VILLAGE OF LIONS BAY

BOARD OF VARIANCE MEETING

OF THE VILLAGE OF LIONS BAY
WEDNESDAY, FEBRUARY 8, 2023 at 6:00 p.m.
AT 400 CENTRE RD LIONS BAY, BC AND
VIA ZOOM VIDEO CONFERENCE

Link to join meeting: https://us02web.zoom.us/j/89701665252
To join via phone, dial 778-907-2071 - Meeting ID: 897 0166 5252

AGENDA

1. **Call to Order**

2. **Appointment of the Chair**
   THAT Morgan Gatto be appointed as the Chair of the Board of Variance Committee.

3. **Approval of the Agenda**
   THAT the February 8, 2023 Board of Variance agenda be approved, as presented.

4. **Approval of the Minutes**
   THAT the October 12, 2022 Board of Variance Meeting minutes be approved as circulated. (Page 2)

5. **Public Comments**

5. **New Business – Application to be heard** (Page 5)

   1)

Civic Address:	385 Timbertop Drive, Lions Bay, BC
Legal Description:	Plan 14997, DL 2985, Lot 42
Owner:	James Mole & Anne McCulloch
Request:	Approval sought for rear yard setback in the northwest corner from 7.50 meters to 3.80 meters and height from 7.50 meters to 9.44 meters (30’ 11”)

6. Public Questions & Comments

7. Adjournment

THE MUNICIPALITY OF THE VILLAGE OF LIONS BAY

BOARD OF VARIANCE MEETING

OF THE VILLAGE OF LIONS BAY
HELD ON WEDNESDAY, OCTOBER 12, 2022 at 6:00 PM
AT 400 CENTRE ROAD, LIONS BAY, BC
AND VIA ZOOM VIDEOCONFERENCE

MINUTES

In Attendance:

Board of Variance:	Morgan Gatto (Chair) Scott Gordon David Lee
Staff:	Linda Brick, Municipal Coordinator (Recorder)
Public:	18
Applicants:	Robert Smith, owner Jing Chen, owner Rodrigo Munguia, representative on behalf of owners

1. Call to Order

Morgan Gatto called the meeting to order at 6:00 p.m.

2. Approval of the Agenda

Moved/Seconded
THAT the October 12, 2022 Board of Variance agenda be approved, as presented.

CARRIED

3. Approval of the Minutes

Moved/Seconded
THAT the July 20, 2022 Board of Variance meeting minutes be approved as circulated.

CARRIED

4. Public Comments

A. Keegan Rittinger, 27 Brunswick Beach, Neighbour
- Advised that he represents the neighbours and is not in support of the proposal.
- Inquired if a shadow study has been conducted to identify the negative impact of the proposed project on neighbouring properties.

- Noted that the proposed building will have a negative impact on the enjoyment of his property as the additional height will cast a shadow on his yard.

B. A consortium of neighbours spoke:

- Expressed concern that the proposed house will impact their views and the views of the neighbourhood in general.
- Opined that the variance requested can be addressed by adjusting the 9 foot ceiling height within the proposed home on the second floor and in the various rooms such as the walk in closet and bedrooms which have 10 foot ceiling heights.
- Suggested that the homeowner could have conducted due diligence prior to purchase of home to understand the restrictions on the development of the property and requirements for flood control levels.
- Inquired if the roof top patio and staircase wall were structural features or could be eliminated.

C. Ron, a neighbour,

- Advised that this is the third house on this property and they all need variances;
- Noting that the past experiences have been very negative.

5. New Business – Applications to be Heard

1) **Civic Address:** 26 Brunswick Beach Road, Lions Bay, BC
Legal Description: Lot H, Block 19, Plan 18523, DL 1815
Owner: Robert Smith, Jing Chen, Simon Smith, Sarah Smith
Rodrigo Munguia, representative, on behalf of the owners
Request: A relaxation of the building height for the pitch roof and flat roof. The roof mean elevation is requested to go from 29'6 3/8" (9.0 m) and flat from 24.7' (7.5m) to a new variance of 31'7" (9.64m) mean elevation for sloping roof (a total of 2.1' over height), and 39.18' flat roof deck (a total of 4.14' over height)
Per Zoning Bylaw 520, 2017 sec. 7.8 (1)

6. Public Questions and Comments

A. Robert Smith, Owner,
Presented his hardship advising

- that the land is a challenging site and an odd shape;
- that the first level is not legally habitable due to flood construction levels;
- It was not possible to obtain 3000 square feet of habitable space on two levels without a variance;
- inquired about the opposition to the height of the proposed building;

DRAFT

- Advised that the rooftop patio and wall can be removed in the design as it is aesthetic and not structural.

B. Rodreigo Munguia, designer on behalf of owner,

- Advised that the FSR cannot be met within the lot size;
- The flood hazard assessment report brought up the flood construction level which has caused a hardship;
- The proposed house is 3000 square feet on a 40,000 square foot lot;
- The first floor is not habitable space in compliance with FCL regulations.

Decision
After considering the facts before it, the Board of Variance determined that the requested variance was to be deferred as it was noted that not enough information has been provided and some of the provided information was inaccurate. The BOV requested a new site plan that would show the true intent of the project.

Moved/Seconded
THAT the Board of Variance defers the application for 26 Brunswick Beach Road to the next meeting wherein the applicant provides the additional information:

- Updated accurate site plan
- A street scape drawing which shows the outline of the existing homes and the outline of the proposed home superimposed
- A shadow study
- Obtain a level of support from the neighbours

CARRIED

Requested that the Village provide more information on the Flood Construction Level and a history of the application process and understand the delay in the application coming before the Board of Variance.

7. Adjournment

Moved/Seconded
THAT the meeting be adjourned.

CARRIED
(7:15 p.m.)

_____ _____
Chair Corporate Officer

Date Approved:	

RECEIVED
OCT 19 2022

Schedule "A"

Village of Lions Bay
Board of Variance Application Form

I hereby apply for a hearing before the Board of Variance for:

LAND SUBJECT OF THE APPLICATION
Street Address: 385 TIMBERTOP DRIVE
Legal Description: LOT 42 DISTRICT LOT 2985
Zoning: RS-1
OWNER/CONTACT INFORMATION
Full Name(s) of Property Owner(s): JAMES MOLE / ANNE MCCULLOCH
Full Name of Owner's Authorized Representative (if applicable):
Address to Which Notices Should be Mailed: BOX [redacted] LIONS BAY BC
Daytime Phone # of Owner or Authorized Representative: [redacted]
Name of Person Who Will Represent Applicant at the Hearing: JAMES MOLE
TYPE OF APPLICATION (Complete Applicable Section)
A. VARIANCE OF BYLAW RESPECTING SITING, SIZE OR DIMENSION OF A BUILDING OR STRUCTURE [s.540(a)(i)]
Bylaw Name/Number & Section(s) from which relief is sought: SITING OF PRINCIPAL BUILDING 8.3.1 (PAGE 26 BYLAW 520)
Variance From (current requirement): REAR PROPERTY LINE SETBACK 7.5 METER (24.6 FT) N/W
To (new requirement requested): REAR PROPERTY LINE SETBACK 3.8 METERS (12 FT-)6"
B. EXEMPTION FROM PROHIBITION OF A STRUCTURAL ALTERATION OR ADDITION TO A BUILDING OR STRUCTURE WITH A NON-CONFORMING USE [s.540(c) and s.531(1)]
Bylaw Name/Number & Section(s) Which Previously Permitted Use:
Bylaw Name/Number & Section(s) Which Resulted in Legal Non-Conforming Status:

AND HEIGHT FROM 7.15 metres to 9.144 metres
FOR A TOTAL OF 6'-4" OVERHEIGHT.

Continuing Non-Conforming Use:
Structural Alteration or Addition Desired: *Note: If alteration or addition will result in a structure contrary to current bylaw siting, size or dimension requirements, also complete Section A.*
C. APPEAL OF BUILDING INSPECTOR'S DETERMINATION OF DAMAGE TO NON-CONFORMING BUILDING [s.532(1) and s.544]
Date of Building Inspector's Determination (application must be filed within 30 days):
Summary of Building Inspector's Determination (copy attached):
Determination Requested of Board:
D. EXEMPTION TO RELIEVE HARDSHIP FROM EARLY TERMINATION OF LAND USE CONTRACT [s.543]
Bylaw Name(s)/Number(s) & Section(s) from which relief is sought:
Variance From (current requirement):
To (new requirement requested):
STATEMENT OF HARDSHIP (not required for Type C applicants)
I allege that compliance with either the bylaw or section 531(1) [strike one] would cause me hardship by: STEEP TERRAIN OFFERS ONLY ONE SAFE LOCATION FOR HOUSE BUILD (attach additional pages if necessary)
TIME REQUIRED TO COMPLETE Respecting Type A or B applications, the Board may specify a time for completion of the construction of the Building or Structure permitted by the minor variance or exemption, after

which the permission or exemption would terminate. If your application is permitted, when do you expect to complete the work?

ADDITIONAL INFORMATION/REASONS SUPPORTING THE APPLICATION

(Attach additional pages if required)

ATTACHMENTS

Fee and Title Documents:

- ☑ A Non-refundable application fee of $500.00 (cash or cheque), payable to the Village of Lions Bay.
- ☐ A Title Search Print dated within 30 days of the application and copies of all registered non-financial encumbrances noted thereon.

Drawings Which May be Required:

- ☑ A site plan showing the location of all Buildings and Structures, or proposed Buildings or Structures, on the subject property, preferably prepared and signed by a BC Land Surveyor A floor plan (for existing and proposed Buildings) showing space uses and door and window locations, preferably certified by an architect or structural engineer.
- ☐ A Building or Structure elevation plan preferably certified by an architect or structural engineer, including original and proposed alterations to site levels, if applicable.

Other Documents Which May be Required:

- ☐ A geotechnical engineer's report with respect to drainage, topography, and other geotechnical considerations.
- ☐ Explanatory materials and such other additional information as may be advisable in support of the application (eg: photographs, letters of support, etc.)

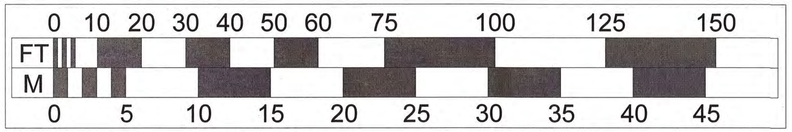
The Village Building Department may have some of the documents noted above – check first before ordering new. Further information may be required to enable the Board of Variance members to visualize the proposal and its relationship to the surrounding area. Approval, if given by the Board, is for the plans submitted. Changes to plans after the Board's decision will require a new application.

