

DATE: February 22, 2024

FILE: 3160-20/FR 4B 23

TO: Chair and Directors
Electoral Areas Services Committee

FROM: Marc Rutten
Acting Chief Administrative Officer

Supported by Marc Rutten,
Acting Chief Administrative
Officer
M. Rutten

RE: Site Specific Floodplain Setback Lot 16 Andrew Avenue (Humenny)

Purpose

To consider a request for a site-specific building setback relative to the prescribed floodplain setback requirements outlined in the Floodplain Management Bylaw No. 600, being the "Floodplain Management Bylaw No. 600, 2020" (Bylaw 600) for a proposed single detached dwelling and carriage house.

Recommendation from the Acting Chief Administrative Officer:

THAT a site-specific engineer's prescription for the siting of a proposed single detached dwelling and carriage house relative to the 2100-year floodplain setback of Bylaw No. 600, being the "Floodplain Management Bylaw No. 600, 2020," be approved on the property described as Lot 16, District Lot 191, Comox District, Plan 14276, PID 004-402-375;

AND FINALLY THAT, as a condition of the engineer's site specific floodplain setback, the property owners, at their own expense, register a restrictive covenant under Section 219 of the *Land Title Act*, specifying conditions that would enable the land to be safely used for the use intended according to the terms of the engineer report prepared by Alex McBride, P.Eng., of McElhanney Ltd., dated September 6, 2023, which will form part of the restrictive covenant, as well as an acknowledgement that no Disaster Financial Assistance funding is available for the building or its contents and releasing and indemnifying the Comox Valley Regional District from liability in the event any damage is caused by flooding or erosion.

Executive Summary

- The applicants propose to construct a single-detached dwelling and carriage house within 100 metres of the sea. An engineer must determine the Flood Construction Level (FCL) and floodplain setback to the year 2100 that are required to render the new habitable area "safe for the intended use" (this is a requirement of the 2018 update to the provincial *Flood Hazard Area Land Use Management Guidelines*). The purpose of this requirement is to protect new

habitable area from coastal flood hazard. The proposed location of the two dwelling units does not meet the prescribed floodplain setback.

- Bylaw 600 enables owners to make an application to construct a building with alternative provisions where an engineer specifies conditions that would enable the land to be safely used for the use intended. The applicants have provided this report (Appendix A)
- Given the findings in the engineer’s report and the provincial guidelines regarding valid hardship, staff support the approval of this application with the engineer’s report registered as a restrictive covenant which releases and indemnifies the Comox Valley Regional District (CVRD) from liability in the event any damage is caused by flooding.

Prepared by:

Concurrence:

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Government and Community Interests Distribution (Upon Agenda Publication)

Applicant	✓
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Background/Current Situation

An application has been received to consider a site-specific building setback relative to the prescribed floodplain setback requirements outlined in Bylaw 600 for a new single-detached dwelling and carriage house (Figure 1). The subject property is approximately 0.11 hectares (0.27 acres), is zoned Residential One (R-1), and is located in Electoral Area B – Lazo North (Figures 2 and 3). The subject property lies approximately 67 metres northwest of the Present Natural Boundary (PNB) of the Strait of Georgia. Andrew Avenue and a privately owned lot exist between the subject property and the Strait of Georgia. The property is currently undeveloped, and is within the Settlement Expansion Area. The property is within the Comox Fire Protection District. There is no water or sewer service. The property is located within the Coastal Floodplain, as mapped in the Coastal Flood Adaptation Strategy (Figure 4).

Planning Analysis

Floodplain Management Bylaw

The construction of habitable area within 100 metres of the sea must adhere to an FCL and floodplain setback prescribed by an engineer in accordance with the methodologies found in the provincial *Flood Hazard Area Land Use Management*

Guidelines and the Engineers and Geoscientists of BC's Professional Practice Guidelines – Legislated Flood Assessments in a Changing Climate. The engineer must be able to certify the land as being safe for the intended use. These methodologies account for sea level rise to the year 2100. In the report provided by Alex McBride, P.Eng., of McElhanney Ltd., dated September 6, 2023 (Appendix A), the engineer prescribes a 2100-year FCL of 5.7 metres geodetic (the same as the CVRD Coastal Flood Mapping Project transect level FCL result (Figure 4)). The proposal meets the FCL requirement.

For the 2100-year floodplain setback, as per the Provincial Guidelines, the report finds that the entire subject property would be flooded, and the prescribed setback exists beyond the extent of the property (shown in purple in Figure 1). Given the inability to meet the prescribed setback due to the setback existing beyond the property, the property owner is applying for a site-specific building setback relative to the prescribed floodplain setback requirements. The engineer prescribes a lesser minimum floodplain setback for the property of 73 metres from the PNB (shown in green in Figure 1 and Figure 5), which is the proposed setback. This setback lies 5.5-6.5 metres northwest of the front property line (fronting Andrew Avenue).

Valid Hardship

For floodplain setback, Section 1.3 of the provincial *Flood Hazard Area Land Use Management Guidelines* addresses requests for a modification of the floodplain bylaw and states that 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. The economic circumstances or design and siting preferences of the owner should not be considered as grounds for hardship.” This property does not have a compliant location within its boundaries. Staff suggests that this is a valid hardship.

Hazard and Risk

The engineer assesses that the property falls within a moderate to high risk rating; however, the engineer confirms that “the land is considered safe for the use intended (construction and habitation of a single detached dwelling and a carriage house) provided that the FCL is set and enforced, the building is horizontally offset at least 73 metres from the PNB, and the risk reduction strategies outlined in Section 6.5 are applied” (p. 1). The risk reduction strategies required for the land to be considered safe for its intended use generally includes:

1. constructing all habitable floor space above the prescribed 2100 year FCL and adhering to the prescribed lesser setback;
2. designing foundations to withstand hydraulic loading;
3. protecting the site from erosion; and,
4. site grading to permit efficient drainage on the property.

The above-noted risk reduction strategies are intended to increase the building’s resiliency during flood events and bring the risk categories of economic, intangibles, and ecological down to negligible impacts.

The engineer requires the registration of the report as a restrictive covenant against the land title of the subject property. This covenant will include acknowledgment that no Disaster Financial Assistance Funding is available for the building or its contents and that the CVRD is indemnified from liability in the event of any damage caused by flooding or erosion.

Options

1. Approve the site-specific setback proposal subject to the registration of the engineer’s report as a covenant against the land title.
2. Request more information on flood analysis and risk, generally done through a third-party review of the report.
3. Deny the application.

Staff recommend Option 1.

Financial Factors

Applicable fees have been collected for this application under Bylaw No. 328, being the “Comox Valley Regional District Planning Procedures and Fees Bylaw No. 328, 2014”.

Strategic Considerations - Strategic Drivers						
Fiscal Responsibility	✓	Climate Crisis and Environmental Stewardship and Protection	✓	Community Partnerships	Indigenous Relations	Accessibility, Diversity, Equity and Inclusion

Fiscal Responsibility: a condition of a site-specific floodplain setback recommendation is a covenant, registered at the applicants’ expense, to indemnify the CVRD from liability in the event any damage is caused by flooding.

Climate Crisis and Environmental Stewardship and Protection: in justifying a lesser setback, the engineers had to include risk mitigation strategies in order to protect development from the hazards of flooding due to sea level rise and increased storm events.

