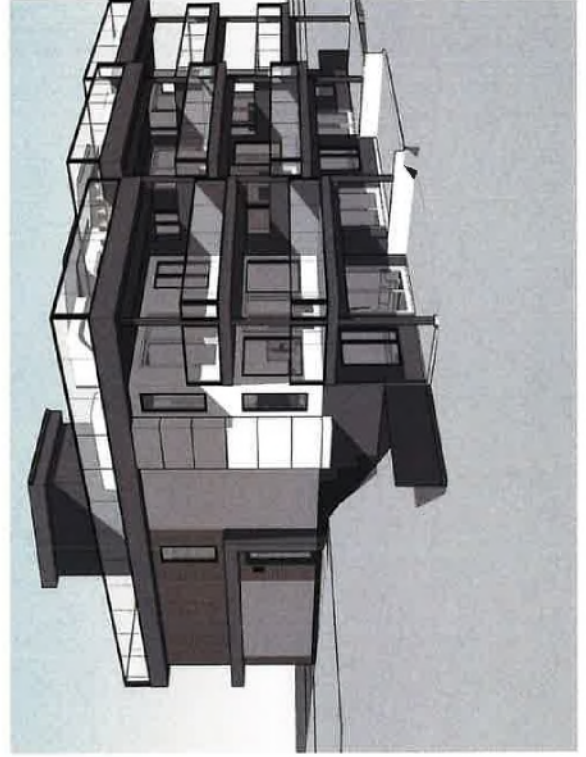
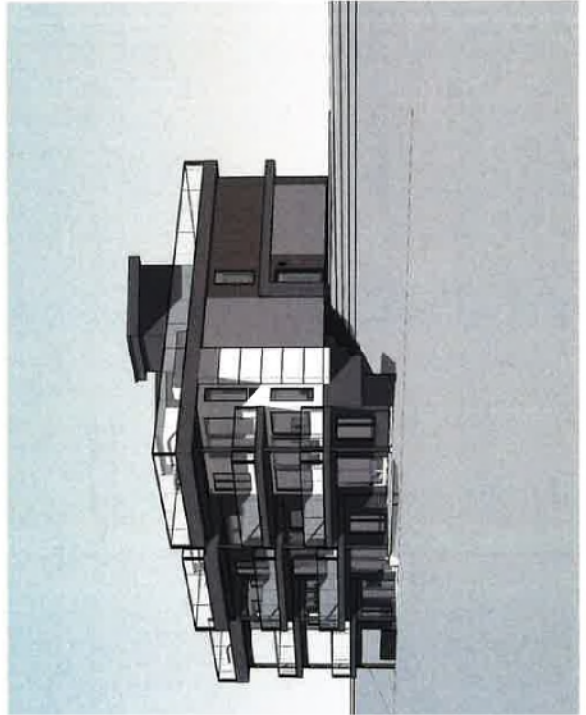
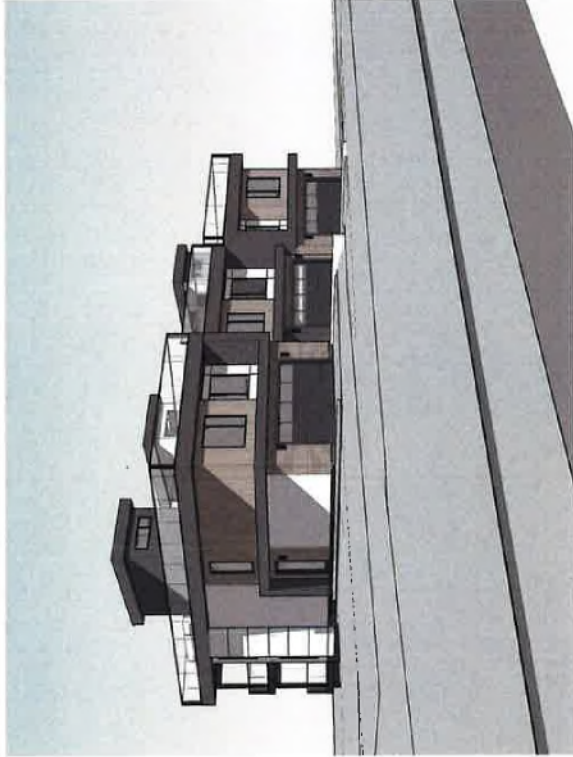
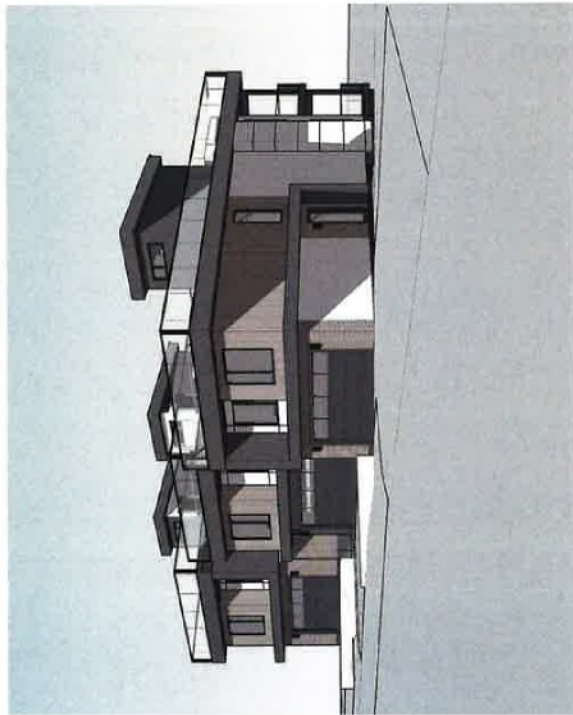
Scale: 1/4" = 1'-0"

UNITS 4, 5, 6, 7 PRODUCTION (NO STAIRS)
 UNIT 4: 1100
 UNIT 5: 1100
 UNIT 6: 1100
 UNIT 7: 1100
 TOTAL UNIT AREA: 4400 SQ FT
 TOTAL UNIT VOLUME: 11000 CU FT
 GROUND AREA: 1100 SQ FT



- 1 WHITE STUCCO
- 2 GRAY STUCCO
- 3 WHITE WALLS
- 4 BROWN BRICK
- 5 BROWN BRICK
- 6 BROWN BRICK
- 7 BROWN BRICK
- 8 BROWN BRICK
- 9 BROWN BRICK
- 10 BROWN BRICK

RIGHT ELEVATION 1/4" = 1'-0"



PRIME BUILDING
DESIGN

#102 - 4764 32nd St. Vernon, BC
+1(250)546-1469
phil.p@primebuildingdesign.com

primebuildingdesign.com

No	Description	Date
01	Issue No. 01	2022-03-29
02	Revision	2023-07-13

AURORA HEIGHTS
WALKUP TRIPLEX
UNITS 8/9/10

69 KESTREL PLACE,
VERNON, BC

TITLE PAGE

Project Number: 22-033
Date: 2022-03-29
Designed By: PW

A01

Scale:



**PRIME BUILDING
DESIGN**

#202 - 5704-32nd St. Vernon, BC
+1(250) 640-3449
philip@primebuildingdesign.com

primebuildingdesign.com

No.	Description	Date
01	Issued for GP	2022-03-29
02	Revision	2022-03-13

**AURORA HEIGHTS
WALKUP TRIPLEX
UNITS 8/9/10**

**69 KESTREL PLACE,
VERNON, BC**

FRONT ELEVATION

Project Number: 22-033
 Date: 2022-03-29
 Designer: PW

A08

Scale: 1/4" = 1'-0"



UNIT 8
 1. WHITE BRICK
 2. GRAY BRICK
 3. WHITE BRICK
 4. BROWN BRICK
 5. BROWN BRICK
 6. WHITE BRICK
 7. GRAY BRICK
 8. WHITE BRICK
 9. BROWN BRICK
 10. BROWN BRICK

UNIT 9
 1. WHITE BRICK
 2. GRAY BRICK
 3. WHITE BRICK
 4. BROWN BRICK
 5. BROWN BRICK
 6. WHITE BRICK
 7. GRAY BRICK
 8. WHITE BRICK
 9. BROWN BRICK
 10. BROWN BRICK

UNIT 10
 1. WHITE BRICK
 2. GRAY BRICK
 3. WHITE BRICK
 4. BROWN BRICK
 5. BROWN BRICK
 6. WHITE BRICK
 7. GRAY BRICK
 8. WHITE BRICK
 9. BROWN BRICK
 10. BROWN BRICK

FRONT ELEVATION 1/4" = 1'-0"



**PRIME BUILDING
DESIGN**

202-4704-1044 ST. Vernon, BC
 41 2801 540-5400
 philip@primebuildingdesign.com
primebuildingdesign.com