SIGNED BY ALL OWNERS ON TITLE ON OCTOBER (month) 18 (day), 2022 (year):

[redacted] [redacted]

Note: Decisions of the Board of Variance regarding Type A, B or D applications are FINAL, other than an appeal to the BC Supreme Court in respect of procedure under the *Judicial Review Procedure Act*. Decisions regarding Type C applications may be appealed by the applicant or the Village of Lions Bay to the BC Supreme Court. Information in this application is subject to the *Freedom of Information and Protection of Privacy Act*.

SCALE BAR



SITE PLAN SCALE: $\frac{1}{16}$" = 1'

CIVIC ADDRESS

385 TIMBERTOP DRIVE,
LIONS BAY, B.C.
V0N-2E0

LEGAL DESCRIPTION:

PID: 007-713-240
LOT 42, DISTRICT LOT 2985
VILLAGE OF LIONS BAY DISTRICT
PLAN 14997

APPLICABLE BUILDING CODE: BCBC 2018

LOT INFO:

ZONING CODE- RS-1
VILLAGE OF LIONS BAY DISTRICT

SETBACKS:

FRONT=	7.5M	[24.83 FT]
SIDE(S)=	2.4M	[7.58 FT]
REAR=	7.5M	[24.83 FT]

BofV REQUIRED N.W. CORNER TO 12'-6" (3.80M)

MAX. BUILDING HEIGHT= 7.5M [24.6 FT]
(THE VERTICAL DISTANCE FROM AVERAGE GRADE OF A STRUCTURE TO THE HIGHEST POINT OF THE ROOF SURFACE)

BofV REQUIRED 9.14 meters (30'11")

(AS PER VILLAGE OF LIONS BAY ZONING AND DEVELOPMENT BYLAW NO. 520, 2017)

CALCULATED LOT COVERAGE:
AREA OF ALL BUILDINGS & STRUCTURES
(INCLUDING STAIRS, PORCHES, BALCONIES, DECKS & COVERED EXTERIOR OPEN SPACE)

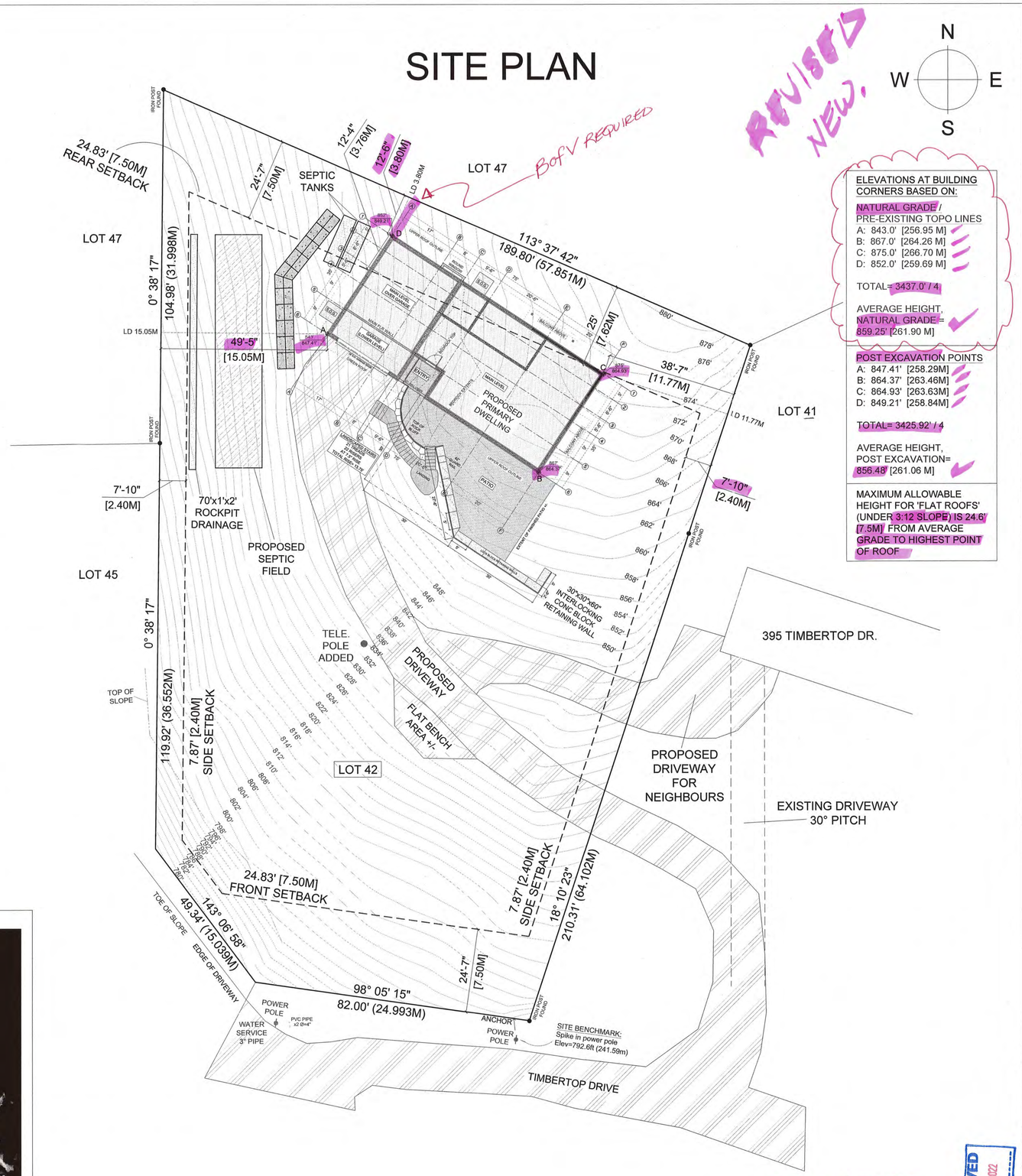
LOT AREA:	33820.90 SF	[0.314 HA]
PRINCIPAL BUILDING:		
PROPOSED PRIMARY DWELLING:	2468.00 SF	[214.98 SM]
COVERED PATIOS & PORCHES:	809.00 SF	[75.16 SM]
TOTAL:	3277.00 SF	[290.14 SM]
TOTAL PROPOSED LOT COVERAGE:	9.69%	
[TOTAL MAX. ALLOWABLE LOT COVERAGE:]	[30%]	

GOOGLE EARTH MAPS (NTS)



SITE PLAN

REVISED NEW,



ELEVATIONS AT BUILDING CORNERS BASED ON:

NATURAL GRADE / PRE-EXISTING TOPO LINES
A: 843.0' [256.95 M]
B: 867.0' [264.26 M]
C: 875.0' [266.70 M]
D: 852.0' [259.69 M]

TOTAL= 3437.0' / 4

AVERAGE HEIGHT, NATURAL GRADE = 859.25' [261.90 M]

POST EXCAVATION POINTS
A: 847.41' [258.29M]
B: 864.37' [263.46M]
C: 864.93' [263.63M]
D: 849.21' [258.84M]

TOTAL= 3425.92' / 4

AVERAGE HEIGHT, POST EXCAVATION= 856.48' [261.06 M]

MAXIMUM ALLOWABLE HEIGHT FOR 'FLAT ROOFS' (UNDER 3:12 SLOPE) IS 24.6' [7.5M] FROM AVERAGE GRADE TO HIGHEST POINT OF ROOF

ISSUED FOR PERMIT

- BofV ONLY - HEIGHT & REAR YARD.

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MOLE RESIDENCE
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LIONS BAY, B.C. V0N 2E0
SITE PLAN

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SCALE: AS NOTED (36"x24")

DRAWN BY: KK/ MRM

NOV 18 / 22

DIMENSIONS SHOWN TO:
O/S FACE OF 8" CONC WALL AT FOUNDATION
O/S FACE OF 1/2" PLYWD SHTG ON EXT. WALLS
CENTERLINE OF INT. WALLS AND COLUMNS

ALL WATER CLOSETS TO BE MAX. 4.8L FLUSH.
ALL FIXTURES TO BE WATER-SAVER TYPE

BEDROOM WINDOW MIN. UNOBSTRUCTED OPENING 3.75 SQ. FT WITH MINIMUM DIMENSION OF 15".
WINDOW HARDWARE MUST NOT OBSTRUCT WINDOW OPENING

FIRE BLOCKING:

ANY STUD CAVITY OVER 9' IN HEIGHT REQUIRES SOLID BLOCKING

SMOKE ALARM ON EACH FLOOR TO BE HARD-WIRED AND INTERCONNECTED. CARBON MONOXIDE ALARM IN OR WITHIN 5m OF BEDROOMS ON FLOORS WITH GARAGE OR FUEL BURNING APPLIANCE

RADON GAS CONTROL: (IF REQ'D)
SEE SECT. 9.13.4.3
- MIN 4" CLEAN COARSE GRANULAR FILL UNDER SLAB
- 6 MIL POLY V.B.
- SLAB PERIMETER AND PENETRATIONS SEALED W/ FLEXIBLE SEALANT
- 4" PIPE CAST VERTICALLY INTO SLAB, CENTRALLY LOCATED, CONTINUOUS TO VENT AT ROOF, CLEARLY LABELLED
- ROUGH IN WIRING FOR FUTURE ACTIVE INLINE FAN INSTALLATION

EXTERIOR FLASHING INSTALLATION:

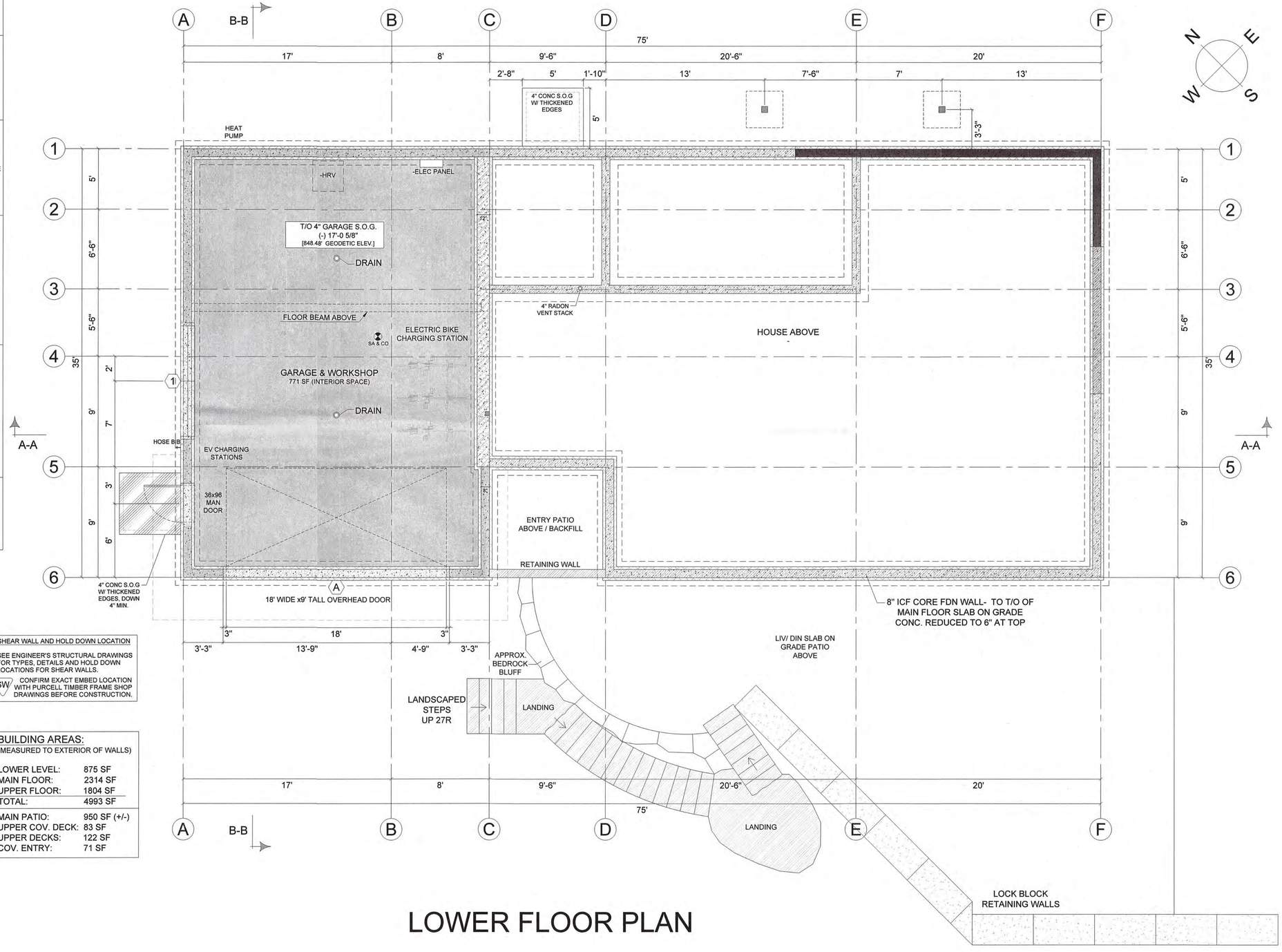
FLASHING SHALL BE INSTALLED WITH END DAMS:
- AT EVERY HORIZONTAL JUNCTION OR OFFSET BETWEEN CLADDING ELEMENTS
- AT EVERY HORIZONTAL LINE WHERE THE CLADDING SUBSTRATE CHANGES
- WHERE THE CLADDING ON THE LOWER SUBSTRATE MAY COMPROMISE THE DRAINAGE OF MOISTURE FROM BEHIND THE CLADDING ABOVE
- OVER ALL EXPOSED OPENINGS

BCBC 2018 - PART 9.8 - STAIRS, HANDRAILS, GAURDS

- RECTANGULAR STAIR TREAD (RUN) AND RISER DIMENSIONS TO CONFORM TO BCBC 2018 9.8.4.2. FOR PRIVATE RESIDENCE.
- RUN = 10" [255mm] (MIN.) - 13-31/32" [355mm] (MAX.)
- RISE = 4-29/32" [125mm] (MIN.) - 7-7/8" [200mm] (MAX.)
- CONTINUITY OF HANDRAILS AND ERGONOMIC DESIGN OF GRASPABLE HANDRAILS MUST CONFORM TO BCBC 2018 9.8.7.2. & 9.8.7.5. RESPECTIVELY
- HANDRAILS ATTACHED TO SMOOTH SURFACES MUST HAVE A CLEARANCE OF 1-15/16" [50mm] OR GREATER. IF THE SURFACE IS ROUGH OR ABRASIVE, THE MINIMUM CLEARANCE MUST BE INCREASED TO 2-11/32" [60mm] OR GREATER. GUARD RAILS MUST BE DESIGNED TO NOT FACILITATE CLIMBING AS PER BCBC 2018 9.8.8.6.

MECHANICAL VENTILATION:
-EVERY DWELLING MUST HAVE A MECHANICAL VENTILATION SYSTEM CONFORMING TO CSA F326 RESIDENTIAL MECHANICAL VENTILATION SYSTEM, OR ABC 9.32.3.
-VENTILATION AIR MUST BE DISTRIBUTED TO EACH BEDROOM AND A COMMON AREA.
-IF HRV IS INSTALLED, IT MUST HAVE A SENSIBLE HEAT RECOVERY EFFICIENCY RATING OF 55%-60% DEPENDING ON THE DESIGN TEMPERATURE SET OUT IN 9.32 OF THE BCBC.
-IF HRV IS NOT INSTALLED, PRINCIPAL VENTILATION EXHAUST FAN SYSTEM (9.32.3.5.) MUST BE DESIGNED TO RUN CONTINUOUSLY, ACCESSIBLE FOR SERVICING, AND IS CONTROLLED BY DEDICATED SWITCH.
-KITCHEN AND BATHROOMS MUST HAVE EXHAUST FAN INSTALLED UNLESS SERVICED BY PRINCIPAL VENTILATION SYSTEM.
-CRAWLSPACE VENTILATION REQUIRED

REFER TO STRUCTURAL DRAWINGS FOR:
- CONCRETE REINFORCEMENT SPECS, SIZING AND LOCATIONS
- FOUNDATION WALLS, RETAINING WALLS, SHEAR WALLS, FOOTINGS, PIERS, BEAM POCKETS AND HOLD-DOWN ANCHORAGE
- SIZES FOR POSTS, STUD PACKS, BEAMS, LINTELS, FLOOR AND DECK JOISTS, ROOF RAFTERS & FRAMING
- SPECIFIC STRUCTURAL ASSEMBLY DETAILS



SHEAR WALL AND HOLD DOWN LOCATION

SEE ENGINEER'S STRUCTURAL DRAWINGS FOR TYPES, DETAILS AND HOLD DOWN LOCATIONS FOR SHEAR WALLS.

SW CONFIRM EXACT EMBED LOCATION WITH PURCELL TIMBER FRAME SHOP DRAWINGS BEFORE CONSTRUCTION.

BUILDING AREAS:
(MEASURED TO EXTERIOR OF WALLS)

LOWER LEVEL:	875 SF
MAIN FLOOR:	2314 SF
UPPER FLOOR:	1804 SF
TOTAL:	4993 SF
MAIN PATIO:	950 SF (+/-)
UPPER COV. DECK:	83 SF
UPPER DECKS:	122 SF
COV. ENTRY:	71 SF

LOWER FLOOR PLAN

ISSUED FOR PERMIT

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LOWER FLOOR PLAN

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1/4"=1'-0" (36"x24")

DRAWN BY: KK/ MRM

NOV 9 / 22

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- SPECIFIC STRUCTURAL ASSEMBLY DETAILS

SPATIAL AREA SEPARATION:
WHERE THE BUILDING FACE OR BUILDING PROJECTIONS (SUCH AS OVERHANGS, CANTILEVERS) ARE LESS THAT 1.2M (~4FT) FROM THE PROPERTY LINE, REFER TO PART 9.10 (FIRE PROTECTION OF THE 2018 BCBC)

*WALL AREA IS MEASURED FROM PROPOSED GRADE TO TOP OF WALL TOP PLATE

WINDOWS & DOORS (AS VIEWED FROM OUTSIDE)

#	LOCATION	JAMB	HEAD	SILL	UNIT SIZE (WxH)	R.O. (WxH)	CONFIG-OPERATION	NOTES
4	GYM / GUEST	6-11/16	96	18	60 [30-30] x 78		CL-F	TEMPERED
5	GYM / GUEST	"	96	18	60 [30-30] x 78		F-CR	TEMPERED
6	STAIRWELL	"	239.5^234	76	66 x 163.5 [72-66-25.5] ^158 [72-66-20]		F-F-F	RAKED, BOTTOM TEMPERED
7	ENTRY	"	96	0	24 x 96		F	MULLED TO B, TEMPERED
8A	LIVING ROOM	"	78	24	168 [48-72-48] x 54		A-F-A	6" MULL CAP BTWN 8A & 8B
8B	LIVING ROOM	"	156	84	168 [48-72-48] x 72		F-F-F	6" MULL CAPS BTWN 8A & 8C
8C	LIVING ROOM	"	218^204	162	168 [48-72-48] x 56^42		F-F-F	6" MULL CAP BTWN 8B & 8C
17	MASTER	"	132^120	24	144 [36-72-36] x 108 [72-36] ^ 96 [72-24]		[F-F-F]-[CL-F-CR]	RAKED, EGRESS
18	NOOK	"	107^102	12	60 x 95 [36-32-27] ^ 90 [36-32-22]		A-F-F	TEMPERED, RAKED
19	BEDROOM 4	"	86^93	24	84 [42-42] x 62 [24-38] ^69 [24-45]		[A-A]-[F-F]	RAKED, EGRESS
A	GARAGE	"	216	0	216 x 108		OVERHEAD	-
B	ENTRY	"	96	0	42 x 96		INSWING RIGHT	MULLED TO 7
C	DINING	"	96	0	180 x 96		O-X-X-O	TEMPERED, SLIDER

*NOTE: SILL & HEAD HEIGHTS ARE BASED OFF CORRESPONDING SUBFLOOR/SLAB

P=PIC F=FIXED A=AWNING CR=CSMT RIGHT CL=CSMT LEFT
O=FIXED DOOR PANEL X=OPERATIONAL DOOR PANEL



FRONT ELEVATION

ISSUED FOR PERMIT

- BofV ONLY -

SPATIAL SEPARATIONS CALCULATIONS:
(BASED ON BCBC 2018 TABLE 9.10.14.4.-A- MAX. AGGREGATE AREA OF UNPROTECTED OPENINGS IN EXTERIOR WALLS)

