



# Committee Report

**Date of Report:** July 31, 2023  
**Date & Type of Meeting:** August 16, 2023 Rural Affairs Committee  
**Author:** Zachari Giacomazzo, Planner  
**Subject:** SITE SPECIFIC EXEMPTION TO THE FLOODPLAIN MANAGEMENT BYLAW  
**File:** F2301J - Bourcier  
**Electoral Area/Municipality** J

## SECTION 1: EXECUTIVE SUMMARY

The purpose of this report is for the Rural Affairs Committee and Regional Board to consider an application for a Site Specific Exemption to Regional District of Central Kootenay Floodplain Management Bylaw No. 2080, 2009, in Electoral Area 'J'.

The applicant seeks relief from the 30 metre Floodplain Setback for the Columbia River specified in the RDCK Floodplain Management Bylaw No. 2080, 2009 in order to build a new dwelling 23.5 metres from the Natural Boundary of the Columbia River. This dwelling would replace the previous one that was destroyed by fire a year ago. Staff recommend that the Board approve the site specific exemption to the Floodplain Management Bylaw.

## SECTION 2: BACKGROUND/ANALYSIS

### GENERAL INFORMATION

**Property Owner:** Michael John Arthur Bourcier

**Property Location:** 3974 Broadwater Road, Electoral Area 'J'

**Legal Description:** PARCEL 1 (REFERENCE PLAN 38752I) BLOCK 8 DISTRICT LOT 4599 KOOTENAY DISTRICT PLAN 794 (PID: 008-494-622)

**Property Size:** 0.08 hectares (0.2 acres)

**Zoning:** Rural Residential (R3) – Zoning Bylaw No. 1675, 2004

**Land Use Designation:** Rural Residential (RR) – Kootenay-Columbia Rivers Official Community Plan Bylaw No. 1157, 1996

### SURROUNDING LAND USES

**North:** Rural Residential (R3)

**West:** Rural Residential (R3)

**East:** Rural Residential (R3)

**South:** Open Space (OS) – Columbia River

## Background and Site Context

The subject property is located approximately 4.5 km west of the City of Castlegar and 3 km east of the Hugh Kennleyside Dam in Electoral Area 'J'. There was previously a one-family dwelling located on the subject property that was destroyed by a fire approximately one year ago.

This site specific floodplain exemption application is required in order to rebuild a new dwelling in approximately the same location as the original dwelling that was destroyed by a fire. Based on the limited size of lot and topographic constraints, the proposed building site is the only possible location for a dwelling on the subject property. The applicant seeks relief from the 30 metre Floodplain Setback for the Columbia River specified in the RDCK Floodplain Management Bylaw No. 2080, 2009 in order to build a new dwelling 23.5 metres from the Natural Boundary of the Columbia River. Based on the information provided, the proposed dwelling will comply with the required Flood Construction Level of 426.3 metres G.S.C.

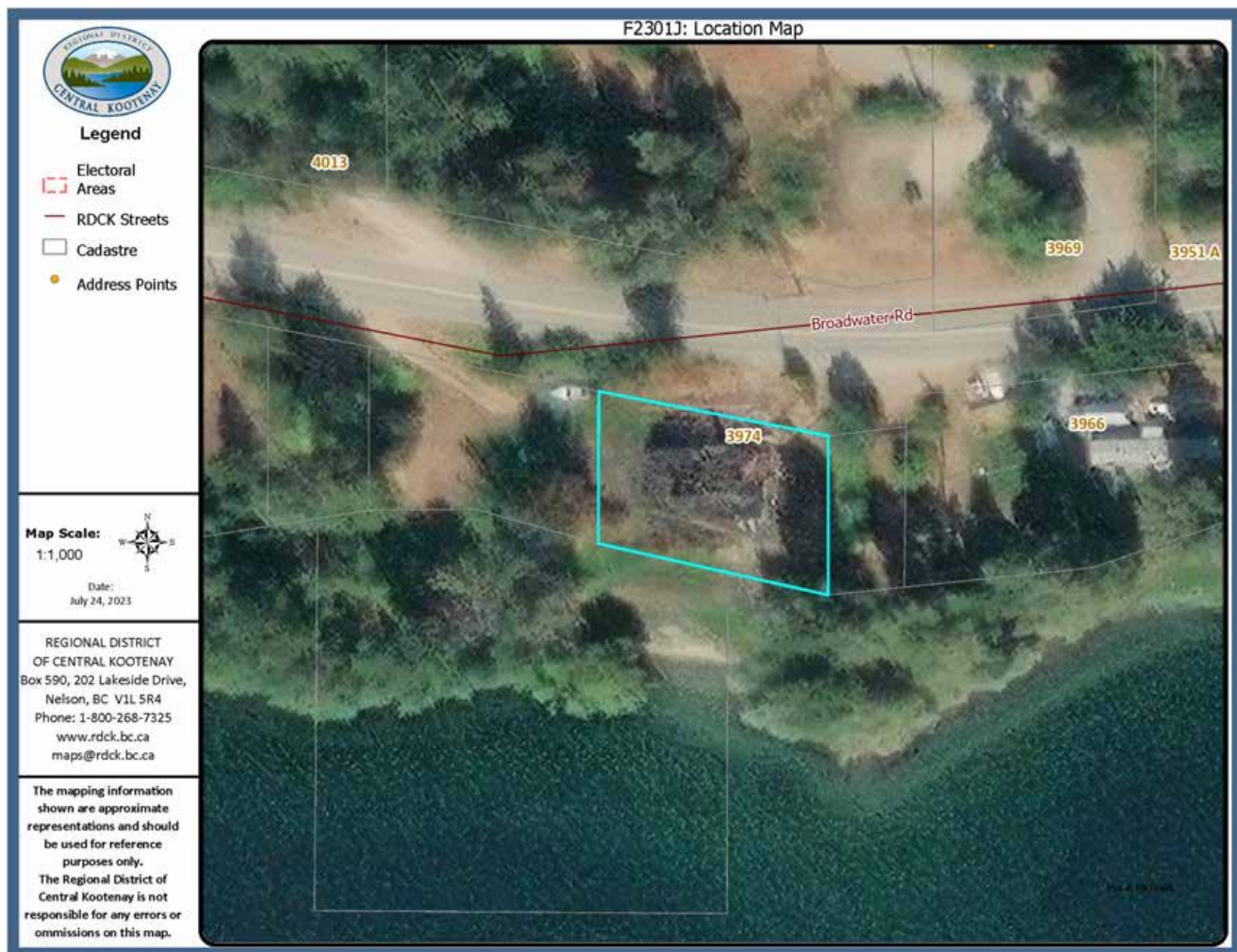


Figure 1 - Location Map







*Figure 3 - View looking east towards building site*



*Figure 4 - View from shoreline of Columbia River. The proposed building site is above the retaining wall*

## SECTION 3: DETAILED ANALYSIS

### 3.1 Financial Considerations – Cost and Resource Allocations:

Included in Financial Plan:  Yes  No      Financial Plan Amendment:  Yes  No  
Debt Bylaw Required:  Yes  No      Public/Gov't Approvals Required:  Yes  No

The \$500 fee for a Site Specific Floodplain Exemption application has been paid pursuant to the RDCK's *Planning Procedures and Fees Bylaw No. 2457, 2015*.

### 3.2 Legislative Considerations (Applicable Policies and/or Bylaws):

Under Section 524 of the *LGA*, the Board has the authority to exempt a development proposal from "requirements in relation to floodplain areas" provided a report prepared by a professional engineer or geoscientist is received stating that the land may be used safely for the use intended.

### 3.3 Environmental Considerations

No environmental impacts are anticipated on this developed site.