Strategic Considerations – Regional Growth Strategy Goals						
Housing		Ecosystems, Natural Areas and Parks		Local economic development		Transportation
Infrastructure		Food Systems		Public Health & Safety	✓	Climate Change

Public health and safety: Policy 8F-6 of the Regional Growth Strategy recommends discouraging new development within established floodplains, and that this type of development may only be supported “where technical analysis by a qualified professional has been undertaken to ensure that lands are safe for use, development will not impact floodplain functions, and construction levels include safety factors to account for climate change.” The analysis and the recommendations in the engineer report are consistent with this policy.

Intergovernmental Factors

There are no intergovernmental factors related to this application.

Citizen/Public Relations

Public consultation is not required for this application.

Attachment: Appendix A – Engineer Report prepared by Alex McBride, P.Eng., of McElhanney Ltd., dated September 6, 2023

↑
Strait of Georgia

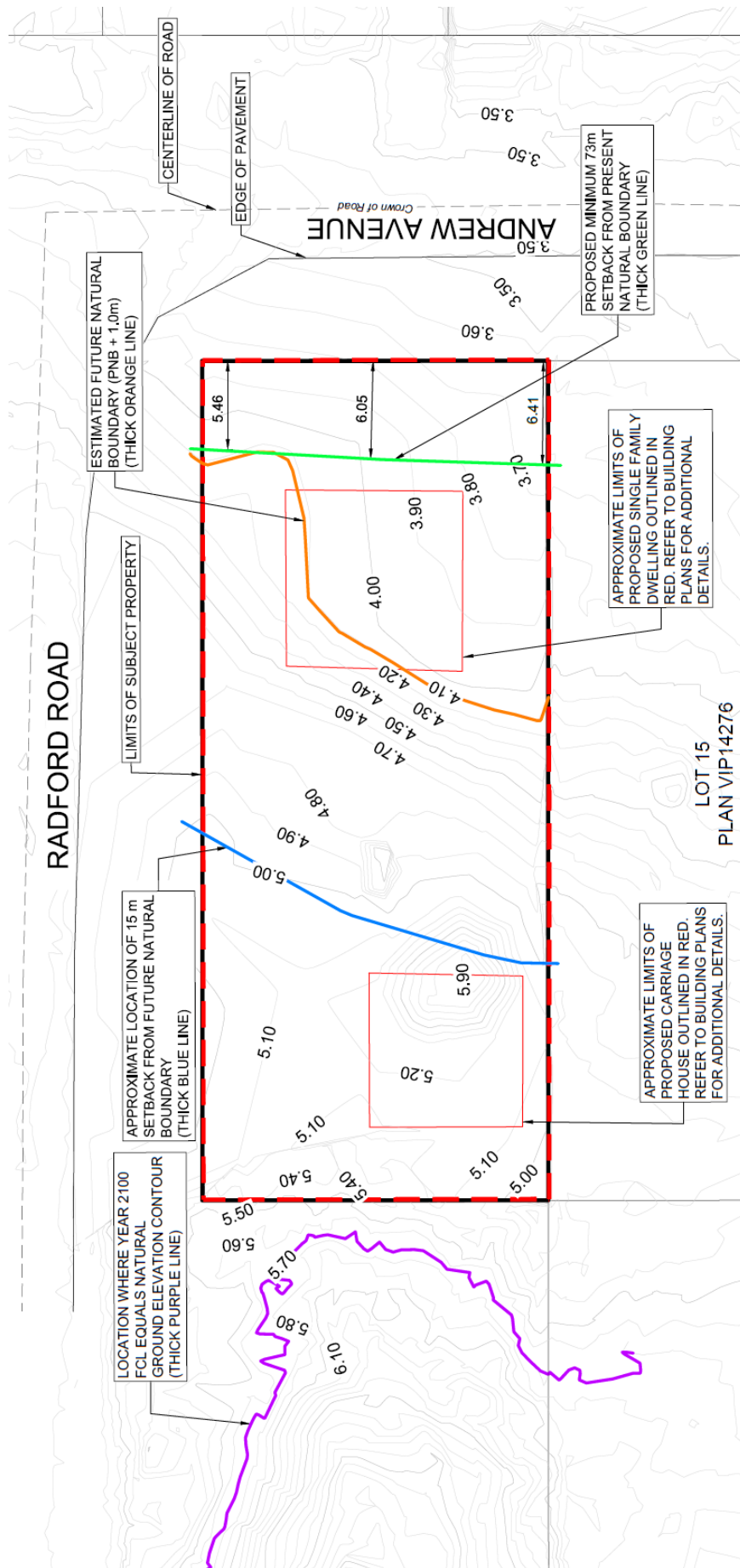


Figure 1: Site Plan



Figure 3: Airphoto

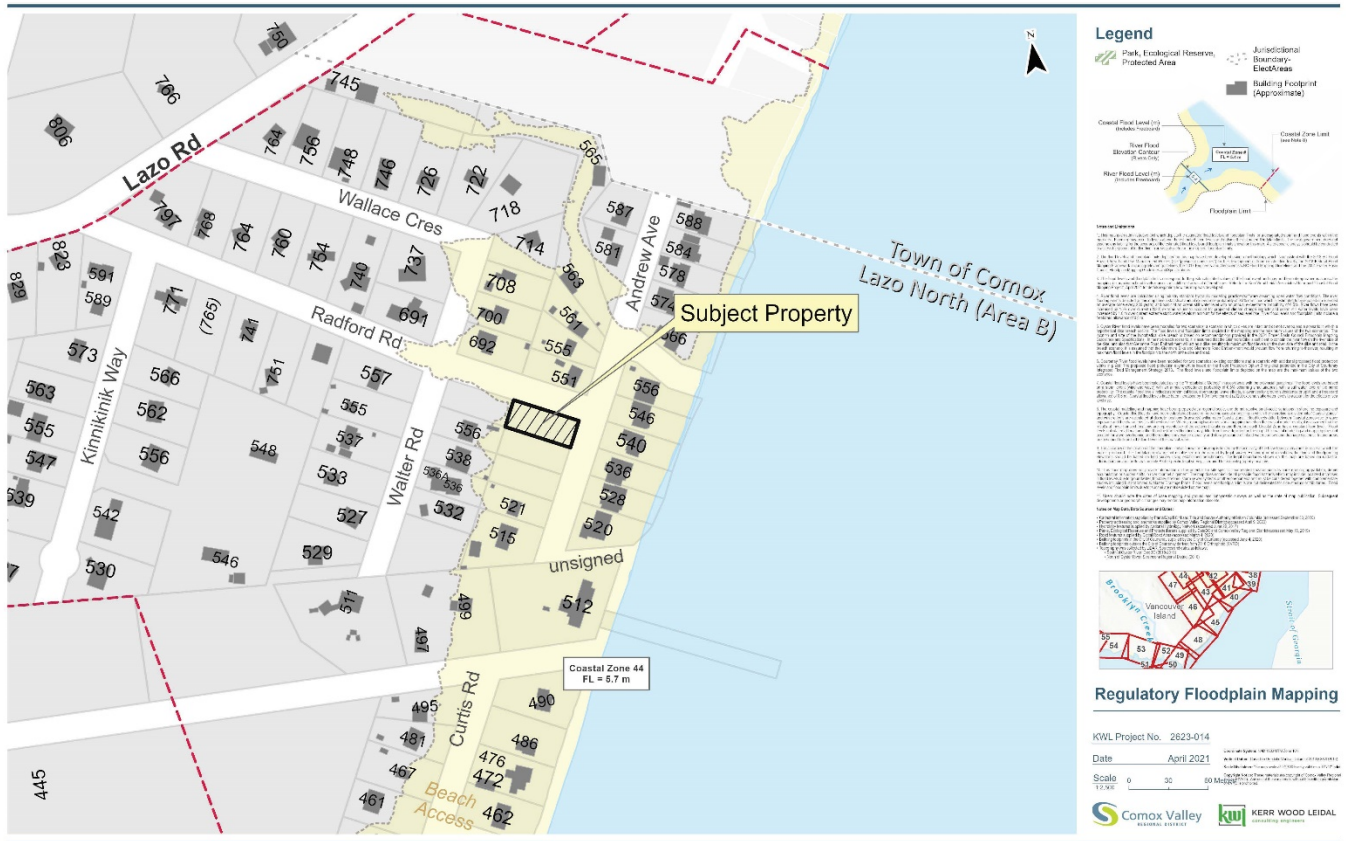


Figure 4: CVRD Coastal Flood Adaptation Strategy Mapping, Showing Property within Floodplain

Our File: 2211-47741-00

TECHNICAL MEMO

To Kelvin Humenny 1204 Slater Place Comox, BC V9M 0A3	From Alex McBride, P.Eng. McElhanney / 2211
Re Flood Assessment Report Single-Family Residential - New SF Dwelling and Carriage House Lot 16 Andrew Ave, Comox, BC	Date September 6, 2023

1. Introduction

As requested, McElhanney Ltd. (McElhanney) has prepared this memo which summarizes our recommendations for a Flood Construction Level (FCL) and building setbacks at the above-referenced site (see **Figure 1.1**), in support of permitting applications for the construction of a new home and garage, featuring an auxiliary dwelling unit above, on the subject site.

The intention of this memo is to address floodplain regulations in Comox Valley Regional District Bylaw (2020) No. 600, part 300. Per Section 303(2) of the Floodplain Management Bylaw No.600 (2020), any proposed construction of habitable area within 100 metres of the sea requires an engineer to confirm what the floodplain setback is to the year 2100. The proposed Site Plan is attached to this memorandum as **Appendix B**. No biological, archaeological, or environmental reviews were completed as part of this assessment.

The development work on the subject property that triggers this assessment is the construction of a single detached dwelling (Principal Use) and a carriage house (Accessory Use). The proposed development requires an exemption from the building setback criteria listed in Section 303(2) (summarized below) of the Comox Valley Regional District Bylaw No. 600 due to the lower lying existing ground elevations at the Site (relative to the Year 2100 FCL). The outcome from this assessment is that the land is considered safe for the use intended (construction and habitation of a single detached dwelling and a carriage house) provided that the FCL is set and enforced, the building is horizontally offset at least 73m from the Present Natural Boundary, and the risk reduction strategies outlined in **Section 6.5** are applied.

This report confirms that McElhanney is appropriately qualified for this assessment, and the undersigned is a member 'in good standing' with Engineers & Geoscientists British Columbia (EGBC).

McElhanney

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Figure 1.1 Site Location for Lot 16 Andrew Avenue, Comox (Image Source: CVRD iMap)

2. Scope of Work

The following line items were included in the scope of work for this project:

- Field review of subject site and proximal foreshore conditions;
- Desktop review of surficial geology & local coastal processes;
- Review of the EGBC Professional Practice Guidelines for Legislated Flood Assessments in a Changing Climate in BC (EGBC Guidelines), including the completion of Flood Hazard and Risk Assurance Statement (see **Appendix C**);
