SPECIAL MEETING OF COUNCIL
Tuesday, June 7, 2022 @ 5:00 PM
Ucluelet Community Centre
500 Matterson Drive, Ucluelet

AGENDA

Page

1. CALL TO ORDER
2. ACKNOWLEDGEMENT OF THE YUUŁUʔIŁʔATḤ
   - 2.1. Council would like to acknowledge the Yuułuʔiłʔatḥ First Nation, on whose traditional territories the District of Ucluelet operates.
3. NOTICE OF VIDEO RECORDING
   - 3.1. Audience members and delegates are advised that this proceeding is being video recorded and broadcast on YouTube and Zoom, which may store data on foreign servers.
4. APPROVAL OF AGENDA
5. ADOPTION OF MINUTES
6. PUBLIC INPUT & DELEGATIONS
   - 6.1. Public Input
   - 6.2. Delegations
7. UNFINISHED BUSINESS
8. BYLAWS
   - 8.1. Minato Bay Housing Development - 221 Minato Road — 3 - 98
     Bruce Greig, Director of Community Planning
     Minato Bay Housing Development
9. REPORTS
10. NOTICE OF MOTION
11. CORRESPONDENCE
12. INFORMATION ITEMS
13. MAYOR'S ANNOUNCEMENTS
14. COUNCIL COMMITTEE REPORTS
    - 14.1. Councillor Marilyn McEwen
      Deputy Mayor January 1 - March 15, 2022

14.2. Councillor Lara Kemps
Deputy Mayor March 16 - May 31, 2022

14.3. Councillor Jennifer Hoar
Deputy Mayor June 1 - August 15, 2022

14.4. Councillor Rachelle Cole
Deputy Mayor August 16 - October 31, 2022

14.5. Mayor Mayco Noël

15. QUESTION PERIOD

16. ADJOURNMENT

DISTRICT OF UCLUELET

REPORT TO COUNCIL

Council Meeting: June 7, 2022

500 Matterson Drive, Ucluelet, BC V0R 3A0

FROM: BRUCE GREIG, DIRECTOR OF COMMUNITY PLANNING **FILE NO:** 3360-RZ22-03

SUBJECT: MINATO BAY HOUSING DEVELOPMENT - 221 MINATO ROAD **REPORT NO:** 22- 74

ATTACHMENT(S): APPENDIX A – LETTER FROM APPLICANT JUNE 1, 2022
APPENDIX B – DRAFT UCLUELET ZONING AMENDMENT BYLAW NO. 1312, 2022
APPENDIX C – COW REPORT MAY 24, 2022, INCLUDING APPLICATION MATERIALS
APPENDIX D – ADDITIONAL TECHNICAL REPORTS

RECOMMENDATIONS:

THAT Council, with regard to the proposed housing development at 221 Minato Road:

1. Give first reading to District of Ucluelet Zoning Amendment Bylaw No. 1312, 2022;
2. Give second reading to District of Ucluelet Zoning Amendment Bylaw No. 1312, 2022;
3. Direct staff to give notice for a public hearing to be held on District of Ucluelet Zoning Amendment Bylaw No. 1312, 2022;
4. Indicate to the applicant and the public that adoption of District of Ucluelet Zoning Amendment Bylaw No. 1312, 2022, would be subject to registration of a Section 219 restrictive covenant on the title of the property at 221 Minato Road as outlined in Staff Report No. 22-74 to ensure, as a matter of public interest, that the land uses, infrastructure, park dedication, trail construction, housing affordability and tenancies, buildings, site works, and landscaping be developed as proposed to the community.

BACKGROUND:

This application was first introduced at the April 26, 2022, Council meeting. The applicants held a public information meeting on May 18, 2022. Council received an initial staff report with background on the property at 221 Minato Road on May 24, 2022, in a Committee-of-the-Whole meeting (see **Appendix "C"** for report including application materials). That report provides an overview of issues to consider.

After the Committee-of-the-Whole meeting and further discussion with the applicants, the Minato Bay Development Co. have provided a letter confirming their approach, requested zoning and clarifying a number of points (see **Appendix "A").** A key clarification is that the proposed development would contain no short-term vacation rentals – rather a mix of housing types as follows:

a) 10 affordable rental housing units for qualifying households (according to BC Housing criteria) earning a maximum of 80% median income;
b) 88 market rental apartments for households earning between 80% and 100% median income;
c) 67 attainable ownership houses or townhouse units for households earning up to 130% median income; and,

d) 47 residential houses with the option of a secondary suite (no short-term rentals).

This represents 78% non-market housing in a development containing 212 residential units (plus a number of secondary suites).

Discussion

Staff have drafted a zoning amendment bylaw (see **Appendix "B"**) that would create a new Comprehensive Development CD-6 zone and designate areas of the property to this new zone.

Additional technical reports are attached in **Appendix "D"**.

The current application is for rezoning; establishing the location of land uses and densities. Additional studies, design work and legal commitments will be necessary prior to development permits, subdivision, building permits and construction of infrastructure or buildings. To ensure that the features presented to the community for the rezoning are carried through during the following stages, staff recommend a restrictive covenant be required as a condition of any zoning approval (see discussion below). Note staff have inserted percentages for unit sizes for the rental units (40% 1-bed, 40% 2-bed and 20% 3-bed) as a starting point for discussion. The mix acceptable to Council should be spelled out on the covenant.

It usually takes creative project financing to construct a high proportion of non-market housing. Obtaining zoning approval would be an important step for the applicants to seriously discuss financing for the non-market components of the housing development with the Canadian Mortgage and Housing Corporation and BC Housing.

This is a significant housing proposal for Ucluelet. Staff are recommending that Council consider giving first readings to the rezoning bylaw and send it to a public hearing to receive input from the community.

Restrictive Covenant:

Final adoption of zoning amendment bylaw would be subject to a restrictive covenant under S.219 of the *Land Title Act* being registered on the title of the property at 221 Minato Road to restrict the use of the property until conditions are met arising from the public discussion of the proposed development and rezoning.

The covenant would ensure that no subdivision, development, issuance of development permits, building permits or occupancy permits would occur unless the Owner provides the following:

1) Prior to December 31, 2022:
   a) The owner registers a plan with the Land Title and Survey Authority (LTSA) dedicating the following portion of the Lands totaling approximately 35,848.5m^2 area (as shown labelled P-1 on the CD-6 Zone Plan in Bylaw No. 1312) to the District:
      i) The following areas dedicated as Park:
         (1) An area extending 30m inland from the natural boundary of the sea and the watercourse located in the southwest corner of the Lands;
         (2) An area extending 10m on either side of the identified watercourse running through the approximate centre of the Lands;
      ii) The following areas dedicated as Road:

(1) A 10m strip parallel to the east boundary of the Lands for widening of the Minato Road public road right-of-way and extension to the shore of Olsen Bay.

2) Prior to submission of Development Permit and/or Subdivision applications, the Owner is to provide:
   a) archaeological assessment of the site and the proposed development with recommendations for any mitigation measures, design changes and/or permitting requirements to protect archaeological and cultural resources;
   b) assessment by a Qualified Environmental Professional (QEP) of the ecological resources of the Lands and surrounding ecosystem, with recommendations for how the proposed development can avoid and/or mitigate impacts on terrestrial and marine ecosystems or enhance the existing ecological function of the site;
   c) grading and rainwater management plans for the proposed development of the Lands (incorporating the recommendations of the QEP and landscape plans for the proposed development);
   d) engineering analysis and design for safe vehicular and pedestrian access to the proposed residential development on the Lands in a location and configuration to the satisfaction of both the District and BC Ministry of Transportation and Infrastructure;
   e) engineering analysis and design of off-site works and services required to ensure that District infrastructure will accommodate the impact of the proposed development on the Lands, including water, sanitary, roads and pathways;
   f) proposed phasing and servicing plans, identifying thresholds for when infrastructure upgrades (including road access, water, sewer, etc.) would be necessary before additional housing units are constructed;
   g) proposed layout and approach to subdivision (including all proposed elements of fee-simple, bare land strata, or building stratas) identifying proposed property boundaries and the location and extent of public and private infrastructure, facilities, roads, pathways, parks, open space, etc.;
   h) more detailed plans for proposed road and open space design including plans for public / shared recreation and play infrastructure;
   i) description of proposed green building measures including electrical vehicle charging at all units;
   j) engineering analysis of all aspects of the proposed development on the Lands located in areas identified as subject to tsunami flood hazard, according to District of Ucluelet Tsunami Risk Tolerance Interim Policy 8-5280-1;
   k) a proposed plan for construction (and phasing if appropriate) at the Owner's cost for gravel-surfaced pedestrian trails in the approximate alignment shown on the Development Plan, and:
      i) constructed to the Ucluelet Wild Pacific Trail construction standards;
      ii) following specific site-determined alignment to the satisfaction of the Director of Community Planning to achieve the following:
         (1) minimize impact on the natural environment;
         (2) specifically, minimize possibility of pedestrian encroachment into the salt marsh and intertidal areas of Olsen Bay;
         (3) minimize tree removal;
         (4) maximize the experience by trail users; and,
         (5) fit the character of the municipal trail network;

iii) including stairs, bridges, boardwalks, ramps, railings and other similar trail structures as reasonably necessary to achieve the above; and,
iv) including archaeological and environmental assessment and oversight as necessary during construction.

3) Prior to subdivision or development, register a restrictive covenant and S. 483 *LGA* housing agreements on the title of the Lands identifying specific development areas of the Lands and registering against title:
- Affordable rental housing agreements;
- Rental only housing agreements; and,
- Attainable ownership housing agreements,

to achieve the following affordable and attainable housing commitments by the Owners:

a) A minimum of 10 affordable rental housing units for Qualifying Households earning a maximum of 80% median income: (4) 1-bed, (4) 2-bed and (2) 3-bed;
b) A minimum of 88 rental apartments for Qualifying Households earning between 80% and 100% median income: 40% 1-bed, 40% 2-bed and 20% 3-bed ;
c) A minimum of 67 attainable ownership house or townhouse units for Qualifying Households earning up to 130% median income, with a mix of unit sizes;

and specifying, to the satisfaction of the District, the timing and phasing to ensure construction and occupancy of Affordable and Attainable units is reasonably proportionate to the subdivision of lots and/or issuance of building permits for other housing on the Lands. It is expected that affordable and attainable rental units will comprise the majority of the first phase of construction.

If the application is moved forward by Council, staff would request the municipal solicitors to draft the details of the restrictive covenant.

DCC's:

The applicant requests that the value of park land being dedicated be deducted from park Development Cost Charges (DCC's) paid by the development. This is not something that can simply be done as proposed. Also note that the dedication of the proposed park land is already committed prior to subdivision by the restrictive covenant on title - registered by the previous owners as part of their prior campground zoning approval.

The offer to construct the proposed trails represents a substantial public amenity, and is an opportunity to create a significant addition to the municipal trail network. Staff note that DCC's normally collected at the subdivision and building permit stages would not be collected in cases where construction of public infrastructure and facilities by the Owners, including water, sewer and trails, can be demonstrated as overlapping anticipated works within the capital infrastructure program for *Development Cost Charge Bylaw No. 738, 1996*, as amended by *Development Cost Charge Amendment Bylaw No. 1056, 2007*. It appears that this would apply to the proposed trail construction on the 221 Minato Road site, and would lower the overall project costs for the developer.

Density and housing:

Questions for the community are whether this is the right type of housing, whether it is too much and whether this is the right location. The Minato Bay proposal is for 212 dwelling units in a dense neighbourhood cluster, with a significant park dedication surrounding the shoreline of Olsen Bay. This new neighbourhood would represent 6 years' of growth at the pace anticipated in the Official Community Plan. The development is not proposed to be constructed all at once, rather it would be phased over a number of years. The analysis leading to the Low(ish) growth scenario in the OCP anticipated the development of approximately 70 units on this site.

That said, a large portion of this site was logged by the previous owners (without the necessary permits); the new owners are proposing a clustered development on a previously-impacted site. This arguably would have far less impact than constructing 200 homes at lower densities or in areas that would result in clearing of more forest.

The proponents have responded to the District's housing policy by exceeding the 75% non-market housing target for major development proposals. The overall density the Minato Bay owners are seeking is integral to their proposal to construct a mix of types (and tenures) of housing needed by the community. If approved, the District could arguably be quite selective when reviewing other future developments, with the bar set this high.

ANALYSIS OF OPTIONS

A	That Council give first and second readings to Bylaw No. 1312, 2022, and refer it to a public hearing.	Pros	• Would move forward to a public hearing to gather public input. • Would place to rezoning bylaw on a path where it could be approved during this Council term. • Could provide a speedy answer for the proponent on whether there is community support for the project, to enable timely discussions with BCV Housing and CMHC. • Could result in the development of a significant supply of long-term attainable housing for Ucluelet residents.
		Cons	• Some details would need to follow at later stages of the process. • Represents a significant amount of the growth (approx. 6 years' worth); could be perceived as accelerating growth in the community.
		Implications	• Would allow the application to proceed to a public hearing. • May facilitate the development of a significant supply of non-market rental and ownership housing.
B	That Council refer the matter back to the applicant to clarify or provide more detail on aspects of the application.	Pros	• More information that Council deems appropriate may be beneficial to informed comment by the public and decisions by Council.
		Cons	• Unknown at this time.
		Implications	• The application will be delayed. • Approval of the bylaw would likely not be within this Council term.
		Suggested Motion	*" That Council suggest that the applicant provide more details on (insert)"*

C	That Council modify the draft zoning bylaw by stating which elements are to be changed.	Pros	• A modification to the zoning bylaw that Council deems appropriate may be beneficial to the application.
		Cons	• Unknown at this time.
		Implications	• The application may be delayed.
		Suggested Motion	*"That Council direct staff to modify the draft District of Ucluelet Zoning Amendment Bylaw No. 1312, 2022, to (state desired outcome of amendments), for further consideration at a future meeting."*

NEXT STEPS

Work remains to be done to flush out a number of details through the Development Permit and Subdivision stage. Perhaps most significantly, proving that the housing can be built to safely mitigate risk from tsunami is an engineering hurdle that the proponents will need to clear. That work, plus road access and infrastructure design, may result in requested changes to the layout of the development. If the zoning were approved then it will be important to ensure that the key details still meet community expectations as the project is refined - secured by restrictive covenant as discussed above.

If given first and second reading and referred to a public hearing, staff would compete the required statutory notification for Bylaw No. 1312 to be the subject of a hearing tentatively set for June 28, 2022.

Respectfully submitted: Bruce Greig, Director of Community Planning
John Towgood, Municipal Planner
Duane Lawrence, Chief Administrative Officer

MINATO BAY

To: District of Ucluelet
From: Minato Bay Development Co.
Re: 221 Minato Rd rezoning
Attn: Mayor and Council
CC: Bruce Greige, John Towgood, Jon Mara, Christopher Bozman

June 01 2022

This letter is to be part of the rezoning package for the proposed development located at 221 Minato Rd in Ucluelet, British Columbia. The intention of this letter is to provide clarity on several topics so that Minato Bay Development Co (MBDC) and District of Ucluelet (DOU) Staff can continue to move forward on finalizing the details of each of these topics.

MBDC is proposing to give the DOU a significant amount of land totalling approximately 8 acres for the purpose of park dedication and extension of the Wild Pacific Trail. We are committed to finalizing this transfer of land to the DOU by December 31st 2022. MBDC requests that the assessed value of this land as of September 30th 2022 be credited against any future Park DCC fees that would be attached to any and all future development at 221 Minato Rd. and or future addresses that are contained on what is now 221 Minato Rd. In addition to providing the land, MBDC will work with the DOU and the Ucluelet Trails Society to either contribute to the construction of the trail's extension through this land, or construct the extension on behalf of the Ucluelet Trails Society.

MBDC will expand on its existing traffic study and analysis of the intersection of Minato Rd and Peninsula Rd. We will continue to work with district staff, and Ministry of Transportation and Infrastructure to come up with an acceptable solution for site access to the property.

MBDC will work with a civil engineering consultant and the DOU Engineering department to analyze, design, upgrade and/or construct the required offsite civil servicing of the project. It is understood that the DOU currently has sufficient water capacity for the project to connect approximately at the existing intersection of Minato Rr and Peninsula Rd. It is known and understood that a significant upgrade is required to the sanitary lift stations down stream of the project site. MBDC will provide engineering, and construction of the required lift stations down stream of the project. As this is a significant cost to the project that will benefit other developments in the future, we will seek to have a latecomer's fee agreement in place to aid in recovering some of these costs. At this time, it is understood that the pipe work connecting 221 Minato and the wastewater treatment plant does not require any upgrades. As more detailed engineering and analysis of the civil services is completed, should it become known that upgrading the pipe work is required, MBDC and the DOU will need to revaluate the cost of that work, as it would not be feasible for the project to carry those cost while providing non-market housing.
Once more detailed engineering and analysis of the offsite services is completed MBDC will work with the DOU to provide an offsite servicing phasing schedule as part of the servicing agreement.

MBDC understands that prior to the construction of any development within the defined Tsunami Flood Risk zones, engineering work will be required to satisfy the DOUs Tsunami Flood Risk policies.

MBDC will provide archaeological and environmental review as part of the development permitting for the project.

MBDC acknowledges that all legal and survey costs associated with the rezoning of the project will be covered by MBDC.

Proposed Housing:

- 10 BC Housing defined affordable rental units - Target tenants are 80% or less of mean annual income earners already within the community
- 88 Rental apartments – Target tenants are 80%-100% mean annual income earners, already within the community.
- 67 Attainable homes – Target buyers are 130% or less mean annual income earners looking for first time home purchase, or 80% or less mean annual earners who are existing home owners that are looking to move to a new housing unit. This demographic may already reside in the community, or be looking to move to the community. For these units to meet the monthly attainable cost metrics laid out in the Ucluelet housing needs assessment report, MBDC will require assistance from programs provided by groups such as BC Housing, Canadian Mortgage Housing Corporation and/or private market programs.
- 47 Market homes with the option of the units having long term secondary rental suites, where achievable Single family homes are targeted at owners of existing homes looking to move within the community or move to the community.

The anticipated design of the project provides 78% of the housing units deemed to be non-market housing, exceeding the ecommendation in the Housing needs assessment report by 3%. MBDC is committing to working with DOU staff to formalize a ovenant that would be on title to ensure that 65%-75% of the site is constructed to be non-market housing. One significant hange from the proposal reviewed with Council previously is that we are no longer looking for any Vacation Rental zoning.

On behalf of Minato Bay Development Co., we would like to thank the District of Ucluelet Staff and Council for the work hat has been put into this project to date, and we look forward to continuing to work with Staff and Council on this project as it roceeds.

Sincerely,

Christopher Bozman
Minato Bay Development Co. Project Manager.

Jonathan Mara

Jon Mara,
Minato Bay Development Co. President.


PROJECT DATA SUMMARY
CIVIL ADDRESS: 221 Minato Rd. Ucluelet, British Columbia
LEGAL DESCRIPTION: LOT B DL 282 CLAYOQUOT DISTRICT PLAN VIP79908
PARCEL IDENTIFIER: 026-487-764
CURRENT ZONING: CG, GH
PROPOSED ZONING: CD
SITE AREA: 1,082,977 SF
SITE AREA AFTER DEDICATIONS: 697,109 SF
SITE COVERAGE: 17.3%
DENSITY: 32.7 units per hectare
PROPOSED UNITS: 212 UNITS
WATERFRONT HOMES
3 STOREYS
47 UNITS
FAMILY HOMES
3 STOREYS
27 UNITS
STACKED TOWNHOME
3 STOREYS (1 STOREY GROUND APARTMENT, 2 STOREY TOWNHOME ABOVE)
40 UNITS (20 TOWNHOMES, 2 UNITS EACH)
RENTAL MODULAR APARTMENTS
2 STOREYS
98 UNITS (7 BUILDINGS, 14 UNITS EACH)
AMENITY
COVERED GATHERING SPACE
SERVICE BUILDINGS
OUTBUILDINGS FOR SERVICES, PUMP STATION, GARBAGE
Ucluelet Inlet
PHASE 1A
PHASE 1B
PHASE 2A
PHASE 2B
PARK DEDICATION
PENINSULA RD SETBACK
FORMOSIS architecture
MINATO BAY
221 Minato Road
Ucluelet, British Columbia
SITE PLAN
REZONING APPLICATION
A152
PROJECT NO: 2109
DATE: 10MAY2022
SCALE: 1:900
DRAWN BY: AS
1 10MAY2022 ISSUED FOR REZONING

DISTRICT OF UCLUELET

Zoning Bylaw Amendment Bylaw No. 1312, 2022

A bylaw to amend the "District of Ucluelet Zoning Bylaw No. 1160, 2013".

(Zoning amendments for the proposed development of 221 Minato Road – Lot B, Plan VIP79908 Clayoquot District, District Lot 286).

