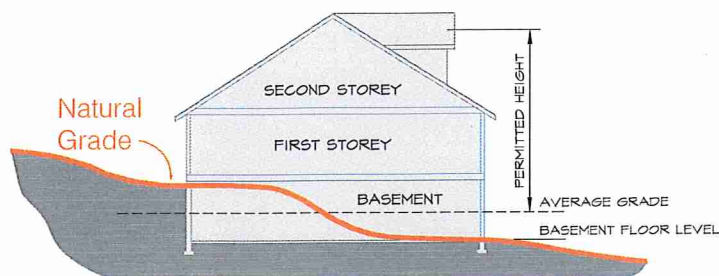


Key Terminology: Grade

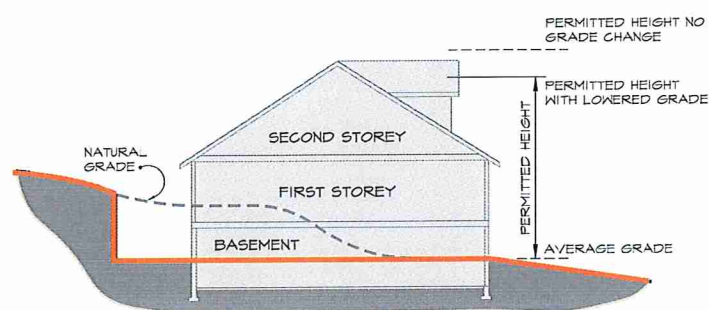
Natural Grade

a)



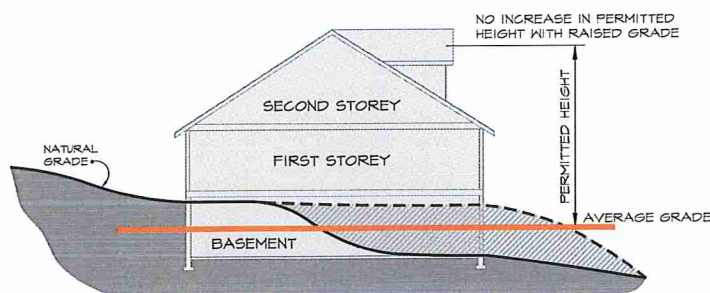
- **Natural Grade:** the undisturbed ground level formed without human intervention.

Finished Grade



- **Finished Grade:** the final ground surface after development, excluding:
 - (a) minor planters less than 1.2 metres in width measured out from the wall, or local mounding of soil, and
 - (b) window wells with a clear width measured out from the wall of less than 0.6 metre to a maximum of 3 metres in cumulative length along each building face.

Average Grade



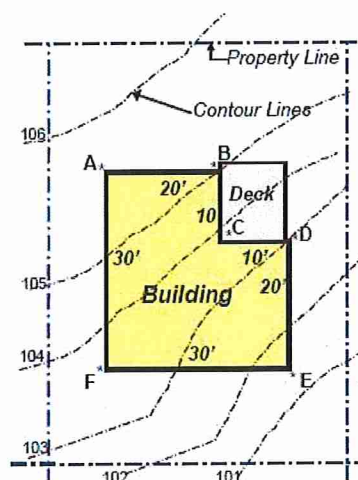
- **Average Grade:** is measured around the perimeter of the building or structure at or directly above or below the outermost projection of the exterior walls or the posts of carports.
- In other words, the average of the natural and finished grades.

Anmore Average Grade Calculation

Example:

Wall Section	X	Length	= Y
Average Grade			
A-B $106.5 + 105.0 \div 2$	X	6 m	= 634.50
B-C $105.0 + 104.0 \div 2$	X	3 m	= 313.50
C-D $104.0 + 103.0 \div 2$	X	3 m	= 310.50
D-E $103.0 + 101.5 \div 2$	X	6 m	= 613.50
E-F $105.5 + 104.0 \div 2$	X	9 m	= 942.75
F-A $104.0 + 106.5 \div 2$	X	9 m	= 947.25
Totals:		36 m	= 3744

Total Y \div Total perimeter length = Average grade
 $3744 \div 36\text{m} = 104\text{ m}$



Key Terminology: Habitable Area

Storey

- The space between a floor level and the ceiling above it (minimum 2.1 metres, except basements, which is 2 metres)

Floor Area

- The floor space contained within a storey.

Habitable Area

- Areas for the purposes of habitation, including, but not limited to: eating, sleeping, washing, bathing, etc.

Ceiling Heights

- The Building Code establishes minimum ceiling heights for habitable areas. These heights establish areas that are suitable for living space, and those that are not.

