Our File: 2211-47748

TECHNICAL MEMO

To	From
Bydand Properties Ltd. [redacted]	Johannes Fischer, P.Eng. McElhanney / 2211
Re	**Date**
Flood Assessment Memo – Proposed Subdivision 721 Lazo Road, Comox, BC	March 6, 2025

1. Introduction

As requested, McElhanney Ltd. (McElhanney) has prepared this memo which summarizes our recommendations for a Flood Construction Level (FCL) and building setback at the above-referenced property (see **Figure 1.1**), in support of permitting approvals for residential strata subdivision.

The intention of this memo is to address floodplain regulations in the Town of Comox Bylaw (2006) No. 1474. The proposed Site Plan is attached to this memorandum as **Appendix B**. We understand that the upland 1.48 hectare portion of the subject property is proposed to be dedicated for park use and conservation of the natural environment. The remaining 0.81 hectares of land adjacent to the Strait of Georgia is proposed to be subdivided into 6 bare land strata lots, each to be used for a single-family dwelling with or without a secondary suite, serviced by municipal water supplied from Hutton Road, onsite sanitary disposal, onsite storm water management, and onsite underground wiring. No biological, archaeological, or environmental reviews were completed as part of this assessment.

The outcome from this assessment is that the land is considered safe for the use intended provided that the FCL is set and enforced, the building is horizontally offset at least 15m from the Present Natural Boundary (see attached site plans), and the risk reduction strategies outlined in **Section 6.5** are applied.

A recent title search print out for the subject property has been reviewed in the preparation of this report.

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).

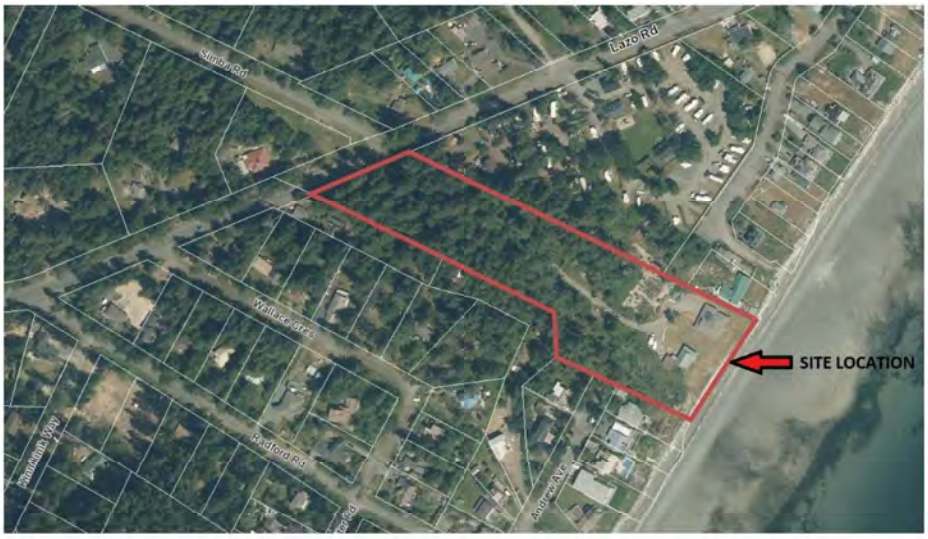

Figure 1.1: Site Location for 721 Lazo Rd

This Flood Assessment Report is provided in conjunction with the following:

- Engineering Servicing Report (draft), dated January 9, 2025, by McElhanney
- Geotechnical Assessment, dated March 6, 2025, by McElhanney
- Environmental Assessment June 24, 2021 pending update per DAI Notice#2 by Pacificus Biological Services, [redacted], RPBio.

These reports have been reviewed by the author of this Flood Assessment Memo.

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 Town of Comox Bylaw No. 1474 "Floodplain Designation Bylaw, No.1474, 2016", 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;

- Recommendations for the minimum building setback from the PNB; and
- Analysis of the Flood Construction Level (FCL) for the Site.