FRONT (SOUTH) Limiting Distance = 47'-30" [14.41M]

Total Exposed Building Face = 1728.85 SF [160.62 SM]
Total Area of Unprotected Openings = 847.59 SF [78.74 SM]

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MOLE RESIDENCE
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LIONS BAY, B.C. V0N 2E0

FRONT ELEVATION

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1/4" = 1'-0" (36"x24")

DRAWN BY: KK/ MRM

NOV 18 / 22

DIMENSIONS SHOWN TO:
O/S FACE OF CONC AT ICF FOUNDATION WALLS
O/S FACE OF 1/2" PLYWD SHTG ON EXT. WALLS
CENTERLINE OF INT. WALLS AND COLUMNS

ALL WATER CLOSETS TO BE MAX. 4.8L FLUSH.
ALL FIXTURES TO BE WATER-SAVER TYPE

BEDROOM WINDOW MIN. UNOBSTRUCTED OPENING 3.75 SQ. FT WITH MINIMUM DIMENSION OF 15".
WINDOW HARDWARE MUST NOT OBSTRUCT WINDOW OPENING

FIRE BLOCKING:

ANY STUD CAVITY OVER 9' IN HEIGHT REQUIRES SOLID BLOCKING

SMOKE ALARM ON EACH FLOOR TO BE HARD-WIRED AND INTERCONNECTED. CARBON MONOXIDE ALARM IN OR WITHIN 5m OF BEDROOMS ON FLOORS WITH GARAGE OR FUEL BURNING APPLIANCE

EXTERIOR FLASHING INSTALLATION:

FLASHING SHALL BE INSTALLED WITH END DAMS:

- AT EVERY HORIZONTAL JUNCTION OR OFFSET BETWEEN CLADDING ELEMENTS
- AT EVERY HORIZONTAL LINE WHERE THE CLADDING SUBSTRATE CHANGES
- WHERE THE CLADDING ON THE LOWER SUBSTRATE MAY COMPROMISE THE DRAINAGE OF MOISTURE FROM BEHIND THE CLADDING ABOVE
- OVER ALL EXPOSED OPENINGS

BCBC 2018 - PART 9.8 - STAIRS, HANDRAILS, GAURDS

- RECTANGULAR STAIR TREAD (RUN) AND RISER DIMENSIONS TO CONFORM TO BCBC 2018 9.8.4.2. FOR PRIVATE RESIDENCE.
- RUN = 10" [255mm] (MIN.) - 13-31/32" [355mm] (MAX.)
- RISE = 4-29/32" [125mm] (MIN.) - 7-7/8" [200mm] (MAX.)
- CONTINUITY OF HANDRAILS AND ERGONOMIC DESIGN OF GRASPABLE HANDRAILS MUST CONFORM TO BCBC 2018 9.8.7.2. & 9.8.7.5. RESPECTIVELY
- HANDRAILS ATTACHED TO SMOOTH SURFACES MUST HAVE A CLEARANCE OF 1-15/16" [50mm] OR GREATER. IF THE SURFACE IS ROUGH OR ABRASIVE, THE MINIMUM CLEARANCE MUST BE INCREASED TO 2-11/32" [60mm] OR GREATER. GUARD RAILS MUST BE DESIGNED TO NOT FACILITATE CLIMBING AS PER BCBC 2018 9.8.8.6.

MECHANICAL VENTILATION:
-EVERY DWELLING MUST HAVE A MECHANICAL VENTILATION SYSTEM CONFORMING TO CSA F326 RESIDENTIAL MECHANICAL VENTILATION SYSTEM, OR ABC 9.32.3.
-VENTILATION AIR MUST BE DISTRIBUTED TO EACH BEDROOM AND A COMMON AREA.
-IF HRV IS INSTALLED, IT MUST HAVE A SENSIBLE HEAT RECOVERY EFFICIENCY RATING OF 55%-60% DEPENDING ON THE DESIGN TEMPERATURE SET OUT IN 9.32 OF THE BCBC.
-IF HRV IS NOT INSTALLED, PRINCIPAL VENTILATION EXHAUST FAN SYSTEM (9.32.3.5.) MUST BE DESIGNED TO RUN CONTINUOUSLY, ACCESSIBLE FOR SERVICING, AND IS CONTROLLED BY DEDICATED SWITCH.
-KITCHEN AND BATHROOMS MUST HAVE EXHAUST FAN INSTALLED UNLESS SERVICED BY PRINCIPAL VENTILATION SYSTEM.
-CRAWLSPACE VENTILATION REQUIRED

REFER TO STRUCTURAL DRAWINGS FOR:

- CONCRETE REINFORCEMENT SPECS, SIZING AND LOCATIONS
- FOUNDATION WALLS, RETAINING WALLS, SHEAR WALLS, FOOTINGS, PIERS, BEAM POCKETS AND HOLD-DOWN ANCHORAGE
- SIZES FOR POSTS, STUD PACKS, BEAMS, LINTELS, FLOOR AND DECK JOISTS, ROOF RAFTERS & FRAMING
- SPECIFIC STRUCTURAL ASSEMBLY DETAILS

SPATIAL AREA SEPARATION:
WHERE THE BUILDING FACE OR BUILDING PROJECTIONS (SUCH AS OVERHANGS, CANTILEVERS) ARE LESS THAT 1.2M (~4FT) FROM THE PROPERTY LINE, REFER TO PART 9.10 (FIRE PROTECTION OF THE 2018 BCBC)

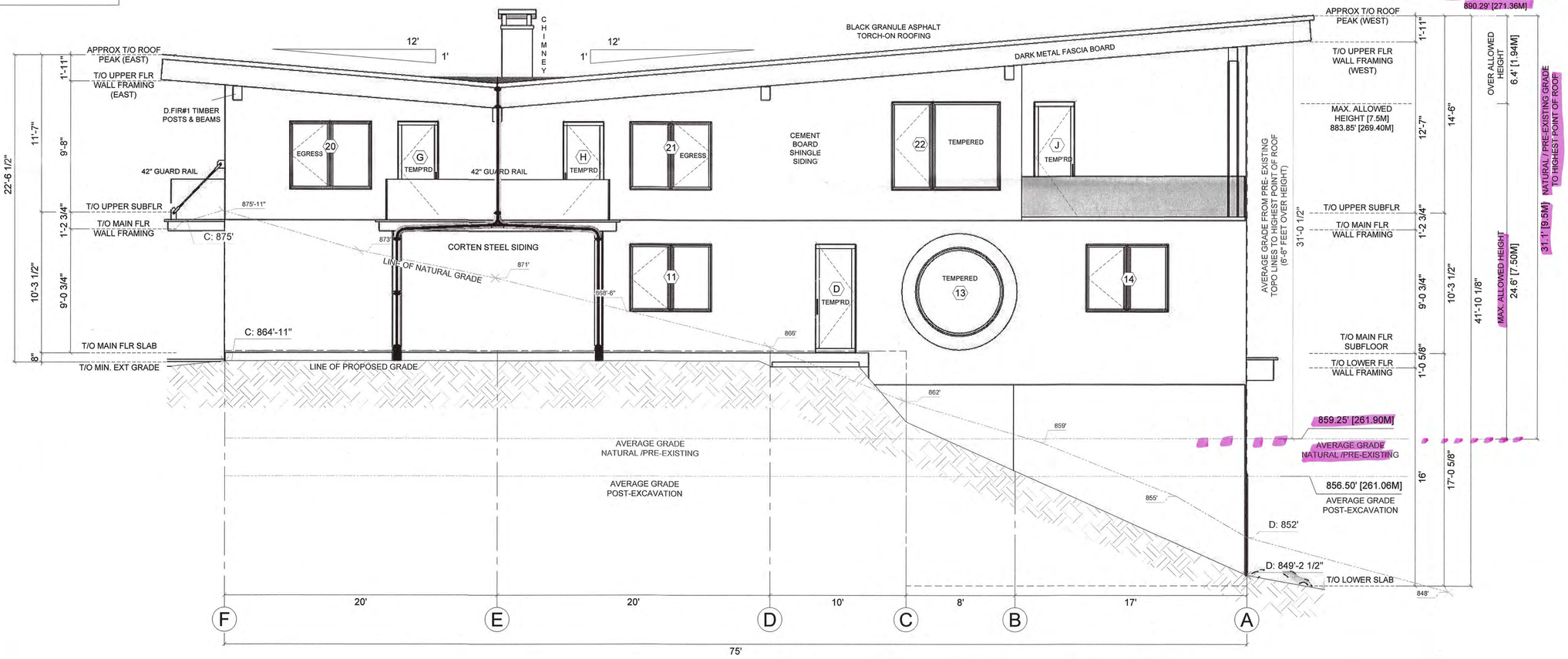
*WALL AREA IS MEASURED FROM PROPOSED GRADE TO TOP OF WALL TOP PLATE

WINDOWS & DOORS (AS VIEWED FROM OUTSIDE)

#	LOCATION	JAMB	HEAD	SILL	UNIT SIZE (WxH)	R.O. (WxH)	CONFIG-OPERATION	NOTES
11	MEDIA	6-11/16	96	36	72 [36-36] x 60		CL-F	-
13	LIBRARY	"	92	14	R = 39"		F	CIRCLE, TEMPERED
14	OFFICE	"	96	36	72 [36-36] x 60		CL-F	-
20	BEDROOM 3	"	84	24	72 [36-36] x 60		CL-F	EGRESS
21	BEDROOM 2	"	84	24	72 [36-36] x 60		F-CR	EGRESS
22	MASTER ENSUITE	"	102	24	96 [36-60] x 78		CL-F	TEMPERED
D	MUDROOM	"	96	0	36 x 96		INSWING RIGHT	TEMPERED
G	BEDROOM 3	"	84	0	36 x 84		OUTSWING RIGHT	TEMPERED
H	BEDROOM 2	"	84	0	36 x 84		OUTSWING LEFT	TEMPERED
J	MASTER WIC	"	102	0	36 x 102		OUTSWING RIGHT	TEMPERED

*NOTE: SILL & HEAD HEIGHTS ARE BASED OFF CORRESPONDING SUBFLOOR/SLAB

P=PIC F=FIXED A=AWNING CR=CSMT RIGHT CL=CSMT LEFT
O=FIXED DOOR PANEL X=OPERATIONAL DOOR PANEL



BACK ELEVATION

B of V ONLY

ISSUED FOR PERMIT

SPATIAL SEPARATIONS CALCULATIONS:
(BASED ON BCBC 2018 TABLE 9.10.14.4.-A- MAX. AGGREGATE AREA OF UNPROTECTED OPENINGS IN EXTERIOR WALLS)

FRONT (SOUTH) Limiting Distance = 47'-30" [14.41M]

Total Exposed Building Face = 1728.85 SF [160.62 SM]
Total Area of Unprotected Openings = 847.59 SF [78.74 SM]

purcell TIMBER FRAME HOMES
www.purcell.com 1-800-655-5574

MOLE RESIDENCE
385 TIMBERTOP DRIVE
LIONS BAY, B.C. V0N 2E0

BACK ELEVATION

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1:50 (36"x24")

DRAWN BY: KK/ MRM

NOV 18 / 22

TERRANE
GEOTECHNICAL GROUP

114-2433 Dollarton Highway
North Vancouver, BC V7H 0A1

604-770-0355
info@terranegroup.com

May 14th, 2022
Project #7616

Mr. James Mole
[redacted]
LIONS BAY, B.C.
V0N 2E0

Dear Sir:

Re: PRELIMINARY HAZARD ASSESSMENT
PROPOSED NEW RESIDENTIAL STRUCTURE
385 TIMBERTOP DRIVE, LIONS BAY, B.C.