Table 9.5.3.1.
Room Ceiling Heights
Forming part of Sentences 9.5.3.1.(1) and (4)

Room or Space	Minimum Ceiling Height, m	Minimum Clear Height, m	Minimum Area Over Which Minimum Ceiling Height Shall Be Provided ⁽¹⁾
Living room or space	2.1		Lesser of area of the space or 10.0 m ²
Dining room or space	2.1		Lesser of area of the space or 5.2 m ²
Kitchen or kitchen space	2.1		Lesser of area of the space or 3.2 m ²
Master bedroom or bedroom space	2.1		Lesser of area of the space or 4.9 m ²
Other bedroom or sleeping space	2.1		Lesser of area of the space or 3.5 m ²
Unfinished <i>basement</i> including laundry area therein		2.0	Clear height under beams and in any location that would normally be used for passage
Bathroom, water-closet room or laundry area above <i>grade</i>	2.1		Lesser of area of the space or 2.2 m ²
Passage, hall or main entrance vestibule	2.1		Area of the space
Habitable rooms and spaces not specifically mentioned above	2.1		Lesser of area of the space or 2.2 m ²

Notes to Table 9.5.3.1.:

(1) Area of the space shall be measured at floor level.

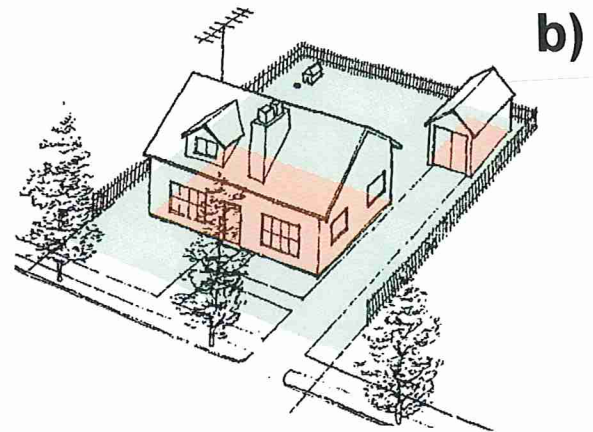
Key Definitions: Site Coverage

Site Coverage (Review)

The maximum or minimum lot coverage is the portion of the parcel that may be covered by principal and accessory uses. Under Belcarra's current bylaw, buildings are limited to 40% lot coverage.

The lot coverage of principal and accessory uses can be regulated separately or together (e.g. 40% total coverage, or 30% for principal and 10% for accessory).

Maximum Site Coverage



West Vancouver

- Site Coverage Definition: The percentage figure obtained when the total projected area of all buildings and structures is divided by the site area.
- Site coverage:
 - 30% of site area maximum, if site area is greater than 885 square metres.
 - 266 square metres maximum, if site area is between 664 square metres and 885 square metres.
 - 40% of site area maximum, if site area is less than 664 square metres.

Belcarra

- Site Coverage Definition: The total horizontal area at grade of all buildings or parts thereof, as measured from the outermost perimeter of all buildings on the lot, and expressed as a percentage of the total area of the lot, but does not include the permitted projection into required yards as otherwise provided for in this Bylaw.
- Site coverage for single family lots: 40%.

Group Discussion: Defining Site Coverage

1. How should lot / site coverage be defined?
2. What should be included?
3. What should be excluded?

Notes...

Key Definitions: Floor Area

Floor Area (Review)

The Bylaw may stipulate the maximum floor area of all uses on the property.

Floor area can be set as an absolute maximum, or can be regulated on a sliding scale. For example, Belcarra's current bylaw allows maximum floor areas between 7,000 ft² to 12,002 ft² depending on the size of the lot.

Maximum Floor Area

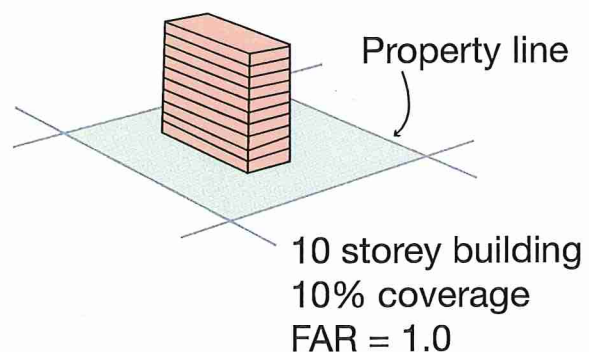
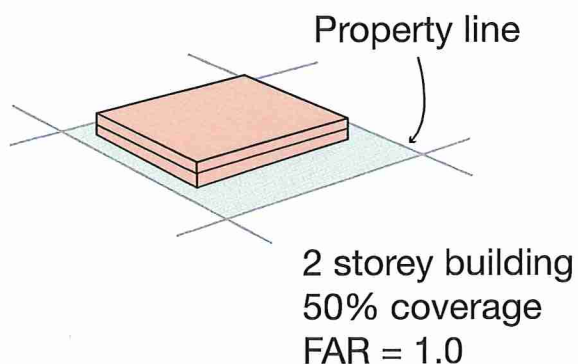
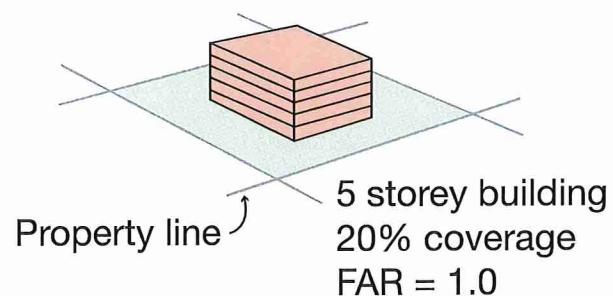
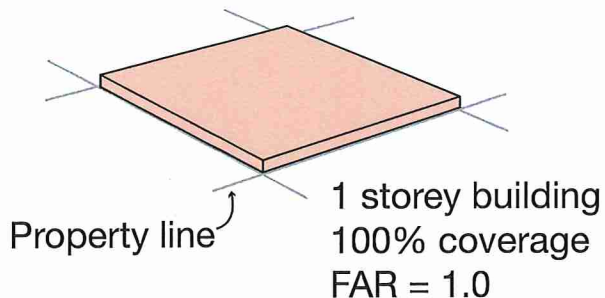