No	Description	Date
01	Issued for DP	2022-09-29
02	Revision	2023-03-13

**AURORA HEIGHTS
WALKUP TRIPLEX
UNITS 8/9/10**

**69 KESTREL PLACE,
VERNON, BC**

REAR ELEVATION

Project Number	22-033
Date	2022-03-28
Designed By	PW

A09

Scale **1/4" = 1'-0"**



- 1 WHITE STUCCO
- 2 DARK STUCCO
- 3 LIGHT STUCCO
- 4 REDWOOD VERTICAL GRAB
- 5 REDWOOD VERTICAL
- 6 BRICK VERTICAL
- 7 BRICK VERTICAL
- 8 BRICK VERTICAL

REAR ELEVATION 1/4" = 1'-0"



**PRIME BUILDING
DESIGN**

1202 - 3704 32nd St. Vernon, BC
+1(250) 546-4449
philipp@primebuildingdesign.com
primebuildingdesign.com

No.	Description	Date
01	Issued for DP	2022-03-29
02	Revisions	2022-03-13

**AURORA HEIGHTS
WALKUP TRIPLEX
UNITS 8/9/10**

69 KESTREL PLACE,
VERNON, BC

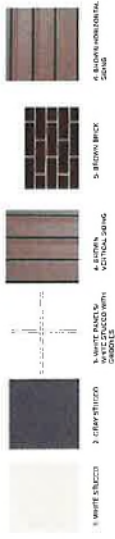
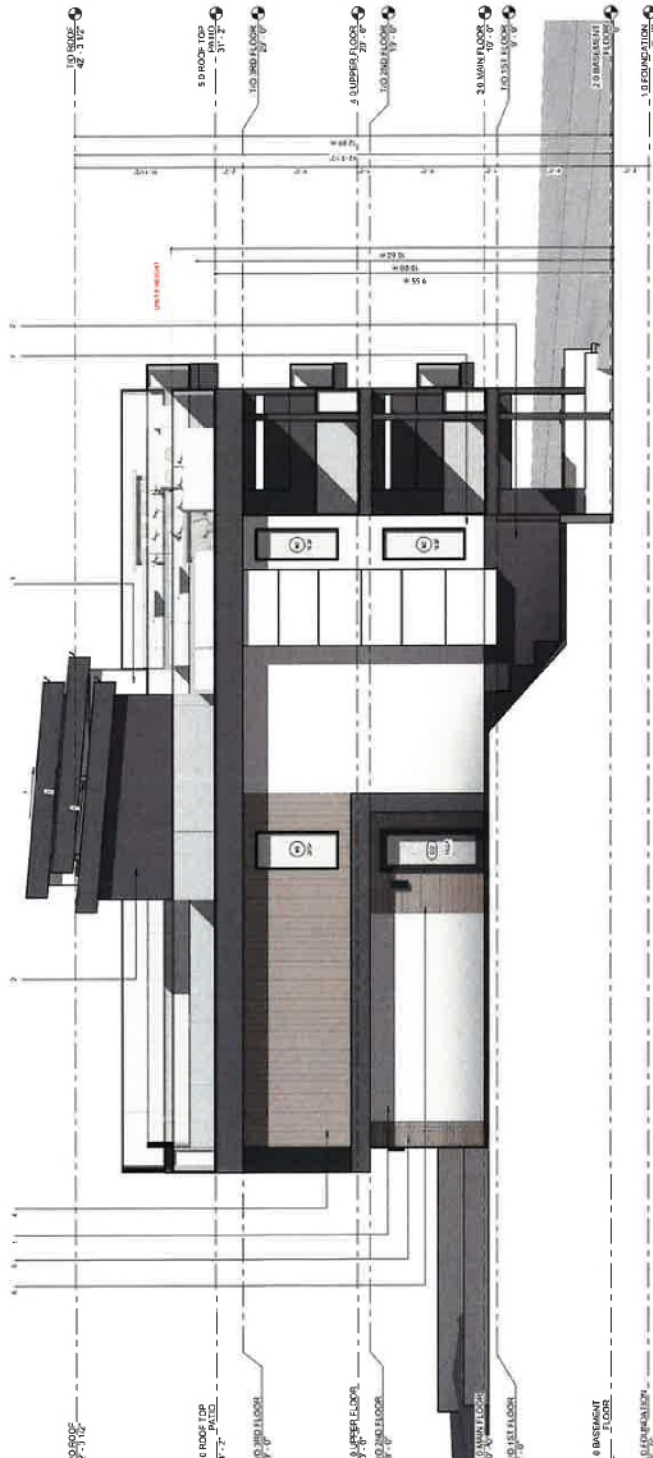
RIGHT ELEVATION

Project Number:	22-033
Date:	2022-03-29
Designed By:	PAV

A10

Scale: 1/4" = 1'-0"

FAIR REPRESENTATION LEGEND INFORMATION:
CITY OF VERNON
1000-1010 10TH ST. S. VERNON, BC
V1S 5M2
250.554.4222
www.vernon.ca



ELEVATION 1/4" = 1'-0"



**PRIME BUILDING
DESIGN**

#202 - 3764 32nd St. 1/6/2022, BC
+1 (250) 540-5444
philipp@primebuildingdesign.com
primebuildingdesign.com

No.	Description	Date
01	Issued for DP	2022-03-29
02	Revised	2022-03-29

**AURORA HEIGHTS
WALKUP TRIPLEX
UNITS 8/9/10**

**69 KESTREL PLACE,
VERNON, BC**

LEFT ELEVATION

Project Number	22-033
Date	2022-03-29
Designed By	PW

A11

Scale: 1/4" = 1'-0"

FINISHES:

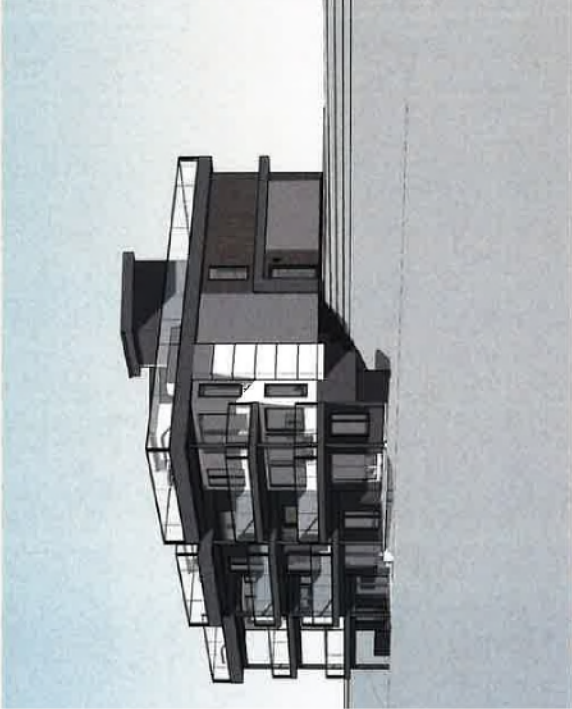
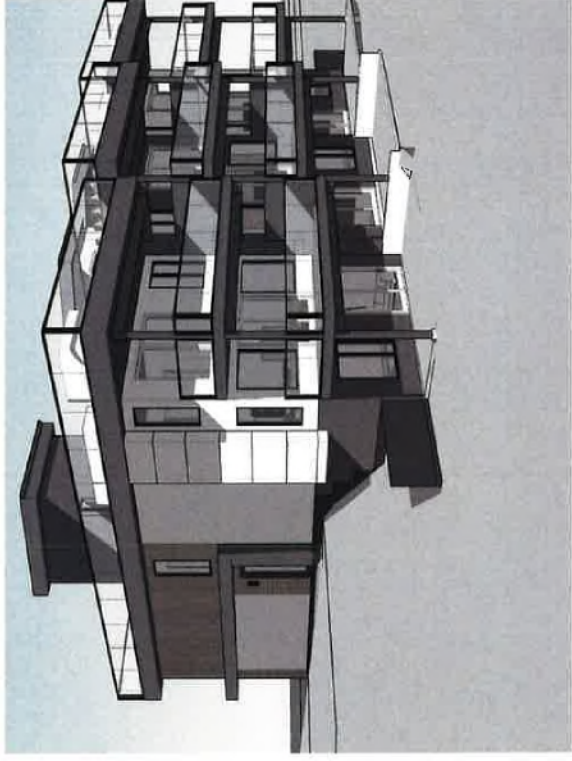
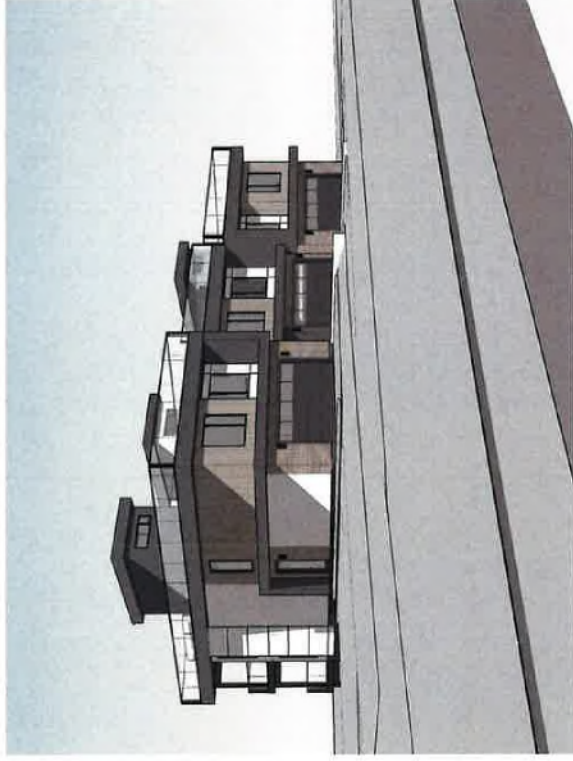
- 1. WOOD PANELING
- 2. BRICK
- 3. STAINLESS STEEL
- 4. CONCRETE
- 5. GLASS

NOTES:

- 1. ALL FINISHES TO BE SUPPLIED BY OTHERS.
- 2. SEE ARCHITECTURAL SPECIFICATIONS FOR FINISH SCHEDULE.
- 3. ALL FINISHES TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- 4. ALL FINISHES TO BE INSTALLED IN ACCORDANCE WITH LOCAL BUILDING CODES.