WHEREAS Section 479 and other parts of the *Local Government Act* authorize zoning and other development regulations;

NOW THEREFORE the Council of the District of Ucluelet, in open meeting assembled, enacts as follows;

1. Text Amendment:

The District of Ucluelet Zoning Bylaw No. 1160, 2013, as amended, is hereby further amended as follows:

A. By adding within Division 100 – Enactment and Interpretation, Section 103 definitions, such that a new definitions are added in alphabetical order reading as follows:

"**Residential Rental Tenure**" means the occupation of a *dwelling unit* for *residential* purposes under a tenancy agreement according to the *Residential Tenancy Act* for a period of at least 4 months, and excludes occupation of a dwelling by the owner.

"Rental Multiple Family" means a *building,* or a group of *buildings* on the same *lot*, each containing three or more *dwelling units* for *residential* use only under a long-term *residential rental tenure.*

B. By adding a new Comprehensive Development zone, to Schedule B – The Zones that directly follows CD-5 Zone – FORMER WEYCO FOREST LANDS such that the new section reads as follows:

"CD-6 Zone – MINATO ROAD

This Zone is intended for the development of a mix of multi-family and single-family residential development providing for a mix of sizes, types and tenures including affordable rental, market rental, attainable ownership (under a housing agreement covenant) and market ownership homes.

CD-6 Zone Plan (Development Areas):

CD-6.1 Permitted Uses

The following uses are permitted within the corresponding Development Areas shown in the CD-6 Zone Plan, but *secondary permitted uses* are only permitted in conjunction with a *principal permitted use*:

Development Area	Principal Use	Building Form	Secondary Uses
A	Rental Multiple Family	apartment	
			home occupation
B	Multiple Family	townhouse	
			home occupation
C	Single Family or Duplex		
			home occupation
D	Single Family		
			secondary suite
			home occupation
E	Rental Multiple Family	apartment	
			home occupation
F	Single Family or Duplex		
	Multiple Family	townhouse	
			home occupation
G	Single Family	house	
			secondary suite
			home occupation

CD-6.2 Lot Regulations

CD-6.2.1 Minimum Lot Frontage: 7.5 m (25 ft)

CD-6.3 Density:

Development Area	Principal Use	Density (max. # dwelling units)
A	Rental Multiple Family	70
B	Multiple Family	28
C	Single Family or Duplex	5
D	Single Family	19
E	Rental Multiple Family	28
F	Single Family or Duplex	22
	Multiple Family	12
G	Single Family	28

CD-6.3.1 For clarity the maximum number of principal *dwelling units* in table CD-6.3 does not count *secondary suites* in areas "D" and "G".

CD-6.4 Maximum Size (Gross Floor Area):

Development Area	Principal Use	Maximum Gross Floor Area
A	Rental Multiple Family	average 65m^2(700ft$^{2)}$/unit
B	Multiple Family	average 84m^2 (900ft$^{2)}$/unit
C	Single Family or Duplex	average 144m^2(1,550ft$^{2)}$/unit
D	Single Family	172m^2 (1,850ft$^{2)}$/unit
E	Rental Multiple Family	average 65m2(700ft2)/unit
F	Single Family or Duplex	average 144m2(1,550ft2)/unit
	Multiple Family	average 84m2 (900ft2)/unit
G	Single Family	172m2 (1,850ft2)/unit

CD-6.5 Maximum Size of Accessory Buildings:

CD-6.5.1 on *lots* containing a *Single Family* or *Duplex* dwelling: 30 m^2 (323 ft^2) combined total.

CD-6.5.2 on *lots* containing *Multiple Family* or *Rental Multiple Family* buildings: 50m2 (538 ft^2) combined total.

CD-6.6 Maximum Height:

Development Area	Principal Use	Max. Height	
		principal	accessory
A	Rental Multiple Family	11m	5.5m
B	Multiple Family	11m	5.5m
C	Single Family	8.5m	5.5m
	Duplex	8.5m	5.5m
D	Single Family	8.5m	5.5m
E	Rental Multiple Family	11m	5.5m
F	Single Family	8.5m	5.5m
	Duplex	8.5m	5.5m
	Multiple Family	11m	5.5m
G	Single Family	8.5m	5.5m

CD-6.7 Minimum Setbacks:

CD-6.7.1 The following minimum setbacks apply, as measured from the *front lot line*, *rear lot line* and *side lot line*(s), respectively:

Development Area	Principal Use	Setbacks			
		front	rear	side interior	side exterior
A	Rental Multiple Family	7.5m	6m	5m	5m
B	Multiple Family	7.5m	6m	5m	5m
C	Single Family	7.5m	6m	1.5m	5m
	Duplex	7.5m	6m	0m (one side)	5m
D	Single Family	7.5m	6m	1.5m	5m
E	Rental Multiple Family	7.5m	6m	5m	5m
F	Single Family	7.5m	6m	1.5m	5m
	Duplex	7.5m	6m	0m (one side)	5m
	Multiple Family	7.5m	6m	5m	5m
G	Single Family	7.5m	6m	1.5m	5m

"

2. Map Amendment:

Schedule A (Zoning Map) of District of Ucluelet Zoning Bylaw No. 1160, 2013, as amended, is hereby further amended by changing the zoning designation of areas of Lot B, District Lot 286, Clayoquot District, Plan VIP79908 (221 Minato Road: PID 026-487-764), from "GH: Guest House" and "CG: Campground", to areas designated as "P-1: Public Institutional" and "CD-6: Comprehensive Development 6 Zone – MINATO ROAD" as outlined in black on the map attached to this Bylaw as Appendix "A".

3. Citation:

This bylaw may be cited as "District of Ucluelet Zoning Amendment Bylaw No. 1312, 2022".

READ A FIRST TIME this day of , 2022.

READ A SECOND TIME this day of , 2022.

PUBLIC HEARING held this day of , 2022.

READ A THIRD TIME this day of **,** 2022.

ADOPTED this day of , 2022.

CERTIFIED A TRUE AND CORRECT COPY of "District of Ucluelet Zoning Amendment Bylaw No. 1312, 2022."

Mayco Noël
Mayor

Corporate Officer

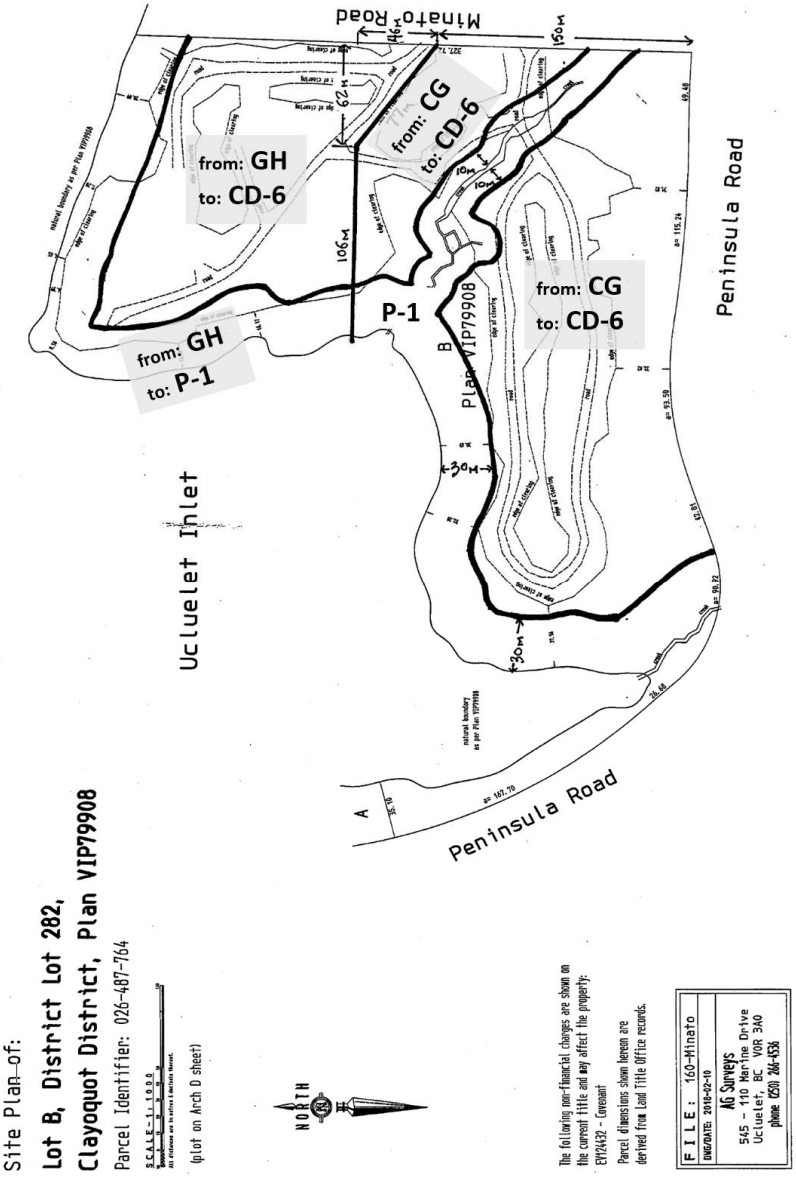
THE CORPORATE SEAL of the District of Ucluelet was hereto affixed in the presence of:

Corporate Officer

APPENDIX 'A' to District of Ucluelet Zoning Amendment Bylaw No. 1312, 2022
(CD-6 Zone -Minato Road)

From: GH (Guest House); and,
CG (Campground)

To: P-1 (Public Institutional); and,
CD-6 (CD-6 Minato Road); as shown:



DISTRICT OF UCLUELET

REPORT TO COMMITTEE OF THE WHOLE

Council Meeting May 24, 2022

500 Matterson Drive, Ucluelet, BC V0R 3A0

FROM: BRUCE GREIG, DIRECTOR OF COMMUNITY PLANNING **FILE NO:** 3360-RZ22-03

SUBJECT: PROPOSED "MINATO BAY" HOUSING DEVELOPMENT - 221 MINATO ROAD **REPORT NO:** 22- 63

ATTACHMENT(S): APPENDIX A – APPLICATION MATERIALS

SUMMARY OF DESIRED OUTCOME

That the Committee of the Whole provide Staff with direction to inform the next steps for the proposed "Minato Bay" housing development at 221 Minato Road.

BACKGROUND

The property at 221 Minato Road was rezoned for Campground and Guest House uses in 2020. The new owners of the property are proposing to amend the zoning to permit a mix of housing on the site, including 70 rental housing units in the first phase (see **Appendix 'A'**). This is a significant development proposal for Ucluelet, proposing 212 housing units over all phases (see **Figure "1"**):

PROJECT DATA

221 MINATO ROAD									March 22, 2022
PROJECT DATA									
Site Area	ft2	Acres		Hectares					
Total Site	**1,082,977 SF**	24.86		10.06					
30m Shoreline Dedication	-358,230 SF	-8.22		-3.33					
Minato Rd Dedication	-27,638 SF	-0.63		-0.26					
Buildable Site	**697,109 SF**	16.00		6.47					
Site Coverage	16%								
Density Pre-Dedication	21.1	Units Per Hectare							
Density Post-Dedication	32.7	Units Per Hectare							
AREA SUMMARY	AVG. SIZE	UNITS (PHASE 1)	UNITS (PHASE 2)	AREA (GROSS)	EXCLUSIONS	AREA (NET)	FAR	UNITS	ATTAINABLE
Rental Housing	550 SF	70	28	53,900 SF		53,900 SF	0.08	98	46%
Family Homes, Attainable	1,500 SF	5	22	40,500 SF		40,500 SF	0.06	27	13%
Family Apartments (Stacked TH)	1,200 SF	14	6	24,000 SF		24,000 SF	0.03	20	9%
Apartments, Attainable (Stacked TH)	600 SF	14	6	12,000 SF		12,000 SF	0.02	20	9%
Waterfront Homes w/ nightly rental	1,850 SF	19	28	86,950 SF		86,950 SF	0.12	47	
Amenity	3,000 SF	1	1	6,000 SF	6,000 SF	0 SF			
		UNITS	**UNITS**	AREA (GROSS)	EXCLUSIONS	AREA (NET)	FAR	UNITS	ATTAINABLE
TOTAL (GBA)		**122** Phase 1	**90** Phase 2	**223,350 SF** (20,749.9 m²)	**6,000 SF** (557.4 m²)	**217,350 SF** (20,192.5 m²)	**0.31**	**212**	**78%**

Figure 1: project data

1

The owners held a public information Open House on May 18, 2022. The Committee may wish to invite the proponent to briefly introduce themselves and their approach to this development, highlight features of particular interest, summarize the feedback received at the Open House, indicate any changes they may be considering in response to that feedback and answer questions from the Committee.

KEY QUESTIONS & PROCESS

Following is a brief description of main aspects from the initial development review, and questions for the Committee to consider. Not all details are known at this time: some would be provided at later stages (e.g., during the subdivision process) and some will come from analysis that is underway. It is expected that there may be questions that the applicant will need to answer in the near future to facilitate the approvals process. This is a normal and somewhat iterative process where the developer gauges the community support and concerns, and Council seeks information to inform a decision on whether the proposal presents a net benefit to the community.

A note on process:

This development application is at an early stage. The application was introduced to Council and the public at the April 26, 2022, Regular Council meeting. Given the amount and mix of affordable and attainable housing types proposed - and the need for appropriate housing in the community - the application has been moved to a Committee-of-the-Whole (CoW) meeting in an expedited manner. Depending on the feedback from the public Open House and the discussion in the CoW meeting, staff expect that the proponent will quickly indicate a preferred direction among the following typical paths:

i. reconsider the concept, and go back to the drawing board to make major changes to the application;
ii. adjust or clarify aspects of the proposal and move forward with the application – seeking approval for some or all of what has been shown to date; or
iii. continue with the application in its current form, and pursue next steps to seek community approval, adoption of bylaws, issuance of permits, etc.

Site features, prior approvals and environmental values

The property at 221 Minato Road (Lot B, Plan VIP79908 Clayoquot District, District Lot 286) is a 10 ha (25-acre) parcel located on the north side of Peninsula Road and on the west side of Minato Road, adjacent to Olsen Bay and the Ucluelet Inlet to the north.

This property had considerable environmental value prior to extensive logging and clearing by the previous owners, in late 2016. Two fish bearing streams and associated riparian areas cross the site, one of which was been impacted by the site clearing. In 2019 site restoration work began under the guidance of a Qualified Environmental Professional (QEP) after the District issued Development Permit DP19-01 for that work. The project biologist confirmed that the replanting work along the stream corridor and shoreline was completed as directed (see **Figure "2"**):

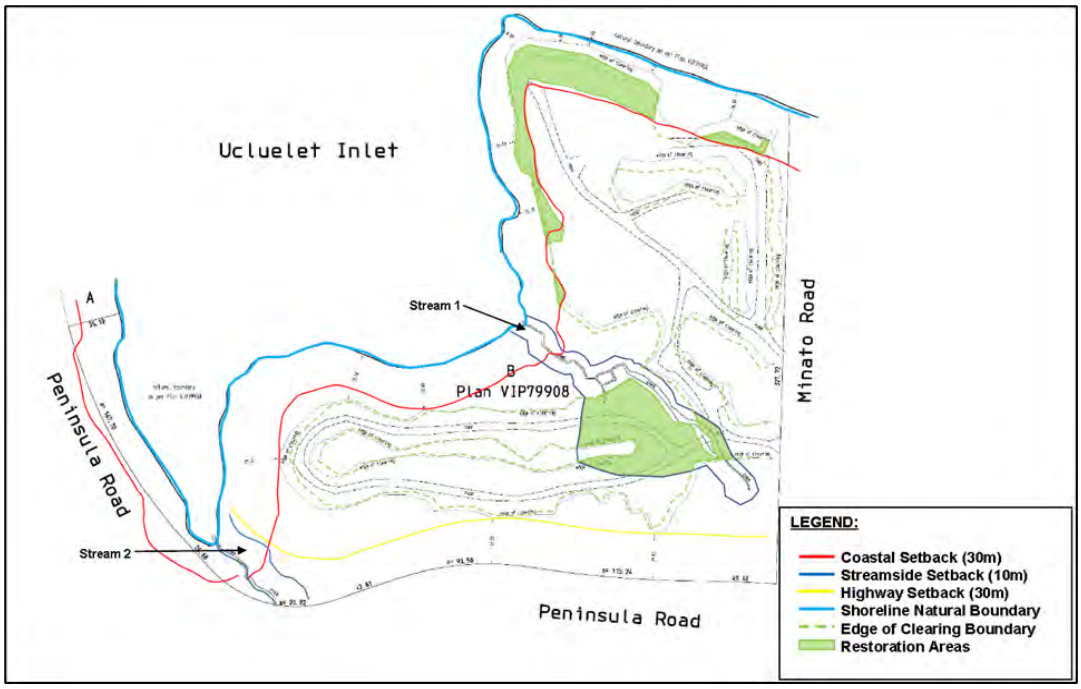


Figure 2: restoration areas (green) under DP19-01

In November of 2019, with the adoption of Zoning Amendment Bylaw No. 1244, the property was rezoned for a mix of GH – Guesthouse, CG – Campground, and P1 – Public Institutional zoning designations (see **Figure "3"**):

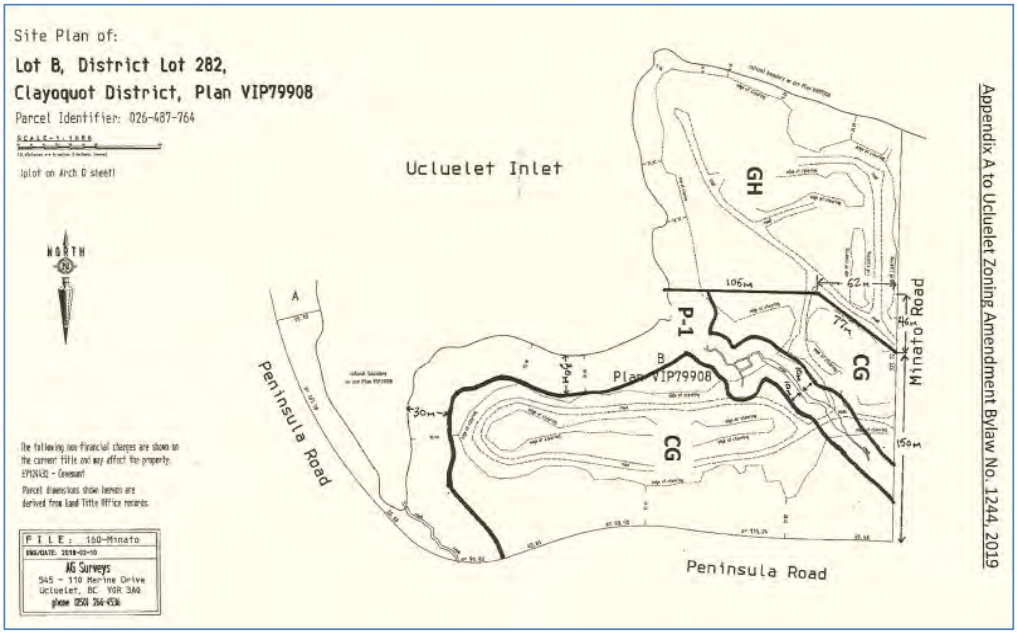


Figure 3: current Zoning designations

As part of the 2019 rezoning process, the owners offered to register a restrictive covenant on the title of the property to assure that a number of commitments would follow as the property was subdivided and developed for the proposed campground and guesthouse. These commitments include:

- Subdivision according to the approved plans;
- Dedication of park land along the stream corridor and shore of Olsen Bay next to the campground parcel (the areas zoned P-1);
- $10,000 payment toward 2 viewing platforms;
- $50,000 payment toward the stream corridor pedestrian trail;
- A further covenant to be registered on the guesthouse parcel ensuring:
    a. Protection of the green space along the shoreline of Olsen Bay; and,
    b. Prohibiting any further subdivision unless the 30m shoreline green space bordering Olsen Bay is dedicated as public park and the owner provides 100% of the cost of constructing a public trail along the shoreline green space.

"Minato Bay" proposal:

Ownership of the property subsequently changed. The new owners are applying to rezone the property for a mix of vacation rental, single-family residential and multi-family housing, including

"attainable" and "affordable" ownership, market rental and affordable rental units. The proposal indicates that 78% of the units will be attainable or affordable. The proposal includes all of the park and road right-of-way dedications anticipated in the previous rezoning (and covenant registered on the property title).

Housing:

The Ucluelet OCP includes the following policy **Policy 3.134:**

"Ensure larger developments are required to provide affordable housing as a portion of each development phase. Completion of the Land Use Demand Study (underway) and Housing Needs Assessment (2021) should provide guidance for the District to adopt targets for percentages of affordable housing in new developments. As a starting point, target a minimum of 75% of housing in new developments to be attainable by Ucluelet resident households."

The Minato Bay development proposes to create 84% housing in the first phase and 78% overall that is "attainable" – this includes market rental units as well as a portion of rent-restricted affordable rental units. The 70 rental housing units shown in the first phase represent 57% of the phase 1 units.

There are a variety of ways to define what is "affordable" (affordable for whom?) and "attainable".