- Review of Comox Valley Regional District's "Floodplain Management Bylaw, No.600, 2020", and associated floodplain management reports;
- Review of the Ministry of Forests, Lands and Natural Resources Operations – Coastal Floodplain Mapping – Guidelines and Specifications (June 2011)
- Review of the Ministry of Forests, Lands and Natural Resources Operations (MFLNRO) – Amendment to Flood Hazard Area Land Use Management Guidelines (January 2018)
- Review of the CVRD Coastal Flood Mapping Project, Final Report dated April 2021; and
- Recommendations for the minimum building setback from the PNB; and
- Analysis of the Flood Construction Level (FCL) for the property.



3. Site Description

The subject site is located on Lot 16 Andrew Ave, Comox. The Site is zoned Residential One (R-1), covers a plan area of approximately 0.11 Ha, and is bounded by vacant R-1 zoned lots to the west and south, Radford Road to the north, and Andrew Avenue to the east.

The legal address is: LOT 16, DISTRICT LOT 191, COMOX DISTRICT, PLAN 14276, PID: 004-402-375

A review of online satellite imagery indicates that the Site has not been previously developed. At the time of the field review the lot was vegetated with grass cover.

3.1. GEOLOGICAL SETTING

Surficial geology mapping indicates that the study area contains Salish Sediments primarily consisting of dune sand.

3.2. COASTAL SETTING

The subject site lies approximately 67m northwest of the Present Natural Boundary (PNB) of the Strait of Georgia. A 3-5m wide band of beach grass, bushes and lockblock retaining wall (which transitions to large diameter riprap further south of the subject site) separate the beach from the properties that front the Strait of Georgia. A large accumulation of large woody debris (LWD) was noted along the PNB. The beach dipped to the south-east at approximately 12%. Substrate consisted of medium to fine sand that is predominantly covered with larger rocks cobbles (See **Photos 3.1 & 3.2** below.)

The maximum fetch is approximately 100km to the southeast. The foreshore is oriented at approximately 30° True (northeast/southwest). The shoreline runs perpendicular to the southeast winds and maybe be classified as a high energy zone.



Photo 3.1. View of beach conditions north of subject site, facing northeast





Photo 3.2. View of beach conditions south of subject site, facing southwest

4. Floodplain Bylaws and Guidelines Review

4.1. COMOX VALLEY REGIONAL DISTRICT FLOODPLAIN MANAGEMENT BYLAW 600 (2020)

Applicable guidelines from the CVRD Bylaw 600, are summarized below. Section 301, Floodplain Designation states:

“1) The following land is designated as floodplain:

- b) Land lower than the flood construction levels specified in Section 302;*
- c) Land within the floodplain setbacks specified in Section 303.”*

Section 302, Flood Construction Levels, states:

“2) Where Floodplain Mapping is NOT available, the following elevations are specified as flood construction levels:

- e) 1.5 metres above the natural boundary of the sea, any lake, wetland, or pond, where the land is within a distance of 100 metres of that sea, lake, wetland, or pond.*

“3) If new construction of habitable area is proposed within 100 metres of the sea and the lands are subject to, or likely subject to, flooding resulting from high tides, storm surge and wave effects, the property owner is required to provide a report from a professional engineer experienced in coastal engineering prepared in accordance with the Provincial Flood Hazard Area Land Use Management Guidelines and the Engineers and Geoscientists of BC’s



Professional Practice Guidelines - Legislated Flood Assessments in a Changing Climate, as amended from time to time. The report shall:

- a) Confirm that the land may be used safely for the use intended.*
- b) Prescribe the required flood construction level based on minimum allowance for future sea level rise to the year 2100.”*

A Flood Construction Level (FCL) is defined in the Floodplain Management Bylaw as “The Designated Flood Level plus the allowance for freeboard and is used to establish the elevation of the underside of a wooden floor system or top of concrete slab for habitable buildings.”