ELEVATION 1/4" = 1'-0"



**PRIME BUILDING
DESIGN**

#202 - 3704 12th St. Vernon, BC
#1 (250) 540-3449
philipp@primebuildingdesign.com
primebuildingdesign.com

No.	Description	Date
01	Issued For GRP	2022-07-28
02	Revised	2023-02-28

AURORA HEIGHTS
WALKOUT TRIPLEX
UNITS 11/12/13

69 KESTREL PLACE,
VERNON, BC

TITLE PAGE

Project Number 22-052
Date 2022-03-29
Drawn By PW

A01

Scale

No.	Revisions	Date
01	Issued for RFP	2022-03-29
02	Revisions	2022-03-29

**AURORA HEIGHTS
 WALKOUT TRIPLEX
 UNITS 11/12/13**

**69 KESTREL PLACE,
 VERNON, BC**

FRONT ELEVATION

Project Number	22-032
Date	2022-03-29
Designed By	PW

A08

Scale: 1/4" = 1'-0"



- 1. WHITE BRICK
- 2. GRAY STUCCO
- 3. WHITE BRICK
- 4. BROWN VERTICAL SIDING
- 5. BROWN BRICK
- 6. BROWN HORIZONTAL SIDING

FRONT ELEVATION 1/4" = 1'-0"



PRIME BUILDING
DESIGN

202 - 3704 32nd St. Vernon, BC
V1S 2S0 | 640 3449
onlpp@primebuildingdesign.com
primebuildingdesign.com

NO	DESCRIPTION	DATE
01	Issued for RFP	2022-07-28
02	Revisions	2022-07-29

AURORA HEIGHTS
WALKOUT TRIPLEX
UNITS 11/12/13

69 KESTREL PLACE,
VERNON, BC

REAR ELEVATION

Project Number	22-032
Date	2022-03-29
Designer By	PW

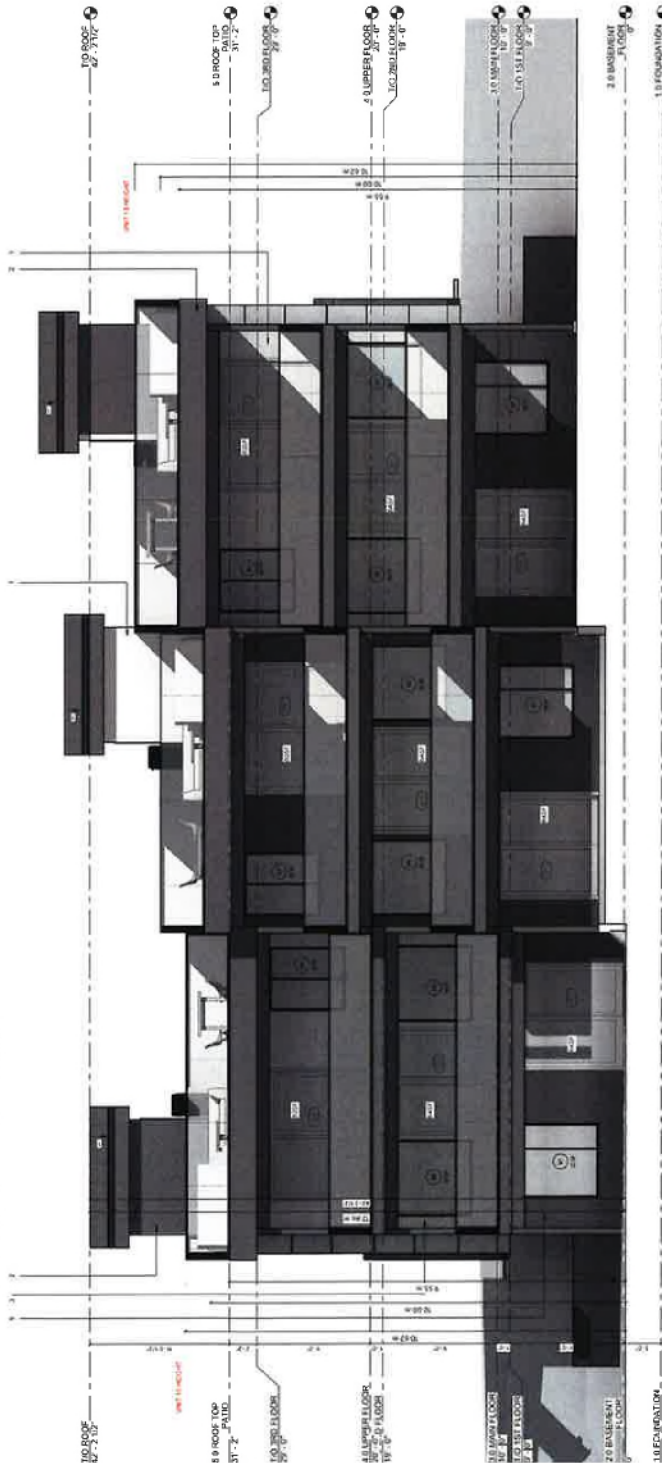
A09

Scale 1/4" = 1'-0"

FIRE COMPARTMENT (UNIT 11) (R-10) (M-1/2) (A-1/2) (E-1/2) (S-1/2) (L-1/2) (G-1/2) (P-1/2) (O-1/2) (D-1/2) (U-1/2) (V-1/2) (W-1/2) (X-1/2) (Y-1/2) (Z-1/2) (AA-1/2) (BB-1/2) (CC-1/2) (DD-1/2) (EE-1/2) (FF-1/2) (GG-1/2) (HH-1/2) (II-1/2) (JJ-1/2) (KK-1/2) (LL-1/2) (MM-1/2) (NN-1/2) (OO-1/2) (PP-1/2) (QQ-1/2) (RR-1/2) (SS-1/2) (TT-1/2) (UU-1/2) (VV-1/2) (WW-1/2) (XX-1/2) (YY-1/2) (ZZ-1/2) (AAA-1/2) (BBB-1/2) (CCC-1/2) (DDD-1/2) (EEE-1/2) (FFF-1/2) (GGG-1/2) (HHH-1/2) (III-1/2) (JJJ-1/2) (KKK-1/2) (LLL-1/2) (MMM-1/2) (NNN-1/2) (OOO-1/2) (PPP-1/2) (QQQ-1/2) (RRR-1/2) (SSS-1/2) (TTT-1/2) (UUU-1/2) (VVV-1/2) (WWW-1/2) (XXX-1/2) (YYY-1/2) (ZZZ-1/2) (AAA-1/2) (BBB-1/2) (CCC-1/2) (DDD-1/2) (EEE-1/2) (FFF-1/2) (GGG-1/2) (HHH-1/2) (III-1/2) (JJJ-1/2) (KKK-1/2) (LLL-1/2) (MMM-1/2) (NNN-1/2) (OOO-1/2) (PPP-1/2) (QQQ-1/2) (RRR-1/2) (SSS-1/2) (TTT-1/2) (UUU-1/2) (VVV-1/2) (WWW-1/2) (XXX-1/2) (YYY-1/2) (ZZZ-1/2)

FIRE COMPARTMENT (UNIT 12) (R-10) (M-1/2) (A-1/2) (E-1/2) (S-1/2) (L-1/2) (G-1/2) (P-1/2) (O-1/2) (D-1/2) (U-1/2) (V-1/2) (W-1/2) (X-1/2) (Y-1/2) (Z-1/2) (AA-1/2) (BB-1/2) (CC-1/2) (DD-1/2) (EE-1/2) (FF-1/2) (GG-1/2) (HH-1/2) (II-1/2) (JJ-1/2) (KK-1/2) (LL-1/2) (MM-1/2) (NN-1/2) (OO-1/2) (PP-1/2) (QQ-1/2) (RR-1/2) (SS-1/2) (TT-1/2) (UU-1/2) (VV-1/2) (WW-1/2) (XX-1/2) (YY-1/2) (ZZ-1/2) (AAA-1/2) (BBB-1/2) (CCC-1/2) (DDD-1/2) (EEE-1/2) (FFF-1/2) (GGG-1/2) (HHH-1/2) (III-1/2) (JJJ-1/2) (KKK-1/2) (LLL-1/2) (MMM-1/2) (NNN-1/2) (OOO-1/2) (PPP-1/2) (QQQ-1/2) (RRR-1/2) (SSS-1/2) (TTT-1/2) (UUU-1/2) (VVV-1/2) (WWW-1/2) (XXX-1/2) (YYY-1/2) (ZZZ-1/2) (AAA-1/2) (BBB-1/2) (CCC-1/2) (DDD-1/2) (EEE-1/2) (FFF-1/2) (GGG-1/2) (HHH-1/2) (III-1/2) (JJJ-1/2) (KKK-1/2) (LLL-1/2) (MMM-1/2) (NNN-1/2) (OOO-1/2) (PPP-1/2) (QQQ-1/2) (RRR-1/2) (SSS-1/2) (TTT-1/2) (UUU-1/2) (VVV-1/2) (WWW-1/2) (XXX-1/2) (YYY-1/2) (ZZZ-1/2)