In accordance with your request, Terrane Engineering Group Limited (Terrane Group) conducted a preliminary qualitative hazard risk assessment at the above referenced site. It is understood that it is proposed to construct a new residential structure on the upper portion of the site. Cordilleran Geoscience Report entitled "The Village of Lions Bay, Natural Hazards Development Permit Area Strategy, Coastal, Creek and Hillslope Hazards" dated January 18th, 2018 (the reference report) describes hazards that may impact the Village of Lions Bay. This letter report assesses the hillslope hazards that may impact the proposed new residential structure at the site.

The site is located at 385 Timbertop Drive in the Village of Lions Bay, B.C. (Figure 1). The legal description is Lot 42, District Lot 2985, New Westminster District, Plan VAP14997. It is irregular in shape and has a total area of about 3,116 m^2. The site is bounded by forested undeveloped land to the north, by residential properties with residential structures to the east and west, and by Timbertop Drive and residential properties to the south. The topography in the area slopes downward to the west at between 25° and 35°. The site and surrounding area is heavily vegetated with coniferous trees with trunk diameters of up to 0.6 m. Some small outcrops of bedrock are present on the site. Figures 1 & 2 show topography.

Terrane Group conducted field reconnaissance on the slope above the subject site area on April 21st, 2022. The top of the subject site is located at approximately elevation 260 m geodetic. The field reconnaissance extended upslope to approximately elevation 450 m (to the flat bench area where Sleepless Nights South Trail intersects Trudi's Trail (refer to Figure 1)). The slope immediately above the site up to about elevation 300 m slopes downwards to the west at some 40°. Above 300 m to about elevation 400 m, the slope angle decreases to 25° to 35°. The slope is heavily vegetated with coniferous and some deciduous trees (second growth forest) with trunk diameters of up to 0.7 m. The tree trunks exhibit little or no curvature. Several groups of detached angular boulders with a dimension of up to 2 m are present on the slope (Photos 1 to 3). Bedrock outcrops are present on the slope at lower Trudi's Trail (elevation 340 m) and above (Photos 4 & 5). Above elevation 400 m, the topography flattens to between 15° and 20°. The area in the vicinity of the intersection of Sleepless Nights South and Trudi's Trail is flat (Photos 6 & 7).

Geological Survey of Canada (GSC) mapping and the reference report indicate that the site area is underlain by Lower Cretaceous Gambier Group marine sedimentary and volcanic rock. Higher upslope, above about elevation 500 m, Mid-Cretaceous quartz dioritic intrusive rock of the Coast Plutonic Complex is present. Review of slope conditions and the reference information indicates that the slope directly above and east of the site consists of Gambier Group volcanic rock overlain by a thin mantle of colluvium and forest litter.

The reference report indicates that the site is located within DPA Areas 3A (Open Slope Landslide), 3B (Rock Fall) & 3C (Slope > 30%).

In regards to DPA 3A, the slope immediately above the site, between elevations 260 m and 400 m, may be subject to open slope landslide. It is noted that there are no known documented open slope landslides in the Lions Bay area and thus the frequency of occurrence of such an event is judged to be very low. As indicated above, this slope is bedrock controlled and is surfaced with a thin mantle of colluvium. The slope is convex in shape (in plan view) so any landslide event would have to occur directly above the site in order to impact the site. As the proposed residential structure will be located close to the toe of the slope, such an event has the potential to cause severe damage to the structure depending on the magnitude of the event. Key triggering mechanisms for this type of slope failure include a concentrated source of water, rock fall from above, windthrow of trees, and seismic motion. No concentrated sources of water or seepages were observed on the slope above the site. There have been some very heavy rainfall events over the past 30 years without the occurrence of open slope landslides so that initiation of a landslide in this area by a concentrated source of water is considered to be very low probability. Rock fall from the bluffs much higher in elevation (above 500 m) is considered to be a low probability (this is discussed in more detail below) and thus low risk as a triggering mechanism. Windthrow of the trees is possible however, considering spatial effects from topography, this is also considered to be of low probability. The probability of a large seismic event occurring within the lifespan of the proposed structure is likely quite low and thus low risk as a triggering mechanism. In consideration of the above discussion, it is judged that the risk of an open slope landslide impacting the site is low and within the acceptable and tolerable range.

In regards to DPA 3B, the site may be subject to rock fall. The site is located at the toe of a 150 m high steep slope with some detached boulders on it as well as localized bedrock outcrops also with detached boulders (Photos 1 to 5). It is assessed that the proposed residential structure does not lie within the track of any boulders that potentially could move downslope. The reference report indicates that rock fall could potentially occur from the granodiorite rock bluffs higher upslope (above elevation 450 m). Rock fall from this area is not expected to move beyond the flatter bench area at about elevation 450 m (directly upslope of the site). The slope between the site (elevation 260 m) and the bench area (elevation 450 m) is convex in shape on plan view. Rock fall with sufficient momentum to move beyond the bench area and onto the 150 m high steep slope below would have to take a very specific track on the slope to impact the proposed residential structure. A small deviation in the track would lead to the rock fall boulder missing the structure. Rock fall impact on the residential structure would likely lead to severe damage. While the consequence of a direct impact would have severe consequences, the probability of such an impact

occurring is extremely low. As such it is judged that the risk of rock fall impacting the proposed structure is low and within the acceptable and tolerable range.

In regards to DPA 3C, the topography in and around site area has a slope that exceeds 30%. Specific recommendations for development on the site itself will be provided under separate cover.

Based on review of site conditions and the reference report, it judged that the proposed new residential structure may be constructed in the location planned and that it will be safe for the use intended. "Safe" does not imply complete freedom from hazard. Serious injury or death to a person or severe damage to the structure is possible, however, the "risk" is judged to be acceptable or tolerable by societal standards.

It is trusted that the information presented fulfils your current requirements. If you have any questions, please do not hesitate to contact the undersigned at your convenience.

For
Terrane Engineering Group Limited (#1001310)

Geoffrey G. Dyer, M.Eng., P.Eng.
Senior Geotechnical Engineer

cc: Village of Lions Bay
Mr. David Butler

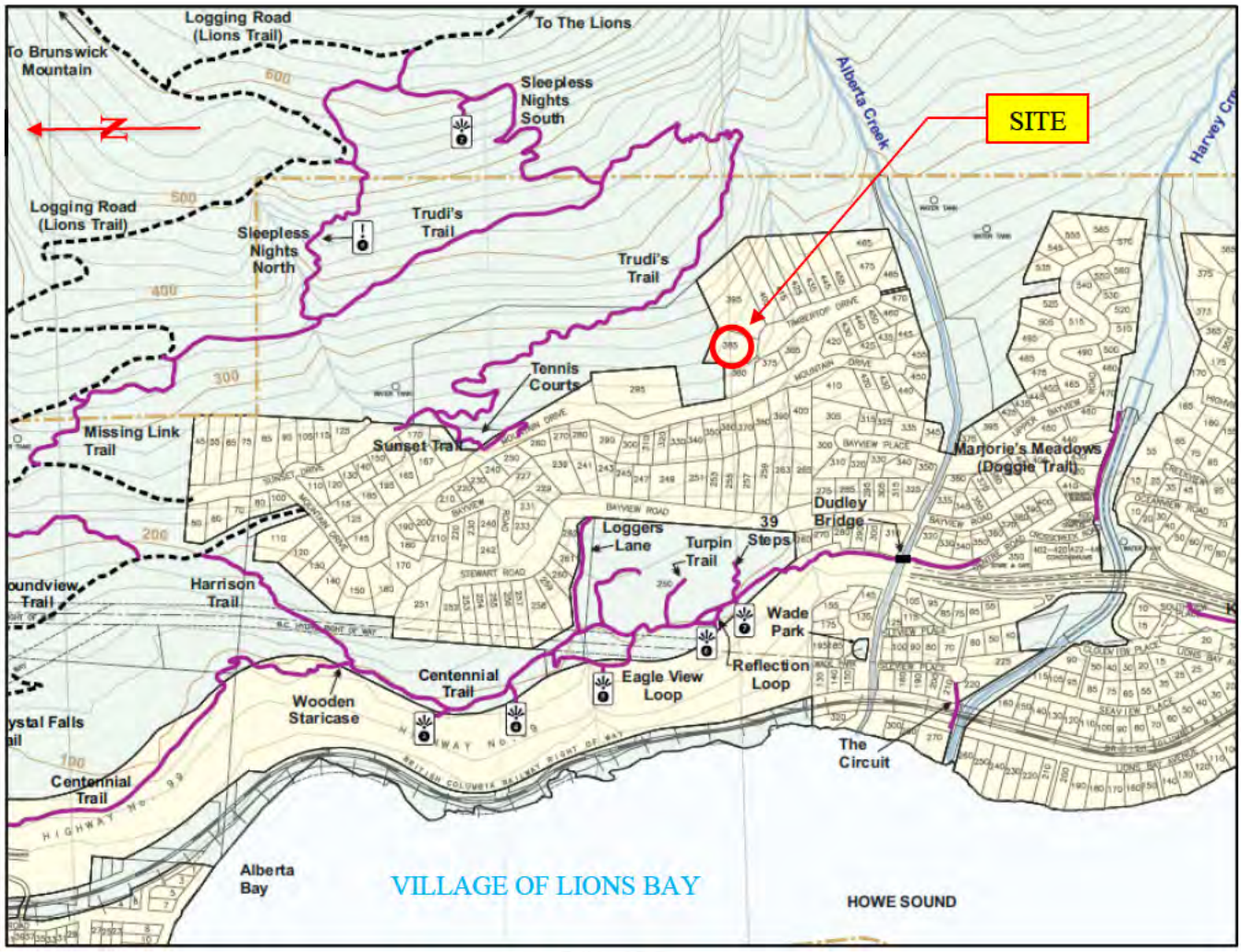

Logging Road (Lions Trail)
To The Lions
To Brunswick Mountain
Sleepless Nights South
Alberta Creek
SITE
Logging Road (Lions Trail)
Sleepless Nights North
Trudi's Trail
Trudi's Trail
Tennis Courts
Missing Link Trail
Sunset Trail
Marjorie's Meadows (Doggie Trail)
Dudley Bridge
Loggers Lane
Turpin Trail
39 Steps
Harrison Trail
Wade Park
Reflection Loop
Eagle View Loop
Centennial Trail
Wooden Staricase
The Circuit
Centennial Trail
Alberta Bay
VILLAGE OF LIONS BAY
HOWE SOUND