Diagrams adapted from "Planning and Design Criteria" by Joseph De Chiara and Lee Koppelman.

Floor Area Ratio (Review)

Floor Area Ratio **determines the size of the building as a proportion of the property size.** This requires smaller buildings on smaller properties, and allows larger buildings on larger properties.

$$\text{Floor Area Ratio} = \frac{\text{Total Floor Area}}{\text{Total Lot Area}}$$



Key Definitions: Floor Area

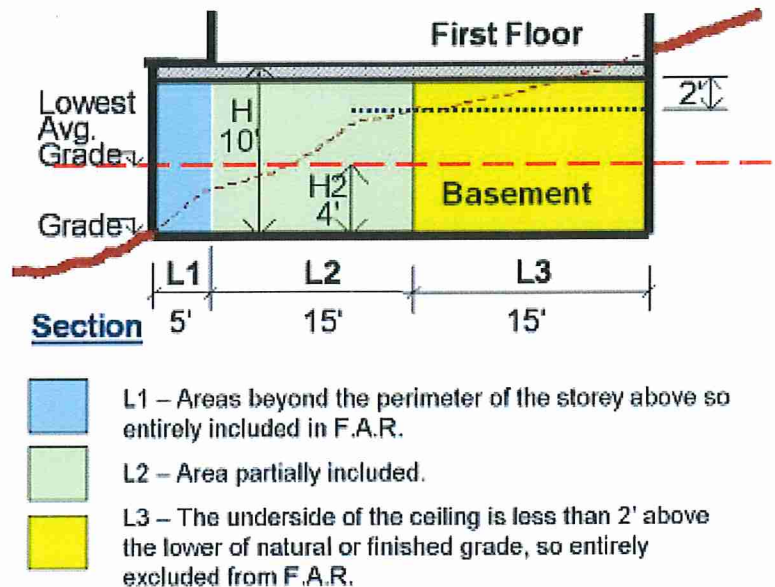
West Vancouver

- Floor Area Ratio Definition: the figure obtained when the total projected floor area of all storeys and attics of the principal building and all accessory buildings is divided by the site area.
- Maximum floor area is 2,551 SF (237 sq m) only for properties between 474 - 677 sq m. Otherwise, density regulated by FAR.
- Maximum floor area ratio ranges from 0.35 FAR to 0.5 FAR.
- Includes the projected storey area of each building (measured to exterior walls).
- Inclusions: roof overhangs and trellises extending more than 1.2 metres over second storey decks, bay windows, open stairwells, elevator shafts, and all similar openings in a storey.
- Exclusions: interior area used for the storage of vehicles accessory buildings other than garages, crawl spaces (up to a maximum height of 0.9m), and non-habitable attics.
- The exempt percentage of the floor area in one basement level is determined as follows:

$$\frac{\text{average grade elevation} - \text{basement floor elevation}}{\text{main floor elevation} - \text{basement floor elevation}} \times 100$$

- The average finished grade and average natural grade levels are as calculated for measuring building height (see Figure 1).
- Any portion of the basement extending beyond the perimeter of the exterior walls of the storeys above shall be included in the floor area ratio (see Figure 1).

Figure 1: Basement Floor Area

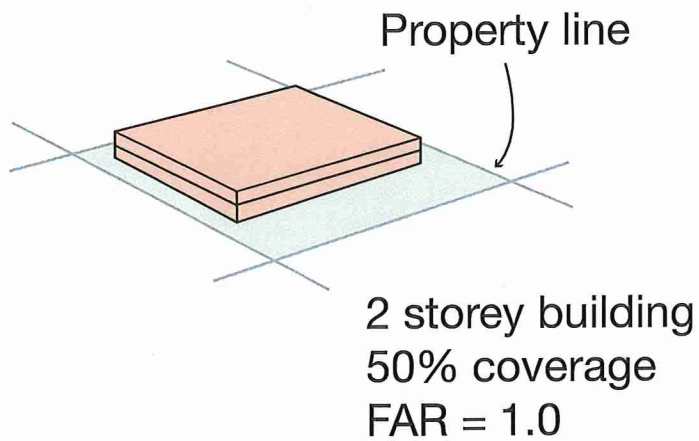


Belcarra

- Floor Area, Gross Definition: the total area of all floors of a building measured to the outermost surface of the exterior walls.
- Maximum floor area ranges from 7,000 SF (650 sq m) to 12,000 SF (1,115 sq m).
- Floor area ratio definition: the figure obtained when the gross floor area of a building on a parcel is divided by the area of the parcel.
- Floor area ratio ranges from 0.2 FAR - 0.66 FAR.