### 3.4 Social Considerations:

No negative social impacts are associated with this site specific exemption application.

### 3.5 Economic Considerations:

No economic considerations are anticipated in response to this land use application.

### 3.6 Communication Considerations:

In accordance with the RDCK's *Planning Procedures and Fees Bylaw No. 2457, 2015* staff referred the application to all relevant government agencies, internal RDCK departments and the Director for Electoral Area 'J' for review. The following comments were received:

#### **Ministry of Transportation and Infrastructure (West Kootenay District) – Development Services Officer**

*The ministry has no concerns with the floodplain exemption.*

#### **Ministry of Forests – Crown Land Authorizations**

*No concerns from MOF Crown Land Authorizations, as it appears all improvements will be within the boundaries of the privately owned lot.*

#### **BC Hydro – Property Coordinator, Reservoir Rights Services**

*BC Hydro has no concerns with this application but please advise the applicant that there is no maximum downstream of Hugh Keenleyside Dam, there is a risk of potential flooding and that erosion from wind and wave action are risks.*

#### **FortisBC – Contract Land Agent, Property Services**

##### Land Rights Comments

- *There are no immediate concerns or requests for additional land rights, however there may be additional land rights requested stemming from changes to the existing FortisBC Electric ("FBC(E)") services, if required.*

##### Operational & Design Comments

- *There are FortisBC Electric ("FBC(E)") primary distribution facilities along Broadwater Road.*

- All costs and land right requirements associated with changes to the existing servicing are the responsibility of the applicant.
- The applicant and/or property owner are responsible for maintaining safe limits of approach around all existing electrical facilities within and outside the property boundaries.
- **To proceed, the applicant should contact an FBC(E) designer as noted below for more details regarding design, servicing solutions, and land right requirements.**

**In order to initiate the design process, the customer must call 1-866-4FORTIS (1-866-436-7847).** Please have the following information available in order for FBC(E) to set up the file when you call.

- Electrician's Name and Phone number
- [FortisBC Total Connected Load Form](#)
- Other technical information relative to electrical servicing

For more information, please refer to FBC(E)'s overhead and underground design requirements:

FortisBC Overhead Design Requirements  
<http://fortisbc.com/ServiceMeterGuide>

FortisBC Underground Design Specification  
<http://www.fortisbc.com/InstallGuide>

## **Archaeology Branch – Archaeologist/Archaeological Information Administrator**

### **Results of Provincial Archaeological Inventory Search**

According to Provincial records, there are no known archaeological sites recorded on the subject property.

However, archaeological potential modelling for the area indicates there is high potential for previously unidentified archaeological sites to exist on the property, as indicated by the brown colour shown over everything in the second screenshot below. Archaeological potential modelling is compiled using existing knowledge about archaeological sites, past indigenous land use, and environmental variables. Models are a tool to help predict the presence of archaeological sites, and their results may be refined through further assessment.

The waterfront location of the property also increases the potential for unknown/unrecorded archaeological deposits.

### **Archaeology Branch Advice**

If land-altering activities (e.g., home renovations, property redevelopment, landscaping, service installation) are planned for the subject property, a Provincial heritage permit is not required prior to commencement of those activities.

However, a Provincial heritage permit will be required if archaeological materials are exposed and/or impacted during land-altering activities. Unpermitted damage or alteration of a protected archaeological site is a contravention of the Heritage Conservation Act and requires that land-altering activities be halted until the contravention has been investigated and permit requirements have been established. This can result in significant project delays.



Therefore, the Archaeology Branch strongly recommends engaging an eligible consulting archaeologist prior to any land-altering activities. The archaeologist will review the proposed activities, verify archaeological records, and possibly conduct a walk-over and/or an archaeological impact assessment (AIA) of the project area to determine whether the proposed activities are likely to damage or alter any previously unidentified archaeological sites.

Please notify all individuals involved in land-altering activities (e.g., owners, developers, equipment operators) that if archaeological material is encountered during development, they must stop all activities immediately and contact the Archaeology Branch for direction at 250-953-3334.

If there are no plans for land altering activities on the property, no action is required at this time.

#### *Rationale and Supplemental Information*

- *There is high potential for previously unidentified archaeological deposits to exist on the property.*
- *Archaeological sites are protected under the Heritage Conservation Act and must not be damaged or altered without a Provincial heritage permit issued by the Archaeology Branch. This protection applies even when archaeological sites are previously unidentified or disturbed.*
- *If a permit is required, be advised that the permit application and issuance process takes approximately 15 to 35 weeks; the permit application process includes referral to First Nations and subsequent engagement.*
- *The Archaeology Branch must consider numerous factors (e.g., proposed activities and potential impacts to the archaeological site[s]) when determining whether to issue a permit and under what terms and conditions.*
- *The Archaeology Branch has the authority to require a person to obtain an archaeological impact assessment, at the person's expense, in certain circumstances, as set out in the Heritage Conservation Act.*
- *Occupying an existing dwelling or building without any land alteration does not require a Provincial heritage permit.*

#### **Ministry of Water Lands and Resource Stewardship – Ecosystems Section Head**

*The Kootenay-Boundary Ecosystems Section of the Ministry of Water, Land and Resource Stewardship has received your referral request. We are currently unable to provide a detailed review of the referral but provide the following standard requirements, recommendations and/or comments:*

1. *All activities are to follow and comply with all higher-level plans, planning initiatives, agreements, Memorandums of Understanding, etc. that local governments are parties to.*
2. *Changes in and about a “stream” [as defined in the [Water Sustainability Act \(WSA\)](#)] must only be done under a license, use approval or change approval; or be in compliance with an order, or in accordance with Part 3 of the [Water Sustainability Regulation](#). Authorized changes must also be compliant with the [Kootenay-Boundary Terms and Conditions and Timing Windows](#) documents. Applications to conduct works in and about streams can be submitted through [FrontCounter BC](#).*
3. *No “development” should occur within 15 m of the “stream boundary” of any “stream” [all as defined in the [Riparian Areas Protection Regulation \(RAPR\)](#)] in the absence of an acceptable assessment, completed by a Qualified Professional (QP), to determine if a reduced riparian setback would adversely affect the natural features, functions and conditions of the stream. Submit the QP assessment to the appropriate Ministry of Water, Land and Resource Stewardship office for potential review. Local governments listed in Section 2(1) of [RAPR](#) are required to ensure that all development is compliant with RAPR.*

4. The federal [Species at Risk Act \(SARA\)](#) protects Endangered, Extirpated or Threatened species listed under Schedule 1 of SARA. Developers are responsible to ensure that no species or ecosystems at risk (SEAR), or Critical Habitat for Federally listed species, are adversely affected by the proposed activities. The BC Species and Ecosystem Explorer website provides information on known SEAR occurrences within BC, although the absence of an observation record does not confirm that a species is not present. Detailed site-specific assessments and field surveys should be conducted by a QP according to [Resource Inventory Standard Committee \(RISC\)](#) standards to ensure all SEAR have been identified and that developments are consistent with any species or ecosystem specific [Recovery Strategy or Management Plan](#) documents, and to ensure proposed activities will not adversely affect SEAR or their [Critical Habitat for Federally-listed Species at Risk \(Posted\)](#).
5. Development specific Best Management Practices (BMPs) should be applied to help meet necessary legislation, regulations, and policies. Current BC BMPs can be found at: [Natural Resource Best Management Practices - Province of British Columbia \(gov.bc.ca\)](#) and [Develop with Care 2014 - Province of British Columbia](#).
6. Vegetation clearing, if required, should adhere to the least risk timing windows for nesting birds (i.e., development activities should only occur during the least risk timing window). Nesting birds and some nests are protected by Section 34 of the provincial [Wildlife Act](#) and the federal [Migratory Birds Convention Act](#). Guidelines to avoid harm to migratory birds can be found at: [Guidelines to avoid harm to migratory birds - Canada.ca](#). If vegetation clearing is required during the bird nesting period (i.e., outside of the least risk timing window) a pre-clearing bird nest survey should be completed by a QP. The following least risk windows for birds are designed to avoid the bird nesting period:

<b>Bird Species</b>	<b>Least Risk Timing Windows</b>
Raptors (eagles, hawks, falcons, & owls)	Aug 15 – Jan 30
Hérons	Aug 15 – Jan 30
Other Birds	Aug 1 – March 31
7. The introduction and spread of invasive species is a concern with all developments. The provincial [Weed Control Act](#) requires that an occupier must control noxious weeds growing or located on land and premises, and on any other property located on land and premises, occupied by that person. Information on invasive species can be found at: [Invasive species - Province of British Columbia](#). The [Invasive Species Council of BC](#) provides BMPs that should be followed, along with factsheets, reports, field guides, and other useful references. For example, all equipment, including personal equipment such as footwear, should be inspected prior to arrival at the site and prior to each daily use and any vegetative materials removed and disposed of accordingly. If noxious weeds are established as a result of this project or approval, it is the tenure holder's responsibility to manage the site to the extent that the invasive, or noxious plants are contained or removed.
8. Section 33.1 of the provincial [Wildlife Act](#) prohibits feeding or attracting dangerous wildlife. Measures should be employed to reduce dangerous human-wildlife conflicts. Any food, garbage or organic waste that could attract bears or other dangerous wildlife should be removed from the work area. If this is not feasible and waste is not removed, it should be stored in a bear-proof container to avoid drawing wildlife into the area and increasing the threat of human/wildlife conflict.
9. If this referral is in relation to a potential environmental violation it should be reported online at [Report All Poachers & Polluters \(RAPP\)](#) or by phone at 1-877-952-RAPP (7277).
10. Developments must be compliant with all other applicable statutes, bylaws, and regulations.

**RDCK Emergency Management Department – Emergency Program Coordinator**

- The subject property is in a hazard zone studied under NDMP 1, and is rated Very Low/Very Low.



- *As the request is to replace a single family home with a similar structure, there would be no significant increase in occupants on the site.*
- *No objection from Emergency Management.*

#### **RDCK Water Services – Environmental Coordinator**

*Water Services has no concerns on this one. It is a floodplain exemption request for the rebuild of a house that burned down. There is an active account. The applicant will need to submit a turn on request when and if they rebuild the home and want to connect to water once again.*

#### **RDCK Building Services**

*The Building Department does not have a concern with the inability of the proposed rebuild to meet the 30 m setback (this would be an orphan parcel otherwise) as long as the FCL of 426.3 masl or higher can be met. The design of the foundation will require submission of a Schedule B addressing both the bearing surface and design of the foundation (geotechnical and structural Schedule B's). Additional engineering requirements, if any, will be communicated at the time of permit application.*

### **3.7 Staffing/Departmental Workplace Considerations:**

Should the Board support the requested site specific floodplain exemption to reduce the floodplain setback, including registration of a restrictive covenant on title, a Building Permit would then be required for the construction of the new dwelling.

### **3.8 Board Strategic Plan/Priorities Considerations:**

This application falls under the operational role of Planning Services.

## **SECTION 4: OPTIONS & PROS / CONS**

#### Planning Discussion

Staff have reviewed this site specific floodplain exemption application, and conducted a site visit. Other than the site specific floodplain exemption requested, the proposal is consistent with the relevant objectives and policies under the *Electoral Area 'J' Official Community Plan*.

The **Provincial Guidelines** or the Flood Hazard Area Land Use Management Guidelines for landowner requests for modification of bylaws provides the following guidance:

*Setback requirements should not be reduced unless a serious hardship exists and no other reasonable option is available. A valid hardship should only be recognized where the physical characteristics of the lot (e.g., exposed bedrock, steep slope, the presence of a watercourse, etc.) and size of the lot are such that building development proposals, consistent with land use zoning bylaws, cannot occur unless the requirements are reduced.*

Based on the limited size of the subject property (0.08 hectare) and a review of the “topographic site plan showing setback allowances” prepared by Hango Land Surveys, it is clear that it is not possible to construct the proposed dwelling so that it complies with the applicable zoning bylaw (specifically the 4.5 metre setback from Broadwater Road) and also satisfies the 30 metre Floodplain Setback in the RDCK Floodplain Management Bylaw No. 2080, 2009. In the original building permit submission the new dwelling was proposed to be 7.5 metres from the front lot line (Broadwater Road). The location of the new dwelling has since been revised and is now proposed at a distance of 4.5 metres from Broadwater Road in an effort to increase the distance from the

Columbia River while still complying with the applicable Zoning Bylaw.

Planning staff support the requested floodplain exemption, since:

- The applicants have engaged a professional geotechnical engineer, who have submitted a report confirming that the proposed development, as designed, is safe for the use intended; and,
- The flood hazard assessment geotechnical report submitted has been reviewed by Regional District staff and meets the necessary assurance requirements and is consistent with the Provincial flood hazard land use management guidelines; and,
- The applicant has requested this exemption from the required floodplain setback as it is not possible to construct the proposed dwelling so that it meets the required 4.5 metre setback from the front lot line (Broadwater Road) while also maintaining a 30 metre setback from the Columbia River.
- There is a steep slope between Broadwater Road and the building site which makes building closer to the road more difficult.

## OPTIONS

**Option 1:** That the Board APPROVE a Site Specific Floodplain Exemption to permit the construction of a new residence with a floodplain setback of 23.5 metres in accordance with the Engineering Report prepared by Crowsnest Engineering Ltd. for property located at 3974 Broadwater Road, Electoral Area 'J' and legally described as PARCEL 1 (REFERENCED PLAN 387521) BLOCK 8 DISTRICT LOT 4599 KOOTENAY DISTRICT PLAN 794 (PID: 008-494-622), SUBJECT to preparation by Michael John Arthur Bourcier of a restrictive covenant under Section 219 of the Land Title Act and Section 56 of the Community Charter in favour of the Regional District of Central Kootenay.

**Option 2:** That the Board NOT APPROVE a Site Specific Floodplain Exemption to permit the construction of a new residence with a floodplain setback of 23.5 metres in accordance with the Engineering Report prepared by Crowsnest Engineering Ltd. for property located at 3974 Broadwater Road, Electoral Area 'J' and legally described as PARCEL 1 (REFERENCED PLAN 387521) BLOCK 8 DISTRICT LOT 4599 KOOTENAY DISTRICT PLAN 794 (PID: 008-494-622), SUBJECT to preparation by Michael John Arthur Bourcier of a restrictive covenant under Section 219 of the Land Title Act and Section 56 of the Community Charter in favour of the Regional District of Central Kootenay.

## SECTION 5: RECOMMENDATIONS

That the Board APPROVE a Site Specific Floodplain Exemption to permit the construction of a new residence with a floodplain setback of 23.5 metres in accordance with the Engineering Report prepared by Crowsnest Engineering Ltd. for property located at 3974 Broadwater Road, Electoral Area 'J' and legally described as PARCEL 1 (REFERENCED PLAN 387521) BLOCK 8 DISTRICT LOT 4599 KOOTENAY DISTRICT PLAN 794 (PID: 008-494-622), SUBJECT to preparation by Michael John Arthur Bourcier of a restrictive covenant under Section 219 of the Land Title Act and Section 56 of the Community Charter in favour of the Regional District of Central Kootenay.