Figure 1

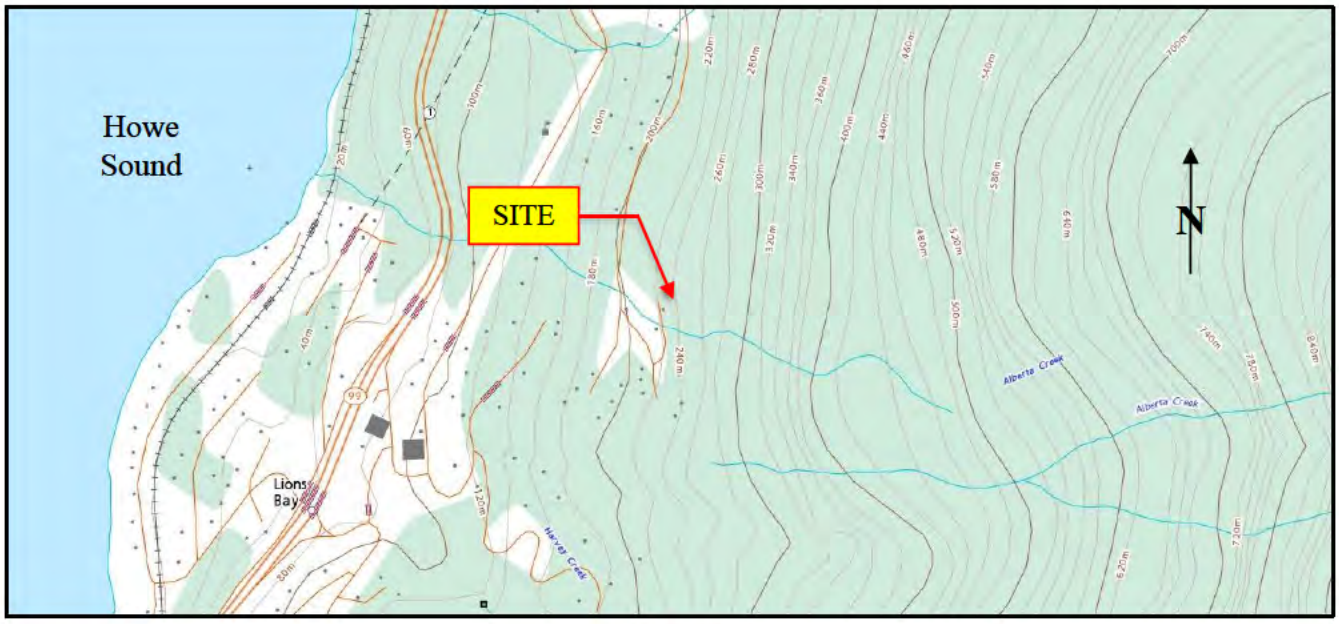

Howe
Sound
SITE
N
Lions
Bay
Alberta Creek
Alberta Creek
Harvey Creek

Figure 2



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6



Photo 7

TERRANE
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114-2433 Dollarton Highway
North Vancouver, BC V7H 0A1

604-770-0355
info@terranegroup.com

August 11th, 2022
Project #7616

Mr. James Mole
[redacted]
LIONS BAY, B.C.
V0N 2E0

Dear Sir:

Re: PRELIMINARY LANDSLIDE RISK ASSESSMENT
PROPOSED NEW RESIDENTIAL DEVELOPMENT
385 TIMBERTOP DRIVE, LIONS BAY, B.C.

1.0 INTRODUCTION

In accordance with your request, Terrane Engineering Group Limited (Terrane Group) conducted a preliminary qualitative landslide risk assessment at the above referenced site. It is understood that it is proposed to construct a new residential structure as well as a carriage house on the site. Cordilleran Geoscience Report entitled "The Village of Lions Bay, Natural Hazards Development Permit Area Strategy, Coastal, Creek and Hillslope Hazards" dated January 18th, 2018 (the reference report) describes hazards that may impact the Village of Lions Bay. This letter report assesses the hillslope hazards that may impact the proposed development at the site.

2.0 SITE DESCRIPTION

The site is located at 385 Timbertop Drive in the Village of Lions Bay, B.C. (Figure 1). The legal description is Lot 42, District Lot 2985, New Westminster District, Plan VAP14997. It is irregular in shape and has a total area of about 3,116 m^2. The site is bounded by forested undeveloped land to the north, by residential properties with residential structures to the east and west, and by Timbertop Drive and residential properties to the south. The topography in the immediate site area slopes downward from northeast to southwest. At larger scale, the topography around the site slopes downward from east to west at between 25° and 35°. The site and surrounding area is heavily vegetated with coniferous trees with trunk diameters of up to 0.6 m. Some small outcrops of bedrock are present on the site. Figures 1 & 2 show topography.

3.0 PROPOSED DEVELOPMENT

It is proposed to construct a three-level wood-framed residential structure on the upper portion of the site as shown on Figure 3. A detached garage with carriage house above is proposed on the lower portion of the site as shown on Figure 3.

4.0 FIELD RECONNAISSANCE

Terrane Group conducted field reconnaissance on the slope above the subject site area on April 21st, 2022. The top of the subject site is located at approximately elevation 260 m geodetic. The field reconnaissance extended upslope to approximately elevation 450 m (to the flat bench area where Sleepless Nights South Trail intersects Trudi's Trail (refer to Figure 1)). The slope immediately above the site up to about elevation 300 m slopes downwards to the west at some 40°. Above 300 m to about elevation 400 m, the slope angle decreases to 25° to 35°. The slope is heavily vegetated with coniferous and some deciduous trees (second growth forest) with trunk diameters of up to 0.7 m. The tree trunks exhibit little or no curvature. Several groups of detached angular boulders with a dimension of up to 2 m are present on the slope (Photos 1 to 3). Bedrock outcrops are present on the slope at lower Trudi's Trail (elevation 340 m) and above (Photos 4 & 5). Above elevation 400 m, the topography flattens to between 15° and 20°. The area in the vicinity of the intersection of Sleepless Nights South and Trudi's Trail is flat (Photos 6 & 7).

5.0 BEDROCK GEOLOGY

Geological Survey of Canada (GSC) mapping and the reference report indicate that the site area is underlain by Lower Cretaceous Gambier Group marine sedimentary and volcanic rock. Higher upslope, above about elevation 500 m, Mid-Cretaceous quartz dioritic intrusive rock of the Coast Plutonic Complex is present. Review of slope conditions and the reference information indicates that the slope directly above and east of the site consists of Gambier Group volcanic rock overlain by a thin mantle of colluvium and forest litter.

6.0 PRELIMINARY RISK ASSESSMENT DISCUSSION

The reference report indicates that the site is located within DPA Areas 3A (Open Slope Landslide), 3B (Rock Fall) & 3C (Slope > 30%). These are discussed in more detail below.

6.1 DPA 3A – Open Slope Landslide

In regards to DPA 3A, the slope immediately above the site, between elevations 260 m and 400 m, may be subject to open slope landslide. It is noted that there are no known documented open slope landslides in the Lions Bay area and thus the frequency of occurrence of such an event is judged to be very low (determining a specific return period for this type of event is well beyond the scope of this assessment). As indicated above, this slope is bedrock controlled and is surfaced with a thin mantle of colluvium. The slope is convex in shape (in plan view) so any landslide event would have to occur directly above the site in order to impact the site. As the proposed residential structure will be located close to the toe of the slope, such an event has the potential to cause severe damage to the structure depending on the magnitude of the event.

Key triggering mechanisms for this type of slope failure include a concentrated source of water (heavy extended rainfall event or heavy rainfall event on snow pack), windthrow of trees, seismic motion, and possibly rock fall from above. No concentrated sources of water or seepages were observed on the slope

above the site. There have been some very heavy rainfall events over the past 30 years without the occurrence of open slope landslides so that initiation of a landslide in this area by a concentrated source of water is considered to be very low probability. It is noted that the "Atmospheric River" event ("Pineapple Express") that occurred in November 2021 was a record setting rainfall event that dropped more than 200 mm of rainfall in just over two days. There were no documented slope failures from this event in the Lions Bay area. Windthrow of the trees is possible, however, considering spatial effects from topography, this is also considered to be of low probability. The probability of a large seismic event occurring within the lifespan of the proposed structures is likely quite low and thus low risk as a triggering mechanism. Rock fall from the bluffs much higher in elevation (above 500 m) is considered to be a low probability (this is discussed in more detail below) and thus low risk as a triggering mechanism.

Installation of mitigation works would dramatically reduce the risk to the proposed development. Mitigation works would typically take the form of a large berm to deflect the landslide or extensive drainage works to address the key (main) triggering mechanism. Installation of mitigation works involving construction of a berm within the site area, however, is considered not to be economically feasible for the property owner. Further, this option is not recommended from a legal standpoint as the risk would be transferred to adjacent property owners. If construction of a berm of some type was to be considered, it would have to be constructed off the subject site upslope some 150 m higher (east) on flatter terrain. Mitigation consisting of drainage works would also have to be constructed off site upslope of the site. Again, this is considered not to be economically feasible for the property owner. Mitigation by increasing the structural integrity of the structure is not considered to be feasible from a cost perspective. Massive structural reinforcement and a complete change in the architectural design would be required. Mitigation can be achieved in some situations by siting proposed structures in areas less at risk to the hazard. It is judged that moving the proposed structure within property boundaries will not reduce the risk of the hazard.