Section 303, Floodplain Setbacks, states:

“1) The following distances are specified as floodplain setbacks:

- d) 15.0 meters from the natural boundary of the sea, any lake, wetland, or pond.*
- 2) If new construction of habitable area is proposed within 100 metres of the sea and the lands are subject to, or likely subject to, flooding resulting from high tides, storm surge and wave effects, the property owner is required to provide a report from a professional engineer experienced in coastal engineering prepared in accordance with the Provincial Flood Hazard Area Land Use Management Guidelines and the Engineers and Geoscientists of BC’s Professional Practice Guidelines - Legislated Flood Assessments in a Changing Climate, as amended from time to time. The report shall:*

- a) Confirm that the land may be used safely for the use intended.*
- b) Prescribe the required floodplain setback.*
- c) Notwithstanding Section 303 (2) b), if meeting the setback would sterilize the lot (i.e. not allow even one of the land uses or structures permitted under the current zoning bylaw), a professional engineer can recommend a reduced setback provided that this is augmented through a restrictive covenant under Section 219 of the Land Title Act stipulating the hazard, building requirements and includes a liability disclaimer.”*

4) Where more than one floodplain setback is applicable, the greater of them shall be the floodplain setback.”

Section 403, Site Specific Exemption, states:

“1) Pursuant to Section 524 (7) of the Local Government Act (RSBC, 2015, c. 1) a person may make an application to the Comox Valley Regional District to exempt a specific parcel of land or a use, building or other structure on that parcel of land from the provisions of this bylaw. An application for a site specific exemption shall be completed in the form provided by the Comox Valley Regional District and submitted in accordance with the instructions on the application. This provision is not a substitute for any requirements under Section 56 of the Community Charter.



2) *The Comox Valley Regional District Board may provide an exemption from the provisions of this bylaw where:*

- a) The Comox Valley Regional District Board considers the exemption advisable.*
- b) The exemption is consistent with the Provincial Flood Hazard Area Land Use Management Guidelines. c) The property owner has provided a report prepared by a professional engineer in accordance with the Provincial Flood Hazard Area Land Use Management Guidelines and the Engineers and Geoscientists of BC's Professional Practice Guidelines - Legislated Flood Assessments in a Changing Climate, as amended from time to time, that provides a description of the proposed development and specifies conditions that would enable the land to be safely used for the use intended.*
- d) The professional engineer has provided a completed Flood Hazard and Risk Assurance Statement.*

3) *As a condition of a site specific exemption the property owner will be required at their expense to prepare and register a restrictive covenant under Section 219 of the Land Title Act in favour of the Comox Valley Regional District:*

- a) Specifying conditions that would enable the land to be safely used for the use intended according to the terms of the report prepared by a professional engineer which will form part of the restrictive covenant.*
- b) Acknowledging that no Disaster Financial Assistance Funding is available for the building or its contents.”*

A Setback is defined in the Floodplain Management Bylaw as “Withdrawal of a building or siting of a building or landfill from the natural boundary or other reference line to maintain a floodway and to allow for potential land erosion.”

4.2. MFLNRO: FLOOD HAZARD AREA LAND USE MANAGEMENT GUIDELINES

Section 3.5.5.1 states the following regarding standard FCLs and setbacks:

“The Year 2100 FCL should be established for specific coastal areas by a suitably qualified Professional Engineer, experienced in coastal engineering. This work could be completed as part of regional floodplain mapping, SLR Planning Area studies, or as part of development approval processes. The Year 2100 FCL should be the minimum elevation for the underside of a wooden floor system or top of concrete slab for habitable buildings....”

“The building setback should be at least the greater of 15 m from the future estimated Natural Boundary of the sea at Year 2100, or landward of the location where the natural ground elevation contour is equivalent to the Year 2100 FCL....”

Section 3.5.5.3 states the following regarding development on existing lots:

“Standard setbacks and elevations apply. To regulate redevelopment at the end of the building lifespan, the development approving official should require a restrictive covenant stipulating that any future reconstruction must meet the FCL and setbacks requirements in force at the time of redevelopment...

The Year 2100 FCL requirements would still apply to new habitable building construction.”



4.3. EGBC GUIDELINES: LEGISLATED FLOOD ASSESSMENTS IN A CHANGING CLIMATE IN BC, V.2.1

Given the location of the Site within 100m of the sea (Bylaw 600), Appendix F of the EGBC Guidelines, Section F2.2.2: New Single Family or Duplex House (Not a Fan and No Dike) applies. Section F2.2.2 states:

“Where a proposed building site is located in an area adjacent to a creek, river, lake, or ocean that is not protected by a Dike, the need for both Dike works and Mitigation Measures must be considered. In general, new buildings should be considered for unprotected floodplains only if:

- *the local government has adopted an appropriate bylaw or land use regulation that provides for building Construction with knowledge of the Flood Hazard; or*
- *the QP concludes that the site may be suitable for the intended use.*

A QP may conclude that the site may be suitable for the intended use if at least one of the following conditions applies:

- *A standard/adequate Dike or equivalent other Structural Mitigation Works is constructed with the pertinent approvals as part of the development*
- *The building site is not in a high hazard area of the floodplain (i.e., an avulsion path, a flood velocity greater than 1 m/s, a flood depth greater than 2.5 m, and where safe access and egress is not possible)*
- *A Risk Assessment is undertaken whereby the local government establishes a tolerable level of Risk, and the QP assessment confirms that the Risk would be within this level*

If the QP concludes that the land may be suitable for the intended use, the FCL should be at the 200-year return period flood level plus Freeboard (0.3 m for instantaneous peak floods and 0.6 m for daily peak floods). Particular attention needs to be given to specification of appropriate on-site Mitigation Measures such as foundation design, method of achieving the FCL, and site grading.”

5. Flood Hazard Assessment

Flood Hazard Assessments (FHA), as defined in the EGBC Guidelines, determine the probability of floods of variable magnitudes and assess their intensities. Appendix D of the EGBC Guidelines provides the outline for an FHA. It is important to determine the appropriate level of effort that is to be applied to the FHA as the type of assessment changes with the size of the study and the potential elements at risk. As flood levels are governed by bounding sea level conditions, **Table D-1** from the EGBC guideline is referenced.

Table D - 1: Types of Flood Hazard Assessments for Rainfall- and Snowmelt-Generated Floods and Ice Jam Floods

CLASS	TYPICAL HAZARD ASSESSMENT METHODS AND CLIMATE/ENVIRONMENTAL CHANGE CONSIDERATIONS	TYPICAL DELIVERABLES	APPLICATIONS	RETURN PERIODS FOR FLOOD HAZARD MAPS	APPLICATION FOR DEVELOPMENT TYPE
0	<ul style="list-style-type: none"> • Site visit and qualitative assessment of Flood Hazard • Identify any very low hazard surfaces in the consultation area (i.e., river terraces) • Estimate erosion rates along river banks 	Letter report or memorandum with at least water levels and consideration of scour and bank erosion	Very low loss potential for rivers and floodplains; loss of life very unlikely	20-year 200-year 500-year (for Alluvial Fans)	Building Permit: <ul style="list-style-type: none"> • Renovations, expansions, new single house, new duplex house



This assessment is in support of a building permit; therefore, a Class 0 hazard assessment is appropriate. A typical deliverable for a Class 0 assessment is a technical memorandum.