Respectfully submitted,

Zachari Giacomazzo, Planner

## CONCURRENCE

Planning Manager – Nelson Wight *Digitally approved*

General Manager Sustainability and Development Services – Sangita Sudan *Digitally approved*

Chief Administrative Officer – Stuart Horn *Digitally approved*

### ATTACHMENTS:

**Attachment A – Geotechnical Report**



# Crowsnest Engineering

Jordan Baer  
TSL Developments Ltd.  
4013 Broadwater Road  
Castlegar, BC V1N 4V8

Date: May 27<sup>th</sup>, 2023  
File: BAER-2023-001

Attn.: Jordan Baer

Re: Flood Assessment for Proposed Site-Specific Floodplain Setback Exemption  
3974 Broadwater Road - Regional District of Central Kootenay, BC, V1N 4V5

This letter presents a summary of a Flood Assessment conducted by Crowsnest Engineering for 3974 Broadwater Road, Castlegar BC, as it relates to a proposed Site-Specific Floodplain Exemption application.

Legal Description of the subject property is: **BLOCK 8 PLAN NEP794 DISTRICT LOT 4599 KOOTENAY LAND DISTRICT PARCEL 1, (REF PL 38752I).**

## 1.0 SCOPE OF WORK

The scope of work includes the following aspects:

1. Reconnaissance of the site and existing conditions.
2. Flood Assessment as part of a Floodplain Exemption Application.

## 2.0 LIMITATIONS OF REPORT

Crowsnest Engineering has prepared this floodplain exemption report for the exclusive use of The Owner, at their expense, and specifically for the proposed development detailed within the report. The content of this report reflects our professional judgment based on the information available to us at the time of report preparation, and is valid only for the current time and conditions that governed during our consideration and report preparation. The conclusions presented herein are drawn from historical flow data and knowledge of local flow regimes available at the time of reporting. Our scope of work is limited to the specific details outlined above, and we do not accept responsibility for any aspects of the project outside of our approved scope. This includes, but is not limited to, typical geotechnical services such as assessments of bearing capacity, settlement, or slope stability analyses.

Third parties using this report or relying on decisions based on it do so at their own risk. Crowsnest Engineering assumes no responsibility for any damages, if any, that may be incurred by third parties as a result of decisions made or actions taken based on this report. Notwithstanding other provisions of this agreement, our total liability shall be limited to the total compensation paid for the services described herein.

To safeguard the interests of our client, the public, and ourselves, all reports and drawings are submitted for the confidential use of our client. Any use, publication, or dissemination of this report or any data, statements, conclusions, or abstracts from or regarding our reports and drawings through print or electronic media requires written approval from Crowsnest Engineering. This disclaimer does not apply to the designated Building Official or Provincial Approving Officer, who may rely on this reporting as necessary, and solely for the proposed development and conditions detailed within this report.



### 3.0 SITE INVESTIGATION

The site field investigation was conducted by the writer on May 3<sup>rd</sup>, 2023. Land-survey (by others) had recently been conducted across the subject property, delineating the Natural Boundary, topographic contours, as well as the property extents. This survey is referenced below as Appendix 1.

The entirety of the subject property was traversed during the course of this site investigation. This report summarizes our flood hazard assessment while also providing conditions and design recommendations to allow for safe encroachment into the floodplain setback at the subject property.

The proposed development location has historically been occupied by a residential structure that was severely fire damaged and requires replacement. As we currently understand, the current intention is to rebuild a new structure within the approximate location of the historic structure (noting a relatively modest additional encroachment towards the Columbia River is proposed), complete with new cast-in-place reinforced concrete foundations that will be suitably placed to comprise an increased flood and erosion resistance with respect to the Columbia River. An existing concrete earth-retaining structure resides to the South of the proposed residential development, at a varying setback from the Natural Boundary defined by Reference Plan 38752I.

### 4.0 SITE DESCRIPTION AND GOVERNING REGULATIONS

The subject property is located Northwest of the City of Castlegar, on the Northern shore of the Columbia River downstream of the Hugh Keenleyside dam within the Regional District of Central Kootenay (RDCK). The property is bounded on the North by Broadwater Road, on the East and West by other residential land parcels, and on the South by the Columbia River and a residential land parcel. The orientation of the subject property is as shown below in Figure 4.1:

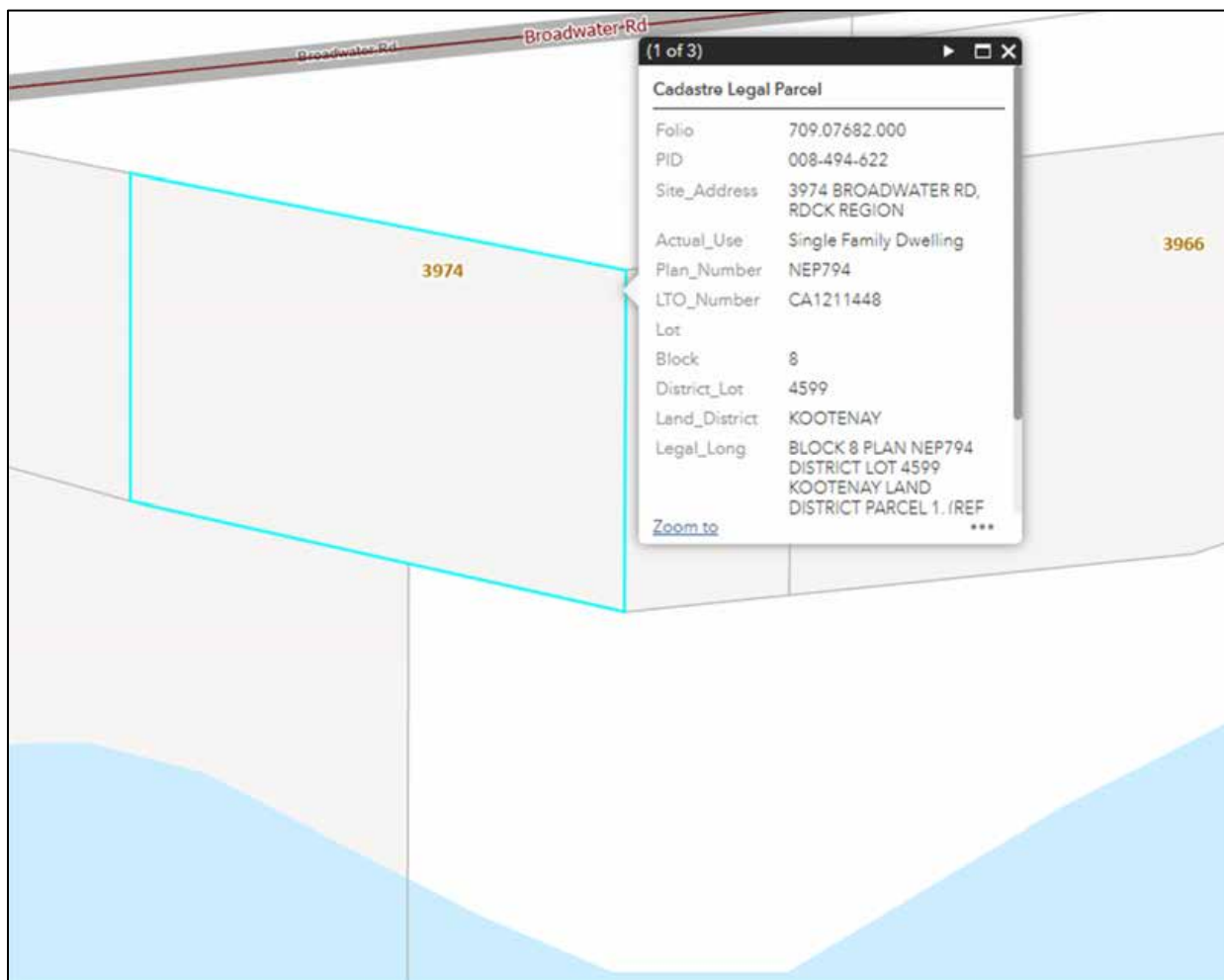


Figure 4.1: Orientation of Subject Property in Relation to the Columbia River. North = up. Taken from RDCK Interactive Web Mapping Service.