The following items have been reviewed and considered in the preparation of this report:

- Recognition and characterization of the flood processes within, and if required, beyond the development boundaries;
- Sections 3.5 and 3.6 of the Provincial Flood Hazard Area Land Use Management Guidelines, May 2004, Amended Jan 1, 2018, as updated from time to time;
- The implications of climate change, inclusive of but not limited to potential for rising sea levels; and
- Establishment of or analysis of Year 2100 FCL (Flood Construction Level) with a 1:200 Annual Exceedance Probability (minimum 200-year return period) to determine an appropriate "flood construction level" for the site as defined by the Provincial Flood Hazard Area Land Use Management Guidelines, May 2004, Amended Jan 1, 2018

3. Site Description

The subject site is located at 721 Lazo Road, and is zoned Residential Single Family – Large Lot (R3.3). The legal address is: PARCEL B (DD20772N), DISTRICT LOT 191, COMOX DISTRICT. The site covers a plan area of approximately 2.30 Ha and is bounded by Lazo Road to the northwest, an RV park and residential lots to the northeast, the strait of Georgia to the southeast, and single-family residential lots to the southwest.

A review of satellite imagery indicated that the site has been developed with two single-family residential buildings since at least 1996. At the time of the site visit, the subject lot contained a gravelled access drive, two residential buildings, and a storage/tool shed.

Approximately 80% of the site was dominated by gently rolling hills up to 10m high with slope grades up to approximately 47%. These areas were forested with mature coniferous trees and underbrush. The remaining cleared areas around the existing buildings were either gravelled or grass covered.

The foreshore frontage was delineated with a 1.5m high lock block wall that was buttressed with riprap along half of the wall length.

3.1. GEOLOGICAL SETTING

Surficial geology mapping indicates that the study area contains Salish Sediments consisting of primarily dune sand deposits. Surficial soil exposures in the vicinity appeared to be primarily sand with some to trace gravel (rounded) and trace silt.

3.2. COASTAL SETTING

The subject site lies next to the Strait of Georgia, immediately south of Point Holmes. The foreshore alignment is oriented at approximately 30° True (northeast to southwest) and is exposed to over 100km of fetch to the southeast.

Storm winds from the southeast dominate the local nearshore coastal processes and drive a southward littoral drift. This shoreline forms part of a longshore drift system that typically transports sediments to the southwest, before depositing them at Goose Spit. The alignment of the beach is perpendicular to prevailing winds from the southeast that are typical during winter storms. Observed wave action during winter storms is significant enough to shift pieces of riprap. The local beach area may be classified as a high energy zone.

A 1.5m high concrete lock block wall extended along the full length of the lot's ocean frontage. The blocks were buttressed by riprap beginning from the north end to approximately 50m south. The remaining 60m of wall alignment was fronted with large woody debris (LWD). The foreshore to the north and south of the site was armored with vertical cast in place concrete walls.

The ocean facing slope of the riprap ranged from 2H:1V to approximately 6H:5V, and comprised of angular rock that ranged in diameter from 0.5m to 1.2m. The blocks and riprap appeared to be founded on sand or gravelly sand subgrade. The beach substrate comprised coarse sand with some gravel (rounded to subrounded). The beach sloped at approximately 6%. This area is subject to significant wave action in the winter, however no signs of scour or other significant erosion were observed along the toe of the block and riprap revetment.

The backshore on the subject site consisted of grassed areas. (See **Photos 3.1 & 3.2** below.)