FIRE COMPARTMENT (UNIT 13) (R-10) (M-1/2) (A-1/2) (E-1/2) (S-1/2) (L-1/2) (G-1/2) (P-1/2) (O-1/2) (D-1/2) (U-1/2) (V-1/2) (W-1/2) (X-1/2) (Y-1/2) (Z-1/2) (AA-1/2) (BB-1/2) (CC-1/2) (DD-1/2) (EE-1/2) (FF-1/2) (GG-1/2) (HH-1/2) (II-1/2) (JJ-1/2) (KK-1/2) (LL-1/2) (MM-1/2) (NN-1/2) (OO-1/2) (PP-1/2) (QQ-1/2) (RR-1/2) (SS-1/2) (TT-1/2) (UU-1/2) (VV-1/2) (WW-1/2) (XX-1/2) (YY-1/2) (ZZ-1/2) (AAA-1/2) (BBB-1/2) (CCC-1/2) (DDD-1/2) (EEE-1/2) (FFF-1/2) (GGG-1/2) (HHH-1/2) (III-1/2) (JJJ-1/2) (KKK-1/2) (LLL-1/2) (MMM-1/2) (NNN-1/2) (OOO-1/2) (PPP-1/2) (QQQ-1/2) (RRR-1/2) (SSS-1/2) (TTT-1/2) (UUU-1/2) (VVV-1/2) (WWW-1/2) (XXX-1/2) (YYY-1/2) (ZZZ-1/2) (AAA-1/2) (BBB-1/2) (CCC-1/2) (DDD-1/2) (EEE-1/2) (FFF-1/2) (GGG-1/2) (HHH-1/2) (III-1/2) (JJJ-1/2) (KKK-1/2) (LLL-1/2) (MMM-1/2) (NNN-1/2) (OOO-1/2) (PPP-1/2) (QQQ-1/2) (RRR-1/2) (SSS-1/2) (TTT-1/2) (UUU-1/2) (VVV-1/2) (WWW-1/2) (XXX-1/2) (YYY-1/2) (ZZZ-1/2)



Material Legend:

- 1. WHITE STONE
- 2. DARK STONE
- 3. LIGHT STONE
- 4. BRICK
- 5. BRICK
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- 95. BRICK
- 96. BRICK
- 97. BRICK
- 98. BRICK
- 99. BRICK
- 100. BRICK

REAR ELEVATION 1/4" = 1'-0"



PRIME BUILDING
DESIGN

7202 - 3754 32nd St, Vernon, BC
V1T 2S0 | 250-540-3449
philipp@primebuildingdesign.com
primebuildingdesign.com

No.	Description	Date
01	Issued for ICP	2022-09-28
02	Revisions	2022-03-05

**AURORA HEIGHTS
WALKOUT TRIPLEX
UNITS 11/12/13**

69 KESTREL PLACE,
VERNON, BC

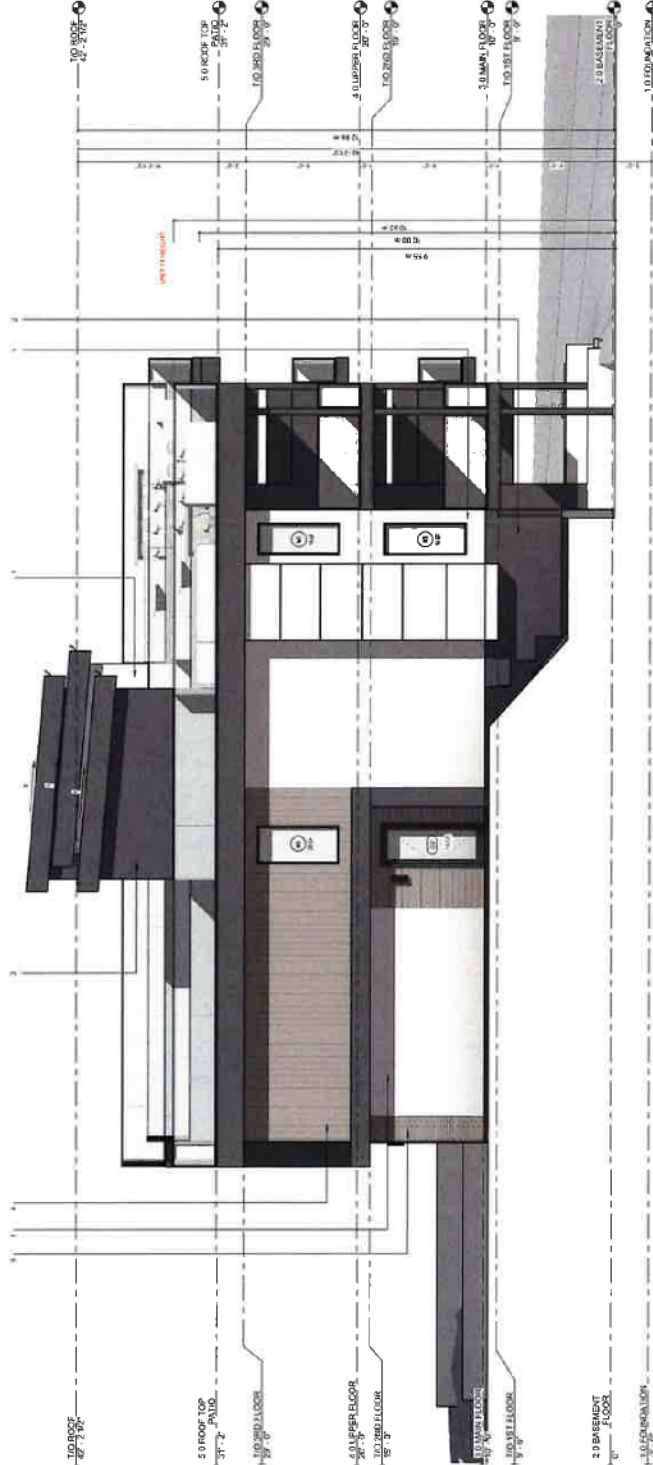
RIGHT ELEVATION

Project Number	22-032
Date	2022-03-20
Designed By	PW

A10

Scale: 1/4" = 1'-0"

NOTES:
1. ALL DIMENSIONS UNLESS OTHERWISE NOTED.
2. FINISHES TO BE DETERMINED BY THE ARCHITECT.
3. ALL WORK TO BE IN ACCORDANCE WITH THE BC BUILDING DEPARTMENT REGULATIONS.
4. REFER TO THE ARCHITECT'S SPECIFICATIONS FOR MATERIALS AND FINISHES.
5. ALL WORK TO BE DONE IN ACCORDANCE WITH THE BC BUILDING DEPARTMENT REGULATIONS.



- 1. WHITE BRICK
- 2. LIGHT BRICK
- 3. WHITE BRICK WITH DARK GROUT
- 4. HORIZONTAL VERTICAL BRICK
- 5. BRICKWORK
- 6. BRICKWORK
- 7. BRICKWORK
- 8. BRICKWORK

RIGHT ELEVATION 1/4" = 1'-0"



PRIME BUILDING DESIGN

#202 - 470-437nd St, Vernon, BC
+1 (250) 840-3449
philipp@primebuildingdesign.com

primebuildingdesign.com

No.	Description	Date
01	Issue for RFP	2022-03-29
02	Revision	2022-03-29

AURORA HEIGHTS
WALKOUT TRIPLEX
UNITS 11/12/13

69 KESTREL PLACE,
VERNON, BC

LEFT ELEVATION

Project Number	22-032
Date	2022-03-29
Designed By	PW

A11

Scale 1/4" = 1'-0"

RECOMMENDED FINISHES
 1. WALLS: BRICK
 2. FLOORING: POLISHED CONCRETE
 3. CEILING: POP
 4. ROOFING: METAL
 5. EXTERIOR: BRICK
 6. INTERIOR: BRICK
 7. PAINT: WHITE
 8. GLASS: CLEAR



- 1. WHITE BRICK
- 2. GRAY STUCCO
- 3. WHITE ENCLIP PANELS
- 4. BROWN VERTICAL SLATS
- 5. BROWN BRICK
- 6. BROWN HORIZONTAL SLATS