The proposed development relative to the Subject Property is attached as Appendix 1 and shown below in Figure 4.2. This proposed development lies at or above approximately elevation 426.5 metres, and would reside approximately 23.5 metres and 6.8 metres from the present and plan natural boundaries, respectively.

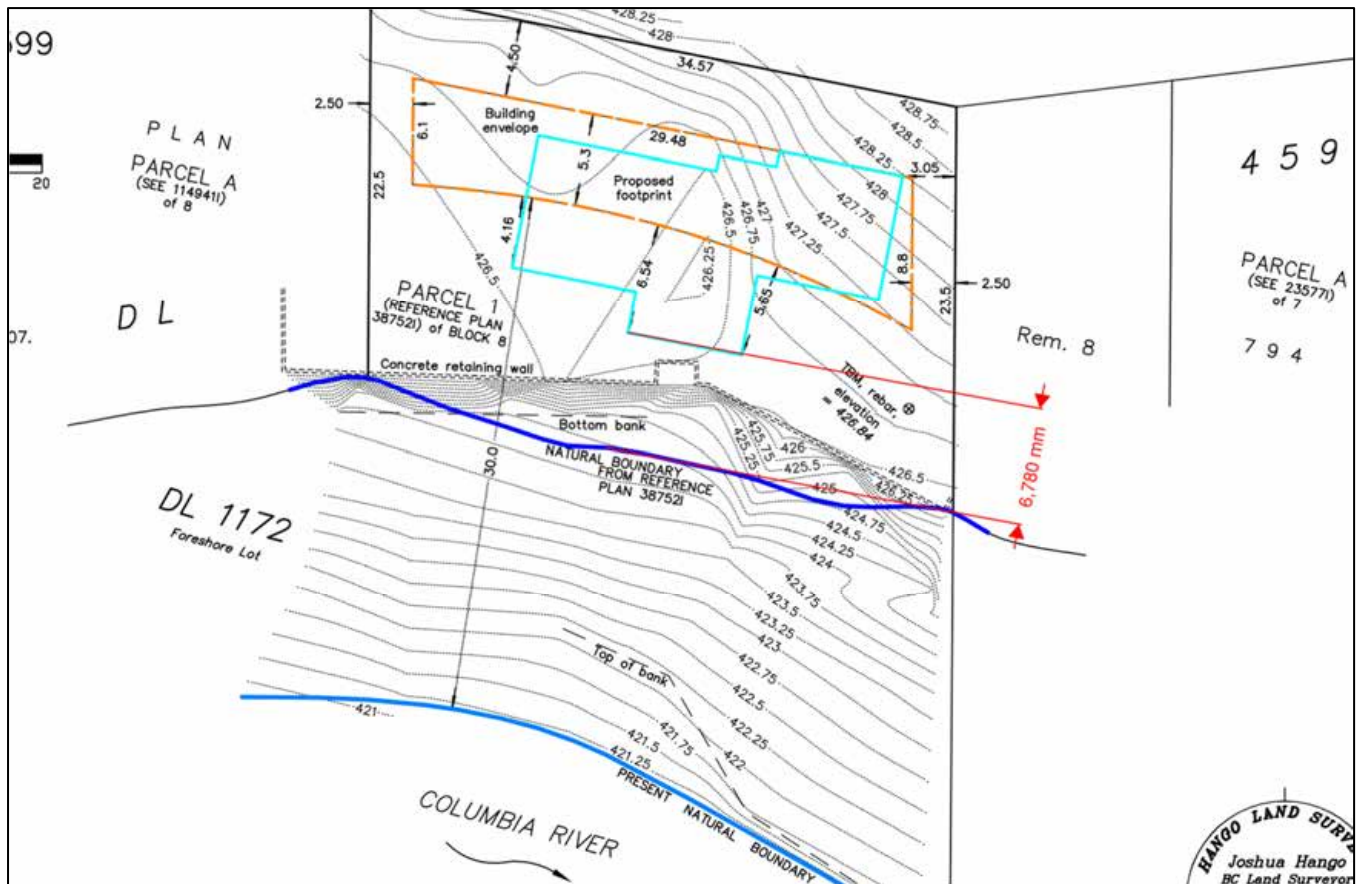


Figure 4.2: Orientation of subject property in relation to the Plan Natural Boundary (delineated in dark blue), the Present Natural Boundary as designated by Hango Land Surveys (delineated in light blue), the proposed structure footprint (delineated in cyan), and the historic fire-damaged structure (delineated in orange). Repurposed from Hango Land Surveys topographic site plan, attached as Appendix 1.

With reference to RDCK Floodplain Management Bylaw 2080, 2009, the minimum Floodplain Setback from the Natural Boundary is 30.0 metres, while the Flood Construction Level (FCL) is 426.3 metres elevation.

When considering the 30.0m minimum required setback from the *Plan* Natural Boundary, the entirety of the subject property is ineligible for development without exemption to the setback requirement. With reference to the *Present* Natural Boundary as delineated by Hango Land Surveys, approximately 23% of the subject property area is currently eligible for development while also considering a 4.5 metre required setback from the Broadwater Road right of way, and 2.5 metre side lot setback requirements.

## 5.0 FLOOD HAZARD ASSESSMENT

With reference to the Province of British Columbia Flood Hazard Area Land Use Management Guidelines (namely Section 3.2.6 – Downstream of Dams), the proposed works detailed herein are consistent with numerous other residential developments downstream and upstream of the subject property with regard to both setback and general flooding/erosion risk from the Columbia River, and are thus not considered to constitute an increase to the downstream consequence classification of the Hugh Keenleyside Dam.

Given our considerations outlined above, we feel the under side of proposed wooden flooring systems or habitable spaces should be at or above elevation 426.3m in order to provide the requisite flood hazard mitigation for up to and including 1:200 year return-period flooding events.

Foundations associated with the proposed development should consider the natural angle of repose for the beach sands and gravels, and this should be used as a reference for the establishment of all new footings within the Subject Property. In order to provide effective long-term resistance to erosion and scour, footings for new

developments should be borne at a nominal 450.00 mm lower elevation than a theoretical plane along the naturally established grade of the beach, extended to the location of the foundation in question. Alternatively, a suitable approach is to project a theoretical plane upward and away from the toe of the natural boundary where native beach sands and gravels terminate, at a slope of no more than 6H:1V (10 degrees, 17%). To provide long-term resistance to erosion and scour, footings for new developments should be placed at a nominal 450.00 mm lower elevation than this alternate theoretical plane at their respective horizontal locations. These intentions are conceptually shown below in Figure 5.1.

If the aforementioned foundation elevation intentions are not considered practical, a new earth-retaining structure could be constructed with foundations meeting this requirement. In this instance, we suspect the existing retaining structure will offer a degree of flooding/erosion protection to the proposed development, however it was constructed prior to our engagement and thus we have conservatively elected to not consider this structure.