Photo 3.1 - View of property foreshore conditions, facing southwest

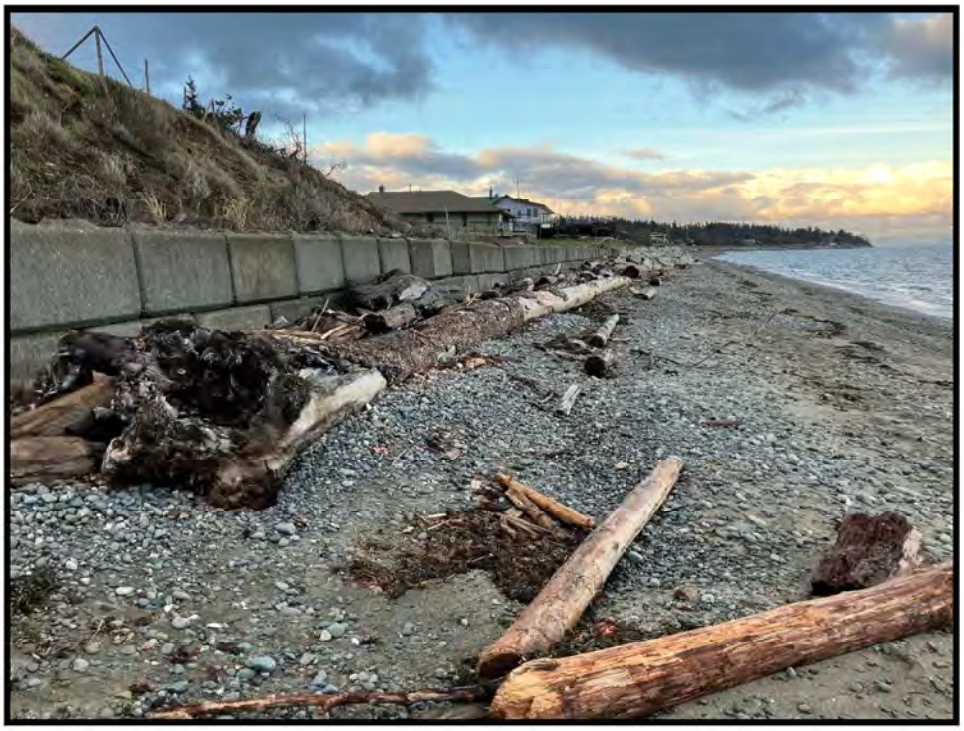

Photo 3.2 - View of property foreshore conditions, facing northeast

4. Floodplain Bylaws and Guidelines Review

4.1. TOWN OF COMOX BYLAW 1474 (2006)

Applicable guidelines from the Town of Comox Flood Plain Designation Bylaw No 1474, are summarized below. Section (5), states that:

> *"Land lower than a flood level specified in section 6 or located within a setback specified in section 7 is designate as a flood plain":*

Section (6) d. states that the flood level should be:

> *"1.5 metres above the Natural Boundary of the sea."*

Section (7) e. states that the flood plain setback should be:

> *"15.0 metres from the Natural Boundary of the sea."*

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 the designated floodplain area, 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, the most applicable scope was captured by Table **D-2** from the EGBC guideline.

Table D-2: Types of Flood Hazard Assessments for Debris Floods, Debris Flows, Glacial Lake/Moraine Dam Floods, Including Alluvial Fans

CLASS	TYPICAL HAZARD ASSESSMENT METHODS AND CLIMATE/ENVIRONMENTAL CHANGE CONSIDERATIONS	TYPICAL DELIVERABLES	APPLICATIONS	RETURN PERIODS FOR HAZARD MAPS	APPLICATION FOR DEVELOPMENT TYPE
0	• Site visit and qualitative assessment of Flood Hazard without modelling • Identify any very low hazard surfaces in the consultation area (i.e., inactive fan surfaces) • Consider watershed scale environmental changes	Letter report or memorandum with water levels, approximate flow velocities, and (where appropriate) loading conditions	Very low loss potential for rivers and floodplains; loss of life very unlikely	Typically not needed	Building Permit: • Renovations, expansions, new single house, new duplex house
1	• All that was completed for Class 0 • Qualitative description of process potential, preliminary estimates of process magnitude and frequency, mapping of hazard zones based on field evidence, separation into direct and indirect impact zones • Same as Class 0	Maps showing hazard zones, report with water levels, approximate flow velocities, and (where appropriate) loading conditions	Possible loss of life even for single homes; scoping level studies for linear infrastructures, mines, urban developments	20-year 200-year 500-year (for Alluvial Fans)	Small Subdivision: • Subdivision into separate lots (3 to 10 single-family lots)

This assessment is in support of a development permitting for a small subdivision; therefore a Class 1 hazard assessment is appropriate. A typical deliverable for a Class 1 assessment is a technical memorandum.

The hazards for this property are tied to potential wave action during periods of higher ocean water levels. The potential loss is mainly related to water damage to structures nearest to the PNB. Energy from impacting waves would only be partially absorbed by the riprap. Energy from larger waves is expected to partially be redirected vertically, resulting in sea spray that may impact ocean facing windows and accelerate corrosion/weathering of exterior cladding.