In Canada, "affordable" often defaults to the CMHC definition of a household earning 80% median income (in Ucluelet this would equate roughly $50k annual household income), spending no more than a third of their income on housing costs. The term "attainable" is useful when considering those households which earn more than the 80% median income level but who cannot afford to buy or rent the housing which is available on the free market without spending more (sometimes significantly more) than 30% of their household budget on housing.

The following graph (**Figure "4"**) from the 2021 West Coast Housing Needs Assessment illustrates how the market price of housing has rapidly diverged from what can be afforded by most households in the community:

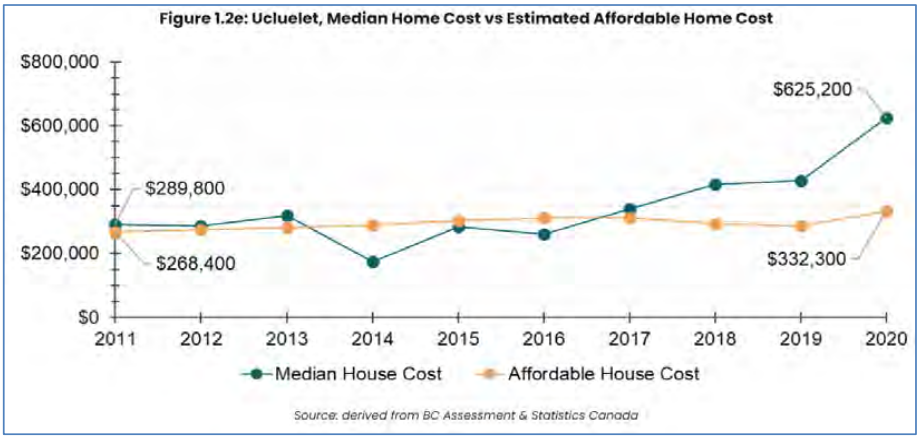


Figure 4: Ucluelet median home price vs. what is affordable to median household

The proponent defines “attainable” as *“housing that can be attained by a significant portion of the local staff and resident community in Ucluelet, now and for the life span of the community”.*

The applicants should be commended for approaching this project with a goal to create a mix of housing types, sizes and tenures. Not all of the details are yet known; the applicants have shown awareness and willingness to work with the District to define the details of the affordable and attainable housing - and the mechanisms to create and maintain the levels of affordability they are proposing.

A consideration is that the type and size of housing is no longer enough to constrain market prices to bring units into the “attainable” range. Smaller home, lots and multi-family units may have been attainable by the median household even a couple of years ago, but the recent prices of both new and used multi-family units (even in buildings where short-term rentals are not a possibility) are far beyond the purchasing power of the median Ucluelet household. The 2021 Housing Needs Assessment pointed to the need for Ucluelet to build an increasing supply of non-market housing to address the needs of the community. Units created by private developments have a role to play in this, and various mechanisms can be used to ensure that the affordability and attainability carries through. Again, not all the details are in hand, but the current proposal is – at this point – heading down the right path. A few points to consider:

- additional supply of market rental units (not short-term rentals: long term leases to residential tenants) is a positive contribution to the housing supply in Ucluelet;
- restrictions on sale price or rental rates can be achieved by covenants and housing agreements;
- since the provision of affordable and attainable housing will factor into the rezoning decision, the details of any housing agreements and covenants will need to be flushed out ahead of a public hearing on any rezoning bylaw;
- rent-restricted or price-restricted units, and their covenants, need to be overseen by a third party in the role of “housing authority”. That function does not currently exist in Ucluelet but is needed, particularly if we see more developments coming forward proposing a mix of market and non-market housing types. The housing authority role can be accomplished in different ways; options and recommendations will be the subject of a separate report to Council in the very near future.

Growth and Density

The "Low(ish) Growth Scenario" in the Ucluelet OCP projected the development of 1140 new residential units and 335 new tourist accommodation units over the next 30 years. The development currently proposed for the subject property shows a total of 212 units: 165 housing and 47 tourist accommodation in waterfront houses. This equates to 14% of the total development projected under the growth scenario shown on Map 9 of the OCP.

The Minato Bay proposal is a large development for Ucluelet. If 212 units are approved for this site, the community should be satisfied that the mix of housing hits the right balance to create a net benefit for the town.

The pace and amount of new development is influenced by the sum of many individual decisions. The community lacks affordable rental and ownership housing options. Simply building more housing will not solve the problem, without ensuring that the unit mix is delivering the right types of housing - including enough non-market housing - to do its share of meeting the needs of Ucluelet residents. Doing otherwise would simply fuel growth to accommodate more visitors, second home owners and future residents.

Financing the construction of new infrastructure and less profitable (i.e., more affordable) housing units is balanced by the sale of premium units at the highest price the market will bear. The application proposes that 47 waterfront homes be zoned to allow for whole-house nightly vacation rental. These would be premium investment properties; those units would not function as housing serving the community, rather they would be a form of commercial tourist accommodation and an investment product. If this land use is supported in the zoning, it would be important that the developers and the municipality put adequate mechanisms in place to ensure that the other 78% of the units are truly affordable to a range of Ucluelet resident households.

Short-term vacation rentals (STR's) within standalone single family "homes" is potentially a lucrative commercial investment. The 47 waterfront units proposed for this use should not be confused with homes – although constructed to look like a house and taxed as if it were a residence, these units command prices that reflect their investment potential, and have different impacts on the community as a form of commercial accommodation. The "AirBnB" house also does not bring with it the other investment, infrastructure and jobs that an equivalent hotel suite would carry. Approving a portion of standalone short-term rental houses in the requested zoning should only be done as part of a clear and careful balance between all aspect of the proposed development.

Access & Circulation

The preliminary plans submitted for the proposed Minato Bay development show the access to be two internal loop roads accessed from the Peninsula Highway from the existing intersection at Minato Road. The applicants have provided a traffic study to support this approach, which identified the need for some improvements on the highway to enable safe queuing and turning movements.

Staff review of the proposal has identified that for improved sight lines and the long-term planning for growth in the community, the primary access to the development should be considered approximately 220m to the west. The OCP long-range land use plan anticipates a future intersection in this location at the top of the rise, where visibility is improved and a future road would extend to the south (see **Figure "5"**). This alignment would provide better visibility for vehicles and for a pedestrian crossing to the multi-use path running parallel to the highway:

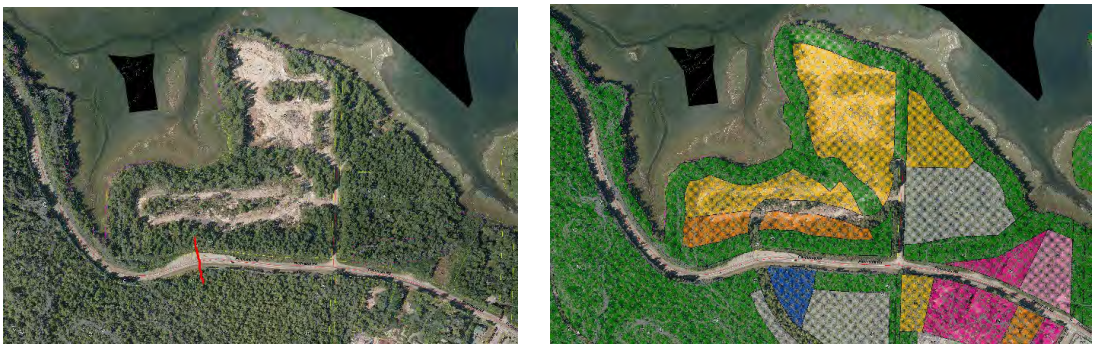


Figure 5: Approximate alignment of future intersection (left) and OCP overlay (right)

In this configuration, the current Minato Road entrance could remain as a right-in access from the westbound lane of Peninsula Road. The through-connection from the new intersection to the current Minato Road would also provide two points of access for emergency purposes. Engineering design has not been completed for the road access, nor has the Ministry of Transportation and Infrastructure approved any changes to the highway at this point; that more detailed work would be required as part of the subdivision approval stage. The applicants have begun the work at this earlier stage to understand the District's requirements and the associated costs. The cost of constructing any road improvement works, including pedestrian pathways and crossings, would be borne by the developer.

The park dedication and trail construction anticipated by the previous campground proposal has been included in the current Minato Bay proposal. New footpaths would also connect through the site, providing residents of the new neighbourhood connections to the shared open space and amenities proposed by the developers. A new public trail following the shoreline and stream corridor would provide connection to the Wild Pacific Trail (WPT) at the Ancient Cedars trailhead. These new trail connections are key parts of connecting the Wild Pacific Trail to the Safe Harbour Trail on the inlet, providing an opportunity to experience the salt marsh and waters of Olsen Bay and ultimately connecting the WPT to the centre of town. The trail connection through this site would enable parking on the Minato Road end to serve the WPT – preferrable to the highway shoulder parking which occurs at the Ancient Cedars.

Servicing

Analysis of the water and sewer servicing requirements has been initiated. Water servicing appears to be feasible, however - depending on building sizes - additional analysis will be required to determine whether the available fire flow is adequate or if offsite improvements would be necessary.

The analysis of sewer system capacity indicates that upgrades to three pump stations may be required (Peninsula, Hemlock and Fraser) to handle the additional flows generated by the proposed development.

The cost of offsite infrastructure upgrades necessary to serve the proposed development would be the responsibility of the developer. Understanding the total costs will be necessary for the proponent, as they weigh the total construction costs, mix of uses and the degree to which community amenities – such as more affordable forms of housing – fit within their development plans. Engineering and constructing the onsite and offsite infrastructure is required as part of the

subdivision process. A degree of engineering is required at this early stage for the developer to understand the servicing costs.

Tsunami risk

The Ucluelet Flood Hazard Mapping included mapping of lands subject to tsunami flood hazard, as shown in OCP map 5 (see excerpt showing the subject property in **Figure "6"**):

Figure 6: excerpt from OCP Map 5 showing tsunami flood hazard

Further site-specific analysis by Ebbwater Consulting identified that the tsunami Flood Construction Reference Plane for the site is at an elevation of 9.6m; the majority of the proposed housing development is located on lands below this elevation. Only the rental buildings in the first phase are located outside the mapped tsunami flood hazard. In response to the tsunami risk the developer shows a combination of regrading by adding fill material and building foundations atop pilings within the tsunami hazard areas. Further engineering work is necessary to determine the combination of structural foundation and geotechnical works that would be required to certify that the buildings and their occupant would be kept safe from tsunami risk – an engineered approach made possible by the recently adopted Tsunami Risk Tolerance Interim Policy #8-5280-1.

Measures for mitigating tsunami risks may also include risk management strategies such as warning systems and multiple evacuation routes. The roads and pathways discussed above may play a part in this. As a result of the more detailed engineering analysis for mitigating tsunami risks the proponents may choose to employ structural measures, adjust the siting of buildings, or both.

Whether the proposed rezoning were adopted or not, addressing the tsunami risk must be satisfied prior to subdivision approval. The Committee may wish to consider to what degree adding uses and densities to the zoning designation of the property is appropriate before the practical application of tsunami mitigation strategies are known in detail. The development is proposed to be built in phases over what may be a ten-year time span. A phased approach to development approvals may be worth considering given the evolving understanding of the tsunami risks and possible responses.

Questions for discussion:

The following areas are suggested as a starting point for discussion of community impact and how the proposed development fits within current District plans, policies, and infrastructure:

1. Number of units and density
2. Affordability
3. Access and circulation
4. Community benefit
5. Development approvals and phasing
6. Tsunami flood risk
7. Any changes that Council considers necessary at this point?

Next steps:

As noted above, the next steps will be determined in part by the feedback the applicant receives from the public and Council. The Committee may wish to indicate to the applicant and staff if there is a strong preference for how the application proceeds – essentially whether some or all of the development is ready for staff to draft zoning amendments for Council to consider at an upcoming meeting.

Respectfully submitted: BRUCE GREIG, DIRECTOR OF COMMUNITY PLANNING
DUANE LAWRENCE, CAO

Development Application

District of Ucluelet
Planning Department
200 Main Street, Ucluelet, BC
V0R 3A0, PO. Box 999
tel 250-726-4770 fax 250 726 7335

Type of Application

An application is submitted for one or more of the following:

- ☐ **Official Community Plan Amendment**
- ☒ **Zoning Bylaw Amendment**
- ☐ **Development Permit (no variances)**
- ☐ **Development Permit (with variances)**
- ☐ **Development Permit Amendment**
- ☐ **Development Variance Permit**
- ☐ **Temporary Use Permit**
- ☐ **Board of Variance**
- ☐ **Strata Conversion**
- ☐ **Subdivision**

RECEIVED
MAY 02 2022
District of Ucluelet

Description of Property

Civic Address (es): 221 Minato Rd
Legal Description: Lot B Plan 79908 Block _____ Section _____ DL 286,471,472

Applicant Information

Notice of Disclosure to Applicant(s): The following contact information will be available to the public and may be posted on the Districts' website to allow interested parties to contact you about this application.

Applicant name: Chris Bozman Company name: Minato Devlopment Co.
Mailing address: Po Box 221 Ucluelet BC Postal Code: V0R0A5
Tel : 604 848 4040 Cell : _____
Email : chris@bozman.ca Fax : _____

The undersigned owner/authorized agent of the owner makes an application as specified herein, and declares that the information submitted in support of the application is true and correct in all respects.

Applicant Signature: Christopher Bozman Date: _____

Registered Owner(s)

List all registered owners. For strata properties, provide accompanying authorization from all strata owners (not just strata corp.). If the owner is an incorporated company/society, attach a current corporate/society search or "notice of directors".

Registered Owner (s) name: Minato Devlopment Co
Mailing address: Po Box 221 Ucluelet BC Postal Code: V0R0A5
Tel : 604 848 4040 Cell : _____
Email : chris@bozman.ca Fax : _____

Freedom of Information and Protection of Privacy Act (FOIPPA): Personal information is collected, used and disclosed under the authority of the Local Government Act, and section 26 (c) of the FOIPPA. The information will be used for the purpose of processing this application.

Owner Signature: Christopher Bozman Date: _____

Office Use Only:

Folio No.:	File No.:	Date:	Receipt No.:	Fee:
196 036	RZ-22-03	May 2 2022		**7,700**

SITE PLAN

221 Minato Road

UCLUELET, BRITISH COLUMBIA.

Revised Rezoning Application

ISSUED FOR REZONING
MARCH 22, 2022

MINATO BAY

FORMOSIS architecture

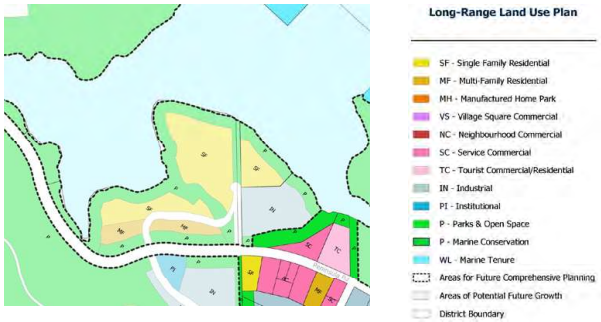
OCP AND CONTEXT

UCLUELET'S 2020 OCP

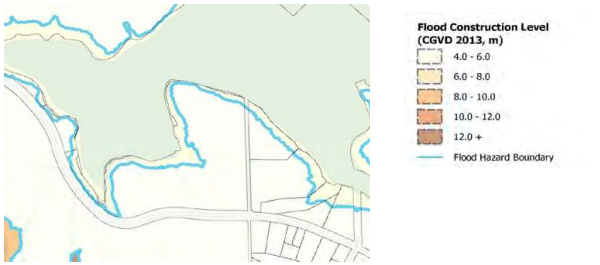
This site will be subject to these development permit areas:

- Multi-Family, Commercial & Mixed-Use (DPA IV)
- Terrestrial (Mature Forest) (DPA V)
- Streams and Riparian Areas (DPA VI)
- Marine Shorelines (DPA VII)

OCP LAND USE SUGGESTS SINGLE FAMILY AND MULTIFAMILY ON THE SITE.



FLOOD CONSTRUCTION LEVEL ONLY OCCURS IN 30M SHORELINE SETBACK



SATELLITE VIEW OF CONTEXT AROUND SITE

FORMOSIS architecture

MINATO BAY

LETTER OF INTENT

Minato Bay aims to create a sustainable neighborhood that allows nature and residents to flourish, by creating homes that connect people with nature. Our 24.8-acre site located at 221 Minato Rd in Ucluelet is a master planned community of attainable rental, and market rental modular units as well as attainable single family detached, duplex and townhomes.

Throughout the property we have integrated connectivity to the Wild Pacific Trail, outdoor common spaces including play areas, communal gardening plots and significant unaltered green space. In addition to the common green spaces we are also proposing to provide two covered open air gathering structures to give the community safe accessible locations to connect with each other and nature.

We understand that we're changing not only the landscape of Minato Bay but Ucluelet as a whole. The gravity of those changes are not lost on us; at our core we believe this project must stand the test of time. It is being designed and built with a 100 year focus to ensure that it becomes a long term community asset not only for those who will make it home, but for the larger West Coast community. Our team is excited to continue to work with the District of Ucluelet, and its residents to ensure that this project is a success for all.

FORMOSIS architecture

MINATO BAY

PROJECT DATA

221 MINATO ROAD — **March 22, 2022**

PROJECT DATA

Site Area	ft2	Acres	Hectares
Total Site	**1,082,977 SF**	24.86	10.06
30m Shoreline Dedication	-358,230 SF	-8.22	-3.33
Minato Rd Dedication	-27,638 SF	-0.63	-0.26
Buildable Site	**697,109 SF**	16.00	6.47

Site Coverage	**16%**	
Density Pre-Dedication	**21.1**	Units Per Hectare
Density Post-Dedication	**32.7**	Units Per Hectare

AREA SUMMARY	AVG. SIZE	UNITS (PHASE 1)	UNITS (PHASE 2)	AREA (GROSS)	EXCLUSIONS	AREA (NET)	FAR	UNITS	ATTAINABLE
Rental Housing	550 SF	70	28	53,900 SF		53,900 SF	0.08	98	46%
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Amenity	3,000 SF	1	1	6,000 SF	6,000 SF	0 SF			
		UNITS	**UNITS**	**AREA** (GROSS)	**EXCLUSIONS**	**AREA** (NET)	**FAR**	**UNITS**	**ATTAINABLE**
TOTAL (GBA)		**122** Phase 1	**90** Phase 2	**223,350 SF** (20,749.9 m²)	**6,000 SF** (557.4 m²)	**217,350 SF** (20,192.5 m²)	**0.31**	**212**	**78%**

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MINATO BAY

ATTAINABLE HOMES

At its core Minato Bay wants to see community grow and we know that this can not be achieved if the project is not designed to connect with the existing community in Ucluelet and throughout the West Coast. Our proposed design will create housing formats across the housing continuum that will allow for individuals, families and the community at large to continue to grow and prosper. Our vision is to provide a pathway that could potentially give the options of traveling the housing continuum from affordable rental all the way through to water front home ownership.