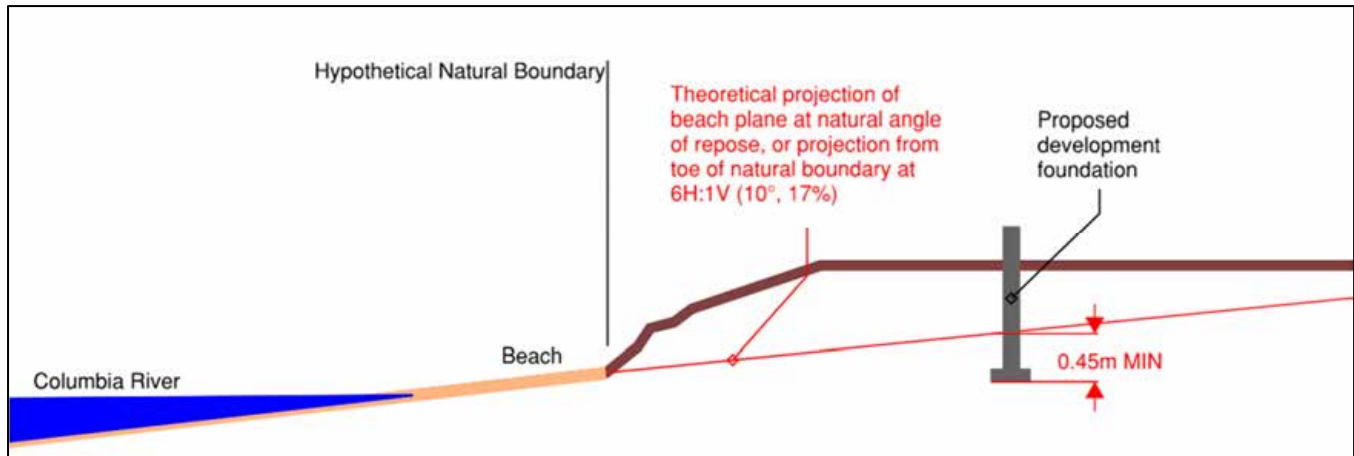


Figure 5.1: Schematic of intention for ensuring proposed development footings are satisfactorily protected from erosion and scour risk from the Columbia River.

## 6.0 CONCLUSIONS

Based on our observations and flood hazard assessment, we assert that the proposed developments would be adequately protected against flooding hazards with return periods of up to 200 years, provided that the recommendations outlined in this report are implemented.

Moreover, considering the potential difficulty for the property owner to comply with the current floodplain management regulations and the fact that the proposed structure would replace a fire-damaged structure with minimal additional encroachment into the floodplain setback, we conclude that a permanent encroachment into the floodplain setback of no less than 6.8m and 23.5m from the Plan and Present Natural Boundaries, respectively, would be geotechnically acceptable, assuming full adherence to the recommendations presented in this report.

## 7.0 RECOMMENDATIONS

- Undersides of proposed wooden flooring systems or habitable space should be at or above elevation 426.3m (CGVD28 Datum).
- Development should not occur within 6.8m and 23.5m of the Plan and Present Natural Boundaries, respectively.
- Foundations associated with the proposed development should consider the natural angle of repose for the beach sands and gravels, and new development foundations should be borne at a nominal 450.00 mm lower elevation than a theoretical plane along the naturally established grade of the beach, extended to the location of the foundation in question. Alternatively, project a theoretical plane upward and away from the toe of the natural boundary where native beach sands and gravels terminate, at a slope of no more than 6H:1V (10 degrees, 17%), placing footings a minimum of 450.00 mm lower than this alternate theoretical plane at their respective horizontal locations. Refer to Figure 5.1 for conceptual sketch. If neither of these options is considered practical given the required foundation depths, a new earth retaining structure may be constructed meeting these same requirements.



## 8.0 CLOSURE

While our flood assessment has concluded that the risk of adverse impact from flooding in this instance is geotechnically acceptable, it should be understood by all parties that flooding (especially larger return-period event flooding) may still have adverse effects on development foundations. It should be acknowledged that the risk of negative impact from flooding events cannot be entirely eliminated. While adherence to the recommendations contained herein is expected to result in safe and satisfactory geotechnical performance of the aforementioned structures during flooding events, maintenance and repair may be required following these events.

Reference should be made to the attached Flood Hazard and Risk Assurance Statement for specific language regarding the suitability of the proposed subdivision lots to be safely used for the purpose intended.

The conclusions in this report are provided on the assumption that future habitable structure development will be designed and constructed in full conformance with the BC Building Code and applicable local bylaws.

We trust this document provides the information you require at present. Please do not hesitate to contact the undersigned should you have any further questions or concerns relating to this matter.

Yours truly,

**Crowsnest Engineering**  
Permit to Practice No. 1002717



R1 - May 27<sup>th</sup>, 2023

Report By:  
Nicholas Ellis, P.Eng.



**Crowsnest  
Engineering**

EGBC Permit to Practice No. 1002717  
1025 Bridgeview Crescent, Castlegar BC  
(C) 1-647-239-5264  
(E) contact@crowsnestengineering.com

### Appendices:

- Appendix 1 – Hango Land Surveys. TOPOGRAPHIC SITE PLAN SHOWING SETBACK ALLOWANCES FOR PARCEL 1 (REFERENCE PLAN 387521) BLOCK 8 DL 4599 KD PLAN 794. Survey date April 21, 2023.
- Appendix 2 – Pederson Drafting & Design Ltd. TSL Developments – 3974 Broadwater Road, Robson BC New Residence Building Plans. Dec 30, 2022.
- Appendix 3 – Flood Hazard Risk Assurance Statement

### References (Listed in Chronological Order):

- Jungen, J. R., "Soil Resources of the Nelson Map Area", RAB Bulletin No. 20, BC Ministry of Environment, 1980.
- City of Castlegar, "Floodplain Management Bylaw 890", 2002.
- BC Topographic Mapping, <https://pub.data.gov.bc.ca/datasets/177864/pdf/082f/082F032.pdf>, 2004.
- **British Columbia Ministry of Water, Land and Air Protection, "Flood Hazard Area Land Use Management Guidelines"**, May 2004.
- Naval Facilities Engineering Command, "Soil Mechanics Design Manual", 7.01, 2005.
- Canadian Geotechnical Society, "Canadian Foundation Engineering Manual", 4th Edition, 2006.
- Regional District of Central Kootenay, "Floodplain Management Bylaw No. 2080", 2009.

**Appendix 1**

**Hango Land Surveys. SITE PLAN SHOWING SETBACK ALLOWANCES FOR PACEL 1  
(REFERENCE PLAN 38752I) BLOCK 8 DL 4599 KD PLAN 794. Survey date April 21, 2023.**