Loss of life due to flooding is unlikely since most of the site lies above the predicted flood levels for the year 2100 and 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. The site appears to be well drained due to surface grading that would direct surface flows back to the beach.

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	• Include a short site survey with qualitative assessment of potential Consequences	• Memorandum or Letter • Sketch Maps	• Building permits	20 200 500
Low	1	• Provide qualitative descriptions or tabulation of potential economic losses associated with various Consequence scenarios (see **Figure E-4**)	• Report • Maps	• Low loss potential for rivers and floodplains	

6.1. HAZARD SCENARIO

The hazard scenarios for this property are related to wave action and are mainly limited to erosion and property damage.

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 the possibility of property damage and the potential for minor hardship associated with the resulting damage to structures proximal to the existing block wall. There is considered to be a low risk for injury or loss of life.

6.4. TOLERABLE RISK

Referring to **Figure E-4** in the EGBC Guidelines, referenced below, the subject property is within the high -risk category when considering flooding from higher sea levels, Although the risk of injury or loss of life is considered to be very low, the potential frequency of the event shifts the hazard scenario into a higher risk category. The level of risk for the anticipated hazards may be tolerable if a risk reduction plan is implemented. This categorization is based on the relatively low consequence of a flood event, which is considered to be primarily erosion and property damage. The hazard scenarios present a low risk to human lives.

FLOOD RISK EVALUATION

RISK EVALUATION AND RESPONSE		
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
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
VL	Very Low	Risk is broadly acceptable; no further review or Risk reduction required

LIKELIHOOD DESCRIPTIONS		PROBABILITY RANGE	1 Negligible	2 Minor	3 Moderate	4 Major	5 Severe	6 Catastrophic
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

unacceptable

tolerable

acceptable

CONSEQUENCE DESCRIPTIONS

INDICES	1 Negligible	2 Minor	3 Moderate	4 Major	5 Severe	6 Catastrophic
SAFETY (INJURY/LOSS OF LIFE)	Minor injuries of few individuals	Major 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 recommendations comprise the risk reduction plan to reduce risks associated with flooding of the Site and to mitigate the extent of property damage during flooding events:

1. FCL and building setbacks for the proposed building must be enforced.
2. No future additions (excluding those that may be exempt from Bylaw No. 1474) to the existing or proposed dwellings below the determined FCL.
3. No area of the proposed works, below the FCL must be used for habitation, business, or installation of fixed equipment that might be damaged by floodwater. Storage of goods or equipment below the FCL (e.g., recreational equipment, vehicles) is acceptable and at the Owner's risk.
4. Proposed structures should be confirmed (through building permit process) to be adequately supported by undisturbed, naturally deposited subgrade soil.
5. No additional habitable area is to be constructed within the 15 meter horizontal offset from the PNB as depicted on the attached site plan.
6. A geotechnical engineer must be consulted if any of the following are observed on or proximal to the riprap revetment and lock block wall fronting the ocean facing side of the subject lot:
    a. Signs of any movement in the block wall (e.g., settlement, tilting),
    b. Any signs of deformation in the beach bluff slope (e.g., tension cracking, slumping, leaning trees), or
    c. Damage to the riprap revetment.
    d. Erosion at the tow of the riprap or Lock Block walls.
    e. If changes to the riprap structure are needed, that work would require a development permit through the Town of Comox.
7. The Site must continue to remain graded in a way that promotes efficient drainage of flood flows to the ocean;
8. Vegetated ground cover or alternate equivalent means of erosion protection must be maintained throughout the Site.
9. 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 (single family 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 (e.g., at the time of a development permit or building permit application for future site improvements).
10. 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 (e.g., carriage house) on this site. The covenant should also address a release of liability of the approving authority for damages caused by wave action and flooding from the ocean.

7. Flood Construction Level

Wave action from the Strait of Georgia, as a result of co-occurring higher ocean levels and major storm events appears to be the governing 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-family dwelling. 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 – This estimated allowance is an addition to typical components of the Combined Method, as outlined in published guidelines. It is an estimate based on field observations made by the author during winter storms.