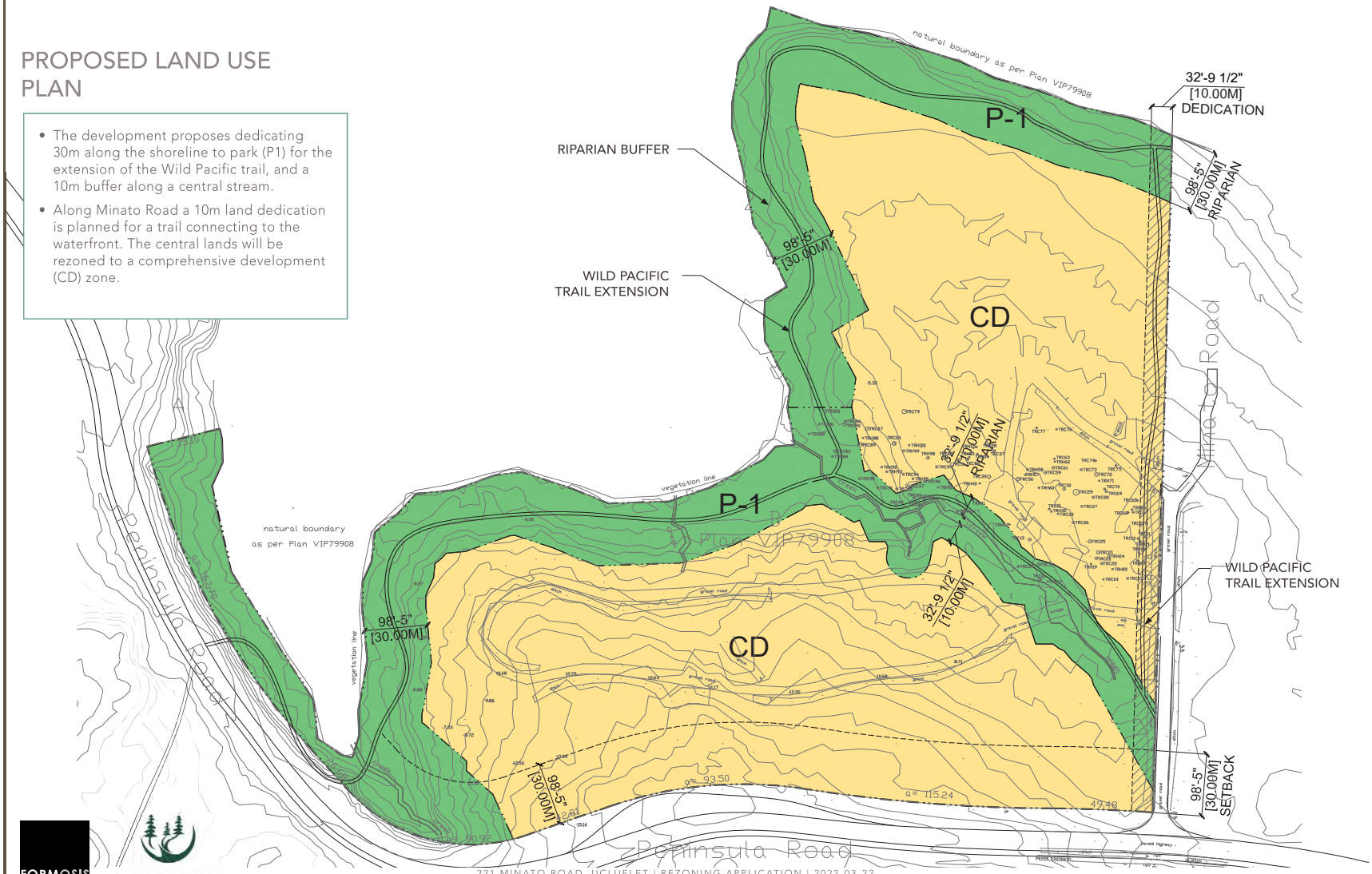
We define attainable housing as housing that services now and for the life span of the community. Knowing that stable long term rental housing is urgently needed within the community we are proposing 98 units of long-term rental housing within the project. This amounts to 46% of the proposed units being designated rental. During the first phase of the project we would look to construct approximately 70 units rental housing. We look forward to working with the District of Ucluelet staff and Council on determining an appropriate formula to achieve a number of units that will meet the BC Housing guidelines for affordable rental rates.

In addition to rental housing, we are proposing 67 units designed around growing families and those looking to enter home ownership. Utilizing a master planned community Minato Bay will cater to provide homes that local family's can comfortably grow into. These homes will be built to BC step code 3 or better with abundant amenity's located within the project site. We look forward to continuing to work with the DOU on coming up with a creative approach to not just make these homes attainable to the initial owners, but to make sure that they are attainable for those that come after. We are committed to working with the DOU on building a community that can help the current and ongoing housing needs of the area.

Our intent to produce attainable housing is sincere and something that all owners of the project are committed too. However, without clear guidelines and requirements set out by the District of Ucluelet it is very hard for us to be able to provide clear numbers and metrics currently. We all hope that from the work we have done to date and the vision that is displayed in our documents, that we can work with District staff, Council and local residents to provide a truly sustainable housing development.

PROPOSED LAND USE PLAN

- The development proposes dedicating 30m along the shoreline to park (P1) for the extension of the Wild Pacific trail, and a 10m buffer along a central stream.
- Along Minato Road a 10m land dedication is planned for a trail connecting to the waterfront. The central lands will be rezoned to a comprehensive development (CD) zone.



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MINATO BAY

SITE PLAN

LEGEND
- RENTAL HOUSING
- FAMILY HOMES
- STACKED TOWNHOMES
- WATERFRONT HOMES
- AMENITY

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MINATO BAY

PHASING

- Phase 1 comprises the lands along Peninsula Road. It comes first to bring much-needed rental housing to Ucluelet.
- Phase 2 extends the neighbourhood north and will be designed to mitigate tsunami risk at lower elevations.
- Build-out of the phases is expected to occur over ten years.

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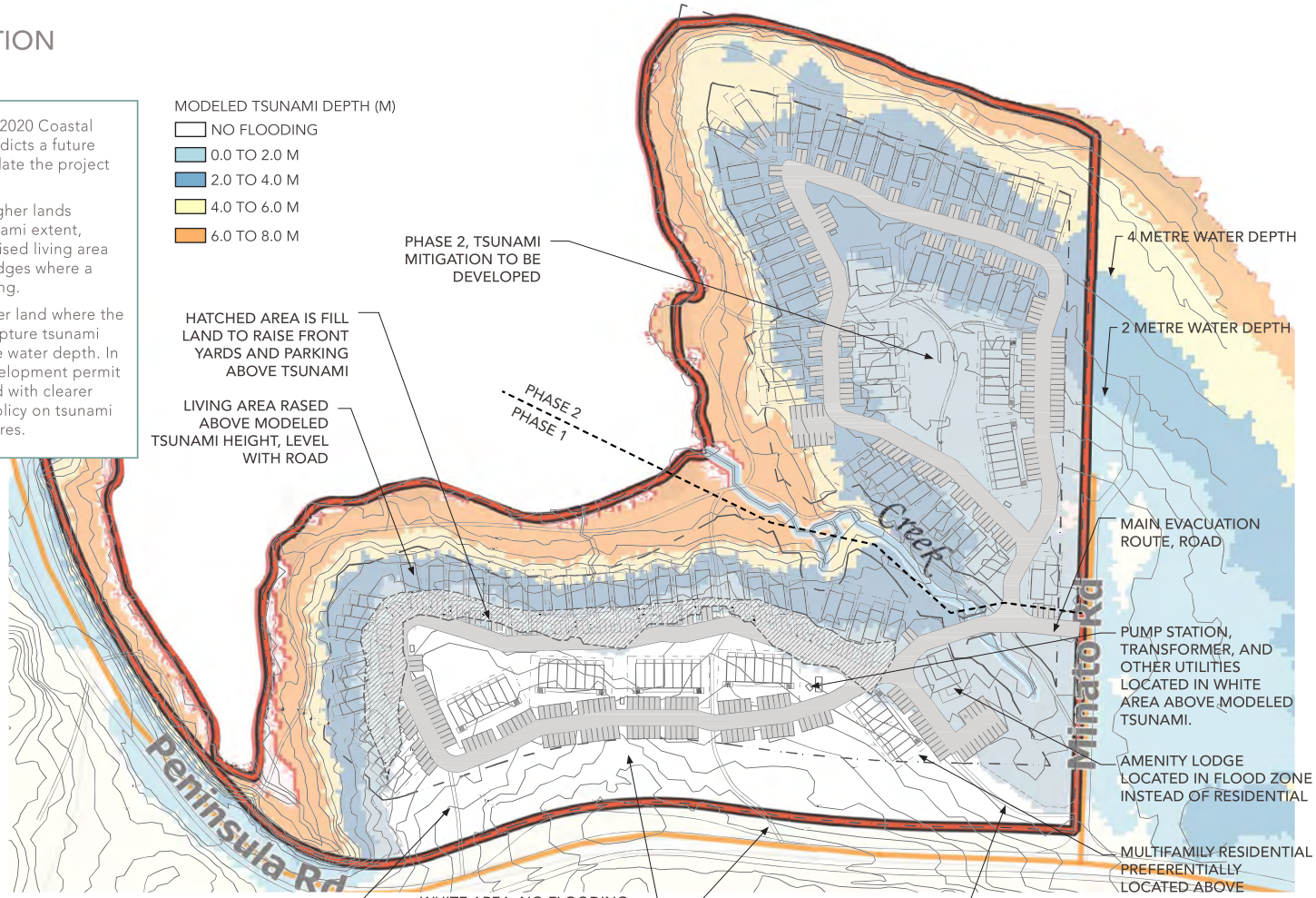
MINATO BAY

TSUNAMI MITIGATION

- Ucluelet commissioned a 2020 Coastal Flood Mapping which predicts a future large tsunami could inundate the project site.
- Phase 1 is built first on higher lands outside the modeled tsunami extent, and involves filling and raised living area for homes on the lower edges where a tsunami may cause flooding.
- Phase 2 is located on lower land where the modeled splay faulting rupture tsunami predicts two to four metre water depth. In several years a future development permit for phase 2 will be drafted with clearer provincial and Ucluelet policy on tsunami risk and mitigation measures.



FORMOSIS architecture

MINATO BAY

SITE SECTIONS

SECTION

TSUNAMI DEPTH (M)

- 0.0 TO 2.0
- 2.0 TO 4.0
- 4.0 TO 6.0
- 6.0 TO 8.0
- OVER 8.0

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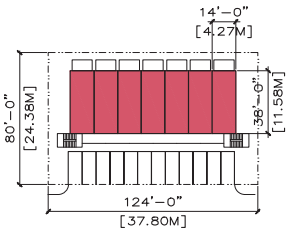
MINATO BAY


SITE SECTIONS
SECTION
Property Line
Road
Setback
Rental Housing
Road
Stacked Townhome
Setback
Property Line
Property Line
MODELED TSUNAMI FLOOD HEIGHT
Setback
FILL AND RAISED LIVING AREA ABOVE TSUNAMI ELEVATION
Setback
Property Line
TSUNAMI DEPTH (M)
0.0 TO 2.0
2.0 TO 4.0
4.0 TO 6.0
6.0 TO 8.0
OVER 8.0
FORMOSIS
MINATO BAY
221 MINATO ROAD, UCLUELET | REZONING APPLICATION | 2022-03-22
11

HOUSING TYPE: RENTAL HOUSING

- One Bedroom units, 550sf, modular, stacked in two storeys.
- Some two-bedroom units.
- Parking on asphalt in front along road.
- Great decks for all units, facing the water.



LOT PLAN

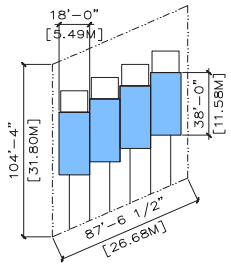
PRECEDENTS

FORMOSIS architecture

MINATO BAY

HOUSING TYPE: STACKED TOWNHOME

- Two storey townhomes stacked over one-bed apartments.
- Ground floor one bedroom units, 600sf.
- Two bedroom townhomes, 1200sf on second and third storeys.
- Strata for sale at more attainable prices than family homes.



LOT PLAN

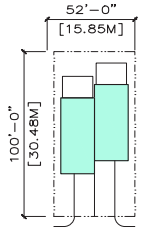
PRECEDENTS

FORMOSIS architecture

MINATO BAY

HOUSING TYPE: FAMILY HOMES

- Single family and duplexes.
- Range of sizes from 1400sf to 1700sf.
- One car parking in front, one in garage.
- Strata, with rental option.



LOT PLAN

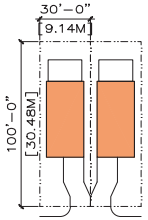
PRECEDENTS

FORMOSIS architecture

MINATO BAY

HOUSING TYPE: WATERFRONT HOMES

- Detached and townhome types at an average of 1850sf, three bedrooms+den/guest.
- One or two cars parked in front, one in garage.
- Strata, zoned for nightly rental or long term occupancy, some with a long term tenanted rental suite on ground floor.



LOT PLAN

PRECEDENTS

FORMOSIS architecture

MINATO BAY

PRECEDENTS - COMMON AMENITY

FORMOSIS architecture

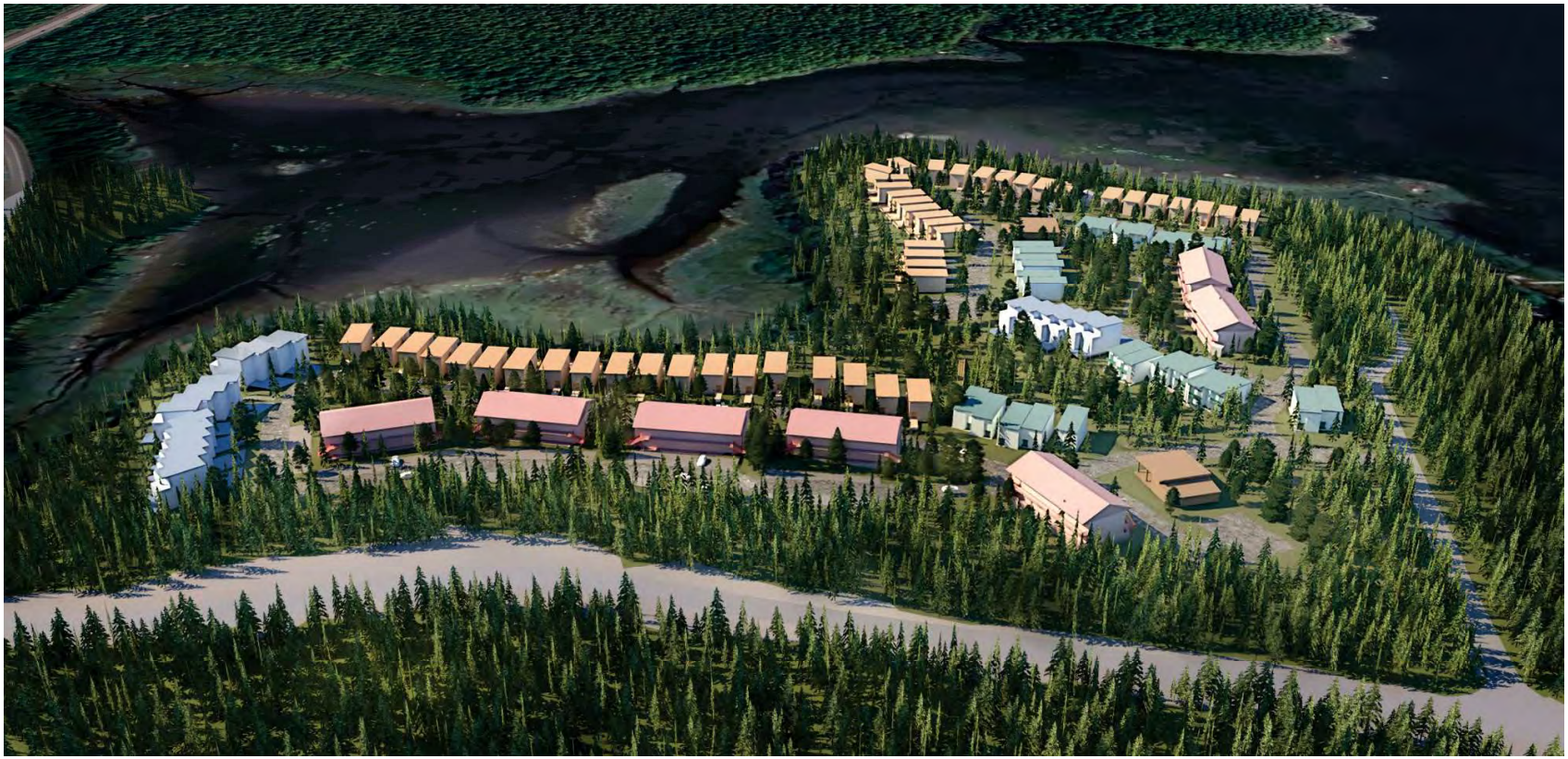
MINATO BAY

PRECEDENTS - FOREST AND TRAILS

FORMOSIS architecture

MINATO BAY

AERIAL PERSPECTIVE FACING NORTH



AERIAL PERSPECTIVE FACING SOUTHEAST

Ucluelet District Lot 286 – Flood Construction and Tsunami Inundation Levels for Proposed Development
Final Draft Report

28 January 2022

ebbwater CONSULTING

Ebbwater Consulting Inc.
510 – 119 West Pender St.
Vancouver, BC V6B 1S5
www.ebbwater.ca
EGBC Permit Number: 1000929

Project Number: P217

Disclaimer

This document has been prepared by Ebbwater Consulting Inc. for the exclusive use and benefit of Minato Developments It has been developed in accordance with generally accepted engineering practices and with full understanding of applicable natural hazard guidelines in the Province of British Columbia.

The contents may be used and relied upon by the officers and employees of Minato Developments. However, Ebbwater Consulting Inc. denies any liability to other parties who access and use this report.

Acknowledgements

This report was written by Jessica Cochran, M.Sc., E.I.T. (Texas) and reviewed by Tamsin Lyle, M.Eng., MRM, P. Eng. (Principal) of Ebbwater Consulting Inc.

We would like to acknowledge that this report was written at the Ebbwater office and home offices, which are located on unceded and Traditional Territory of the Coast Salish people.

Certification

Name, Qualifications, and Project Role	Organization	Signature
Tamsin Lyle, M.Eng., MRM, P.Eng. Senior Reviewer	Ebbwater	*(Signature and Stamp to be provided at project conclusion)*
Jessica Cochran, M.Sc., E.I.T. (Texas) Contributor	Ebbwater	*(Signature provided to be provided at project conclusion)*

Revision History

Revision No.	Date	Description	Remarks
1	17 Jan 2022	Draft Report	Shared with client
2	28 Jan 2022	Final Draft Report	Incorporates comments provided by the client and provides additional policy context.

Table of Contents

1 Introduction

Minato Developments (Minato) is proposing the rezoning and development of a 25-acre (10-hectare) site at Ucluelet District Lot 286, shown at 221 Minato Road in Figure 1-1. The 2021 Draft Site Concept details a mix of single- and multi-family homes, rentals, and vacation homes (Formosis Architecture, 2021). During the preliminary planning stage, Minato Developments documented the tsunami hazard at the site as an issue to be studied further and discussed.

The District of Ucluelet (District, DOU) regulations relating to flood hazards are in flux due to new information and a changing climate. The District suggested that Minato engage Ebbwater Consulting Inc. (Ebbwater) to consider flood construction and tsunami inundation levels at the site and ensure that the development would align with forthcoming regulations.

This document outlines the assessment for flood construction and tsunami inundation levels for the development site shown in Figure 1-1, based on the publicly available 2020 District of Ucluelet (DOU) Report (Ebbwater Consulting Inc. and Cascadia Coast Research Ltd., 2020).

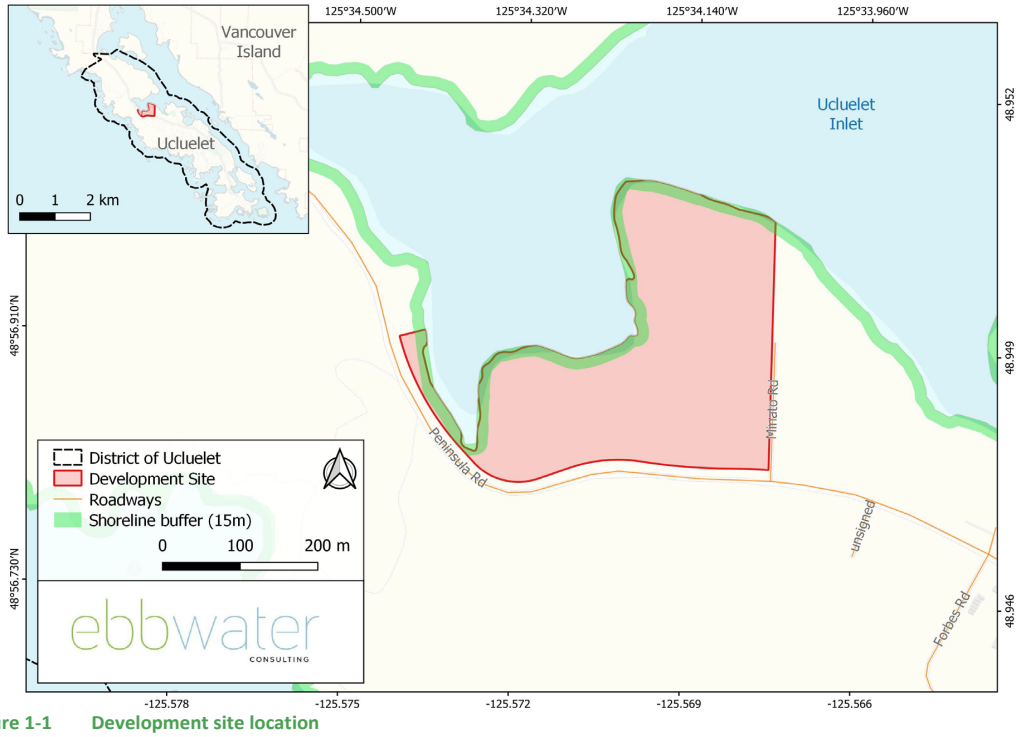


Figure 1-1 Development site location

1.1 Development Site Location

The DOU spans the Ucluth Peninsula on the west coast of Vancouver Island. While the western and southern sides of the peninsula are exposed to the open ocean, the eastern side along the Ucluelet Inlet is more sheltered. The 25-acre development site is located along this more sheltered stretch (Figure 1-1).

The proposed development includes 84 rental housing units, 50 family homes, 67 vacation homes or suites, and 2 amenity buildings according to the Draft Site Concept. The proposed units are distributed outside of the local setbacks (i.e., the 30.0 m coastal setback and 10.0 m environmental or creek setback as well as the roadway setbacks).