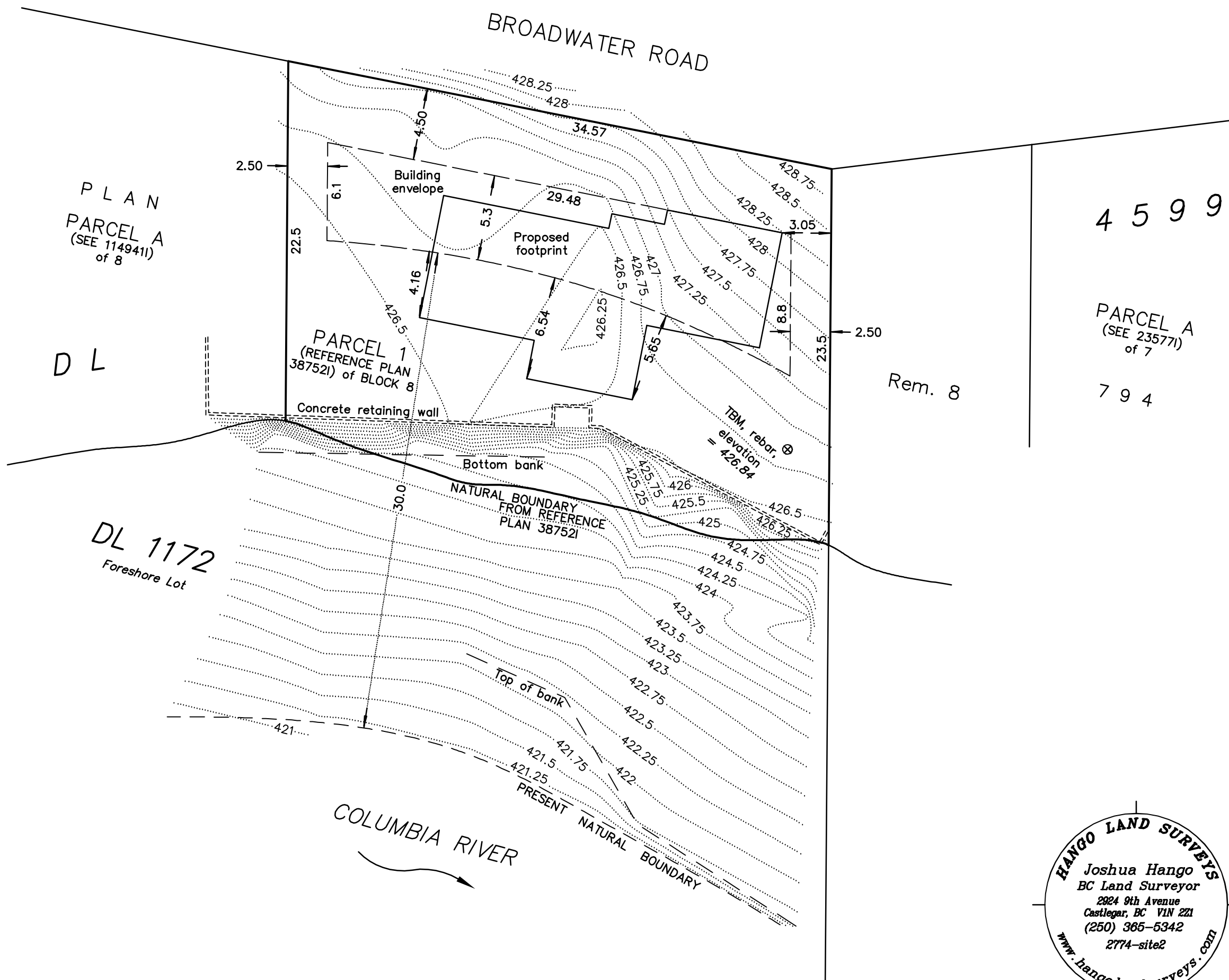
# TOPOGRAPHIC SITE PLAN SHOWING SETBACK ALLOWANCES FOR PARCEL 1 (REFERENCE PLAN 38752I) BLOCK 8 DL 4599 KD PLAN 794.



## LEGEND

Dimensions derived from Posting Plan EPP127107.  
All dimensions are in metric.  
Elevations are geodetic.  
Contour interval - 0.25m

TBM Temporary benchmark



4 5 9 9

PARCEL A  
(SEE 23577I)  
of 7

7 9 4

Rem. 8

DL 1172  
Foreshore Lot



**Appendix 2**

**Pederson Drafting & Design Ltd. TSL Developments – 3974 Broadwater Road, Robson  
BC New Residence Building Plans. Dec 30, 2022.**





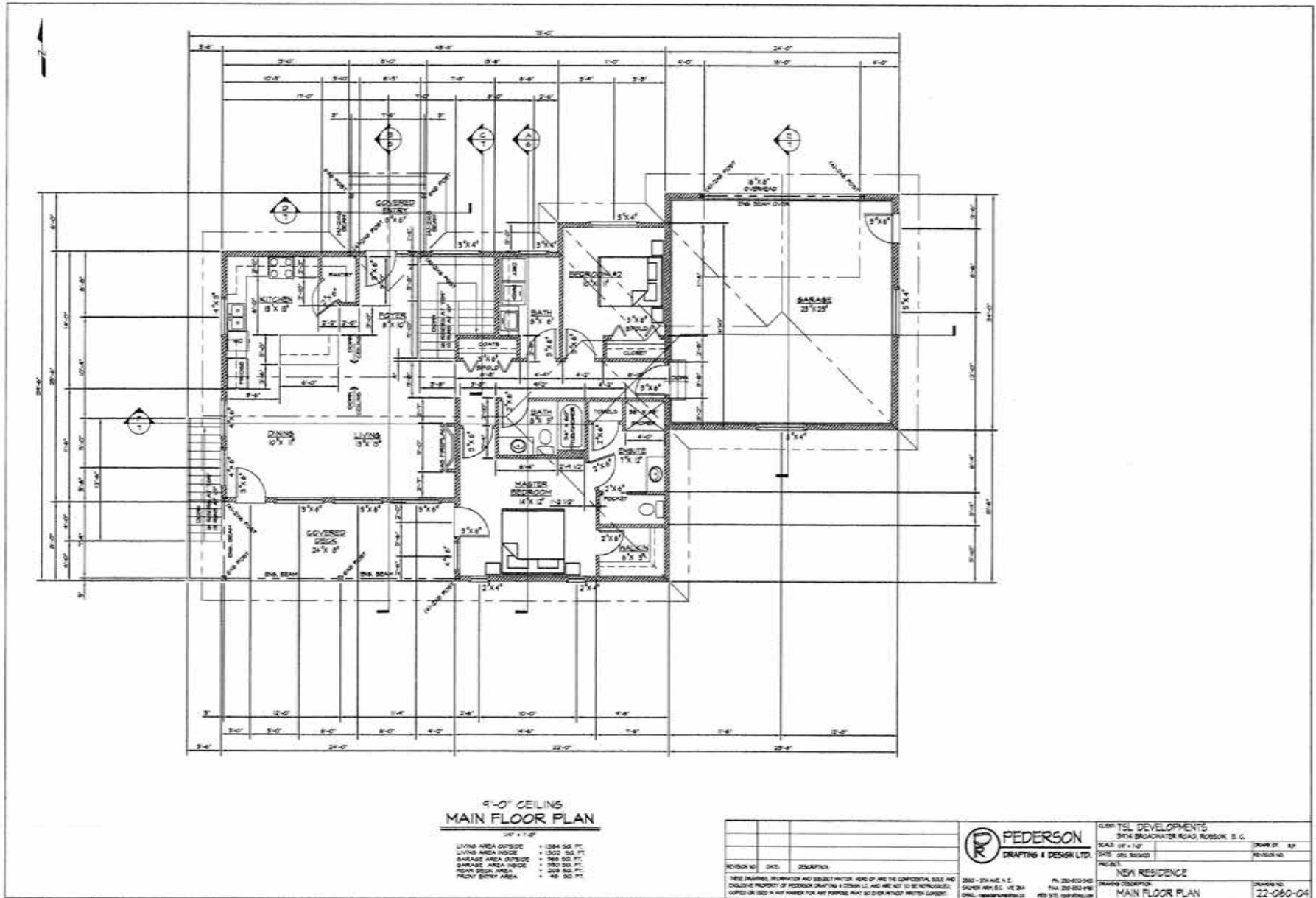
NORTH ELEVATION

EAST ELEVATION

SOUTH ELEVATION

WEST ELEVATION

REVISION NO.    DATE    DESCRIPTION		PEDERSON DRAFTING & DESIGN LTD.	CLIENT: TEL DEVELOPMENTS 3074 BRACKENWOOD ROAD, ROXBORO, B.C.
THESE DRAWINGS, INFORMATION AND SUBJECT MATTER ARE OF AND ARE THE CONFIDENTIAL, SOLE AND EXCLUSIVE PROPERTY OF PEDERSON DRAFTING & DESIGN LTD. AND ARE NOT TO BE REPRODUCED, COPIED OR USED IN ANY MANNER FOR ANY PURPOSE WITHOUT THE WRITTEN CONSENT OF PEDERSON DRAFTING & DESIGN LTD.			SCALE: 1/4" = 1'-0" DATE: DEC. 30, 2022 PROJECT: NEW RESIDENCE
2860 - 511 AVE. N.E. SALTER SPRING, B.C. V2E 3K4 604.298.8888		PH: 250-853-5345 FAX: 250-853-4946 483-5753 10410000000	DRAWN BY: EA REVISION NO. DRAWING DESCRIPTION: ELEVATIONS DRAWING NO: 22-080-01