The hazards for this property are tied to the ocean water levels. The potential loss is mainly related to flooding of property and water damage to structures. Loss of life is unlikely as the water level would rise and fall in co-occurrence with tides and forecasted storm events. Water levels would change slowly enough to allow for evacuation of the property.

6. Flood Risk Assessment

Appendix E of the EGBC Guidelines provides the grounds for a Flood Risk Assessment (FRA). An FRA involves the estimation of the likelihood that a flood will occur and cause some magnitude/type of damage or loss. The FRA must follow the steps listed below.

1. Identify flood hazard scenarios
2. Estimate the probability of hazard scenarios
3. Estimate the consequences
4. Define tolerable risk
5. Prioritize risk reduction strategies

Table E-2 referenced below summarized a typical FRA for building permit applications.

Table E - 2: Types of Flood Risk Assessments

RISK LEVEL	CLASS	TYPICAL RISK ASSESSMENT METHODS	DELIVERABLES	APPLICATIONS	FLOOD RETURN PERIODS [YEARS]
Very Low	0	<ul style="list-style-type: none"> • Include a short site survey with qualitative assessment of potential Consequences 	<ul style="list-style-type: none"> • Memorandum or Letter • Sketch Maps 	<ul style="list-style-type: none"> • Building permits 	

6.1. HAZARD SCENARIO

The hazard scenarios for this property are related to coastal flooding from the Strait of Georgia. There is potential for the Site to be inundated during periods of high water levels from the ocean. Factors contributing to higher water levels include higher tides and storm events. Floodwaters are not expected to be fast moving as they would be driven primarily by rising tides.

6.2. PROBABILITY OF HAZARD SCENARIO

The probability of the hazard scenario from the ocean in 2100 is estimated to be on a semi-annual basis, therefore a 2-year return period has been applied to analyze the consequences and tolerable risks.

6.3. ESTIMATED CONSEQUENCE

Since this assessment only includes the single site, the estimated consequences pertain only to this property. Consequences are primarily related to flood damage to ground floor levels of proposed



buildings and ancillary structures. There is also a potential for erosion of exposed subgrade soils as floodwaters recede. In light of the following, there is considered to be a low risk for injury or loss of life:

- Site egress along Radford Road north-west of the site should be possible as tides advance across Andrew Ave.; and
- The floodwaters in the area would have slow velocities (< 1 m/s) and be temporary (only during the highest tide with storm surge), therefore limiting the potential for erosion in hardscaped and vegetated areas.

6.4. TOLERABLE RISK

Referring to **Figure E-4** in the EGBC Guidelines, referenced below, the subject property is within the moderate risk category as it relates to Safety and Social & Cultural consequences. As previously noted, serious injuries or loss of life is unlikely as the water level would rise and fall in co-occurrence with tides and forecasted storm events. Water levels would change slowly enough to allow for evacuation of the property.

Relative to economic and ecological risk ratings, the subject property is within the high risk category which corresponds to potential economic asset loss/interruption of less than \$100,000 and moderate ecological impacts that would be expected to be recoverable and mitigated within several weeks. For the Intangibles risk rating, the subject property is within the very high risk category based on the anticipated personal hardship (e.g., substantial home repairs, stress induced from post-flood recovery) that would be expected to be managed over the course of several months.

On aggregate of the five risk categories in **Figure E-4**, the subject property falls within a moderate to high risk rating. It is important to qualify that risk ratings classifications are not intended to conclude an inherent risk rating associated with the proposed development, but rather highlight that the appropriate risk reduction strategies are necessary to be incorporated into the development's design such that risk levels for the five risk categories become tolerable (low or moderate risk rating). The risk reduction strategies within **Section 6.5** are proposed to bring risks down to lower and tolerable risk ratings. The risk reduction strategies generally speak to elevating the finished floor above the 2100 year flood levels, designing foundations to withstand hydraulic loading, protecting the site from erosion, and site grading to permit efficient drainage on the property, all of which are intended to increase the building's resiliency during flood events and bring the risk categories of economic, intangibles, and ecological down to negligible impacts.



FLOOD RISK EVALUATION

			RISK EVALUATION AND RESPONSE					
			VH	H	M	L	VL	
LIKELIHOOD DESCRIPTIONS Likelihood of Undesirable Outcome			VH	Very High	Risk is unacceptable short-term (before next flood season); Risk reduction required; long-term Risk reduction plan must be developed and implemented			
			H	High	Risk is unacceptable; medium-term Risk reduction plan must be developed and implemented in a reasonable (<5 years) time frame; planning should begin as soon as feasible			
LIKELIHOOD DESCRIPTIONS Likelihood of Undesirable Outcome			M	Moderate	Risk may be tolerable; more detailed review required; reduce Risk to low where reasonably practicable			
			L	Low	Risk is tolerable; continue to monitor if resources allow			
LIKELIHOOD DESCRIPTIONS	PROBABILITY RANGE		VL	Very Low	Risk is broadly acceptable; no further review or Risk reduction required			
Scenario can be expected on average every other year	Very Likely	0.5 – 0.2	M	H	H	VH	VH	VH
Scenario typically occurs on average every 10 years	Likely	0.2 – 0.07	L	M	H	H	VH	VH
Scenario typically occurs on average every 50 years	Moderate	0.07 – 0.02	L	L	M	H	H	VH
Scenario occurs on average every 100 years	Unlikely	0.02 – 0.007	VL	L	L	M	H	H
Scenario occurs on average every 200 years	Very Unlikely	0.007 – 0.004	VL	VL	L	L	M	H
Scenario occurs on average every 500 years	Extremely Unlikely	0.004 – 0.0013	VL	VL	VL	L	L	M
CONSEQUENCE DESCRIPTIONS	INDICES		1	2	3	4	5	6
			Negligible	Minor	Moderate	Major	Severe	Catastrophic
	SAFETY (INJURY/LOSS OF LIFE)	Minor injuries of few individuals	Minor injury of 1 person	Major injury of several persons	Single fatality	<10 fatalities	>10 fatalities	
	ECONOMIC (MONETARY LOSSES)	Negligible; no business interruption; <\$1,000	Some asset loss; <\$10,000 damages	Serious asset loss; several days business interruption; <\$100,000	Major asset loss; several weeks business interruption; <\$1 million	Severe asset loss; several months business interruption; <\$10 million	Total loss of asset; 1 year or more business interruption; >\$10 million	
	SOCIAL AND CULTURAL	Negligible impact	Slight impact; recoverable within days	Moderate impact; recoverable within weeks	Recoverable within months	Long-term (years) loss of social and cultural values	Complete loss of significant social and cultural values	
	INTANGIBLES (PERSONAL SUFFERING)	Negligible impact	Slight impact; recoverable within days	Moderate impact; recoverable within weeks	Personal hardship; usually recoverable within months	Leaves significant personal hardship for years	Irreparable personal hardship	
	ECOLOGICAL (FLORA AND FAUNA)	Negligible impact	Slight impact; recoverable within days	Moderate impact; recoverable within weeks	Recoverable within months	Severe species loss	Irreparable species loss	

Figure E - 4: Example Risk matrix to determine the relative level of Flood Risk for Proposed Developments.