In consideration of the above discussion, and particularly in consideration that the atmospheric river rainfall event in November 2021 did not trigger any open flow landslides in the subject area, it is judged that the risk of an open slope landslide impacting the site is low.

6.2 DPA 3B – Rock Fall

In regards to DPA 3B, the site may be subject to rock fall. The reference report indicates that the main source area for rock fall impacting the site area is from the "Magnesia-Alberta Face unit rock avalanche headscarp" (granodiorite rock bluffs) located some 1,200 m laterally upslope to the east (approximately elevation 600 m to 700 m). The site area lies within the 27.5° rock fall shadow angle. The majority of rock fall is expected to be contained within this area. The largest rock blocks will tend to travel the farthest based on kinetic energy considerations. The distance an individual rock block will travel will depend on conditions/obstructions in the "landing zone" immediately beyond the detachment location, downslope topography, angularity of the rock block, competency of the rock block (the degree that the rock will break down into smaller pieces during its travel), and the presence of other obstructions downslope such as other rock blocks or densely forested areas. Forest fires may limit or eliminate the ability of forested areas to obstruct rock fall. Similarly, the occurrence of an open slope landslide below a rock fall source area may

reduce obstructions for rock fall. Triggering mechanisms for rock fall typically consist of natural weathering processes, freeze-thaw (ice jacking) in joints/discontinuities, tree roots growing into joints/discontinuities ("root jacking"), impacts for rock fall above, vibration from adjacent rock fall, and seismic motion. The reference report indicates that characterization of 500 year to 2,500 year return periods should be considered for rock fall risk assessments. Terrane Group is not aware of documented return periods for rock fall events in the Lions Bay area and determination of a specific return period for this type of event is well beyond the terms of reference of this assessment.

Review of the topography between the site and the rock bluffs indicates steep areas (slopes greater than 35°) immediately upslope of the site and in the toe area of the rock bluffs but that there is a flatter bench area between these steep areas that is sloped at between 15° and 20° (green coloured areas on Maps 1 to 9 of the reference report). A number of rock blocks with a maximum dimension of up to about 2 m were observed on the flatter bench area and in the vicinity of the toe of the steeper terrain uphill to the east. None of the blocks appeared to be from recent rock fall (all were covered with vegetation and all visible rock surfaces were weathered; no fresh rock surfaces). Considering heavy forest cover upslope of the area, it is assessed that the majority of the rock fall originating from the granodiorite rock bluffs is not expected to move beyond the flatter bench area at about elevation 450 m (directly upslope of the site). Large rock blocks may travel beyond this flatter bench area downslope to the west. The slope between the site (elevation 260 m) and the bench area (elevation 450 m) is convex in shape on plan view. Rock fall with sufficient momentum to move beyond the flatter bench area and onto the steep slope below would have to take a very specific track on the slope to impact the proposed development site. A small deviation in the track would lead to the rock fall block missing the site. Rock fall blocks originating from the granodiorite bluffs impacting the proposed residential structure would likely lead to severe and possibly catastrophic damage. While the consequence of a direct impact would have severe consequences, the probability of such an impact occurring is likely quite low.

Field reconnaissance on the steep slope immediately above the site identified some detached boulders on it as well as localized bedrock outcrops also with detached boulders (Photos 1 to 5). It is assessed that the source area for these detached boulders is from this area of the slope and not from the granodiorite rock bluffs. It is assessed that the proposed residential structure and carriage house does not lie within the track of any of these boulders should they move downslope.

Typical mitigation strategies for rock fall within the source area include scaling loose blocks, scaling and block size reduction using blasting techniques, creating a containment area below the rock fall source area, and stabilization in place (rock bolts/anchors/cables, shotcrete). Typical mitigation strategies for rock fall below the source area include deflection or containment berms, rock fall fences, siting of structures to lower risk areas, and structural reinforcement of structures.

It is judged that it is impractical to install suitable rock fall mitigation works within the site area due to topographic considerations uphill of and within the site, and space considerations given the proposed location for the structure at the uphill end of the site. Structural reinforcement of the proposed structure also seems impractical from a cost perspective. To be effective, rock fall mitigation works involving deflection/containment berms or rock fall fences would have to be installed uphill off site on flatter terrain

(the flatter bench area around elevation 400 m). These mitigation works would benefit multiple adjacent residential lots but would be cost prohibitive for an individual property owner to fund.

In consideration of the above discussion, it is judged that the risk of rock fall impacting the proposed structures is low.

6.3 DPA 3C – Slope >30%

In regards to DPA 3C, the topography in and around site area has a slope that exceeds 30%. Excavations of up to 3.5 m below grade will be required to facilitate construction of the proposed residential structure, carriage house and installation of an access driveway. Terrane Group has been retained to provide geotechnical review during construction. Geotechnical recommendations and reporting will be undertaken as required during construction.

7.0 RISK ASSESSMENT

The site may be subject to both open slope landslide and rock fall hazards. The consequence of direct impact on the proposed development is likely very high (very damaging; potential serious injury or death). The likelihood of occurrence of these events, however, is judged to be low. For rock fall, the likelihood of occurrence is judged to be low but in addition, the likelihood of direct impact should a rock fall event occur, is also judged to be low. The overall risk to the proposed development is judged to be low.

The Village of Lions Bay has not adopted a "Level of Landslide Safety" for a landslide risk assessment or in other words what level is acceptable or tolerable risk for development. Event frequencies (that may result in death to an individual) of 1:10,000 were considered for relocation of the community of Garibaldi in the toe area of the Rubble Creek Barrier landslide. A landslide event frequency of 1:10,000 is also used by The Fraser Valley Regional District, The District of Squamish and the Ministry of Transportation and Infrastructure (MOTI) when considering new development. The District of North Vancouver has adopted an event frequency of 1:100,000 for new development. Where the risk is greater than these values, approval for development is not granted.

For comparison, the risk of death for various activities is listed below:

Activity	Risk of Death
Driving a vehicle	1:100
Walking in the city	1:600
Fire	1: 1,500
Falling down stairs	1:1,600
Choking on food	1:3,000
Riding a bicycle	1:3,500
Drowning	1:1,000
Flying on commercial airliner	1:11,000,000
Riding on a train	1:175,000
NASA risk level for which controlled re-entry of space debris is required to ensure debris will not impact populated areas	1:10,000

These risks cover some everyday activities that society in general is willing to accept. The actual risk numbers in the above table are variable depending on the source but the values listed are an average.

It is judged that the risk for both open slope landslide and rock fall meets the 1:10,000 criteria. Based on review of site conditions and the reference report, it judged that the proposed new residential and carriage house structures may be constructed in the locations planned and that they will be safe for the use intended. "Safe" does not imply complete freedom from hazard. Serious injury or death to a person or severe damage to the structure is possible, however, the "risk" is judged to be acceptable or tolerable based on the above discussion.

As discussed above, installation of mitigation works will further reduce the risk. To be effective and to benefit surrounding properties, these works would have to be installed upslope of the subject site.

A "Save Harmless" covenant registered on the title of the property indicating that the subject site may be subject to open slope landslide and rock fall hazards with the consequences of direct impact being very high may be considered by the Village of Lions Bay if it is desirable to limit liability for development approval.

8.0 ASSESSMENT LIMITATIONS

This assessment is a preliminary assessment only and is based on limited field reconnaissance, review of available reference information including the reference report, and Terrane Group's experience and judgement. The terms of reference for this assessment do not include undertaking extensive field investigation, terrain mapping, or comprehensive computer modelling that is required to quantify return periods for the hazards.

9.0 CLOSURE

It is trusted that the information presented fulfils your current requirements. If you have any questions, please do not hesitate to contact the undersigned at your convenience.

For
Terrane Engineering Group Limited (#1001310)