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

The combined method resulted in an FCL of 5.7m CGVD2013, per **Table 7.1**. The estimated FCL provided by the CVRD coastal floodplain mapping, based on a probabilistic method, was 5.7m CGVD2013, as well. The recommended FCL is **5.7 m** CGVD2013.

Table 7.1: FCL Derivation

FCL COMPONENTS	ELEVATION (m)
HHWLT	2.2 (1)
SLR	1.0 (2)
Storm Surge	1.3 (3)
Uplift	-0.2 (3)
Wave Effect	0.75 (3)
Free Board	0.6
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. 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 4.1**, the Town of Comox Bylaw 1474 specifies that the building setback should be at least 15m from the natural boundary of the sea. The MFLNRO guidelines, summarized in **Section 4.2**, suggest a 15m setback from the estimated Future Natural Boundary (FNB) or a setback equivalent to the landward of the location where the natural ground contour is equivalent to the year 2100 FCL. The Present Natural Boundary (PNB) and estimated Future Natural Boundary (FNB) are near identical (see attached Drawing SK-02). Therefore the 15m setback from the PNB satisfies the current Town Bylaw and corresponds with one of the MFLNRO setback guidelines.

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 **15m from the PNB** is deemed reasonable if the risk reduction strategies outlined in **Section 6.5** are adhered to.

9. Assurance Statement

The Town of Comox 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.

The land is considered safe for the use intended (single-family dwelling), provided that the FCL of 5.7 m (CGVD2013) is set and enforced, buildings are horizontally offset at least 15m landward of the PNB, and the recommendations in this report (per **Sections 6.5 and 10.1**) are adhered to.

10. Conclusions

The flood risk, Flood Construction Level, and building setback from the Present Natural Boundary has been reviewed for the proposed development on 721 Lazo Road, in Comox.

In accordance with Section 524 of the Local Government Act, the land identified as PARCEL B (DD20772N), DISTRICT LOT 191, COMOX DISTRICT, may be used safely for its intended use, provided that the recommendations presented herein are followed.

10.1. CONDITIONS FOR DEVELOPMENT

- Recommendations in this report must be adhered to.
- The underside of any wooden floor system or top of concrete slab of any habitable building on the Site must be above a Flood Construction Level of 5.7 m (CGVD2013 Datum).
- Buildings must be horizontally set back 15m landward of the Present Natural Boundary.
- A geotechnical engineer should be consulted if any movement or damage of riprap revetment and lock block wall fronting the ocean facing side of the subject lot is observed.
- The Site must be graded in a way that promotes efficient drainage of flood flows to the ocean.
- Vegetated ground cover or alternate equivalent means of erosion protection must be maintained throughout the site.
- 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 (single family 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 (e.g., at the time of a development permit or building permit application for future site improvements).
- This report should 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 for any new foundations 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.

Submitted by,

Johannes Fischer, P.Eng.
McElhanney Ltd.

2025-03-06
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Reviewed by:

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I certify this to be a report prepared by

Johannes Fischer, P.Eng.

I am a member of the firm McElhanney Ltd. and I sign this letter on behalf of the firm.

Attachments:
Appendix A - Limitations
Appendix B - Site Plans
Appendix C - Flood Assurance Statements

Revision History

Date	Status	Revision	Author
March 6, 2025	Final	0	JF

APPENDIX A

Statement of Limitations

Statement of Limitations – Geotechnical Services

McElhanney

Use of this Report. This report was prepared by McElhanney Ltd. (**"McElhanney"**) for the particular site, design objective, development and purpose (the "**Project**") described in this report 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 report may not be reproduced, used or relied upon, in whole or in part, by a party other than the Client and Building Authority, without the prior written consent of McElhanney. The Client may provide copies of this report 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 report are at the sole risk of such parties. McElhanney will not be responsible for the use of this report on projects other than the Project, where this report 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 report is preliminary or draft. This is a technical report and is not a legal representation or interpretation of laws, rules, regulations, or policies of governmental agencies. The professional services retained for this Project include only the geotechnical aspects of the subsurface conditions at the site, unless otherwise specifically stated and identified in this report. In particular, environmental conditions such as surface and subsurface contamination are outside the scope of this report.