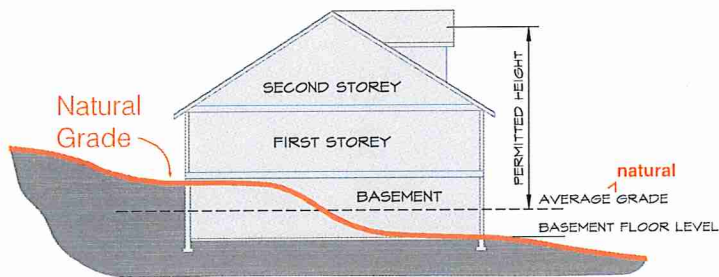
Floor Area is a 3 dimensional issue

Site Coverage

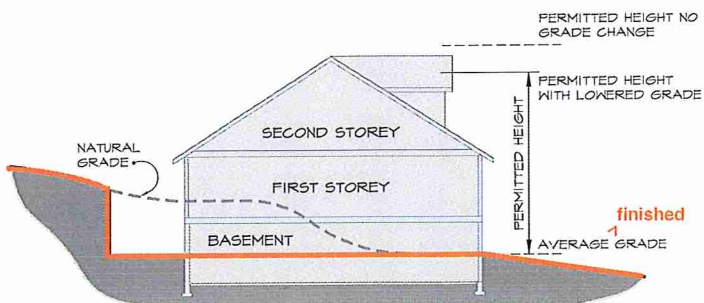


Diagrams adapted from "Planning and Design Criteria" by Joseph De Chiara and Lee Koppelman.

Natural Grade



Finished Grade



Group Discussion: Defining Floor Area

1. How should floor area be defined?
2. What should be included?
3. What should be excluded?

Notes...

Key Definitions: Height

Height (Review)

The Zoning Bylaw may provide a maximum and a minimum building height in each zone. Maximum and minimum height may differentiate for principal and accessory uses.

The points to and from which height is measured can also be specified.

Anmore

- Definition: Height means the vertical height of a building or structure.
- Maximum height of single family home is 31.2 ft (9.5 m) to 32.8 ft (10 m).

Highest Building Face Envelope

- See Figure 1.
- Ground level is based off finished grade.
- All portions of the building must be within the building face envelope except:
 - decks, eaves, projecting decorative features not enclosing the interior of the building,
 - the pitched roof portion of either gable ends or dormers, and for pitched roof portions, the area above the intersection of the ceiling joist and the exterior wall which encloses a non-habitable attic, and the area above the intersection of the vaulted roof joist and the exterior wall.

Average Grade Calculation for Building and Structure Height

- The lower of average natural grade or average finished grade, each calculated separately, will be used in building height and floor area ratio calculations.
- See Figure 2.

Building and Structure Height

- Height is measured from the average natural grade.
- Height is measured up to:
 - The highest part of a building with a flat roof (see Figure 3)
 - The midpoint between the highest point of a building with a pitched roof and a point 2.4 metres above the floor immediately below (see figure 4).
 - Where a roof is both flat and pitched, height is measured to the higher of the highest point of the flat roof or the midpoint of a pitched roof as described above using the "projected" peak of the pitched roof as the highest point.
 - A slope of less than 2 in 12 is considered to be a flat roof.
 - Inclusions: mechanical equipment and enclosures and skylights over 0.6 metres.
 - Exemptions: skylights less than 0.6 metres high and 3 metres wide, chimneys less than 1.8 metres in horizontal length, and vent pipes.

Height Exemptions

- The following are exempt from height calculations:
 - Chimneys less than 1.8 metres in horizontal length, flag poles, telecommunications antennae, sustainable building technologies.
- Exempt features may not exceed twice the maximum height allowable in the zone.