LEFT ELEVATION 1/4" = 1'-0"



PRIME BUILDING
DESIGN

#202 - 3704 32nd St. Vernon, BC
#1(250) 540-3449
pricedesign@primebuildingdesign.com
primebuildingdesign.com

No.	Description	Date
01	Issue for RFP	2022-07-28
02	Revisions	2023-03-08

AURORA HEIGHTS
WALKUP DUPLEX
UNITS 14/15

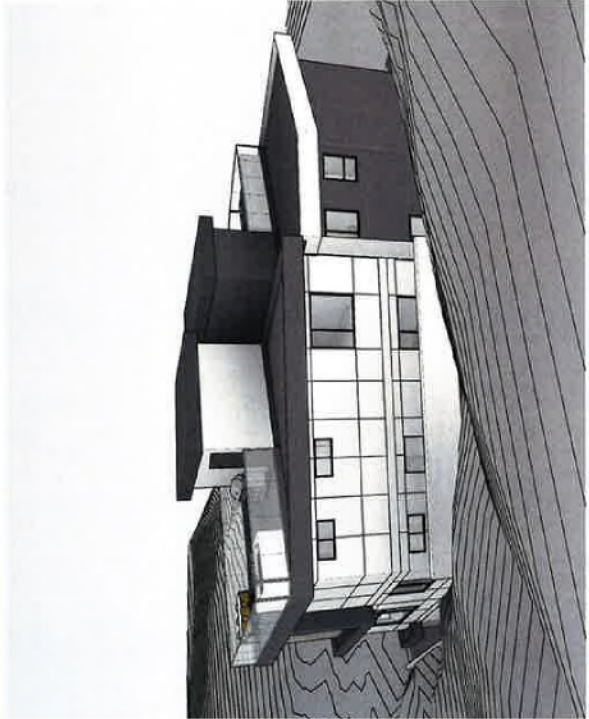
69 KESTREL PLACE,
VERNON, BC

TITLE PAGE

Project Number	22-035
Date	2022-05-15
Design/By	MF

A01

Scale





**PRIME BUILDING
DESIGN**

202 - 3704 32nd St. Vernon, BC
+1(250) 540-3449
philippa@primebuildingdesign.com

primebuildingdesign.com

No.	Description	Date
01	Issued for I.P.	2022-06-20
02	Revised	2022-07-28

**AURORA HEIGHTS
WALKUP DUPLEX
UNITS 14/15**

**69 KESTREL PLACE,
VERNON, BC**

FRONT ELEVATION

Project Number	22-035
Date	2022-06-15
Designed By	MF

A08

Scale: 1/4" = 1'-0"

FIRE ELEVATION CALCULATION

**SPRINKLER
FIRE COMPARTMENT (1100 SPINWALCH)**
1100-1113M
WALL AREA: 1000 sqm
FLOOR AREA: 1000 sqm
GLAZED AREA: 100 sqm

FIRE COMPARTMENT (1100 SPINWALCH)
1100-1113M
WALL AREA: 1000 sqm
FLOOR AREA: 1000 sqm
GLAZED AREA: 100 sqm

FIRE COMPARTMENT (1100 SPINWALCH)
1100-1113M
WALL AREA: 1000 sqm
FLOOR AREA: 1000 sqm
GLAZED AREA: 100 sqm



LEGEND

- 1 WHITE STUCCO
- 2 GRAY BRICK
- 3 BROWN BRICK
- 4 HORIZONTAL SIDING
- 5 BROWN BRICK
- 6 HORIZONTAL SIDING
- 7 BROWN BRICK
- 8 HORIZONTAL SIDING
- 9 BROWN BRICK
- 10 HORIZONTAL SIDING

FRONT ELEVATION 1/4" = 1'-0"



**PRIME BUILDING
DESIGN**

#202 - 3764396rd SA, Vernon, BC
#1 (250) 560-3449
primebuildingdesign@gmail.com

primebuildingdesign.com

No	Description	Date
01	Initial TADP	2022-06-15
02	Revisions	2023-05-08

**AURORA HEIGHTS
WALKUP DUPLEX
UNITS 14/15**

**69 KESTREL PLACE,
VERNON, BC**

FRONT-LEFT ELEVATION

Project Number	22-035
Date	2022-06-15
Designed By	MF

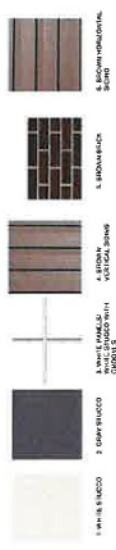
A09

Scale 1/4" = 1'-0"



FILE COMMENTS BY ARCHITECT
Date: 11/20/22

1. PERMITTED TO PROCEED WITH THE CONSTRUCTION OF THE PROJECT.
2. PERMITTED TO PROCEED WITH THE CONSTRUCTION OF THE PROJECT.
3. PERMITTED TO PROCEED WITH THE CONSTRUCTION OF THE PROJECT.
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9. PERMITTED TO PROCEED WITH THE CONSTRUCTION OF THE PROJECT.
10. PERMITTED TO PROCEED WITH THE CONSTRUCTION OF THE PROJECT.



FRONT-LEFT ELEVATION 1/4" = 1'-0"



**PRIME BUILDING
DESIGN**

#202 - 3704 52nd St, Vernon, BC
 #1(250) 560-3449
 philipp@primebuildingdesign.com
primebuildingdesign.com

No	Description	Date
01	Issued for RF	2022-06-28
02	Revisions	2022-07-08

**AURORA HEIGHTS
WALKUP DUPLEX
UNITS 14/15**

**69 KESTREL PLACE,
VERNON, BC**

LEFT ELEVATION

Project Number:	22-035
Date:	2022-06-15
Designed By:	MF

A10

Scale: **1/4" = 1'-0"**



LEFT ELEVATION 1/4" = 1'-0"

No.	Description	Date
01	Issue for DP	2022-05-28
02	Revisions	2022-05-28

**AURORA HEIGHTS
 WALKUP DUPLEX
 UNITS 14/15**

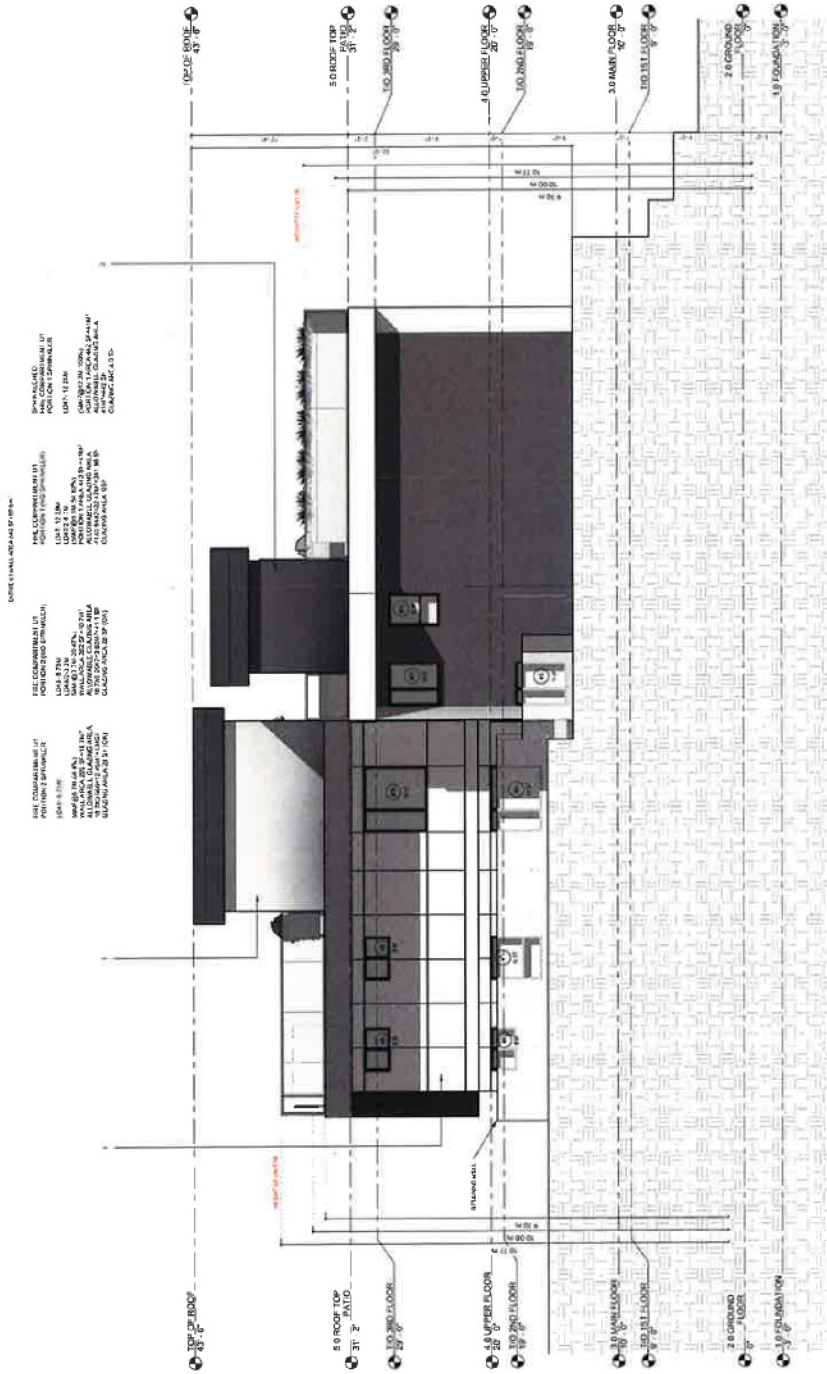
69 KESTREL PLACE,
 VERNON, BC

REAR ELEVATION

Project Number	22-035
Date	2022-05-15
Designed by	MF

A11

Scale 1/4" = 1'-0"