The development site is bound by the inlet to the north and Peninsula Road to the south. The site is bisected by a creek as shown in Figure 2-1. West of the creek varies in elevation from a higher section at approximately 14.0 metre (m) geodetic elevation toward Peninsula Road (Frontera Geotechnical, 2021) to the lower shoreline. Northeast of the creek gradually slopes from a lower 9.0 m geodetic elevation near Minato Road down to the shoreline and creek.

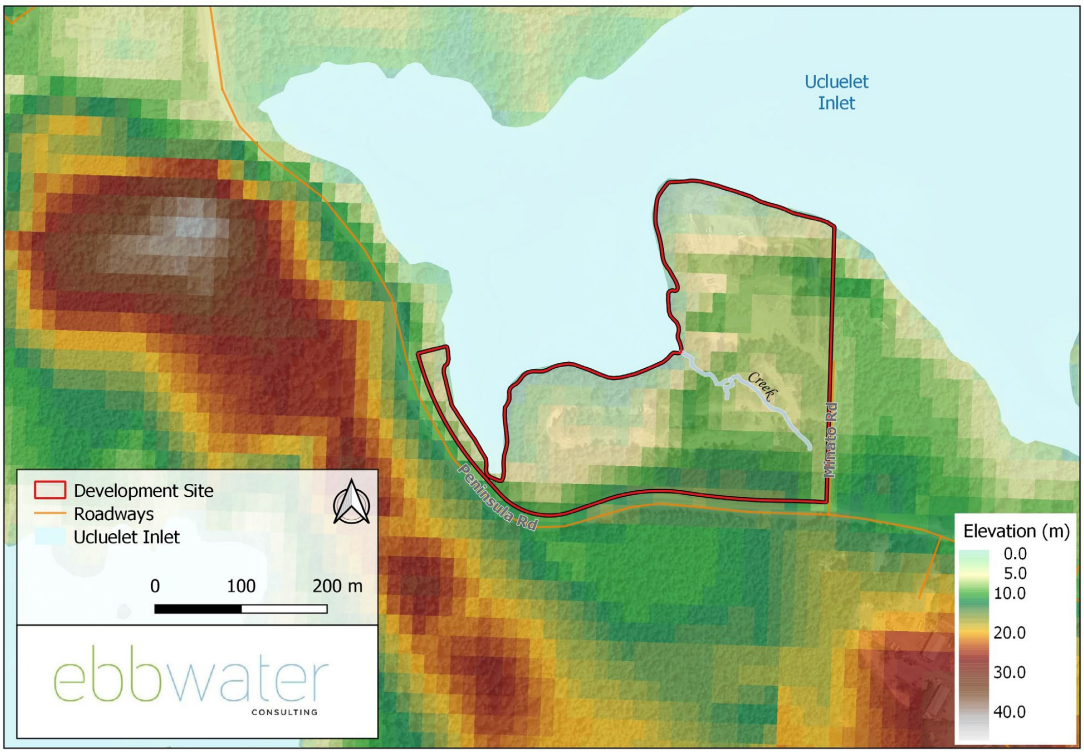


Figure 1-2 Development site elevation in m CGVD28 (2017 10-m CDEM). Update with 2015 LiDAR provided by DOU.

2 Policy Context

As noted in the introduction, natural hazards policy for coastal areas is in flux within the District. This is also true for the Province of BC. The following provides some brief context on existing and changing regulations and guidance.

2.1 British Columbia Policy Context

The Province of BC grants local governments authority to manage hazards under the *Local Government Act*, which authorizes a local government to designate land as a flood plain, to specify the flood construction level for that floodplain and specify setbacks or landfill and structural supports within the floodplain.

In support of the above legislation, the Province has also prepared the *Flood Hazard Area Land Use Management Guideline*, which provides additional information on how to define and designated a floodplain, as well as information on acceptable building practices (i.e. how to apply an FCL in practice). This document was original released in 2004 around the same time as the *Local Government Act* was promulgated. It was revised in 2018 in recognition of climate change and sea level rise. Changes were made to help local governments better define future flood plain areas. Changes to reflect best practice policy for the use of flood hazard areas (e.g., spatial variation in policy, use of property-level flood protection and/or flood-resilient design) have not been made to date. Specific guidance relevant to the project site follows below.

Further, we note that natural hazards policy in BC is in flux. In the wake of recent damaging flood and wildfire events, BC is proposing to update the Emergency Program Act (EPA), to better reflect the direction of the Sendai Framework (the international blueprint for disaster risk reduction), to which BC is a signatory. The EPA modernisation timeline has been derailed by the COVID19 disaster, and no new dates for engagement and ultimately promulgation have been defined. However, it is the authors' understanding that BC wishes to continue moving towards a risk-based approach to hazard management. That is, an approach that considers likelihood and potential consequences of a hazard event as opposed to defining a hazard severity standard (e.g., the 0.5% AEP flood event).

2.1.1 Coastal Flood

In 2011, the Government of BC commissioned a number of reports that provide guidance for land use planning and mapping in consideration of coastal flood hazards and SLR (Ausenco Sandwell 2011a, 2011b, 2011c; Kerr Wood Leidal 2011). Collectively, these documents are referred to as the *Provincial Guidelines*. The guidance in these documents was further refined in the Association of Engineers and Geoscientists British Columbia (APEGBC, now EGBC) Professional Practice Guidelines for Flood Mapping in BC, released in 2017 and referred to in this report as the *Professional Practice Guidelines* (APEGBC, 2017).

The *Provincial Guidelines* define a number of key water levels to be used in flood planning and mapping (see also Section 4.1).

Designated Flood Level (DFL). The DFL is the still water level resulting from a chosen flood hazard event or designated storm.

DFL =

Future SLR Allowance

+ High Tide (HHWLT)

+ Total Storm Surge (deep water storm surge + estimated wind set-up + inter-annual climate variation)

Flood Construction Reference Plane (FCRP). The FCRP is the maximum level that flood water is predicted to reach, based on analysis.

FCRP =

Designated Flood Level (DFL)

+ Estimated Wave Effect

Flood Construction Level (FCL). The FCL is an elevation relative to the Canadian Geodetic Vertical Datum (CGVD), and it is used in planning to establish the elevation of the underside of a wooden floor system (or top of concrete slab) for habitable buildings. It includes a freeboard (for safety) to account for uncertainties in the analysis.

FCL =

Flood Construction Reference Plane (FCRP)

+ Freeboard

The FCL is extended from the shoreline horizontally landward, until the land surface elevation reaches the FCL. All land with an elevation below the FCL landward of the shoreline is considered within the FCL extent.

2.1.2 Tsunami

Ucluelet is in Zone C of the Tsunami Notification Zones for BC (GeoBC, 2015) and therefore subject to significant tsunami hazard. Guidelines for areas subject to significant tsunami hazard are in Flood Hazard Area Land Use Management Guidelines (Amended 2018), Section 3.5.6. The following is stated in direct regard to tsunami hazards:

- Tsunami setbacks and elevations should be required for new lots created through the subdivision approval process. Tsunami hazard requirements and regulations for existing lots may be determined by local governments on a site specific or regional basis.
- The “standard” setbacks and elevations in sections 3.5.5.1 to 3.5.5.4 [of the guidelines] above apply to all coastal areas outside of the Strait of Georgia, except for new subdivisions subject to significant tsunami hazards, in which case the tsunami setbacks and elevations shall apply. Where the tsunami hazard is low, the greater FCLs and setbacks shall apply.
- A subdivision application in a tsunami prone area must include a report by a suitably qualified Professional Engineer, experienced in coastal engineering who must formulate safe building conditions for each proposed lot based on a review of recent Tsunami hazard literature including the report, “Modelling of Potential Tsunami Inundation Limits and Run-Up”, by AECOM for the Capital Regional District, dated June 14, 2013, plus the historical report, “Evaluation of Tsunami Levels Along the British Columbia Coast”, by Seaconsult Marine Research Ltd., dated March 1988.

At a minimum, building conditions should protect improvements from damage from a tsunami of equal magnitude to the 28 March 1964 tsunami that resulted from the Prince William Sound, Alaska earthquake and a possible Cascadia Subduction Zone earthquake.

- Setback requirements should be established on a site-specific basis and consider tsunami hazards. The setback must be sufficient to protect buildings and must be at least 30.0 m from the Year 2100 estimated natural boundary.
- FCL requirements should be established on a site-specific basis and consider tsunami hazards. Reductions to these requirements should only be considered where the building can be built to the Tsunami FCL on bedrock.

2.2 Nearby Guidelines

The nearby District of Tofino (Tofino) completed modern coastal flood mapping in 2019, a year before the DOU. These maps were and integrated some findings in the nearby District of Tofino Official Community Plan to support planning and emergency management (in compliance with Part 14 of the *Local Government Act*). Tofino also recently passed a Floodplain Bylaw to support risk reduction from coastal floods. Both Ucluelet and Tofino are peninsulas on the west coast of Vancouver Island and therefore at risk to similar hazards such as coastal floods, tsunami, and sea level rise.

- Current [tsunami] protocol is to move to high ground if shaking is felt and not to wait for an official warning. A safe planning level has been designated to be above 20 m, however, preliminary tsunami modelling and mapping is required to confirm this, identify high ground (safe areas), and help in determining the most effective evacuation routes.
- Community resiliency is improved by locating future development in areas that are less susceptible to the impacts of sea level rise, coastal flooding, and tsunami inundation and reducing pressure on emergency evacuation routes. (p. 43)
- Prioritize evacuation planning and the development of evacuation options to mitigate the impacts of tsunami hazard. (p. 45)

3 District of Ucluelet Policy

As for all Local Governments the DOU sets out policy related to development generally, and development within hazardous areas within its Official Community Plan, and related bylaws and regulations. The current OCP, from 2011, is currently being updated. A draft version of the OCP from 2020 is available.

3.1 Land Use Policy

The long-range land use plan, in the draft OCP, at the development site currently shows three categories (Figure 2-2). The area is split evenly between parks and open space and residential. The parks and open space landuse follows the three types of setbacks mentioned. The residential plan is for single and multi-family landuse.

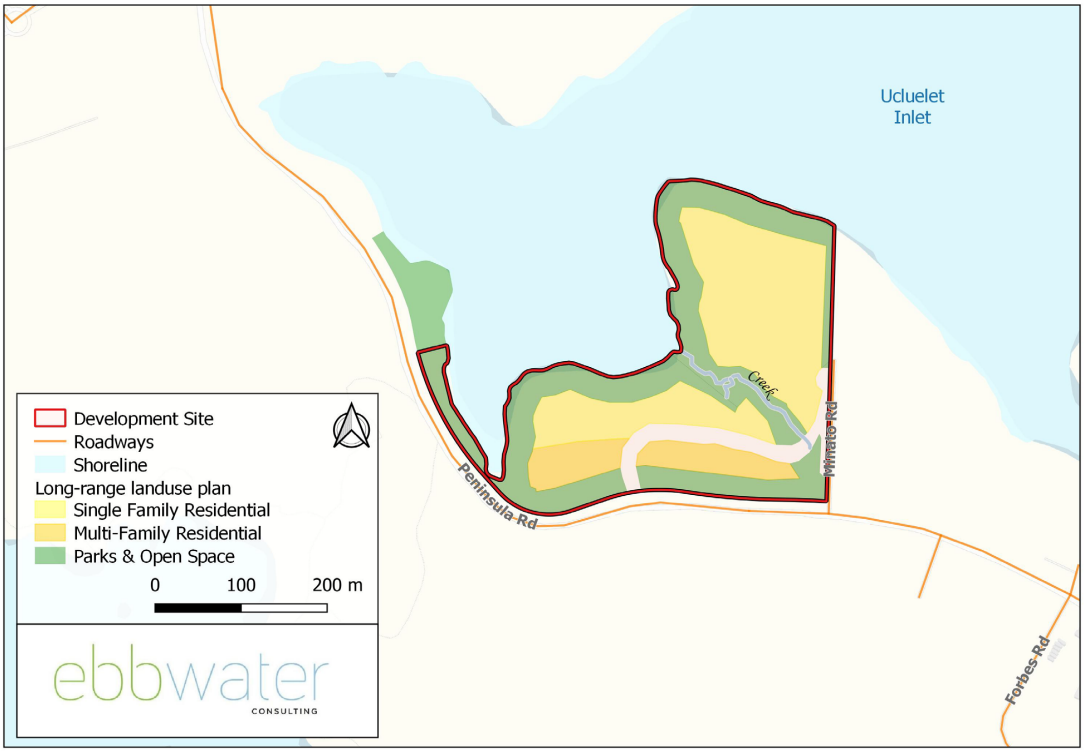


Figure 3-1 Long-range land use plan at the developmnent site based on the DOU Draft Official Community Plan.

3.2 Natural Hazards Policy

As it currently reads, the draft OCP outlines general concerns for flood hazards, explaining that the sea level on the west coast of Vancouver Island will rise approximately one metre by 2100. Therefore, development along the coastline must minimize negative impacts that rising sea levels may have on the built environment and the safety of residents.

Relevant policies related to coastal flood and tsunami include:

- "establish and undertake the work, as necessary, to refine Flood Construction Levels (FCLs) to ensure new development and infrastructure avoids the impacts of rising sea levels" (Policy 2.34).
- "conduct flood risk mapping for sea level rise and use results to communicate and manage risks" (Policy 2.50)
- The development of Development Permit Areas (DPA) for hazardous areas, including flood. (DPA VIII). Several guidelines related to the DPA are also included, which describe the need for a qualified professional to provide a report, and also certify the land safe for the use intended.

The draft OCP also notes the following:

- Pg 48, the DOU notes that parks and open space designated areas often have high habitat value and/or flood potential.
- Pg. 91, the DOU will consider a floodplain bylaw to clarify expectations for flood construction levels.
- Pg. 121 (within the DPA explanatory notes) “It is the District policy that it is in the public interest for new subdivisions and developments to be planned to avoid area of potential flood risk.”

4 Coastal Hazards at the Project Site

The DOU supports the policy process with research and projects. Therefore, to account for climate change and future sea level rise, the 2020 DOU Flood Mapping Project was completed to develop updated flood hazard information. Ucluelet is currently working to apply the 2020 DOU Report flood mapping results into regulations and bylaws with the goal of reducing community risk to flooding. A brief background on the calculations, limitation and results from the report follow.

The flood hazard modelling and mapping conducted under the DOU project looked at multiple coastal storm events as well as tsunamis. For the coastal storms, historic and projected future wind and wave conditions were established, and these were then used to force computer models of the region. The more localised effects of coastal storms which vary depending on the aspect and shape of the local shoreline, where then calculated.

The flood hazard modelling and mapping relied on characterizing the Ucluelet shoreline, which was done by cutting transects at intervals along the shore to represent contiguous reaches, where the conditions that affect how water moves onshore (slope and aspect) are relatively similar.

This slope along the shore was characterized by 48 cross-shore transects at 500-m intervals around the inlet and peninsula for the flood mapping project calculations. Among the transects, one intersected the development site, rather than only characterizing the nearby or adjacent lots, representing the surface elevation for the development site and reach. Still, variability in shore slope conditions, such as that due to erosion or changes in sea level rise, will result in variability in the storm hazard calculations, rendering the results less reliable.

Variability in shore slope conditions within the development site will result in variability in the storm hazard calculations that has not been captured (Ebbwater Consulting Inc. and Cascadia Coast Research Ltd., 2020). The slopes across both sides of the site are low to moderately sloped. Figure 2-2 shows the location and elevation of the transect used for calculations in the DOU Report, Transect No. 24. The slope of the transect is approximately 5.2% (from 115 m to 270 m distance). Of that, the slope down to the shoreline is slightly steeper at 9.3% (from 230 to 270 m distance). The shore slope around the development site tends to be slightly steeper, estimated from the last 5-30 m at the shoreline, closer to a 30% slope, as the land descends toward the inlet. If the site were less steep than the representative transect, then the calculations may not be appropriate for the site. However, since the development site shore slopes are generally steeper, calculations should be appropriately conservative.

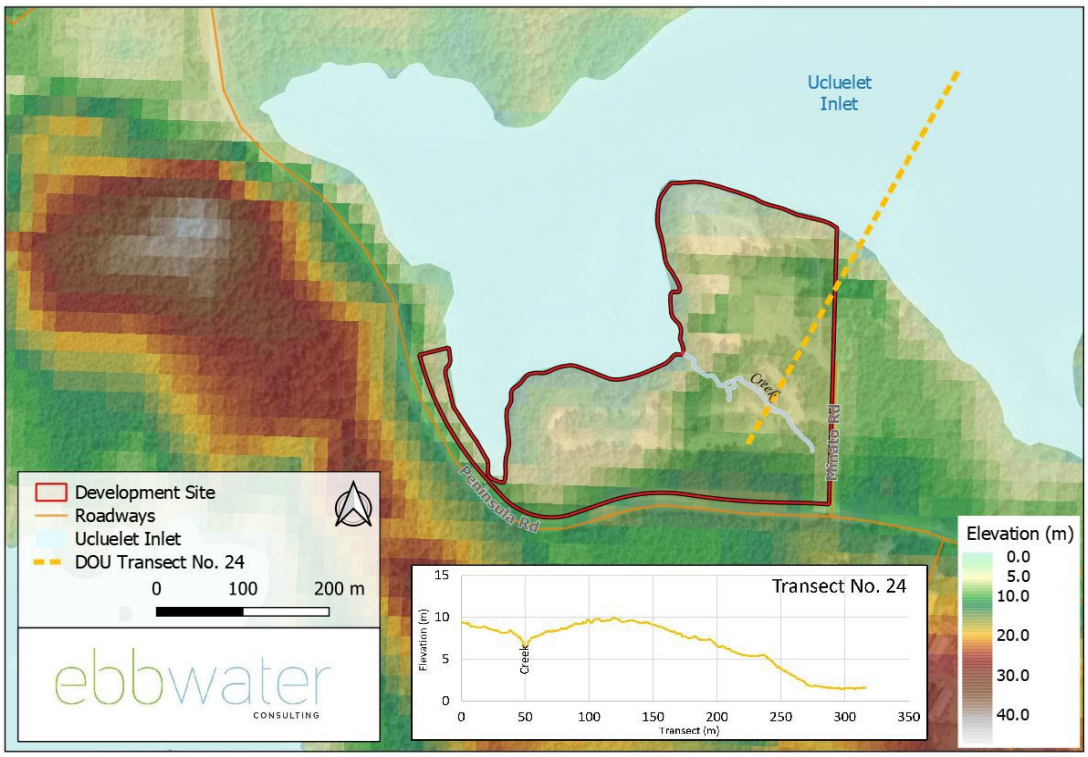


Figure 4-1 Development site elevation (m CGVD28) with transect slopes.

For the complete methodology, results, and limitations of all reporting and mapping products, refer to the 2020 DOU Report (Ebbwater Consulting Inc. and Cascadia Coast Research Ltd., 2020).

4.1 Flood Construction Level for Coastal Storms

One of the measures used in policy to reduce risk is Flood Construction Levels, which describe the height of water for a flood scenario. FCL maps are based on hazard maps and a safety factor (i.e., the flood construction reference plane plus freeboard allowance). These FCL components, illustrated in Figure 4-1, were used to produce the maps in the 2020 DOU Report - Coastal Flood Hazard Map Atlas.

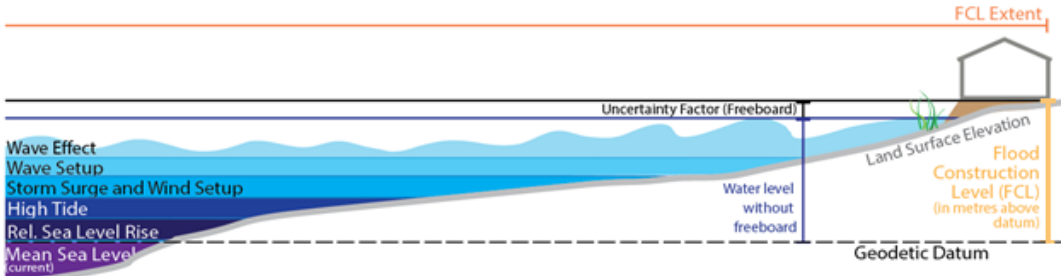


Figure 4-2 Components of total water level (MFLNRORD, 2018).

The atlas is thorough and provides different map types, such as the FCL and Sea Level Rise Planning Area maps, for a range of timeframes. To support short-term and long-term strategic planning and permitting, the mandated FCL maps were developed for both the near future and future scenarios (0.5 m and 1.0 m RSLR). We reviewed the more conservative future (1.0 m RSLR) scenario for the development site, to weigh the longer-term design life of the new development.

There is a wide range of FCLs throughout the DOU (4.0 to 12.0+ m) due to the complex shoreline variation around the peninsula. Therefore, the FCLs are grouped in zones to represent areas of similar hydraulic conditions and planning considerations. Figure 4-2 shows the future FCL coastal storm hazard by FCL zone and a flood hazard boundary line.