Figure 1: Highest Face of Building Envelope

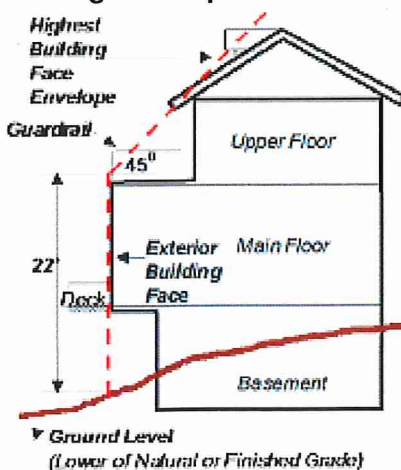


Figure 2: Anmore Grade Calculation Diagram

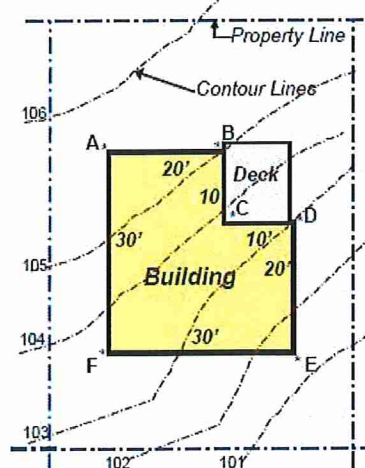


Figure 3: Flat Roof Height Measurement

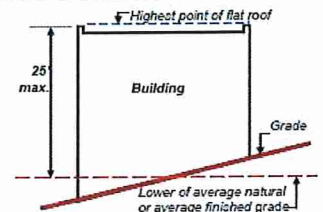
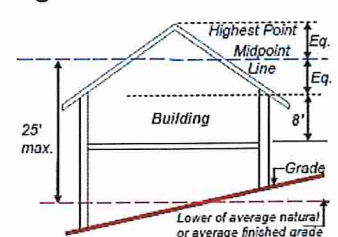


Figure 4: Pitched Roof Height Measurement



Belcarra

- Definition: the vertical distance from the Average Finished Grade to the highest point of the building or structure.
- Maximum height of single family home: 28 ft (8.6 m).
- No portion of the building shall be greater than 38.4 ft (11.7 meters) to be measured from the finished grade to the highest part of the building.

Group Discussion: Defining Height

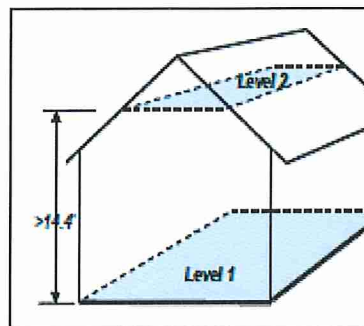
1. How should height be defined?
2. What should be included?
3. What should be excluded?

Notes...

130.08 - Floor Area – Single Family Dwelling Zones and Duplex Dwellings

- (1) Floor area includes the projected storey area of each building. Storey areas are measured to the exterior walls of the floor. The area of roof overhangs and trellises extending more than 1.2 metres over second storey decks are included in floor area. Floor area also includes bay windows, open stairwells, elevator shafts and all similar openings in a storey. (Bylaw # 4679)
- (2) Where the vertical distance between the floor and the horizontal structural members at 0.6 metre on-centre above exceeds 4.4 metres, that floor area shall be counted twice, as shown in Figure 1. (Bylaw # 4679)

Figure 1



- (3) The following areas are excluded from floor area for purposes of this subsection:
 - (a) any interior area used for the storage of vehicles up to a total floor area of 41 square metres.
 - (b) accessory buildings other than garages, up to a total floor area of 22.5 square metres located 4.5 metres or greater from the principal building and not exceeding 4.6 square metres for accessory buildings located closer than 4.5 metres to the principal building.
 - (c) crawl spaces and non-habitable attics.
 - (d) area excavated for foundation construction and which would only require back-filling below grade to create crawl space to exempt the area from floor area ratio, notwithstanding the absence of such back-filling and the construction of basement area. However, the top of the floor structure above the basement area excluded as part of this exemption must be no more than 0.9 metre above the lower of natural or finished grade at the perimeter walls.

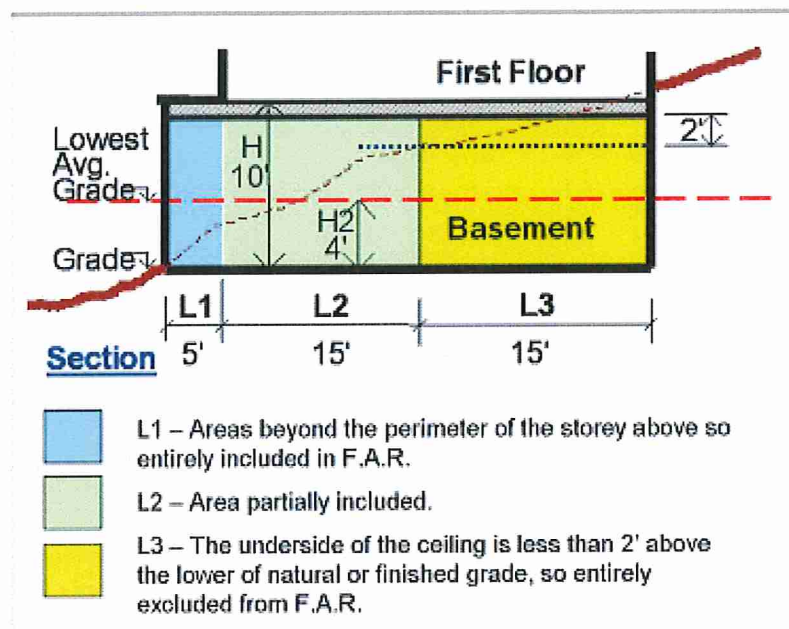
- (e) the exempt percentage of the floor area in one basement level located directly below the building above, equal to the percentage of the basement volume below the lower of average finished grade or average natural grade. The percentage referred to in this clause is determined as follows:

$$\frac{\text{average grade elevation} - \text{basement floor elevation}}{\text{main floor elevation} - \text{basement floor elevation}} \times 100$$