1 WHITE STUCCO

2 DARK BRICK

3 LIGHT BRICK

4 BRICK

5 BRICK

6 BRICK

7 BRICK

8 BRICK

9 BRICK

10 BRICK

REAR ELEVATION 1/4" = 1'-0"



PRIME BUILDING
DESIGN

#202 - 5704 32nd St. Vernon, BC
- (250) 540-3449
philippe@primebuildingdesign.com
primebuildingdesign.com

NO	DESCRIPTION	DATE
01	ISSUED FOR RFP	2022-09-28
02	Revisions	2022-02-08

**AURORA HEIGHTS
WALKUP DUPLEX
UNITS 14/15**

**69 KESTREL PLACE,
VERNON, BC**

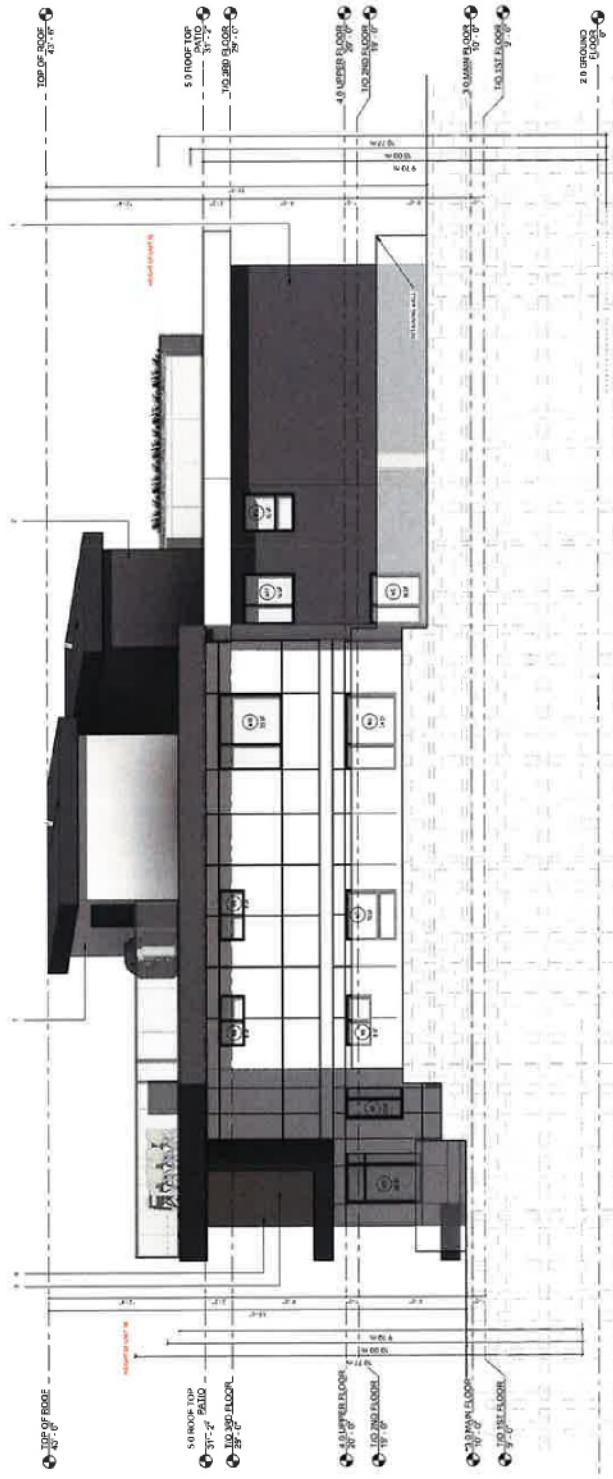
REAR-LEFT ELEVATION

Project Number	22-035
Date	2022-06-15
Designed By	MF

A12


Scale: 1/4" = 1'-0"

1. ALL CONSTRUCTION MATERIALS TO BE APPROVED BY THE ARCHITECT PRIOR TO INSTALLATION.
2. ALL MATERIALS TO BE MATCHED TO THE SAMPLES PROVIDED BY THE ARCHITECT.
3. ALL MATERIALS TO BE MATCHED TO THE SAMPLES PROVIDED BY THE ARCHITECT.
4. ALL MATERIALS TO BE MATCHED TO THE SAMPLES PROVIDED BY THE ARCHITECT.



1 WHITE BRICK
2 DARK BRICK
3 DARK BRICK WITH GROUT
4 BRICK WITH GROUT
5 BRICK WITH GROUT
6 BRICK WITH GROUT
7 BRICK WITH GROUT
8 BRICK WITH GROUT
9 BRICK WITH GROUT
10 BRICK WITH GROUT

REAR-LEFT ELEVATION 1/4" = 1'-0"



PRIME BUILDING DESIGN

#202 - 3704 32nd St, Vernon, BC
 +1(250) 540-5449
 philippa@primebuildingdesign.com
primebuildingdesign.com

NO	Description	DATE
01	Issued for GP	2022-06-28
02	Revisions	2022-03-28

**AURORA HEIGHTS
WALKUP DUPLEX
UNITS 14/15**

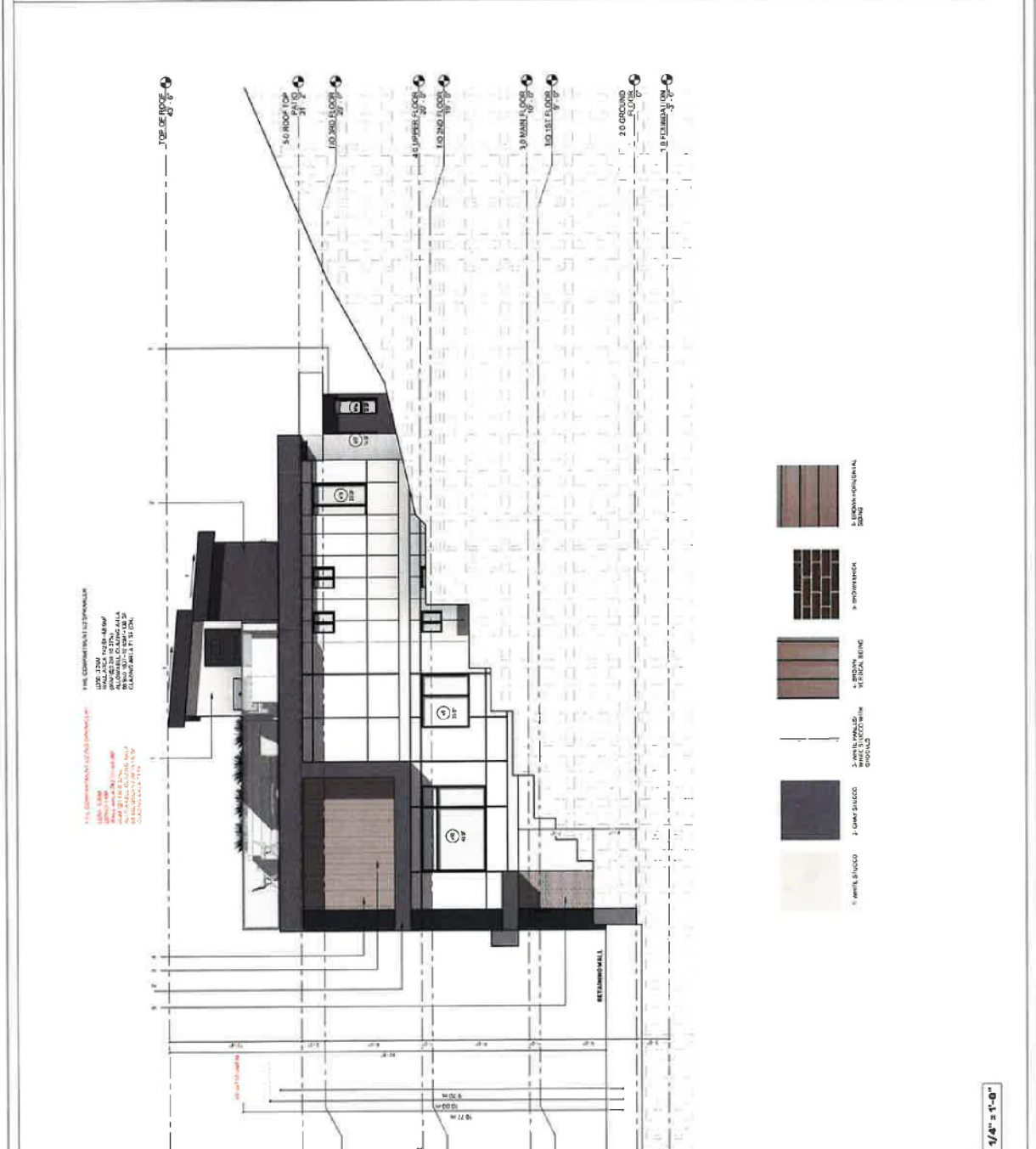
**69 KESTREL PLACE,
VERNON, BC**

RIGHT ELEVATION

Project Number: 22-035
 Date: 2022-06-15
 Designed By: MF

A13

Scale: 1/4" = 1'-0"