The development area, located on the more protected shoreline of the Ucluelet Inlet, is subject to Zone 15 with an elevation of 4.5 m for the future scenario, which is shown by the lowest FCL (tan, 4.5 m CGVD 2013) for Ucluelet. By contrast, the open-ocean shore of the peninsula is subject to elevated FCLs, as shown in the lower left corner of the figure. The difference in shoreline characteristics are considered in zoning. The flood hazard boundary shows the edge of the FCL. For the development site, the flood hazard boundary is contained within the proposed 30.0 m coastal setback. Therefore, the FCL is not an issue for the development site (see also Figure 4).

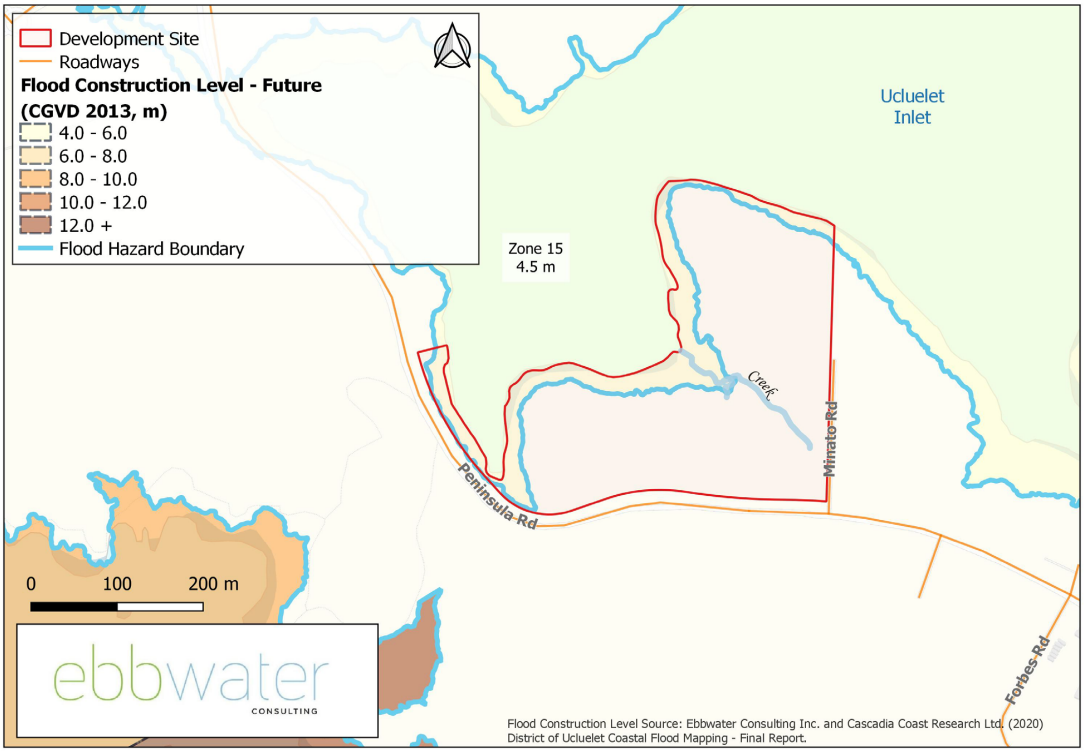


Figure 4-3 Coastal Storm Flood Planning Support Map for Flood Construction Level – zones for rare event (future - 0.5% Annual Exceedance Probability (AEP) + 1.0 m RSLR + 0.6 m freeboard).

The estimated FCRP and FCL for rare event coastal storm hazards is presented in Table 4-1. The FCLs based on three RSLR scenarios (0.0 m, 1.0 m, and 2.0 m) are shown for context. However, the future scenario of 1.0 m RSLR is the most applied scenario in BC, as it is referenced in the 2018 Flood Hazard Area Land Use Management Guidelines (MFLNRORD, 2018). The 1.0 m RSLR scenario is a reasonable and conservative basis for evaluating the coastal storm hazard.

Within Ucluelet Inlet, tides are often the largest contributor to high water levels and storm surge is the second. Waves rarely exceed 0.5 m in the sheltered areas on the inlet.

Table 4-1 Estimated coastal storm hazard FCRP and FCL for a rare event (0.5% AEP) and 0.0 m to 2.0 m RSLR.

Event	RSLR scenario (m)	FCRP (m CGVD28)	FCL (m CGVD28)
Near Future	0.5 m	2.7-3.0	4.2
Future	1.0 m	3.7-3.9	**4.5**
Far Future	2.0 m	4.7-4.9	5.5

FCRP = Tide + RSLR + Storm Surge + Wind Setup + Wave Runup
FCRP read from 2020 DOU Report - transects 24-25
FCL = FCRP + Freeboard (0.6 m)

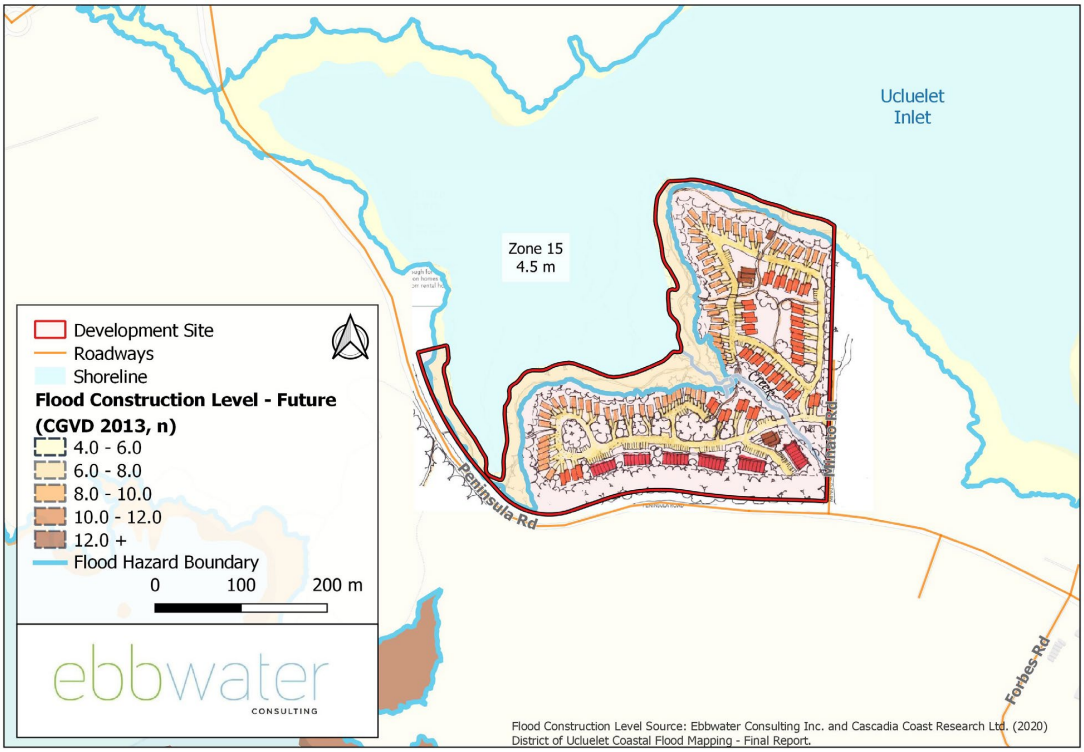


Figure 4-4:Coastal Storm Flood Planning Support Map for Flood Construction Level – zones for rare event (future - 0.5% Annual Exceedance Probability (AEP) + 1.0 m RSLR + 0.6 m freeboard) overlaid on the Draft Site Concept. Note that the Draft Site Concept georefer

4.2 Tsunami Hazard

The complete tsunami flood hazard map series is also publicly available as part of the 2020 DOU Report - Coastal Flood Hazard Map Atlas. The report found that the tsunami flood construction reference plane was defined mostly by the “G2018-S-A splay rupture” scenario, which produced the largest tsunami wave.

The destructive nature of tsunamis as well as their relative infrequency means that they do not naturally fit within the definition of FCL provided in the Provincial Guidelines. For planning support purposes, the 2020 DOU Report proposed a tsunami flood planning level based on 1.0 m RSLR, and a 50% safety factor to the maximum tsunami amplitude.

All tsunami flood planning support maps were completed for the future (1.0 m RSLR) scenario. This tsunami hazard scenario (1.0 m RSLR) is shown in Figure 4-4 and summarized in Table 4-2. The tsunami hazard for the development site indicates risk to approximately 60% of the proposed structures, as shown in Table 4-3 and Figure 4-6. While the majority of rental houses are outside of the tsunami hazard area, all other types have over 50% of proposed structures within the tsunami hazard area for 2.0 to 4.0 m.

Only the higher elevation along Peninsula Road is outside of the specified tsunami hazard zone. The extents of the tsunami planning level is 18.0 m CGVD2013 without a safety factor and 26.0 m with a safety factor. For even the less conservative approach, the development site lot is under the 18.0 m elevation.

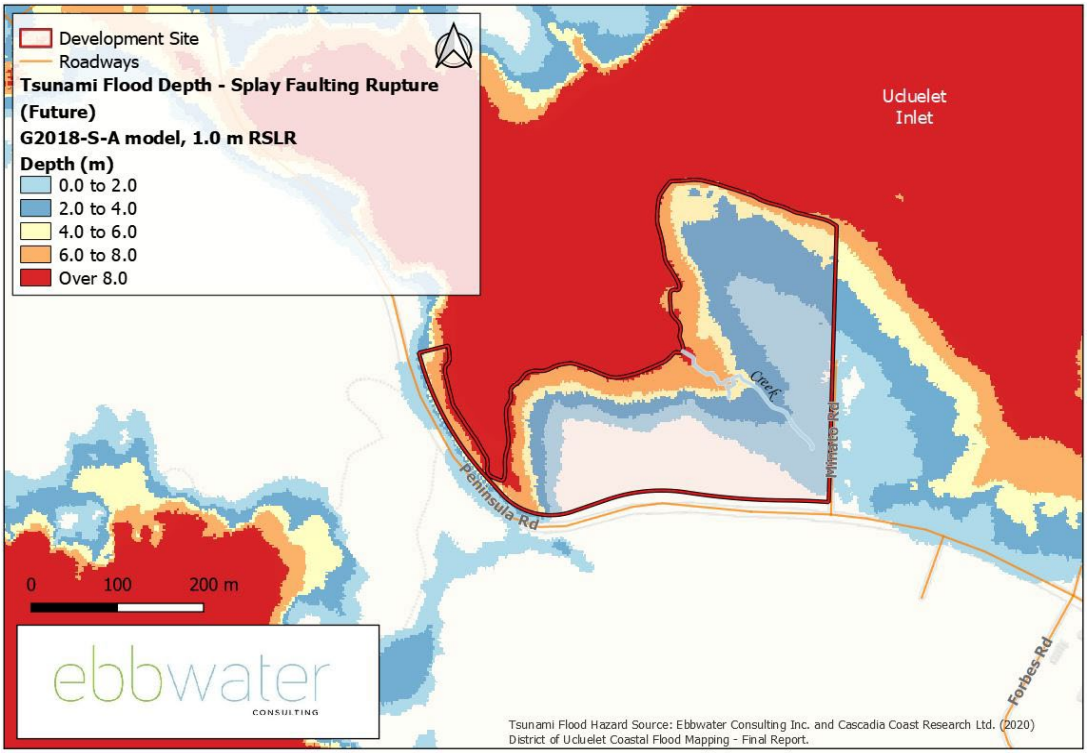


Figure 4-5: Estimated planning level extents for tsunami hazard.

Table 4-2 Estimated tsunami hazard levels for 0.0 m, 1.0 and 2.0 m RSLR based on maximum tsunami amplitude within the development site (transect 24) for splay faulting rupture G2018-S-A model.

RSLR scenario (m)	Tsunami amplitude (m)	FCRP (m CGVD28)	Planning level (m CGVD28)
0.0 m	4.2	8.4	Not assessed
1.0 m	4.5	9.6	11.9
2.0 m	4.7	10.8	Not assessed

FCRP = Tide - Vertical Land Movement + RSLR + Tsunami Amplitude
FCRP read from 2020 DOU Report – Appendix A transect 24
Planning Level = FCRP + 50% of Tsunami Amplitude
Tide = 2.0 m CGVD28, Vertical land movement = - 2.1 m

Table 4-3 Estimated number of proposed structures within the tsunami hazard scenario (1.0 m RSLR, splay faulting rupture G2018-S-A) by depth.

Proposed Structures	Count, total	Count, ground-level	Not affected	0-2 m	2-4 m	4-6 m	6-8 m
Rental houses, stacked	84	42	35	7			
Family homes	50	50	4	18	**28**		
Vacation homes	67	67		2	**39**	19	7
Amenity buildings	2	2		**1**	**1**		
sum	*203*	*161*	*39*	*28*	*68*	*19*	*7*
percent			24%	17%	42%	12%	4%

Rental Houses are stacked, so only 50% are on the ground level.
Bold values show that greater than 50% of the given building type is within the given flood category.
Percent calculation uses count of ground-level structures (161).

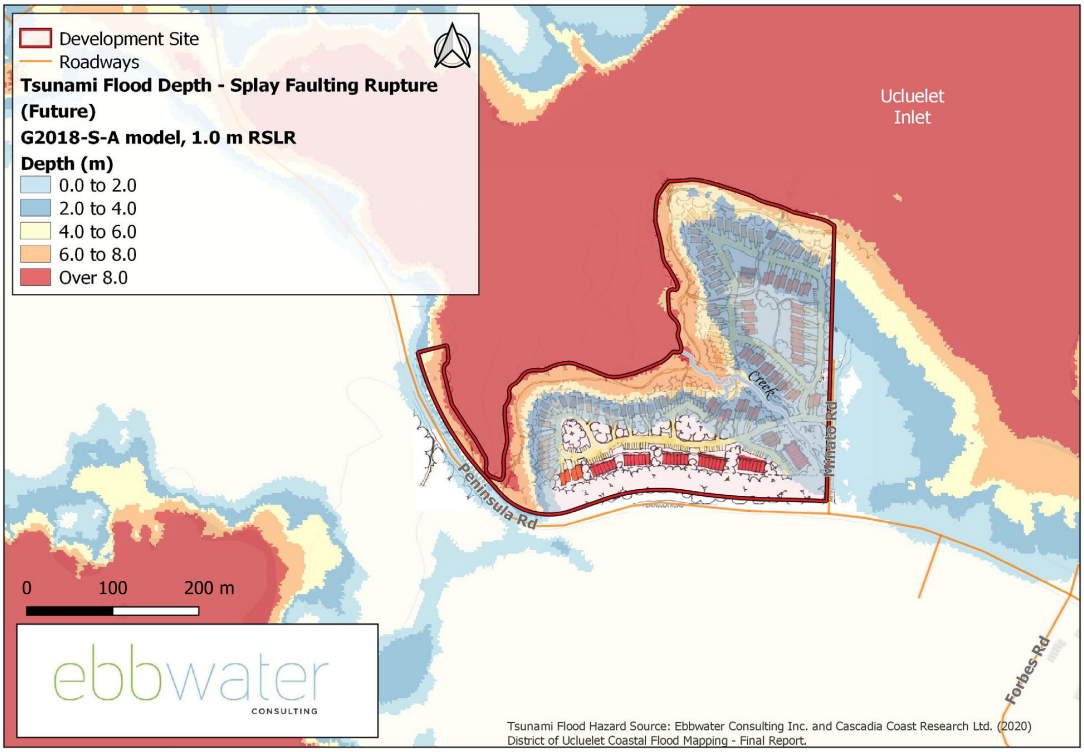


Figure 4-6: Estimated planning level extents for tsunami hazard overlaid on the Draft Site Concept. Note that the Draft Site Concept georeferencing was estimated.

5 Discussion

This report documents the current known flood hazard at the project site. This work shows that, given the current draft concept layout, all properties are outside the coastal flood hazard area. However, the significant tsunami hazard at the site, affects 76% of the proposed development structures.

The destructive nature of tsunamis as well as their relative infrequency means that they do not naturally fit within the definition of FCL provided in the Provincial Guidelines. For planning support purposes, the Ucluelet project proposed a tsunami flood planning level based on 1 m RSLR, and a 50% safety factor to the maximum tsunami amplitude.

Tsunamis and coastal storm events have different hazard profiles and mitigative measures to reduce the risk from these events should be designed to reflect the specific hazard and risk profiles. For example, tsunamis, although more damaging and consequential than coastal storms, are less likely to occur. Further, there are mitigative actions that can be taken to reduce risk-to-life (e.g., warning and evacuation systems, safe havens, etc.). Careful consideration of the best use of land and the risk tolerance of land users using the principle of “as low as reasonably practicable” (ALARP) should apply (EGBC, 2018).

6 Next Steps

Given that a strict application of the draft OCP policies will effectively sterilize a majority of the development site and dramatically reduce the number of housing units, we suggest that the client work collaboratively with the DOU to work towards an ALARP approach for the site, and potentially for the broader DOU policy. Specifically, this might include discussions related to:

- Reducing risk to life and safety through appropriate warning mechanisms (Early Earthquake Warning, Tsunami Sirens, Up-to-date and well publicised evacuation plans, etc.).
- Reducing damage potential for high-value and/or critical structures through the application of forthcoming international guidelines on design standards for tsunami loading.
- Legal and financial mechanisms to enable and support the above in perpetuity.

7 Technical Limitations

Uncertainties exist, the flood mapping project provided a simplified representation of a complex reality. This section summarizes limitations to consider when using the 2020 DOU Report flood mapping results, as well as some additional limitations related to the preparation of this report.

7.1 Coastal Storm Modelling (2020)

- The accuracy of the coastal storm flood estimates relies on the accuracy of the hind-cast. The use of the hind-cast to estimate probability of future coastal storm flooding assumed that the future climate at the DOU will be like the historic climate (assumption of climate stationarity). Also, extrapolation from the 40-year hind-cast introduced uncertainties for the frequency-response curves, especially for the very large events that required the greatest degree of extrapolation.
- There is inherent uncertainty in RSLR values, which have a degree of variation in currently predicted levels. The RSLR values are based on established guidance that is liable to change in the future as predictions are adjusted and the effects of climate change increase.
- The simplified combined method was used to evaluate the storm hazard. This approach is the more conservative method to evaluated standard FCLs (MFLNRORD, 2018) as it does not capture the probabilistic nature of coastal flooding and does not represent a particular Annual Exceedance Probability.

7.2 Tsunami Modelling (2020)

- The accuracy of the tsunami flood estimates relies on the accuracy of the tsunami modelling, including the deformation model of the fault rupture, bathymetry data, and assumptions about the tidal level at the time of the fault rupture. Efforts were made to produce conservative, worst-case scenario results. The levels could potentially be even worse with, for instance, additional storm surge, or mitigated by a lower tide level.
- The tsunami hazard results are extracted from one of six rupture models from the Ucluelet project. The project site is approximately 2.5 km east of the Ucluelet project boundary and has similar coastline exposure. The model was created and optimized for the Ucluelet project and not the project site.
- The tsunami hazard assessment did not include resonance analysis to consider whether the inlet has the potential to amplify tsunami response and increase the hazard, as was observed further

down the inlet in the 1964 tsunami at Port Alberni. A resonance study was conducted for the District of Ucluelet project, and it was not deemed a concern.

- A HHWLT of 2.0 m was assumed to coincide with the tsunami event. This likely represents a worst-case tidal condition, but it could potentially be even worse with, for instance, additional storm surge. The tsunami hazard could also be less severe if it coincides with a lower tide level.

7.3 Flood Mapping (2020)

- When producing the flood hazard maps, uncertainties are introduced DEM creation. Although the vertical accuracy of the LiDAR was generally high, estimated better than 15 cm vertically and 1 m horizontally, small inaccuracies may be introduced. The LiDAR data was collected in 2015, and changes to observed elevations may have occurred since from erosion, sediment accumulation, construction, etc.
- In addition to the general uncertainty from the coastal modelling and hind-casting, there is a limitation caused by the interpolation of results between representative transects across the shoreline. Although the shoreline is sub-divided into 48 characteristic reaches, variation in shoreline type, slope, and orientation still exists within each reach.
- There is a difference in the datum used to produce the water elevations at transects (CGVD28) and that used to map flood elevations (CGVD2013). This is due to not being able to source hind-cast data in the newer datum reference. The differences between the two datums differs across the study area, in the range of 15 and 17 cm, which is relatively small when compared to uncertainties due to modelling and is within the tolerance for error.

7.4 Limitations of this FCL assessment

All assessments, whether preliminary or detailed will have underlying assumptions and limitations. The limitations of this assessment include:

- No site visit was conducted to look at the project site. The consultant team relied on previous reporting (and site visits) conducted in support of the 2020 DOU project.
- Only one transect was used to evaluate the storm hazard wave runup. It should be noted that variability in shore slope conditions within the project area will result in variability in wave runup that has not been captured.