6.5. RISK REDUCTION STRATEGIES

The following are recommendations to reduce risks associated with flooding of the Site:

1. FCL and building setbacks for all habitable structures on the property must be enforced.
2. Applicable bylaws relating to the recommended FCL must be enforced.
3. Vegetated ground cover or alternate equivalent means of erosion protection must be maintained throughout the lot.
4. The set back area, discussed in **Section 8** below, must remain free of drainage impediments.
5. The Site must continue to be graded in a way that promotes efficient drainage of flood flows to the ocean.
6. No area below the FCL must be used for habitation, business, storage of goods or installation of fixed equipment that would present a safety hazard or be damaged by exposure to flood waters. Vehicle storage below the FCL is acceptable and at the Owner's risk.
7. Building foundation design must consider hydraulic loading.
8. Building foundations must bear on suitable, naturally deposited soil, as approved by a qualified engineer.
9. An Engineer's certification of building foundation design should be included in the Building Permit application.
10. Earth embankments within the setback area and adjacent to proposed buildings must be adequately protected from scour and other forms of erosion that may be caused by flood events.
11. A Post-Development Report, including post-construction photos, must be completed by a Qualified Professional to document and confirm that the construction of the proposed development (construction of single detached dwelling) aligns with the description provided within this report and that the risk reduction strategies are met. Risk reduction strategies that are not completed at the time of construction of the building construction should indicate an expected timeline for completion.
12. This report must be registered as a covenant on title to ensure that the current and future owners are aware of the risks and consequences of building a single family dwelling or accessory structure on this site. The covenant should also address a release of liability of the approving authority for damages caused by flooding from the ocean.

7. Flood Construction Level

Coastal flooding from the Strait of Georgia, resulting from predicted future sea-level rise appears to be the governing flood hazard for this site.

The Flood Construction Level (FCL) was determined with the Combined Method, as outlined in Section 3.5 in the provincial *Flood Hazard Management Guidelines* (BC MFLNRO, January 1, 2018). The FCL establishes the minimum elevation for the underside of wooden floor system or the top of concrete slab for habitable buildings. These elevations are referenced to the Canadian Geodetic Vertical Datum 2013 (CGVD2013).



The Combined Method was deemed appropriate after considering the level of effort that would be reasonable for a typical single detached dwelling and a carriage house. The FCL estimate is the sum of the following components:

Higher High Water Large Tide (HHWLT) – The average of the highest high waters, one from each of 19 years of predictions, based on CGVD 2013.

Sea Level Rise (SLR) – Estimated sea level rise for the year 2100.

Storm Surge – Effects of 200-year storm event on water levels.

Uplift – Regional adjustment for crustal uplift.

Wave Effect – This height is associated with the design storm and varies significantly from one site to the next.

Additional Wave Run Up & Spray – The estimated allowance is an addition to typical components of the Combined Method, as outlined in published guidelines.

Free Board – Included to account for uncertainties in design water level estimates and wave run up.

The recommended FCL is **5.7 m** CGVD2013, which was derived from the sum of items listed in **Table 7.1** below.

Table 7.1: FCL Derivation

FCL COMPONENTS	ELEVATION (m)
HHWLT	2.23 ⁽¹⁾
SLR	1.0 ⁽²⁾
Storm Surge	1.3 ⁽³⁾
Uplift	-0.21 ⁽³⁾
Wave Effect	0.65 ⁽³⁾
Additional Wave Run Up	0.1 ⁽⁴⁾
Free Board	0.6 ⁽⁵⁾
FCL	5.7

References:

1. HHWLT for Comox (Station 6028), based on CGVD2013 Datum
2. Guidelines for Management of Coastal Flood Hazard Land Use. January 2011. Ausenco Sandwell/BC Ministry of Environment.



3. *Coastal Floodplain Mapping Guidelines and Specifications*, June 2011, MFLNRO, Kerr Wood Leidal Associates Ltd., Vancouver BC.
4. Per EGBC Guidelines referenced in this report.
5. Section 3.5.5.1, *Flood Hazard Area Land Use Management Guidelines*, January 1, 2018, Ministry of Forests, Lands, Natural Resource Operations and Rural Development.

8. Setback

As summarized in Section 4.2, the building setback should be at least the greater of: 15m from the future estimated Natural Boundary of the sea at Year 2100, or landward of the location where the natural ground elevation contour is equivalent to the Year 2100 FCL. The location of the estimated future Natural Boundary plus 15m offset, extends beyond the midline of the property line of the subject site (see blue line in **SK-01 in Appendix B**). The estimated year 2100 FCL extends beyond the limits of the subject site (see purple line in **SK-01**). Both of the building setback requirements are reflected in **SK-01 in Appendix B**. The landward location where the natural ground elevation contour is equivalent to the Year 2100 FCL is the more restrictive setback requirement. Due to the building setback requirement being further inland than the extents of the subject property, a building setback exemption is required.

A minimum building setback of 73m from the PNB is recommended for this site. This setback lies 5.5-6.5m northwest of the southeast property line (fronting Andrew Avenue). The minimum 73m setback would serve to provide adequate buildable area while providing an area free of drainage impediments in the southeast portion of the lot.

Considering the nature of the flood hazards expected, as well as the low risk for injury and loss of life, a minimum horizontal setback of 73m from the PNB would be considered reasonable if the risk reduction strategies outlined in **Section 6.5** are adhered to.

9. Assurance Statement

The Regional District Bylaw requires that a qualified professional must demonstrate that the land may be used safely for the intended purpose. In this report, “safely” is defined as the condition in which the hazards and resulting harm or damage are tolerable or acceptable. This report identifies the flood hazard risks to the subject property.

Since the risk to human life is low it can be determined that land can be safely used as intended, including construction and habitation of the single family dwelling and a carriage house (and per current R1 Zoning land uses), provided that the FCL of 5.7m is set and enforced, the building is horizontally offset at least 73m from the Present Natural Boundary, and the risk reduction strategies outlined in **Section 6.5** are applied.

Per the EGBC guidelines summarized in **Section 4.3**, the building site is not in a high hazard area of the floodplain (i.e., an avulsion path, a flood velocity greater than 1 m/s, a flood depth greater than 2.5 m, and where safe access and egress is not possible).