Standard of Care and Disclaimer of Warranties. This study and report have been prepared in accordance with generally accepted engineering and scientific judgments, principles and practices. McElhanney expressly disclaims any and all warranties in connection with this report including, without limitation, any warranty that this report and the associated site review work has uncovered all potential geotechnical liabilities associated with the subject property.

Effect of Changes. All evaluations and conclusions stated in this report are based on facts, observations, site-specific details, legislation and regulations as they existed at the time of the site assessment. 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 report 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.

Subsurface Risks. Soil, rock and groundwater data were collected in general accordance with the standards and methods described in the document. The classification and identification of soils, rocks and geologic formations was based on commonly accepted methods employed in the practice of geotechnical engineering and related disciplines. Interpretations of groundwater levels and flow direction are based on water level observations at selected test hole locations and are expected to fluctuate. Observations at test holes indicate the approximate subsurface conditions at those locations only. Subsurface conditions between test holes were based, by necessity, on judgement and assumptions of what exists between the actual locations sampled, and may vary significantly from actual site conditions and all persons making use of this report should be aware of, and accept, this risk. Even a comprehensive sampling and testing program, implemented in accordance with appropriate equipment by experienced personnel, may fail to detect all or certain conditions.

Information from Client and Third Parties. McElhanney has relied in good faith on information provided by the Client and third parties noted in this report 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.

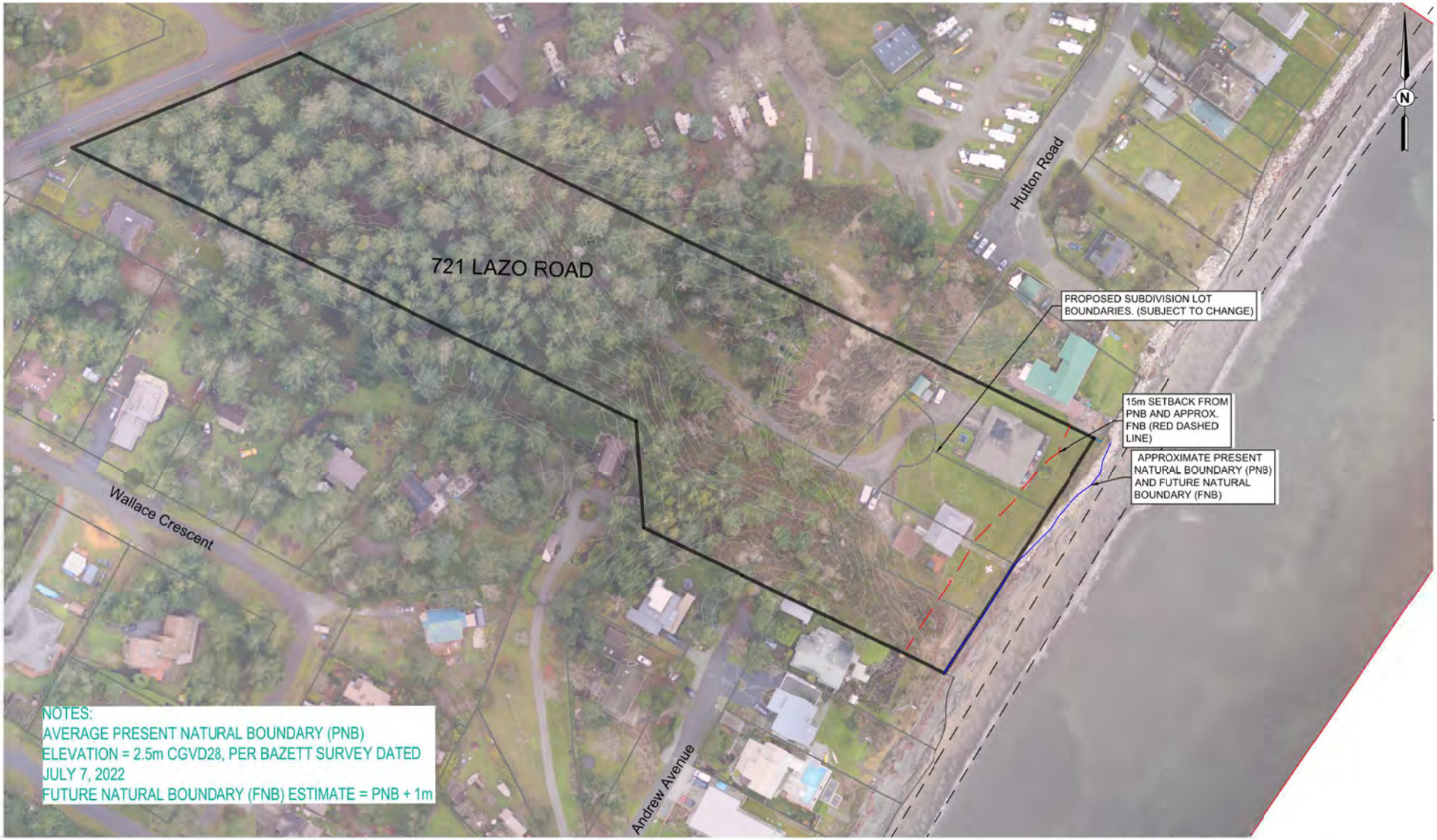
Underground Utilities and Damages. In the performance of the services, McElhanney has taken reasonable precautions to avoid damage or injury to subterranean structures or utilities. Subsurface sampling may result in unavoidable contamination of certain subsurface areas not known to be previously contaminated such as, but not limited to, a geologic formation, the groundwater or other hydrous body. McElhanney will adhere to an appropriate standard of care during the conduct of any subsurface sampling.