8 References

BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development (BC MFLNRORD). (2018). Amended flood hazard area land use management guidelines. Available online: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/integrated-flood-hazard-mgmt/flood_hazard_area_land_use_guidelines_2017.pdf

District of Tofino. (2021). District of Tofino Official Community Plan Bylaw No. 1290, 2021. Available online: https://tofino.civicweb.net/filepro/documents/4210?preview=113587

District of Ucluelet. (2020). 2020 Draft Official Community Plan. Available online: https://ucluelet.ca/images/OCP_2020_draft_7.3.pdf

Ebbwater Consulting Inc. and Cascadia Coast Research Ltd. (2020) *District of Ucluelet Coastal Flood*

Mapping - Final Report. Prepared for the District of Ucluelet. Available online: https://ucluelet.ca/community/sustainability-climate-action/flood-mapping/technical-flood-mapping-reports

EGBC. (2018). Professional Practice Guidelines – Legislated Flood Assessments in a Changing Climate in BC. Version 2.1. Engineers & Geoscientists British Columbia. https://doi.org/10.1002/ejic.201200009

Formosis Architecture. (2021). 221 Minato Road Ucluelet, BC Site Concept DRAFT. Provided by the client, Saltwater Building Co., for reference only.

Frontera Geotechnical. (2021). Preliminary Geotechnical Report, Proposed Comprehensive Development, 221 Minato Road, Ucluelet, BC. Provided by the client, Saltwater Building Co., for reference only.

GeoBC. (2015). Tsunami Notification Zones for BC map. Produced for Emergency Management BC. Available online: https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/embc/preparedbc/tsunami_zone_province_final.pdf

FRONTERA GEOTECHNICAL

1 – 38920 Queens Way
Squamish, BC V8B 0K8
604-898-1093

Saltwater Building Company
221 Minato Road, Ucluelet, BC

December 23, 2021
File: 1748

Attention: Chris Bozman

RE: Preliminary Geotechnical Report, Proposed Comprehensive Development, 221 Minato Road, Ucluelet, BC

1.0 INTRODUCTION

A new development comprising single family and multi family homes is proposed at 221 Minato Road in Ucluelet. As part of the initial permitting process, Frontera Geotechnical Inc. (Frontera) has been engaged to provide preliminary geotechnical recommendations for the project.

The project is currently in the preliminary planning stage. Conceptual site plans prepared by Formosis Architecture, dated October 22, 2021, have been referenced in preparing this report. The concept includes 84 staff housing units, 50 family home units, 67 vacation home units, and 2 amenity buildings. We understand that construction is to be completed in two phases which are separated by a creek that divides the property. Phase 1 is to be located on the west side of the creek and will include staff housing, single family homes, vacation homes, and an amenity building. Phase 2 is to be constructed on the northeast side of the creek and will include single family homes, vacation homes, and an amenity building. New roads and services will be required for the project.

A geotechnical investigation of the site was completed by Frontera on December 3, 2021. This report presents the results of our geotechnical investigation which includes soil and groundwater conditions and provides preliminary geotechnical recommendations for the overall development and buildings.

This report has been prepared exclusively for our client and for the use of others within their design and construction team, however it remains the property of Frontera Geotechnical Inc.

2.0 SITE DESCRIPTION

The site is a 10.06-hectare property located on the northeast side of the Ucluelet Peninsula. The property is bound to the north and west by Ucluelet Inlet, to the east by Minato Road and private forested property, and to the south by Peninsula Road. A creek separates proposed Phases 1 and 2 of the project.

Phase 1, west of the creek, has a central high point with an elevation of approximately 14 m geodetic elevation. Slopes surrounding the high point are gentle and grade to approximately 8 m to the east and 3 m to the west.

Phase 2, northeast of the creek, is relatively flat with the terrain gently undulating between approximately 6 m and 9 m geodetic elevation with grades generally decreasing towards the shoreline of Ucluelet Inlet.

The overall site has been recently logged and there are temporary roads throughout the property. Areas of natural forest remain intermittently through the property. The native forest floor soils have been stripped in areas but remains in others. The excavated native forest floor soil has been stockpiled or spread over the

ground surface. Some aggregate has been placed to build the road network; however, the site is generally unimproved.

3.0 FIELD INVESTIGATION

Frontera conducted a geotechnical investigation on December 3, 2021. The investigation included 11 machine dug test pits within the Phase 2 area, and review of a bank cut which extends across the Phase 1 area. A general review of the site from a geotechnical standpoint was completed at this time.

4.0 SUBSURFACE CONDITIONS

4.1 Soil Conditions

In general, the soil profile noted from the surface downwards at our test pit locations consists of a small amount of topsoil over a layer of silt that is underlain by medium to coarse grained sand. A general description of the soils encountered is as follows:

Forest Duff and Fill

The undisturbed areas of the site are overlain by native forest floor soil which is generally comprised of organic residuals and is dark brown to black in colour. However much of the site has been stripped to accommodate machine access and a thin layer of sand and gravel fill has been placed on roads. In areas of the site that have disturbed by past forestry activities this material has been spread and stockpiled and, therefore, the thickness and continuity of this layer is expected to be highly variable.

Clayey SILT

The uppermost mineral soil is a clayey silt which is very hard at the ground surface and grades hard with depth. In places some rounded gravel and cobble were observed within this stratum.

Bedrock

The clayey silt is expected to be underlain by bedrock. Bedrock was not observed in any of our test pits; however, outcrops were identified in discrete locations along the cut bank within the Phase 1 boundary.

4.2 Groundwater Conditions

Groundwater was not encountered during our investigation. The static groundwater table is expected to be below proposed foundation grades. Perched water is likely to occur in low areas over the silty clay which is of low permeability.

5.0 DISCUSSION

In general, the soil conditions consist of 0.1 to at least 1.5 m of forest floor soils and/or fill over very hard to hard clayey silt and bedrock.

Parts of the proposed development located within a tsunami flood hazard area identified by Appendix C of the District of Ucluelet Coastal Flood Mapping Final Report, prepared by Ebbwater Consulting Inc., titled: *District of Ucluelet Costal Flood Mapping Appendix C: Map Series 4/4: Tsunami Flood Planning Support*. We understand a specialist consultant has been engaged to provide recommendations for flood construction levels or other tsunami flood hazard mitigation measures.

Provided the geotechnical recommendations below are adhered to, we are of the opinion that the project is feasible from a geotechnical standpoint.

5.1 Foundation Support Considerations

The clayey silt and bedrock are generally considered suitable to support conventional strip and spread foundations. Additional foundation support considerations may be required if foundations must be designed to withstand tsunami impact forces and scour. The recommendations from the specialist consultant engaged to provide recommendations for tsunami flood hazard mitigation should be coordinated with Frontera and foundation support considerations should be updated accordingly.

6.0 DESIGN RECOMMENDATIONS

6.1 Site Preparation

6.1.1 Stripping

Prior to construction, all existing vegetation, forest floor soils, and uncontrolled fill should be removed within the construction areas to expose a subgrade consisting of hard to very hard clayey silt or bedrock.

If fill is required to reinstate grades, site stripping extend beyond the outer edge of the foundations by a distance equal to the total thickness of fill required. For example, if 1 meter of fill is to be placed below foundations, then stripping should extend a minimum distance of 1 meter beyond the outside edge.

6.1.2 Engineered Fill

Any grade reinstatement beneath foundations, grade supported slabs, hardscaped areas, or pavement sections should be completed with “engineered fill”. In the context of this report “engineered fill” is defined as clean sand to sand and gravel fill, containing less than 8% fines, compacted in lifts to a minimum standard of 95% of its Modified Proctor Maximum Dry Density (ASTM D1557) while at a moisture content that is within 2% of its optimum for compaction.

If the clayey silt is exposed for extended periods or at times of persistent precipitation, a blinding layer (+/- 100 mm) of 19 mm clear crushed rock should be placed over the subgrade to protect it from disturbance.

6.2 Foundations

6.2.1 Foundations on Clayey Silt

It is expected that foundations will be supported on the native subgrade soils of very hard clayey silt. Following the recommended site preparation, the subgrade soils are considered suitable to support conventional spread foundations at a serviceability limit state (SLS) bearing pressure of up to 200 kPa and a factored ultimate limit state (ULS) of 400 kPa.

6.2.1.1 Foundations on Bedrock

If bedrock is encountered at foundation level, foundations bearing directly on bedrock can be designed for a serviceability limit state (SLS) bearing pressure of 400 kPa, and a factored ultimate limit state (ULS) bearing pressure of 600 kPa.

For foundations on bedrock, level benches should be cut within friable rock sections. We consider level to slope less than 5 degrees. If friable rock slopes exceed 5 degrees, the contractor should confirm with the structural engineer that the structural design can tolerate the sloping subgrade. Where strong bedrock is

present and is sloped between 10 and 30 degrees, the foundations should be dowelled into the rock for additional support. Any rock exceeding 30 degrees should be benched such that it is less than 30 degrees. Dowel diameter and spacing should be specified by the structural engineer, and dowel depth would be specified at the time of construction.

6.2.2 Foundations on Fill

It is preferred to drop all foundations to clayey slit or bedrock. If it is not feasible to do so in discrete areas of the site it may be required to place foundations on engineered fill. Following the recommended site preparation, engineered fill is considered suitable to support conventional spread foundations at a serviceability limit state (SLS) bearing pressure of up to 125 kPa and a factored ultimate limit state (ULS) of 250 kPa.

6.2.3 Settlement of Foundations

Post construction settlements are expected to be less than 25 mm with differential settlements of less than 1 in 300.

6.2.4 Seismic Design of Foundations

We expect the subgrade conditions underlying the site to be classified as Site Class C as defined in Table 4.1.8.4A of the 2018 British Columbia Building Code (2018 BCBC).

The subsurface soils beyond the depth of foundations are not considered prone to ground liquefaction or other forms of ground softening caused by earthquake induced ground motions.

6.2.5 Frost Protection

The underside of foundations should be located at least 0.45 m below finished site grades for frost protection.

6.3 Concrete Slabs on Grade

All grade supported concrete slabs should be underlain by a minimum of 150 mm of 19 mm clear crushed rock, placed over an approved subgrade. The crushed rock should be compacted in place. We recommend that a poly moisture barrier be placed overlying the gravel beneath the grade supported slabs to help reduce moisture within the concrete slab.

6.4 Foundation Drainage

We recommend that a conventional perimeter drainage system is included to intercept and dispose of any migrating water at foundation level. The under-slab fill should have a hydraulic connection to the perimeter drain to help ensure water does not build up below the slab or adjacent to foundation walls. This can be achieved with weep holes or by placing free draining material below foundations.

6.5 Earth Pressures on Buried Walls

We recommend that buried walls be designed for static and seismic earth pressures. The walls can be designed for a static pressure distribution of 5.1H (kPa) triangular, where H is the height of the restrained soil in metres. Dynamic loading induced by the design earthquake should be added to the static loads and should be taken as 6.2H (kPa) inverted triangular. These loading recommendations assume that the backfill is a clean, free draining sand and gravel, the backfill is level behind the wall, and the wall is frictionless.

Our calculations assume that a back-of-wall drainage system will be installed to prevent the build-up of any water pressure behind the walls. All earth pressures provided herein are based on unfactored soil parameters and are assumed to be unfactored loads.

6.6 Backfill

Backfill adjacent to the foundations should be completed with free draining material such as clean sand and gravel or crushed rock fill containing less than 5% fines. The backfill should be compacted in lifts. In areas where the backfill will support hard landscaping or pavement areas the material should be compacted to a minimum of 95% of its Modified Proctor Maximum Dry Density while at a moisture content that is within 2% of its optimum for compaction.

6.7 On-site Pavement Structures

Following the recommended site preparation outlined in this report, the following pavement structure is considered sufficient to carry the vehicular loading for on-site parking areas.

Table 5. Recommended **minimum** pavement structure for parking areas.

Material	***Thickness (mm)***
Asphalt	75
19 mm minus crush gravel base	150
100 mm minus, well graded, clean, sand and gravel subbase course	300

In areas where heavy loading is expected, such as drive aisles and access roads, we recommend that the asphalt thickness be increased to 100 mm.

All base and sub-base materials should be compacted to a minimum of 95% of their Modified Proctor Maximum Dry Density (ASTM D1557) at a moisture content that is within 2% of optimum for compaction.

6.8 Excavations

Excavations will likely be required for servicing the development and for the construction of some of the dwellings.

Much of the excavation will likely be in hard to very hard to hard clayey silt or bedrock. We anticipate that mechanical excavation equipment will be sufficient to complete most of the excavations. Blasting may be required in areas if strong bedrock is encountered.

All excavations and trenching must conform to WorkSafeBC requirements, or a professional engineer must review any excavations exceeding 1.2 m in depth prior to worker entry.

6.9 Utility Installations

As part of the development all building lots will have to be serviced. Conventional trenched excavation methods are likely to be suitable for the installation of services for this project.

6.9.1 Temporary Excavation

Temporary excavations will be required for the installation of services. The depth of excavations will be based on the civil design for the project. Generally, conventional trenches with pre-engineered steel shoring

cages are considered suitable for this project. Provided that excavations are sufficiently dewatered. All excavations exceeding 1.2 m in height must be completed in accordance with WorksSafeBC regulations.

Dry excavations should be maintained at all times. We anticipate that dewatering by submersible pump will be sufficient to keep up with the inflow of water into most excavations. If maintaining a dry excavation is not possible with use of submersible pumps, it may be required to engage a specialist dewatering contractor to provide recommendations for maintaining a dry excavation.

6.9.2 Blasting

In areas where near surface bedrock exists, it may be required to blast the bedrock to achieve proper grading and coverage of service pipes. If blasting is required care should be taken as to not over-blast the subgrade. All blasted materials should be removed from trenches and replaced with engineered fill.

6.9.3 Backfill

Any grade reinstatement beneath pavement sections should be completed with "engineered fill". In the context of this report any "engineered fill" is defined as clean sand to sand and gravel fill, containing less than 8% fines, compacted in lifts to a minimum standard of 95% of its Modified Proctor Maximum Dry Density (ASTM D1557) while at a moisture content that is within 2% of its optimum for compaction.

6.9.4 MMCD Specifications

All servicing work should be completed in accordance with MMCD specifications and standards.

7.0 CLOSURE

This report is prepared solely for use by our client and their design team for this project as described to the general standards of similar work for similar projects in this area and no other warranty of any kind is expressed or implied. Frontera Geotechnical Inc. accepts no responsibility for any other use of this report.

We are pleased to assist you with this project, and we trust this information is helpful and sufficient for your purposes at this time. Please do not hesitate to call the undersigned if you require clarification or additional details.

Yours truly,

Frontera Geotechnical Inc.

Jaret Bull, M.A.Sc.
Project Manager

Reviewed by:

Dec 23, 2021

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
S. M. FOFONOFF
30836
#1001392

Steven Fofonoff, M.Eng., P.Eng.
Principal

MINATO ROAD DEVELOPMENT UCLUELET

Traffic Impact Assessment

PERMIT TO PRACTICE
WATT CONSULTING GROUP LTD.
SIGNATURE _____
DATE _____
PERMIT NUMBER 1001432
ENGINEERS & GEOSCIENTISTS
BRITISH COLUMBIA

Author: MJ Oh –
Transportation Technologist

Reviewer: Andy Kading, P.Eng., P.E. –
Transportation Engineer

Date: 2022 Feb 28
File No.: 3235.B01

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1.0 INTRODUCTION

Watt Consulting Group was retained by Pirate Bay Holdings to conduct a traffic impact assessment for the proposed residential housing development at 221 Minato Road in Ucluelet, BC. This study assesses the traffic impacts of the proposed land use, reviews traffic conditions at key intersection, and assesses the need for any mitigation measures. The study reviews the opening day traffic operations along with full build-out and long-term conditions for all modes of transportation.

1.1 STUDY AREA

The site is located on the north-west corner of Peninsula Road / Minato Road in Ucluelet. See **Figure 1** for the study area and location. The study area site access roads including the key intersection of Peninsula Road / Minato Road.

Figure 1: Study Area and Site Location

2.0 EXISTING CONDITIONS

2.1 LAND USE

The site is located in the north-west side of the town and is mostly undeveloped, although some site works are present mainly in the form of several dirt roads. According to the current zoning map, the site is designated as rural residential (RU) and parks (P-1). The area surrounding the proposed site is single-family residential (R-1), guest house (GH), and former Weyco Forest Lands (CD-5). The draft 2020 OCP land use suggests single family and commercial on the site.

2.2 ROAD NETWORK

The proposed site is accessed from Minato Road via Peninsula Road. Peninsula Road is the main highway along this section of Vancouver Island's west coast and connects the community of Ucluelet to Hwy 4 (Tofino and Port Alberni). Peninsula Road is considered running north-south overall, but the road runs east-west around Minato Road. Minato Road is a rural access road with a low volume allowing one-way travel. The intersection of Peninsula Road / Minato Road is stop-controlled (on Minato Road) and three-legged. At the intersection, there is a gravel taper for the westbound right turn, and there is no left turn lane provided for eastbound traffic on Peninsula Road. On Peninsula Road near the site the posted speed limit changes to 70 km/h just 100m west of Minato Road. The Minato Road intersection is within a 50 km/h speed zone.

2.3 TRAFFIC VOLUMES

2.3.1 ESTIMATE OF SUMMER PEAK HOUR VOLUMES

Traffic counts were collected from the MoTI's permanent count data (Site: Ucluelet P-13-7NS-CY). The count site (0.5 km south of Route 4) is located on Ucluelet Road 5.5 km north of Minato Road.

Examination of the count data revealed that the months of July and August had the highest traffic volumes. To establish summer peak hour volumes, data was chosen from hourly traffic data (weekdays and non-holidays only) measured in July and August of

2018 and 2019 to avoid the pandemic period. It was identified that the weekday peak hour volumes were slightly greater than the weekend peak.

Table 1 summarizes average weekday peak hour volumes for July & August of 2018 and 2019. The peak hour typically occurs in the weekday afternoons during 4:00 – 5:00 PM. At the Ucluelet Road count site, weekday peak hour volumes are estimated to be 186 vehicles for the northbound and 295 vehicles for the southbound (two-way total 481 vehicles). It was assumed that 10% of the total volume is absorbed into the side streets between Highway 4 and Minato Road. Therefore, for the opening day analysis, background (existing) peak hour volumes were estimated at 266 vehicles for the eastbound and 167 vehicles for the westbound (two-way total 433 vehicles) on Peninsula Road at Minato Road. These volumes were used as base volumes for opening day background conditions after an adjustment factor was applied.

TABLE 1: MOTI DATA SUMMER PEAK HOUR VOLUMES*

	2018 Jul	2018 Aug	2019 Jul	2019 Aug	Avg
Northbound	179	195	184	187	**186**
Southbound	294	296	280	310	**295**
Two-way Total	473	491	464	497	**481**

*Weekday (non-holiday) average peak hour volumes of Jul/Aug in 2018/2019

2.3.2 GROWTH RATE FOR 10-YEAR HORIZON BACKGROUND

For the 10-year horizon conditions analysis, an annual average growth rate on Ucluelet Road was estimated at **3.5%** based on AADT data between 2010 and 2019 from the MoTI's count data. The estimated 3.5% growth rate is consistent with MoTI's historical growth factors at the adjacent Route 4 count sites (3.1% for UTVS No. 208 / 4.1% for UTVS No. 209). See **Table 2** for the historical AADT data for Ucluelet Road.

TABLE 2: HISTORICAL AADT FOR UCLUELET RD

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
AADT	2468	2374	2222	2159	2442	2753	3071	3238	3266	3360

2.4 TRAFFIC MODELLING – BACKGROUND INFORMATION

Analysis of the traffic conditions at the intersections within the study area were undertaken using Synchro software (for signalized and stop-controlled intersections).

Synchro / SimTraffic is a two-part traffic modelling software that provides analysis of traffic conditions based on traffic control, geometry, volumes, and traffic operations. Synchro software is used because of its ability to provide analysis using the Highway Capacity Manual (2010) methodology, while SimTraffic integrates established driver behaviours and characteristics to simulate actual conditions by randomly "seeding" or positioning vehicles travelling throughout the network. These measures of effectiveness include level of service (LOS), delay and 95th percentile queue length.

For modeling results the delays and type of traffic control are used to determine the Level of Service (LOS). LOS is broken down into six letter grades with LOS A being excellent operations and LOS F being unstable / failure operations. LOS C is generally considered to be an acceptable LOS by most municipalities. LOS D is generally considered to be on the threshold between acceptable and unacceptable operations. A description of LOS and Synchro is provided in **Appendix A**.

3.0 POST DEVELOPMENT ANALYSIS

3.1 PROPOSED LAND USE

The proposed development is a mix of three residential types consisting of 58 waterfront home units (single family housing) with 32 owner-occupied or long-term rental suites, 45 family home units (1,500 sq. ft), and 94 rental housing units (550 sq.ft). A proposed concept site plan can be seen in **Figure 2**.