PRIME BUILDING
DESIGN

#202 470-8200 St. Vancouver, BC
+1 250 560-3429
philipp@primebuildingdesign.com
primebuildingdesign.com

Rev	Description	Drawn
01	Issued for GP	2022-07-28
01	Revised	2022-07-27
01	Revised	2022-07-15

AURORA HEIGHTS
WALKOUT DUPLEX
UNITS 16/17

69 KESTREL PLACE,
VERNON, BC

TITLE PAGE

Project Number: 22-034
Date: 2022-08-01
Designed By: PW

A01

Scale



PRIME BUILDING
DESIGN

3707 - 17704 17th Ave S1, Vernon, BC
+1 (250) 540-3449
philip@primebuildingdesign.com

primebuildingdesign.com

NO	Description	Date
01	Issue for IEP	2022-09-29
02	Revisions	2022-12-07
03	Revisions	2023-04-12

AURORA HEIGHTS
WALKOUT DUPLEX
UNITS 16/17

69 KESTREL PLACE,
VERNON, BC

FRONT ELEVATION

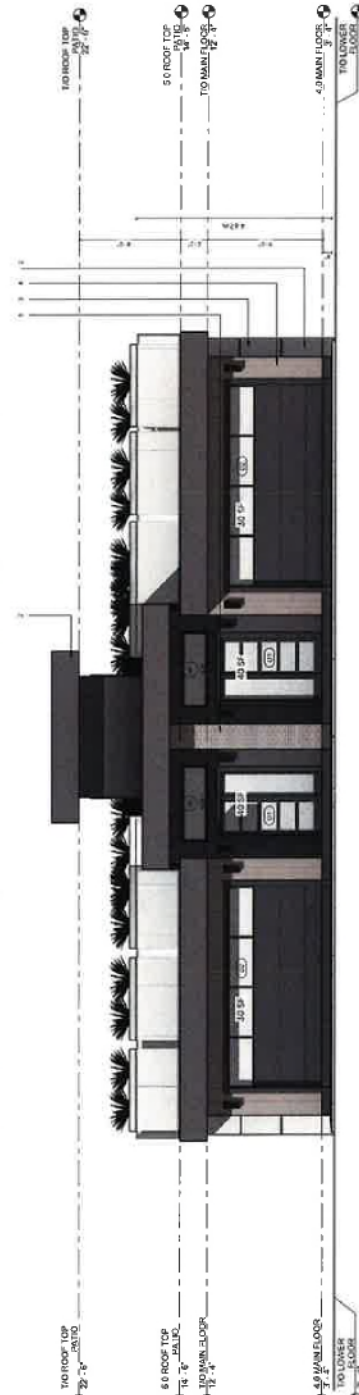
Project Number	22-034
Date	2022-08-01
Drawn By	PW

A08

Scale: 1/4" = 1'-0"

THE COMPANIES OF BC (REGISTERED ARCHITECTS)
US 11530
US 11531
US 11532
US 11533
US 11534
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US 11540
US 11541
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THE COMPANIES OF BC (REGISTERED ARCHITECTS)
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US 11599
US 11600



- 1 WHITE STUCCO
- 2 BROWN STUCCO
- 3 WHITE PANELS
- 4 HORIZONTAL Siding
- 5 SPORTS BRICK
- 6 HORIZONTAL Siding
- 7 HORIZONTAL Siding
- 8 DARK HORIZONTAL Siding

ELEVATION 1/4" = 1'-0"

PRIME BUILDING DESIGN

6222 - 3704 37th St. Vernon, BC
 V1T 2S1 540-3649
 prime@primebuildingdesign.com
primebuildingdesign.com

NO.	Description	DATE
01	Issue for DP	2022-08-28
02	Revisions	2022-09-01
03	Revisions	2022-08-10

**AURORA HEIGHTS
WALKOUT DUPLEX
UNITS 16/17**

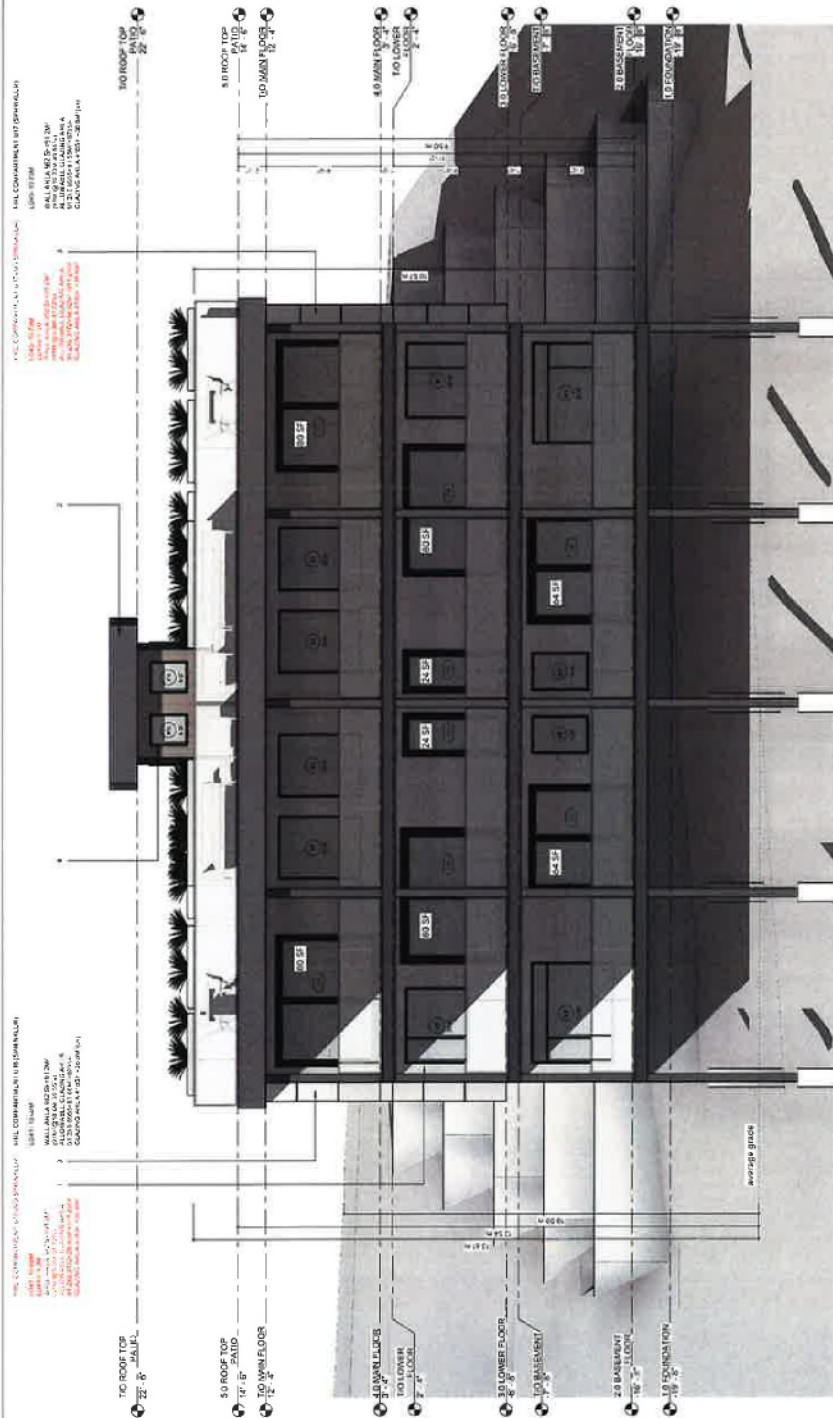
**69 KESTREL PLACE,
VERNON, BC**

REAR ELEVATION

Project Number:	22-034
Date:	2022-08-01
Designed By:	PW

A09

Scale: 1/4" = 1'-0"



ELEVATION 1/4" = 1'-0"

prime building DESIGN

#202 - 3704 37th St. Vernon, BC
 +1(250) 540-3449
 prime@primebuildingdesign.com
 primebuildingdesign.com

No.	Description	Date
01	Issued for IP	2022-05-24
02	Revisions	2022-02-07
03	Revisions	2022-04-10