**Appendix 3**  
**Flood Hazard Risk Assurance Statement**

## FLOOD ASSURANCE STATEMENT

Note: This statement is to be read and completed in conjunction with the current Engineers and Geoscientists BC *Professional Practice Guidelines – Legislated Flood Assessments in a Changing Climate in BC* (“the guidelines”) and is to be provided for flood assessments for the purposes of the *Land Title Act*, Community Charter, or the *Local Government Act*. Defined terms are capitalized; see the Defined Terms section of the guidelines for definitions.

To: The Approving Authority

Date: May 7, 2023

Regional District of Central Kootenay

\_\_\_\_\_  
Jurisdiction and address

With reference to (CHECK ONE):

- Land Title Act* (Section 86) – Subdivision Approval
- Local Government Act* (Part 14, Division 7) – Development Permit
- Community Charter (Section 56) – Building Permit
- Local Government Act* (Section 524) – Flood Plain Bylaw Variance
- Local Government Act* (Section 524) – Flood Plain Bylaw Exemption

For the following property (“the Property”):

3974 Broadwater Road, RDCK. Legal: BLOCK 8 PLAN NEP794 DISTRICT LOT 4599 KOOTENAY LAND DISTRICT PARCEL 1, (REF PL 387521).

\_\_\_\_\_  
Legal description and civic address of the Property

The undersigned hereby gives assurance that he/she is a Qualified Professional and is a Professional Engineer or Professional Geoscientist who fulfils the education, training, and experience requirements as outlined in the guidelines.

I have signed, sealed, and dated, and thereby certified, the attached Flood Assessment Report on the Property in accordance with the guidelines. That report and this statement must be read in conjunction with each other. In preparing that Flood Assessment Report I have:

[CHECK TO THE LEFT OF APPLICABLE ITEMS]

- \_\_\_ 1. Consulted with representatives of the following government organizations:  
\_\_\_\_\_
- x 2. Collected and reviewed appropriate background information
- x 3. Reviewed the Proposed Development on the Property
- \_\_\_ 4. Investigated the presence of Covenants on the Property, and reported any relevant information
- x 5. Conducted field work on and, if required, beyond the Property
- x 6. Reported on the results of the field work on and, if required, beyond the Property
- x 7. Considered any changed conditions on and, if required, beyond the Property
8. For a Flood Hazard analysis I have:
  - x 8.1 Reviewed and characterized, if appropriate, Flood Hazard that may affect the Property
  - x 8.2 Estimated the Flood Hazard on the Property
  - x 8.3 Considered (if appropriate) the effects of climate change and land use change
  - x 8.4 Relied on a previous Flood Hazard Assessment (FHA) by others
  - \_\_\_ 8.5 Identified any potential hazards that are not addressed by the Flood Assessment Report
9. For a Flood Risk analysis I have:
  - x 9.1 Estimated the Flood Risk on the Property
  - x 9.2 Identified existing and anticipated future Elements at Risk on and, if required, beyond the Property
  - x 9.3 Estimated the Consequences to those Elements at Risk

## FLOOD ASSURANCE STATEMENT

10. In order to mitigate the estimated Flood Hazard for the Property, the following approach is taken:
- 10.1 A standard-based approach
  - 10.2 A Risk-based approach
  - 10.3 The approach outlined in the guidelines, Appendix F: Flood Assessment Considerations for Development Approvals
  - 10.4 No mitigation is required because the completed flood assessment determined that the site is not subject to a Flood Hazard
11. Where the Approving Authority has adopted a specific level of Flood Hazard or Flood Risk tolerance, I have:
- 11.1 Made a finding on the level of Flood Hazard or Flood Risk on the Property
  - 11.2 Compared the level of Flood Hazard or Flood Risk tolerance adopted by the Approving Authority with my findings
  - 11.3 Made recommendations to reduce the Flood Hazard or Flood Risk on the Property
12. Where the Approving Authority has not adopted a level of Flood Hazard or Flood Risk tolerance, I have:
- 12.1 Described the method of Flood Hazard analysis or Flood Risk analysis used
  - 12.2 Referred to an appropriate and identified provincial or national guideline for level of Flood Hazard or Flood Risk
  - 12.3 Made a finding on the level of Flood Hazard or Flood Risk tolerance on the Property
  - 12.4 Compared the guidelines with the findings of my flood assessment
  - 12.5 Made recommendations to reduce the Flood Hazard or Flood Risk
13. Considered the potential for transfer of Flood Risk and the potential impacts to adjacent properties
14. Reported on the requirements for implementation of the mitigation recommendations, including the need for subsequent professional certifications and future inspections.

Based on my comparison between:

[CHECK ONE]

- The findings from the flood assessment and the adopted level of Flood Hazard or Flood Risk tolerance (item 11.2 above)
- The findings from the flood assessment and the appropriate and identified provincial or national guideline for level of Flood Hazard or Flood Risk tolerance (item 12.4 above)

I hereby give my assurance that, based on the conditions contained in the attached Flood Assessment Report:

[CHECK ONE]

- For subdivision approval, as required by the *Land Title Act* (Section 86), "that the land may be used safely for the use intended":  
[CHECK ONE]
  - With one or more recommended registered Covenants.
  - Without any registered Covenant.
- For a development permit, as required by the *Local Government Act* (Part 14, Division 7), my Flood Assessment Report will "assist the local government in determining what conditions or requirements it will impose under subsection (2) of this section [Section 491 (4)]".
- For a building permit, as required by the *Community Charter* (Section 56), "the land may be used safely for the use intended":  
[CHECK ONE]
  - With one or more recommended registered Covenants.
  - Without any registered Covenant.
- For flood plain bylaw variance, as required by the *Flood Hazard Area Land Use Management Guidelines* and the *Amendment Section 3.5 and 3.6* associated with the *Local Government Act* (Section 524), "the development may occur safely".
- For flood plain bylaw exemption, as required by the *Local Government Act* (Section 524), "the land may be used safely for the use intended".

# FLOOD ASSURANCE STATEMENT

I certify that I am a Qualified Professional as defined below.

May 7, 2023  
Date

Nicholas Ellis, P.Eng.  
Prepared by

Nicholas Ellis, P.Eng.  
Name (print)

  
Signature

Crowsnest Engineering EGBC Permit to Practice No. 1002717  
1025 Bridgeview Cres, Castlegar, BC V1N 4K9  
Address

1-647-239-5264  
Telephone

contact@crowsnestengineering.com  
Email



(Affix PROFESSIONAL SEAL here)

If the Qualified Professional is a member of a firm, complete the following:

I am a member of the firm Crowsnest Engineering EGBC Permit to Practice No. 1002717  
and I sign this letter on behalf of the firm. (Name of firm)