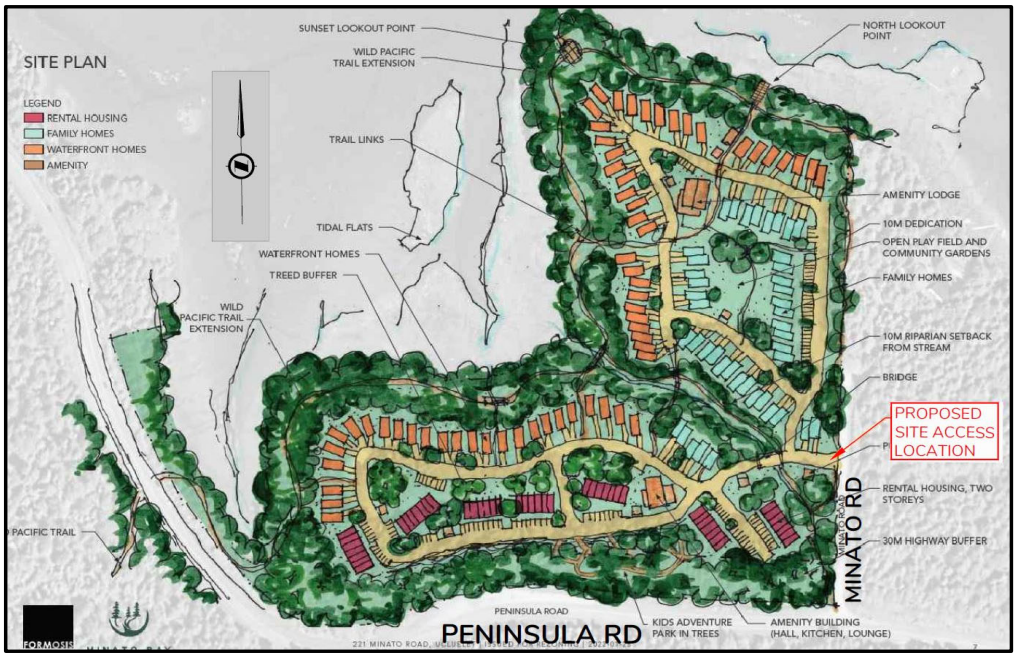

Figure 2: Proposed Site Plan

3.2 SITE ACCESS

A site access is proposed on Minato Road 90m north of Peninsula Road. Minato Road should be upgraded to the municipal standards for local roads.

3.3 TRIP GENERATION

Trip generation rates were estimated using the 11th Edition of the *ITE Trip Generation Manual*. The PM peak hour is considered the governing peak hour and will be used for the opening day analysis.

Table 3 shows the estimated trips generated by the proposed land uses. The development will generate **145** vehicles during the PM peak hour with full build out.

TABLE 3: PEAK HOUR TRIP GENERATION

ITE Land Use		Weekday PM			Generated Trips		
Code	Description	Rate	In	Out	Total	In	Out
210	Single-Family Detached 58 Units	0.94	63%	37%	55	35	20
215	Single-Family Attached 45 Units	0.57	57%	43%	26	15	11
220	Multi-Family Housing (Low-Rise) 126 Units	0.51	63%	37%	64	40	24
				Total	**145**	**90**	**55**

3.4 TRIP ASSIGNMENT

The trips generated by the proposed development were distributed and assigned based on existing traffic patterns on Peninsula Road, and key destinations / origins for traffic in the area. Peninsula Road runs east-west at Minato Road. To the west is Tofino or Port Alberni.

The following is the site's trip distribution for the PM peak hour:

- 60% of site trips total are from / to Peninsula Road West
- 40% of site trips total are from / to Peninsula Road East (Ucluelet)

The resulting trip assignment for the PM peak hour is shown in **Figure 3**.

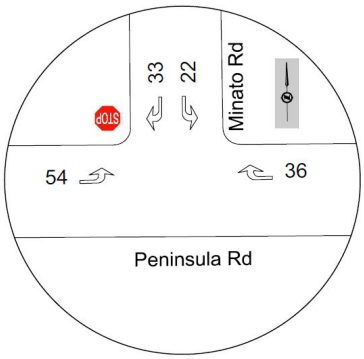

Figure 3: Trip Assignment

3.5 OPENING DAY POST DEVELOPMENT CONDITIONS

The opening day post development conditions were analyzed by adding the development trips to the background traffic volumes. See **Figure 4** for opening day post development volumes during the PM peak hour.

The intersection of Peninsula Road / Minato Road will operate at a LOS A/B for all movements during the PM peak hour with full build out. The eastbound left 95th percentile queue length was estimated at 10m on Peninsula Road at Minato Road. For potential safety improvements at the intersection, the need for turn lanes is discussed in **Section 4.0**. See for **Table 4** for opening day post development conditions at Peninsula Road / Minato Road.

TABLE 4: OPENING DAY POST DEVELOPMENT AT PENINSULA RD / MINATO RD

MOVEMENT	Opening Day Post Development – PM Peak			
	LOS	Delay (s)	Queue (m)*	v/c
EBL	A	7.8	9.9	0.05
EBT	A	0	-	-
WBTR	A	0	0	-
SBLR	B	11.8	14.8	0.115

*Note: 95th Queues based on SimTraffic results (averaged from five simulation runs)

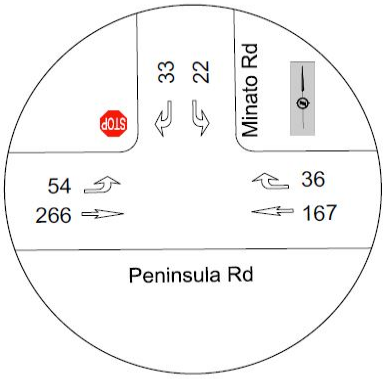

Figure 4: Post Development PM Peak Hour Volumes

3.6 10-YEAR HORIZON POST DEVELOPMENT CONDITIONS

The 10-year horizon post development conditions were analyzed by adding the development trips to the 2032 background traffic volumes. For the 10-Year Horizon analysis, through volumes on Peninsula Road increase by a total of 41% (annual growth rate: 3.5%) compared to the opening day background. See **Figure 5** for 10-Year horizon post development volumes.

In 2032 with 10-year horizon post development, the intersection of Peninsula Road / Minato Road will continue to operate at a LOS A/B for all movements during the PM peak hour. The eastbound left 95th percentile queue length was estimated at 14.7m on Peninsula Road at Minato Road. For intersection safety, potential treatments will be discussed in **Section 4.0**. See for **Table 5** for 10-year post development conditions at Peninsula Road / Minato Road.

TABLE 5: 10-YEAR POST DEVELOPMENT AT PENINSULA RD / MINATO RD

MOVEMENT	Opening Day Post Development – PM Peak			
	LOS	Delay (s)	Queue (m)*	v/c
EBL	A	7.9	14.7	0.052
EBT	A	0	-	-
WBTR	A	0	1.8	-
SBLR	B	13.5	15.1	0.14

*Note: 95th Queues based on SimTraffic results (averaged from five simulation runs)

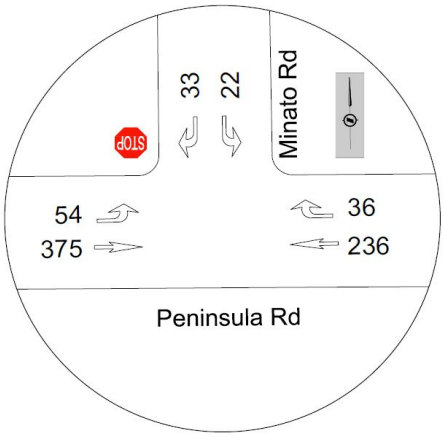

Figure 5: 10-Year Horizon Post Development Volumes

4.0 TURN LANE WARRANT ANALYSIS

4.1 LEFT TURN LANE WARRANT REVIEW

4.1.1 SHORT TERM NEED

While the traffic conditions are excellent along the Peninsula Road approaches, left-turning vehicles may introduce safety concerns that could merit consideration of an eastbound left turn lane at Minato Road. Therefore, a left-turn lane warrant analysis was conducted for eastbound Peninsula Road traffic. The warrant procedure used is that from the *BC MoTI's Left Turn Lane Warrant Manual*, which is based on PM peak hour volumes in the opening year. For the opening day post development volumes, a left turn lane is not

warranted based on the chart analysis (design speed 50km/h, left turn ratio 20%). Therefore, no eastbound left turn lane is required on Peninsula Road at Minato Road in the short term with the development. See **Figure 6** for the left turn lane warrant review for opening day.

Figure 6: Left Turn Lane Warrant Review (Opening Day with Full Build Out)

4.1.2 LONG TERM NEED

A left turn lane warrant analysis was also conducted for the Peninsula Road / Minato Road intersection with 10-year horizon volumes. In the 10-year horizon post development year, an eastbound left turn lane is warranted with a 15 m storage lane. See **Figure 7** for the left turn lane warrant review with 10-year horizon post development volumes. As such a 15 m long left turn lane is recommended as part of the intersection design. The warrant analysis was also checked for a trigger point which requires a left turn lane as the development (phases) makes progress; until 80% (proportionally applied to each land use type) or less of the total proposed dwelling units, a left turn lane is not warranted based on 10-year horizon peak hour volumes.

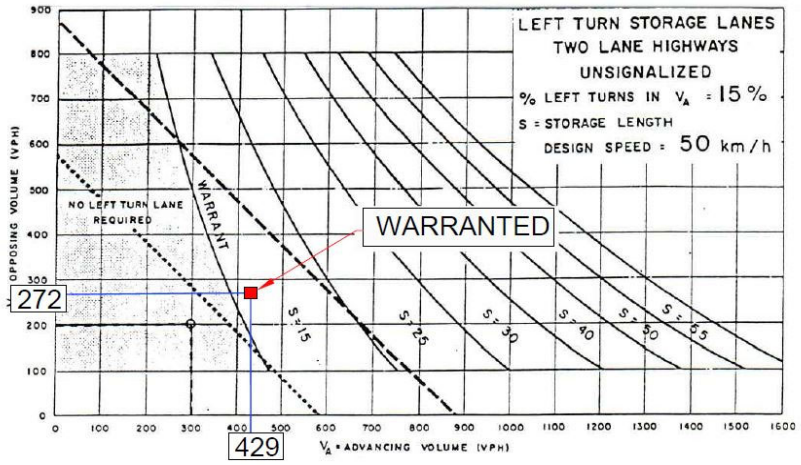

Figure 7: Left Turn Lane Warrant Review (10-Year Horizon Post Development)

4.2 TURN LANE REVIEW

4.2.1 RIGHT TURN LANE

The MoTI's turn lane warrant manual does not provide volume warrant charts for a right turn lane. Estimated turning volumes at Peninsula Road / Minato Road exceed MoTI's private access definition (turning volumes total >100 vph and right turn volume >30 vph). Therefore, the intersection of Peninsula Road / Minato Road should be designed based on the drawings in MoTI's *Supplement to TAC Geometric Design Guide* (Figure 710.F Rural Local Intersection).

For a westbound right lane treatment, a direct taper should be used rather than a parallel right deceleration lane as the speed is low (50km/h), right turning volumes are relatively low (<40 vph), and no queueing issue were found. The intersection should be designed such that the westbound right lane has a direct taper of 55m, and that the raised islands see in in Figure 7.10F are excluded. The islands are not needed due to the low speed and low volume of traffic estimated at Minato Road, and their presence will increase the crossing distance and complexity for people accessing the multiuse trail.

4.2.2 ACCELERATION LANE

The right turn movement from Minato Road would not require the need for an acceleration lane along the westbound of Peninsula Road. Analysis results show LOS A/B for the right turn movement from Minato Road. It is expected that on Peninsula Road, estimated westbound through volumes are not significant, with 280 vph (projected 2032 volumes). The traffic conditions (moderate volumes and 50 km/h speed) will contain enough gap opportunities that right turning vehicles turning onto Peninsula Road will not need the acceleration lane.

5.0 ACTIVE TRANSPORTATION

5.1 PEDESTRIANS / CYCLING FACILITIES

According to the site plan, the development proposes dedicating 30m along the shoreline to park (P1) for the extension of the Wild Pacific Trail. Along Minato Road a 10m land dedication is also planned for a trail connecting to the waterfront.

A multi-use path parallels Peninsula Road's south side, which is usable by both pedestrians and cyclists. On Peninsula Road at Minato Road, a pedestrian crossing warrant review was undertaken based on the *Pedestrian Crossing Control Manual for BC*. At the potential crossing location, enough stopping sight distance is provided for through vehicles on Peninsula Road.

Based on the following information, a warrant model was assessed for the appropriate crossing control device:

- Traffic volume = 701 veh/h (2032 post development volume)
- Pedestrian count = 10 persons assumed (5 adults, 3 children, 2 elderly)
- Roadway cross section = 2 lane (7.5m wide)
- Signal progression = none (Pattern A selected)
- Speed limit = 50 km/h
- Population = < 10,000

Warrant Analysis Result

1. EAU = (5 times 1) + (3 times 2) + (2 times 1.5) = 14
2. Crossing opportunities (Manual Figure 3.5A, Pattern A) = 147
3. Device (Warrant Chart Figure 3.5E) = Not Warranted

Figure 9 (Manual Warrant Chart Figure 3.5E**)** indicates a **Not Warranted** level (> 120) for crossing opportunities/hour. At the potential crossing location, as crossing opportunities are greater than 120, a pedestrian crossing device is not warranted regardless of crossing pedestrian counts. Therefore, no pedestrian crossing device is required on Peninsula Road at Minato Road. See **Figure 8 / 9** for the pedestrian crossing warrant chart review.

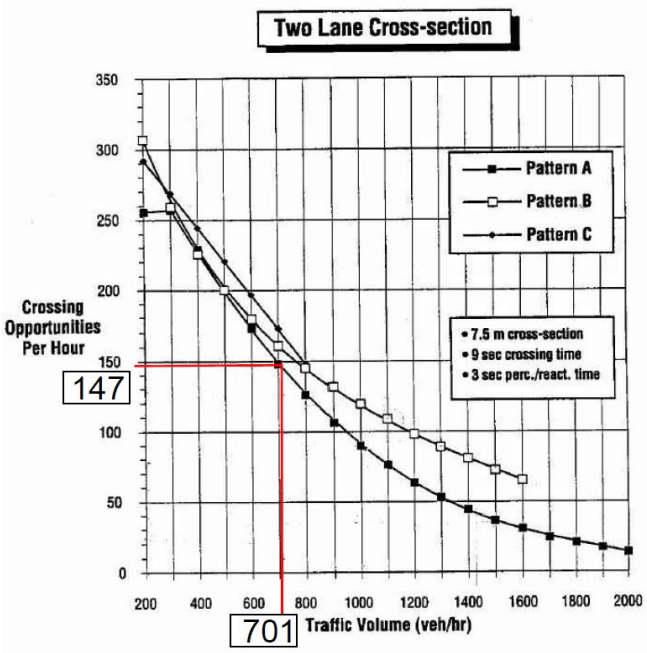

Figure 8: Crossing Opportunities Chart Review

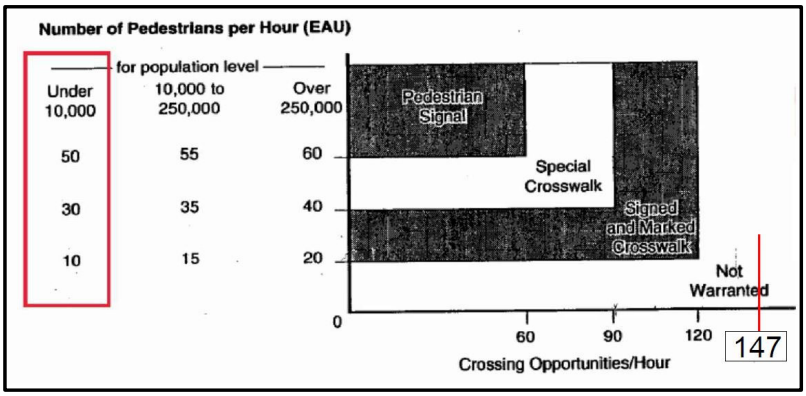

Figure 9: Pedestrian Crossing Warrant Chart Review

5.2 TRANSIT

There is no public transit service in Ucluelet. There are transportation services provided by private companies in Ucluelet. There is a direct bus service (Fraser Lane Transit Stop) between Nanaimo and Ucluelet and services once a day (every day). BC Transit is preparing to introduce transit service between Tofino and Ucluelet in the near future.

6.0 SIGHTLINE AND SAFETY REVIEW

Sightline and other safety aspects were reviewed. See **Appendix B** for a sightline graphic.

The Transportation Association of Canada (TAC) specifies sightline distances for vehicles turning onto a road from a stop condition for both left and right turns. For left turns from a stop on a 50km/h roadway 105m of clear sightline is needed, and 95m is needed for a right turn.

The sightline review showed clear sightlines well beyond the 105m threshold, with no obstructions, significant roadway curvature, or other impediments; sightlines have been met for both left and right turns from a stop condition. Within the graphic in **Appendix B** there are Google Street View images showing the sightlines from the view of vehicles

approaching Minato Road from both the east and west. These images show the clear sightlines from both a horizontal and vertical perspective. There is a small hill to the west of Minato Road, but the crest of the hill (and any corresponding visual impediments due to it) is more than 120m from the mouth of Minto Road, well beyond the 105m of clear sightline.

As the area around Minato Road is an undeveloped rural area there are no other obvious safety issues to be seen.

7.0 CONCLUSIONS

The proposed development will generate 145 trips during the PM peak hour. The impact analysis was undertaken with summer peak hour volumes as a worst-case scenario. At the key intersection of Peninsula Road / Minato Road, no capacity issue was found with the development in the short and long terms. All movements will operate at LOS A/B during the PM peak hour in the long term. However, Minato Road should be upgraded to the municipal road based on the design standards for local roads.

At the intersection, a typical highway intersection design treatment would be required based on the MoTI design standards. An eastbound left turn lane is not warranted based on the opening day post development volumes. However, the left turn lane is warranted based on 2032 post development volumes. The trigger point for the left turn lane would be 80% of the units being built. A westbound right lane should be installed with a 55m direct taper. No raised islands are recommended.

No sightline or other safety issues were found.

Around the site, new trail connections will be provided for pedestrians and cyclists. A paved multi-use trail passes along the south side of Peninsula Road. A pedestrian crossing facility is not required on Peninsula Road at Minato Road based on the warrant review with estimated traffic volumes for the long term.

8.0 RECOMMENDATIONS

The following recommendations are made for the proposed development:

- At Peninsula Road / Minato Road, an eastbound left turn lane (15m storage) is required in the long term with full build out. The trigger point for the left turn lane is an 80% progress level of the proposed land uses.
- At Peninsula Road / Minato Road, a westbound right lane is required with a 55m direct taper.
- Minato Road upgrade as per municipal cross section standards for local roads.

APPENDIX A: SYNCHRO INFORMATION

SYNCHRO MODELLING SOFTWARE DESCRIPTION

The traffic analysis was completed using Synchro and SimTraffic traffic modeling software. Results were measured in delay, level of service (LOS) and 95th percentile queue length. Synchro is based on the Highway Capacity Manual (HCM) methodology. SimTraffic integrates established driver behaviours and characteristics to simulate actual conditions by randomly "seeding" or positioning vehicles travelling throughout the network. The simulation is run five times (five different random seedings of vehicle types, behaviours and arrivals) to obtain statistical significance of the results.

Levels of Service

Traffic operations are typically described in terms of levels of service, which rates the amount of delay per vehicle for each movement and the entire intersection. Levels of service range from LOS A (representing best operations) to LOS E/F (LOS E being poor operations and LOS F being unpredictable / disruptive operations). LOS E/F are generally unacceptable levels of service under normal everyday conditions.

The hierarchy of criteria for grading an intersection or movement not only includes delay times, but also takes into account traffic control type (stop signs or traffic signal). For example, if a vehicle is delayed for 19 seconds at an unsignalized intersection, it is considered to have an average operation, and would therefore be graded as an LOS C. However, at a signalized intersection, a 19 second delay would be considered a good operation and therefore it would be given an LOS B. The table below indicates the range of delay for LOS for signalized and unsignalized intersections.

Table A1: LOS Criteria, by Intersection Traffic Control

Level of Service	Unsignalized Intersection Average Vehicle Delay (sec/veh)	Signalized Intersection Average Vehicle Delay (sec/veh)
A	Less than 10	Less than 10
B	10 to 15	11 to 20
C	15 to 25	20 to 35
D	25 to 35	35 to 55
E	35 to 50	55 to 80
F	More than 50	More than 80

APPENDIX B: SIGHTLINE REVIEW

PERMIT TO PRACTICE
WATT CONSULTING GROUP LTD

SIGNATURE _____

DATE _____

PERMIT NUMBER: 1001432
ENGINEERS & GEOSCIENTISTS
BRITISH COLUMBIA

WATT Consulting Group

Calgary, Edmonton, Lloydminster,
Okanagan, Vancouver, Victoria
WATTCONSULTINGGROUP.COM

TITLE:
Minto Road Sightline
Left Turn From Stop

DESIGNED:	DRAWN: AJK	SCALE: NOT TO SCALE
DATE: 2022-02-25	DRAWING NO:	REV. 0

PROJECT: V:\Project Files\3235 - 221 Minato Road TIAH - Analysis\Sightline Review\SL Review.dwg
PLOT DATE: 2/25/2022 1:35 PM PLOTTED BY: Andy Kading