10. Conclusions

The flood risk and Flood Construction Level and building setback from the Present Natural Boundary has been reviewed for the proposed development on Lot 16 Andrew Ave, Comox, with the following recommendations:

- FCL and building setbacks for all habitable structures on the property must be enforced.
- Applicable bylaws relating to the recommended FCL must be enforced.
- Vegetated ground cover or alternate equivalent means of erosion protection must be maintained throughout the lot.
- The set back area within the Site must remain free of drainage impediments.
- The Site must be graded in a way that promotes efficient drainage of flood flows to the ocean.
- No area below the FCL must be used for habitation, business, storage of goods or installation of fixed equipment that would present a safety hazard or be damaged by exposure to flood waters. Vehicle storage below the FCL is acceptable and at the Owner's risk.
- Building foundation design must consider hydraulic loading.
- Building foundations must bear on suitable, naturally deposited soil, as approved by a qualified engineer.
- Earth embankments within the setback area and adjacent to proposed buildings must be adequately protected from scour and other forms of erosion that may be caused by flood events.
- A Post-Development Report, including post-construction photos, must be completed by a Qualified Professional to document and confirm that the construction of the proposed development (construction of single detached dwelling) aligns with the description provided within this report and that the risk reduction strategies are met. Risk reduction strategies that are not completed at the time of construction of the building construction should indicate an expected timeline for completion.
- The owner is required to grant a covenant under Section 219 of the Land Title Act respecting the use the development of the land which includes an indemnity in favour of the Regional District to indemnify and save harmless the Regional District against any loss or damage with respect to the flooding to the property, or flood damage to the land, structures, and contents thereof, or any injury (including death) to any person or animal arising from the flooding of the property or flood damage to the land.
- This report must be made available to future landowners by registering a covenant on title.

11. Quality Assurance

We recommend that the Client retain a BC Land Surveyor (BCLS) to provide FCL elevation and setback references in the field, prior to construction. Floor elevations should be reviewed by a BCLS after construction to ensure they meet the above requirements. Building subgrades must be reviewed by a geotechnical engineer prior to placement of foundations to ensure that foundations will bear directly on undisturbed, competent native soils.



12. Acknowledgements

McElhanney acknowledges that this report may be requested by the local governing authority as a pre-condition to the issuance of a development or building permit. It is acknowledged that the Approving Officers and Building Officials may rely on this report. The report has been prepared for, and at the expense of the Client. McElhanney has not acted as an agent for the local governing authority in the preparation of this report.

13. Closure

The attached **Limitations** apply to this report and are hereby incorporated herein.

We trust that the information contained in this report is suitable for your current needs. If you have any questions or require additional information, please do not hesitate to contact us.

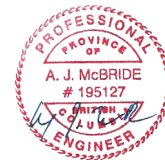
Sincerely,
McElhanney Ltd.

Prepared by:



Sadaf Farzanehfir, EIT.
sfarzanehfir@mcelhanney.com

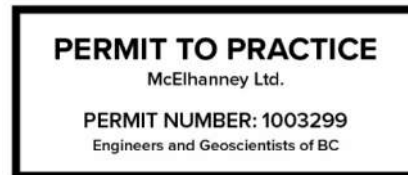
Reviewed by:



Alex McBride, P.Eng.
amcbride@mcelhanney.com

Attachments:

- Appendix A: Limitations
- Appendix B: Site Plan SK-01 and Site Survey Plan
- Appendix C: Flood Assurance Statement



Revision History

Date	Status	Revision	Author
September 6, 2023	Final	0	SF



APPENDIX A

Statement of Limitations

Statement of Limitations

Use of this Document. This document was prepared by McElhanney Ltd. ("McElhanney") for the particular site, design objective, development and purpose (the "Project") described in this document and for the exclusive use of the client identified in this report (the "Client"). The data, interpretations and recommendations pertain to the Project and are not applicable to any other project or site location and this document may not be reproduced, used or relied upon, in whole or in part, by a party other than the Client, without the prior written consent of McElhanney. The Client may provide copies of this document to its affiliates, contractors, subcontractors and regulatory authorities for use in relation to and in connection with the Project provided that any reliance, unauthorized use, and/or decisions made based on the information contained within this document are at the sole risk of such parties. McElhanney will not be responsible for the use of this document on projects other than the Project, where this document or the contents hereof have been modified without McElhanney's consent, to the extent that the content is in the nature of an opinion, and if the document is preliminary or draft. This is a technical document and is not a legal representation or interpretation of laws, rules, regulations, or policies of governmental agencies.

Standard of Care and Disclaimer of Warranties. This document was prepared with the degree of care, skill, and diligence as would reasonably be expected from a qualified member of the same profession, providing a similar document for similar projects, and under similar circumstances, and in accordance with generally accepted engineering and scientific judgments, principles and practices. McElhanney expressly disclaims any and all warranties in connection with this document.

Information from Client and Third Parties. McElhanney has relied in good faith on information provided by the Client and third parties noted in this document and has assumed such information to be accurate, complete, reliable, non-fringing, and fit for the intended purpose without independent verification. McElhanney accepts no responsibility for any deficiency, misstatements or inaccuracy contained in this report as a result of omissions or errors in information provided by third parties or for omissions, misstatements or fraudulent acts of persons interviewed.

Effect of Changes. All evaluations and conclusions stated in this document are based on facts, observations, site-specific details, legislation and regulations as they existed at the time of the site assessment and report preparation. Some conditions are subject to change over time and the Client recognizes that the passage of time, natural occurrences, and direct or indirect human intervention at or near the site may substantially alter such evaluations and conclusions. Construction activities can significantly alter soil, rock and other geologic conditions on the site. McElhanney should be requested to re-evaluate the conclusions of this report and to provide amendments as required prior to any reliance upon the information presented herein upon any of the following events: a) any changes (or possible changes) as to the site, purpose, or development plans upon which this document was based, b) any changes to applicable laws subsequent to the issuance of the report, c) new information is discovered in the future during site excavations, construction, building demolition or other activities, or d) additional subsurface assessments or testing conducted by others.

Independent Judgments. McElhanney will not be responsible for the independent conclusions, interpretations, interpolations and/or decisions of the Client, or others, who may come into possession of this report, or any part thereof. This restriction of liability includes decisions made to purchase, finance or sell land or with respect to public offerings for the sale of securities.