Example:

The average finished grade and average natural grade levels are as calculated for measuring building height (see Figure 1). (Bylaw # 4679)

Figure 1



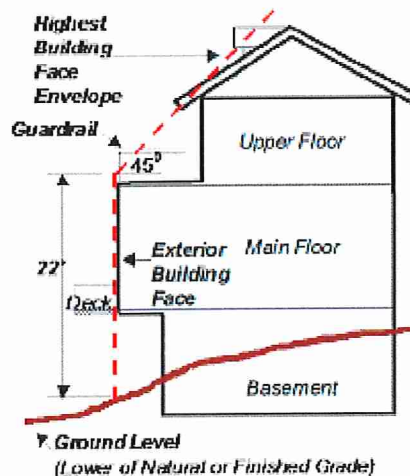
- (f) The average finished grade and average natural grade levels are as calculated for measuring building height.
- (g) Any portion of the basement extending beyond the perimeter of the exterior walls of the storeys above shall be included in the floor area ratio. (Bylaw # 4679)

PART 5 GENERAL REGULATIONS

5.4 HIGHEST BUILDING FACE ENVELOPE

- (1) Highest building face envelope is created by drawing a series of vertical lines at all points along the exterior face of a building, up to the height specified in the zone from ground level then inward over the building at right angles to the plane of the building face at an angle of 45°.
- (2) For purposes of this regulation, ground level:
 - (a) is measured from the outermost extent of the enclosed portion of the building projected to the finished grade.
 - (b) in front of a garage door, is interpreted as a line joining the ground level at each side of the garage door;
 - (c) is based off of finished grade.
- (3) One third of the length of the building need not comply with this requirement.
- (4) All other portions of the building must be within the highest building face envelope, except:
 - (a) decks, eaves, projecting decorative features not enclosing the interior of the building,
 - (b) the pitched roof portion of either gable ends or dormers; and
 - (c) for pitched roof portions:
 - (i) the area above the intersection of the ceiling joist and the exterior wall which encloses a non-habitable attic; and
 - (ii) the area above the intersection of the vaulted roof joist and the exterior wall.
- (5) Highest building face envelope is shown in Figure 1.

Figure 1



5.5 AVERAGE GRADE CALCULATION FOR BUILDING AND STRUCTURE HEIGHT

- (1) Average grade (natural and finished) is measured around the perimeter of:
 - a. A building at or directly above the outermost projections of the exterior walls and includes the dimensions around the posts of an attached carport. A deck attached to a building is not considered in determining the perimeter.
 - b. A structure that is not defined as a building.
- (2) The lower of average natural grade or average finished grade, each calculated separately, will be used in building height and floor area ratio calculations.
- (3) To calculate the average finished grade and natural grade for the building:
 - a. calculate the average grade elevation for each wall section having a constant grade along the finished and natural wall section by dividing the grade elevation at each end by 2 [(grade 'x' + grade 'y') ÷ 2 = average], then multiply this average grade elevation by the length of that wall section;
 - b. add the resulting numbers for each section of wall;
 - c. divide this total number by the total perimeter wall length of the building.

This will be the average grade, natural or finished.
- (4) Additional calculation points and sections are required along a wall if there is a significant change in elevation or grade slope along that length of the wall (for example, if it is level along half the wall and then drops significantly over the second half, there would be two average grade elevations on that section of wall.
- (5)) Where the undisturbed ground level of natural grade cannot be ascertained because of existing landscaping, buildings or structures, and appears to have been significantly altered, the level of natural grade shall be determined by the District Building Inspector, who may rely on the professional opinion of a British Columbia Land Surveyor on the determination of natural grade at the cost of the property owner.
- (6) An example of calculating average grade is shown below (see Figure 1).

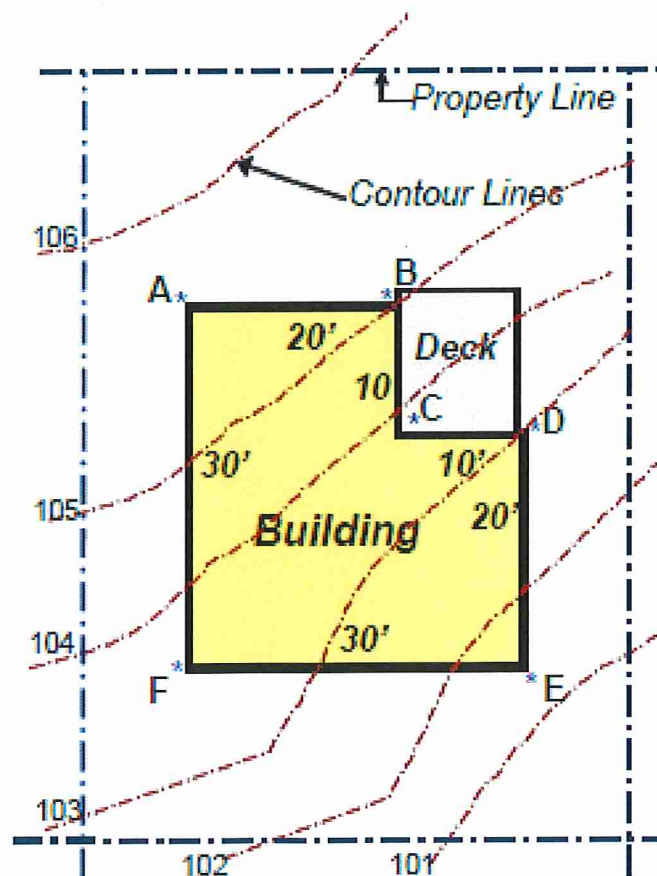
Example:

Wall Section Average Grade	X	Length	= Y
A-B $106.5 + 105.0 \div 2$	X	6 m	= 634.50
B-C $105.0 + 104.0 \div 2$	X	3 m	= 313.50
C-D $104.0 + 103.0 \div 2$	X	3 m	= 310.50
D-E $103.0 + 101.5 \div 2$	X	6 m	= 613.50
E-F $105.5 + 104.0 \div 2$	X	9 m	= 942.75
F-A $104.0 + 106.5 \div 2$	X	9 m	= 947.25
Totals:		36 m	= 3744

Total Y \div Total perimeter length = Average grade

$3744 \div 36\text{m} = 104 \text{ m}$

Figure 1



5.6 BUILDING AND STRUCTURE HEIGHT

- (1) Height is measured from the average natural grade.
- (2) Height is measured up to:
 - a. the highest point of a building with a flat roof (for example, the top of the highest of the roof finish, parapet, or roof deck railing) (see Figure 1);
 - b. the midpoint between the highest point of a building with a pitched roof and a point 2.4 metres above the floor immediately below (see Figure 2); or
 - c. the highest point of all other structures.

Figure 1

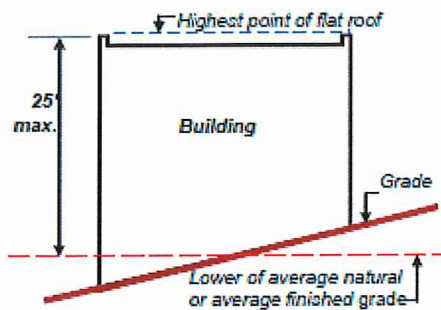
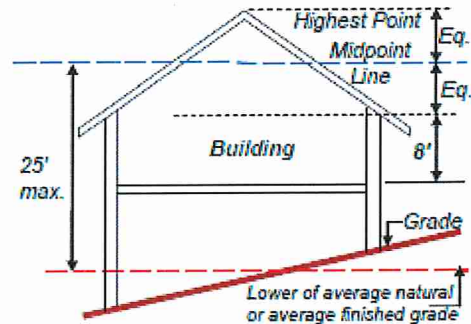


Figure 2



- (3) Where a roof is composed of a combination of pitched and flat elements, height is measured to the higher of:
 - a. the highest point of the flat roof, or
 - b. the midpoint of a pitched roof as described above using the “projected” peak of the pitched roof as the highest point.
- (4) A roof having a slope of less than 2 in 12 is considered to be a flat roof for purposes of this section.
- (5) In calculating height, mechanical equipment and enclosures, and skylights over 0.6 metre in height, shall be included. Skylights less than 0.6 metre in height shall only be exempted, if they are less than 3 metres in horizontal length. Chimneys less than 1.8 metres in horizontal length and vent pipes shall not be included.

5.7 HEIGHT EXEMPTIONS

- (1) The following types of *buildings, structures* or structural parts shall not be subject to the *height* requirements of this Bylaw:
 - a) Church spires; belfries; steeples, monuments; fire and hose towers; transmission towers; chimneys less than 1.8 metres in horizontal length; flag poles; telecommunication antennae; aerials; *sustainable building technologies*; and structures required for a *public service use*.
- (2) Notwithstanding Subsection 5.7(1), no *building or structure* listed in Subsection 5.7(1)(a) and located within a *residential zone* shall exceed twice the maximum allowable *height* permitted by the *zone*; the *height* of the *building or structure* provided that such *buildings or structures* do not cover more than 20 percent of the *parcel area* or more than 10 percent of the roof area if located on a *building or structure*, except in the case of *solar energy devices* which shall have no roof coverage limit.
- (3) Notwithstanding Subsection 5.7(1), no structure listed in Subsection 5.7(1)(a) and located within a *residential zone* shall cover more than 20 percent of the *parcel area* or more than 10 percent of the roof area if located on a *building or structure*, except in the case of *solar energy devices* which shall have no roof coverage limit.

...:943-9433 FAX:943-0421

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N.W.D.