Geoffrey G. Dyer, M.Eng., P.Eng.
Senior Geotechnical Engineer

cc: Village of Lions Bay
Mr. David Butler

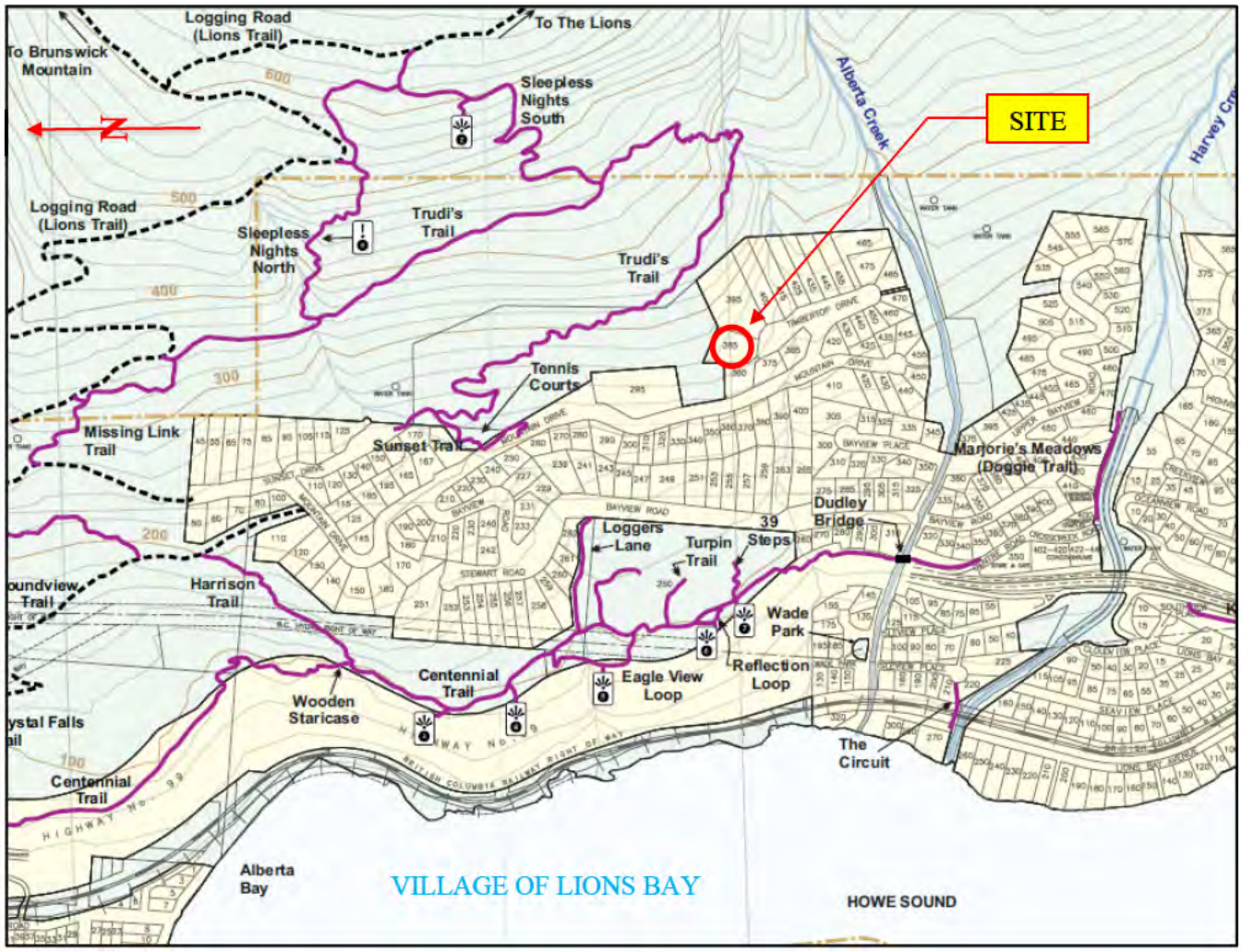

Logging Road (Lions Trail)
To The Lions
To Brunswick Mountain
Sleepless Nights South
Alberta Creek
SITE
Logging Road (Lions Trail)
Sleepless Nights North
Trudi's Trail
Trudi's Trail
Tennis Courts
Missing Link Trail
Sunset Trail
Marjorie's Meadows (Doggie Trail)
Dudley Bridge
Loggers Lane
Turpin Trail
39 Steps
Harrison Trail
Wade Park
Reflection Loop
Eagle View Loop
Centennial Trail
Wooden Staricase
The Circuit
Centennial Trail
Alberta Bay
VILLAGE OF LIONS BAY
HOWE SOUND

Figure 1

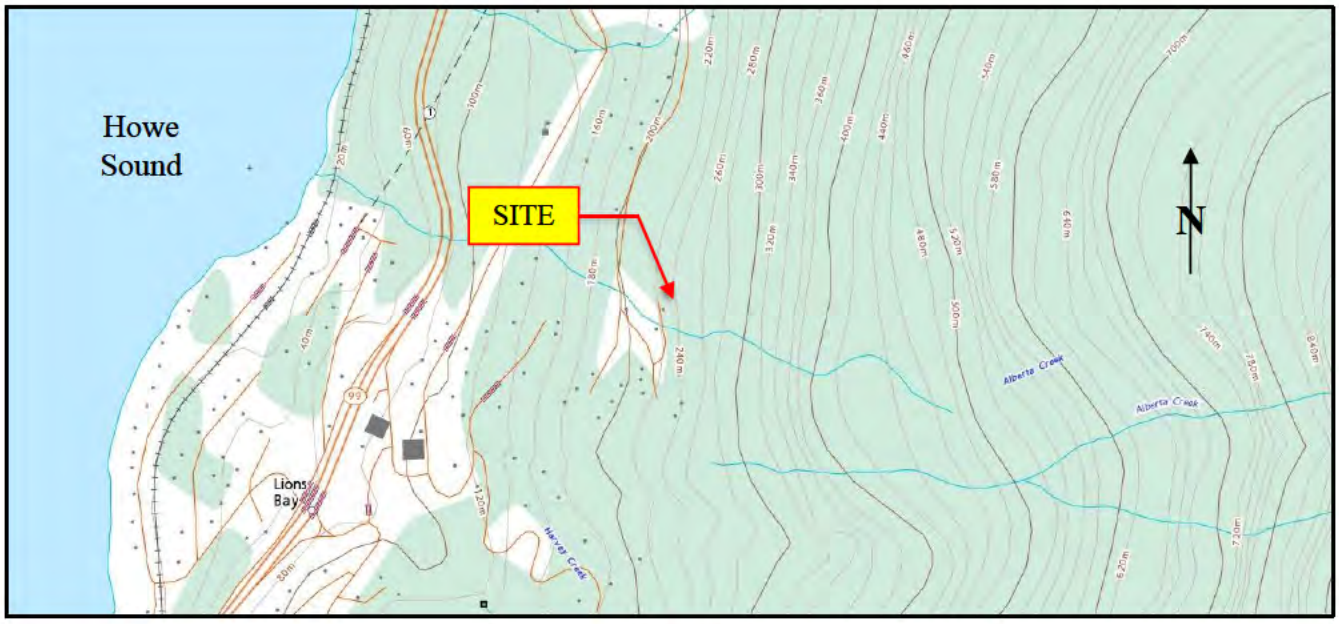

Howe
Sound
SITE
N
Lions
Bay
Alberta Creek
Alberta Creek
Harvey Creek

Figure 2

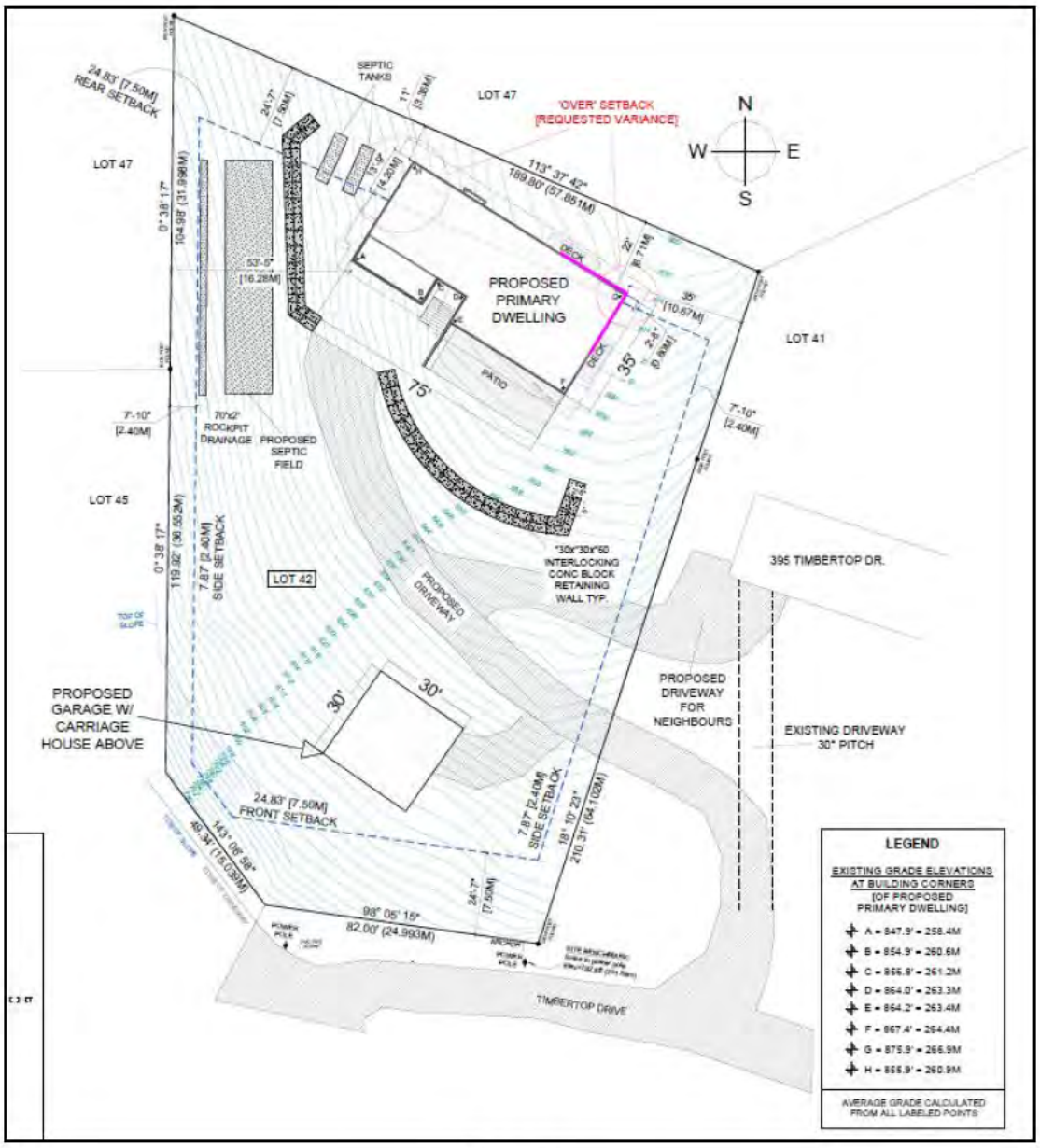

24.83' [7.50M] REAR SETBACK
SEPTIC TANKS
LOT 47
'OVER' SETBACK [REQUESTED VARIANCE]
N
W
E
S
113° 37' 42" 189.80' (57.851M)
PROPOSED PRIMARY DWELLING
DECK
PATIO
LOT 41
LOT 45
LOT 42
70'x2' ROCKPIT DRAINAGE
PROPOSED SEPTIC FIELD
SIDE SETBACK
30'x30'x60' INTERLOCKING CONC BLOCK RETAINING WALL TYP.
PROPOSED DRIVEWAY
395 TIMBERTOP DR.
PROPOSED GARAGE W/ CARRIAGE HOUSE ABOVE
PROPOSED DRIVEWAY FOR NEIGHBOURS
EXISTING DRIVEWAY 30° PITCH
24.83' [7.50M] FRONT SETBACK
98° 05' 15" 82.00' (24.993M)
TIMBERTOP DRIVE
LEGEND
EXISTING GRADE ELEVATIONS AT BUILDING CORNERS (OF PROPOSED PRIMARY DWELLING)
A = 847.9' = 258.4M
B = 854.9' = 260.6M
C = 856.8' = 261.2M
D = 864.0' = 263.3M
E = 864.2' = 263.4M
F = 867.4' = 264.4M
G = 875.9' = 266.9M
H = 855.9' = 260.9M
AVERAGE GRADE CALCULATED FROM ALL LABELED POINTS

Figure 3



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6



Photo 7