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.

Construction. The subsurface information contained in this report were obtained for the owner's information and design. The extent and detail of assessments necessary to determine all relevant conditions that may affect construction costs would normally be greater than the assessments carried out for this report. Accordingly, a contingency fund to allow for the possibility of variations of subsurface conditions should be included in the construction budget to cover costs associated with modifications of the design and construction procedures resulting from conditions that vary from the assumptions in this report. If during construction, subsurface conditions are found to be other than those described in this report, McElhanney is to be notified and may alter or modify the geotechnical report recommendations. If McElhanney is not retained to provide services during construction, then McElhanney is not responsible for confirming or recording that subsurface conditions do not materially differ from those interpreted conditions contained in this report or for confirming or recording that construction activities have not adversely affected subsurface conditions or the recommendations contained in this report.

APPENDIX B

Site Plans



Rev.	Date	Description	Drawn	Design	Appd
#	#	#	#	#	#
#	#	#	#	#	#
#	#	#	#	#	#
#	#	#	#	#	#
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#	#	#	#	#	#
1	2025-02-25	ISSUED FOR REFERENCE	JT	JF	AM
0	2024-02-14	ISSUED FOR DISCUSSION	JT	LD	JF

ORIGINAL DWG SIZE: ANSI B (11" x 17")

McElhanney
1211 Ryan Road
Courtenay BC
Canada V9N 3R6
T 250 338 5496

BYDAND PROPERTIES LTD.

721 LAZO ROAD, COMOX, BC
FLOOD SETBACKS

Drawing No.
SK-02

Project Number
2211-47748-00

Rev.
01

APPENDIX C

Flood Assurance Statements

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: March 6, 2024

Town of Comox

1809 Beaufort Ave, Comox, BC V9M 1R9

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"):

PARCEL B (DD 20772N) OF DISTRICT LOT 191, COMOX DISTRICT

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:
Town of Comox

✓ 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

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 of 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".

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

March 6, 2025
Date

McElhanney Ltd.
Prepared by

Johannes Fischer, P.Eng.
Name (print)

Signature

1211 Ryan Rd, Courtenay BC, V9N 3R6
Address

250-338-5495
Telephone

jfischer@mcelhanney.com
Email

McElhanney Ltd.
Reviewed by

Alex McBride, P.Eng.
Name (print)

Signature

2025-03-06

PROFESSIONAL ENGINEER
J. M. FISCHER
43419
BRITISH COLUMBIA
ENGINEER

PERMIT TO PRACTICE
McElhanney Ltd.
PERMIT NUMBER: 1003299
Engineers and Geoscientists of British Columbia

(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)