APPENDIX B

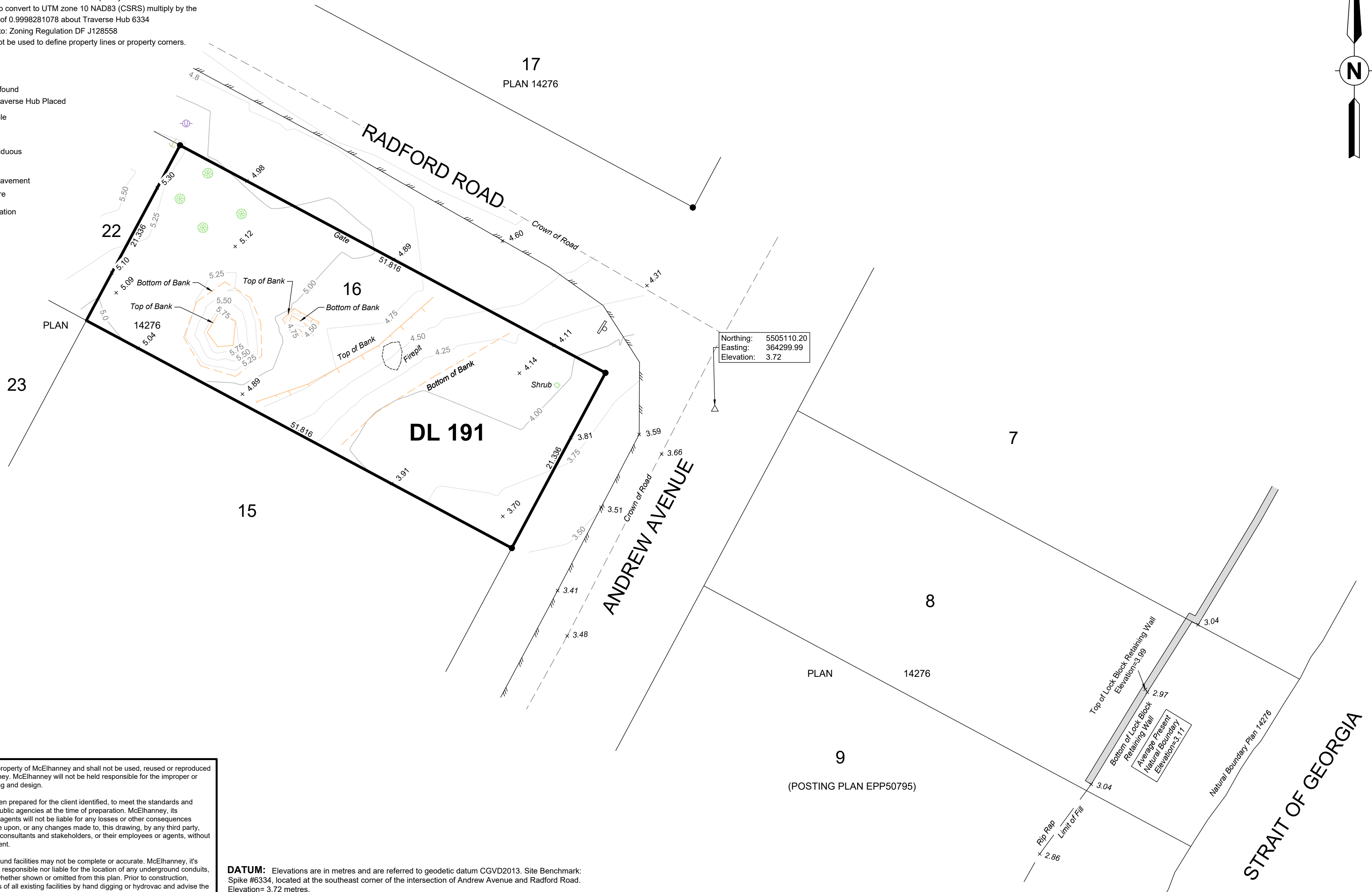
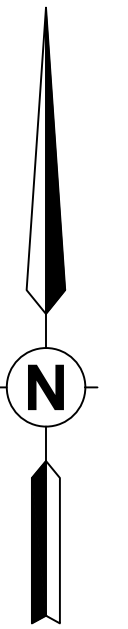
Site Plan – SK-01 and Site Survey Plan

NOTES

- Distances are in metres and decimals thereof.
- Parcel dimensions are derived from field survey and existing Land Title Office records, being Plan 14276 and and Posting Plan EPP50795.
- This plan represents field surveys conducted on July 18th, 2023.
- Contour Interval is 0.25m.
- Local ground coordinates are derived from dual frequency GPS differential carrier phase observations. To convert to UTM zone 10 NAD83 (CSRS) multiply by the combined scale factor of 0.9998281078 about Traverse Hub 6334
- Property Title Subject to: Zoning Regulation DF J128558
- This document shall not be used to define property lines or property corners.

LEGEND

- Iron Post found
- △ Survey Traverse Hub Placed
- Power Pole
- ⌵ Anchor
- ⊗ Tree Deciduous
- ⊠ Stop Sign
- ▬ Edge of Pavement
- - - Fence Wire
- +5.00 Spot Elevation



This drawing and design is the property of McElhanney and shall not be used, reused or reproduced without the consent of McElhanney. McElhanney will not be held responsible for the improper or unauthorized use of this drawing and design.

This drawing and design has been prepared for the client identified, to meet the standards and requirements of the applicable public agencies at the time of preparation. McElhanney, its employees, subconsultants and agents will not be liable for any losses or other consequences resulting from the use or reliance upon, or any changes made to, this drawing, by any third party, including contractors, suppliers, consultants and stakeholders, or their employees or agents, without McElhanney's prior written consent.

Information on existing underground facilities may not be complete or accurate. McElhanney, its employees and directors are not responsible nor liable for the location of any underground conduits, pipes, cables or other facilities whether shown or omitted from this plan. Prior to construction, contractor shall expose locations of all existing facilities by hand digging or hydrovac and advise the engineer of potential conflicts.

DATUM: Elevations are in metres and are referred to geodetic datum CGVD2013. Site Benchmark: Spike #6334, located at the southeast corner of the intersection of Andrew Avenue and Radford Road. Elevation= 3.72 metres.

REV	DATE	DESCRIPTION	DRAF	APRV
0	July 27, 2023	Plan Issued	CDP	MJH
REVISIONS				

SCALE 1:300

ALL DISTANCES ARE IN METRES AND DECIMALS THEREOF UNLESS OTHERWISE NOTED

Original Drawing Size: (432mm x 559mm)

PLAN ID.: 22114774100-V-SITE-001

SHEET 1 OF 1 SHEETS

McElhanney

1211 Ryan Road,
Courtenay BC V9N 3R6
Tel. 250-338-5495

HUMENNY DESIGN LTD.

TOPOGRAPHIC SURVEY OF
LOT 16, DISTRICT LOT 191, COMOX DISTRICT,
PLAN 14276

PID: 004-402-375
ADDRESS UNAVAILABLE

DESTROY ALL PRINTS BEARING PREVIOUS REVISION

APPENDIX C

Flood 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
Comox Valley Regional District
770 Harmston Ave, Courtenay, BC, V9N 0G8
 Jurisdiction and address

Date: September 6, 2023

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”):

LOT 16, DISTRICT LOT 191, COMOX LAND DISTRICT, PLAN 14276, PID: 004-402-375; Lot 16 Andrew Avenue, Comox, BC

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:
Comox Valley Regional District
- 2. Collected and reviewed appropriate background information
- 3. Reviewed the Proposed Development on the Property
- 4. Investigated the presence of Covenants on the Property, and reported any relevant information
- 5. Conducted field work on and, if required, beyond the Property
- 6. Reported on the results of the field work on and, if required, beyond the Property
- 7. Considered any changed conditions on and, if required, beyond the Property
- 8. For a Flood Hazard analysis I have:
 - 8.1 Reviewed and characterized, if appropriate, Flood Hazard that may affect the Property
 - 8.2 Estimated the Flood Hazard on the Property
 - 8.3 Considered (if appropriate) the effects of climate change and land use change
 - 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:
 - 9.1 Estimated the Flood Risk on the Property
 - 9.2 Identified existing and anticipated future Elements at Risk on and, if required, beyond the Property
 - 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.

September 6, 2023

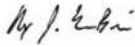
Date

McElhanney Ltd.

Prepared by

Alex McBride, P.Eng.

Name (print)



Signature

1211 Ryan Road, Courtenay, BC V9N 3R6

Address

250-338-5495

Telephone

amcbride@mcelhanney.com

Email

McElhanney Ltd.

Reviewed by

Sadaf Farzanehfar, EIT

Name (print)



Signature



2023-09-06

(Affix PROFESSIONAL SEAL here)

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

I am a member of the firm McElhanney Ltd.

and I sign this letter on behalf of the firm.

(Name of firm)