**AURORA HEIGHTS
 WALKOUT DUPLEX
 UNITS 16/17**

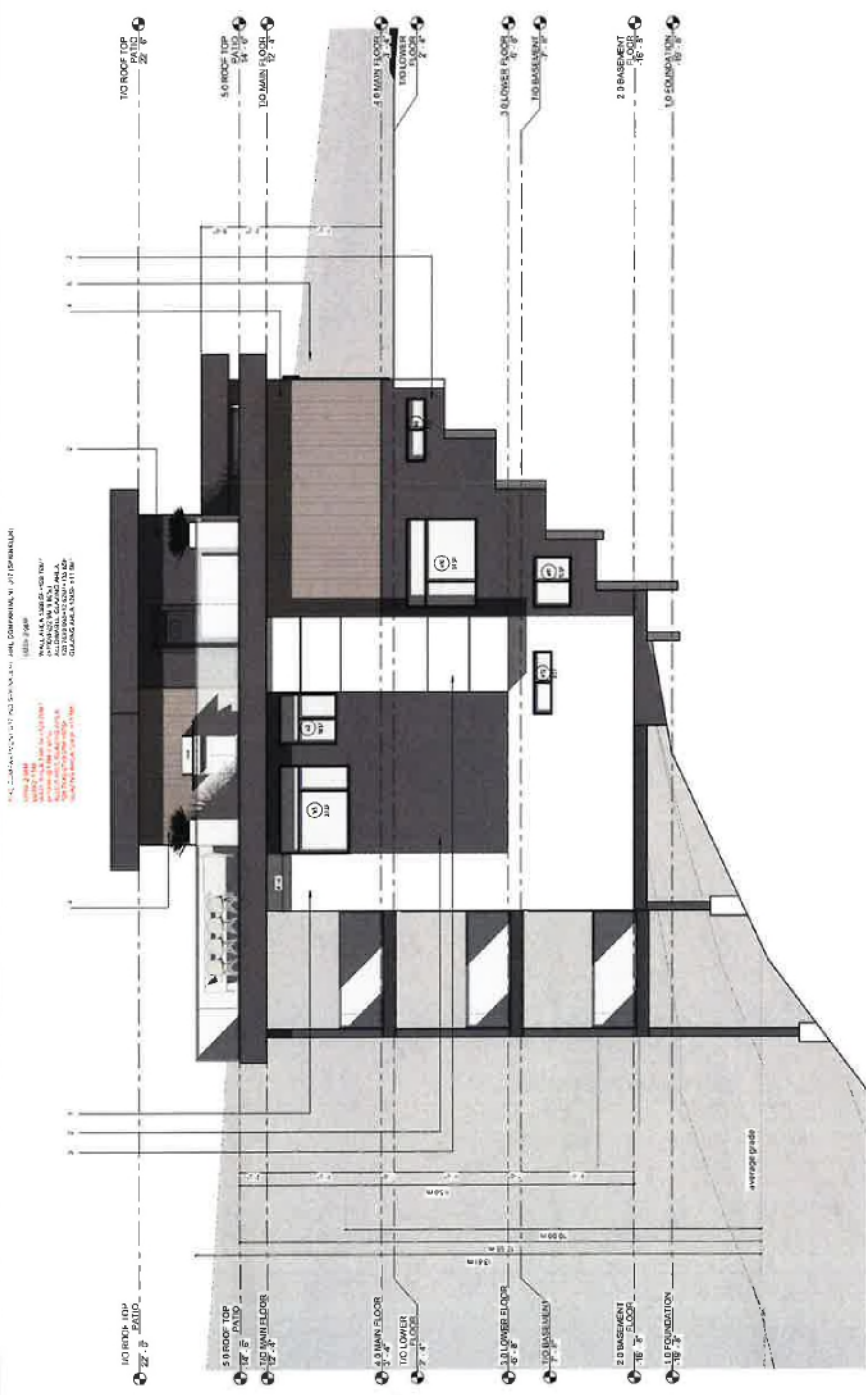
**69 KESTREL PLACE,
 VERNON, BC**

LEFT ELEVATION

Project Number: 22-034
 Date: 2022-08-01
 Designer: PW

A10

Scale: 1/4" = 1'-0"



ELEVATION 1/4" = 1'-0"

PRIME BUILDING DESIGN

2202 - 3704 32nd St. Vernon, BC
 +1 (250) 540-5449
 philipp@primebuildingdesign.com
 primebuildingdesign.com

No.	Description	Date
B1	Sheet for DP	2022-09-01
B2	Revisions	2022-09-01
B3	Revisions	2022-04-13

AURORA HEIGHTS WALKOUT DUPLEX UNITS 16/17

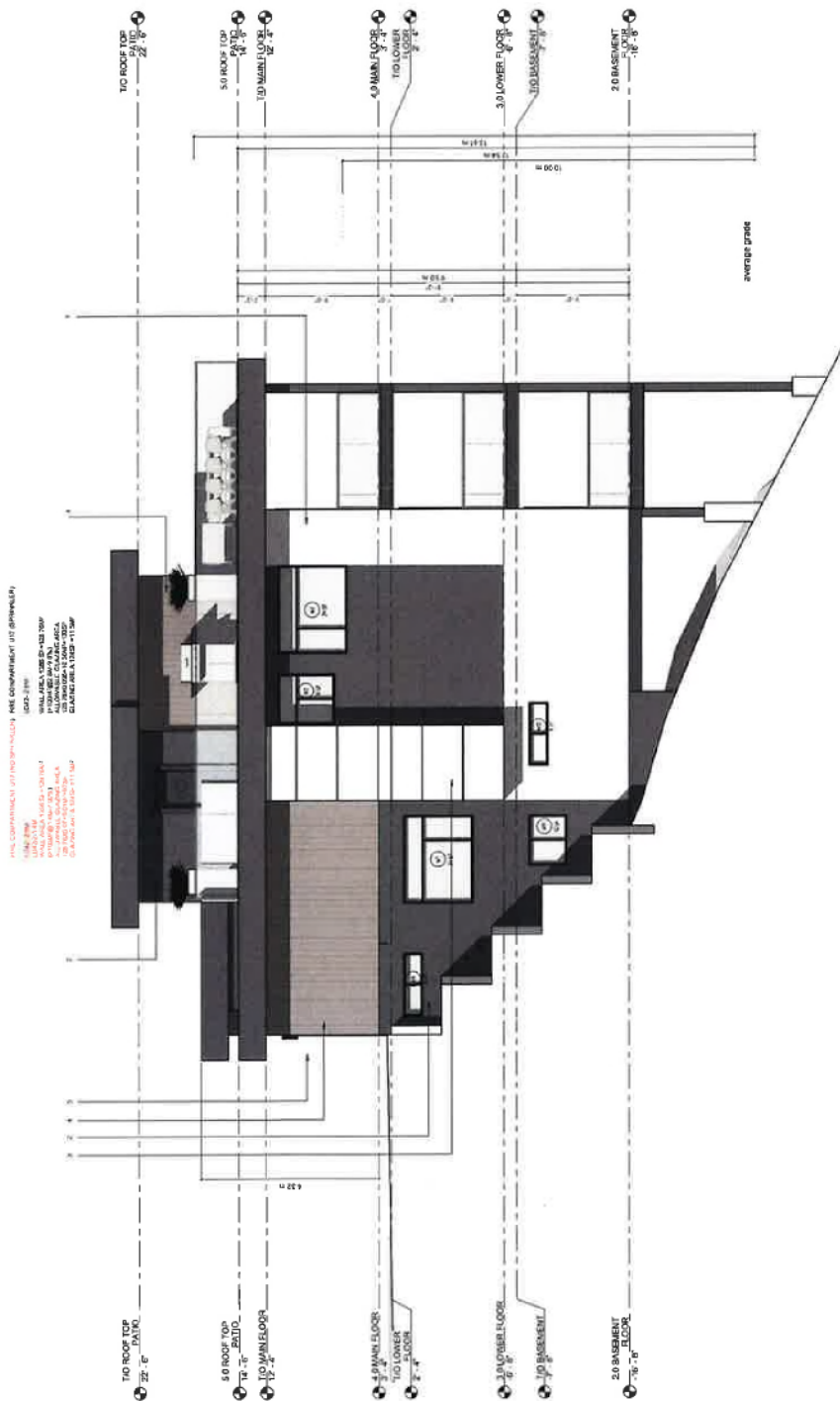
69 KESTREL PLACE, VERNON, BC

RIGHT ELEVATION

Project Number: 22-034
 Date: 2022-09-01
 Designer/Arch: PW

A11

Scale: 1/4" = 1'-0"



ALL DIMENSIONS OF PROJECT SHALL BE GOVERNED BY DIMENSIONS SHOWN ON THIS SHEET UNLESS OTHERWISE NOTED. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE NOTED. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE NOTED. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE NOTED.

- 1. WHITE STUCCO
- 2. DARK STUCCO
- 3. WHITE PANELS
- 4. REDWOOD VERTICAL SLATS
- 5. BRICK
- 6. BRICK
- 7. BRICK
- 8. BRICK

ELEVATION 1/4" = 1'-0"