	1740-646 33 C646-C646...
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BEWARE OF UNDERGROUND ELEC./TEL./CABLE
SERVICES SURROUNDING LOT 549
CONTACT BC ONE-CALL FOR LOCATIONS
PRIOR TO CONSTRUCTION (604) 257-1940
BC ONE-CALL TICKET #201607010

SERVICE REQUIREMENTS	YES	NO
PROPOSED BASEMENT ROOF DRAINS BY GRAVITY TO CITY STORM CONNECTION	✓	
SUMP AND PUMP REQUIRED FOR STORM WATER PUMP SYSTEM DESIGNED BY OTHERS	✓	
HOLDING TANK AND PUMP REQUIRED FOR BASEMENT SANITARY FIXTURES PUMP SYSTEM DESIGNED BY OTHERS	✓	

TREE LIST			
POINT #	TRUNK d (m)	TYPE	CROWN s (m)
192	(30.20, 45.10)	DECIDUOUS	6.0
215	0.85	CONIFEROUS	14.0
216	0.70	CONIFEROUS	14.0
217	0.90	CONIFEROUS	14.0
218-219	0.05	CONIFEROUS	14.0
220	0.40	CONIFEROUS	8.0
221	0.80	CONIFEROUS	6.0
222	CLUSTER	DECIDUOUS	8.0
223	(30.10, 0.40)	DECIDUOUS	6.0

WARREN

xxxxxxxxxxxx

B.C.L.S.

FILE: 24999LD
PLOT: 2016/01/27
MAP: K-1(S)

SL 1

DEERVIEW L

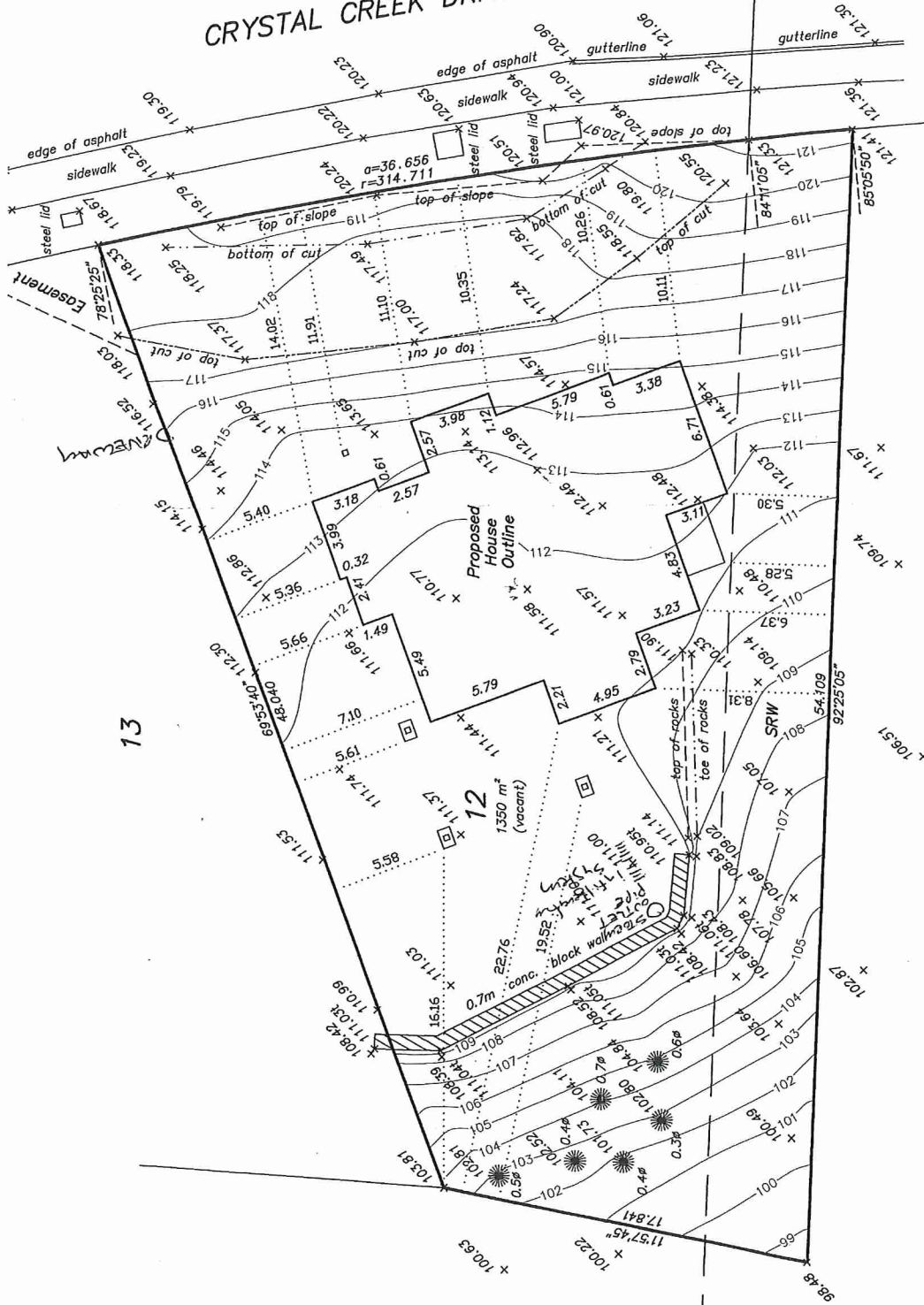
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11

16

11

CRYSTAL CREEK DRIVE



6

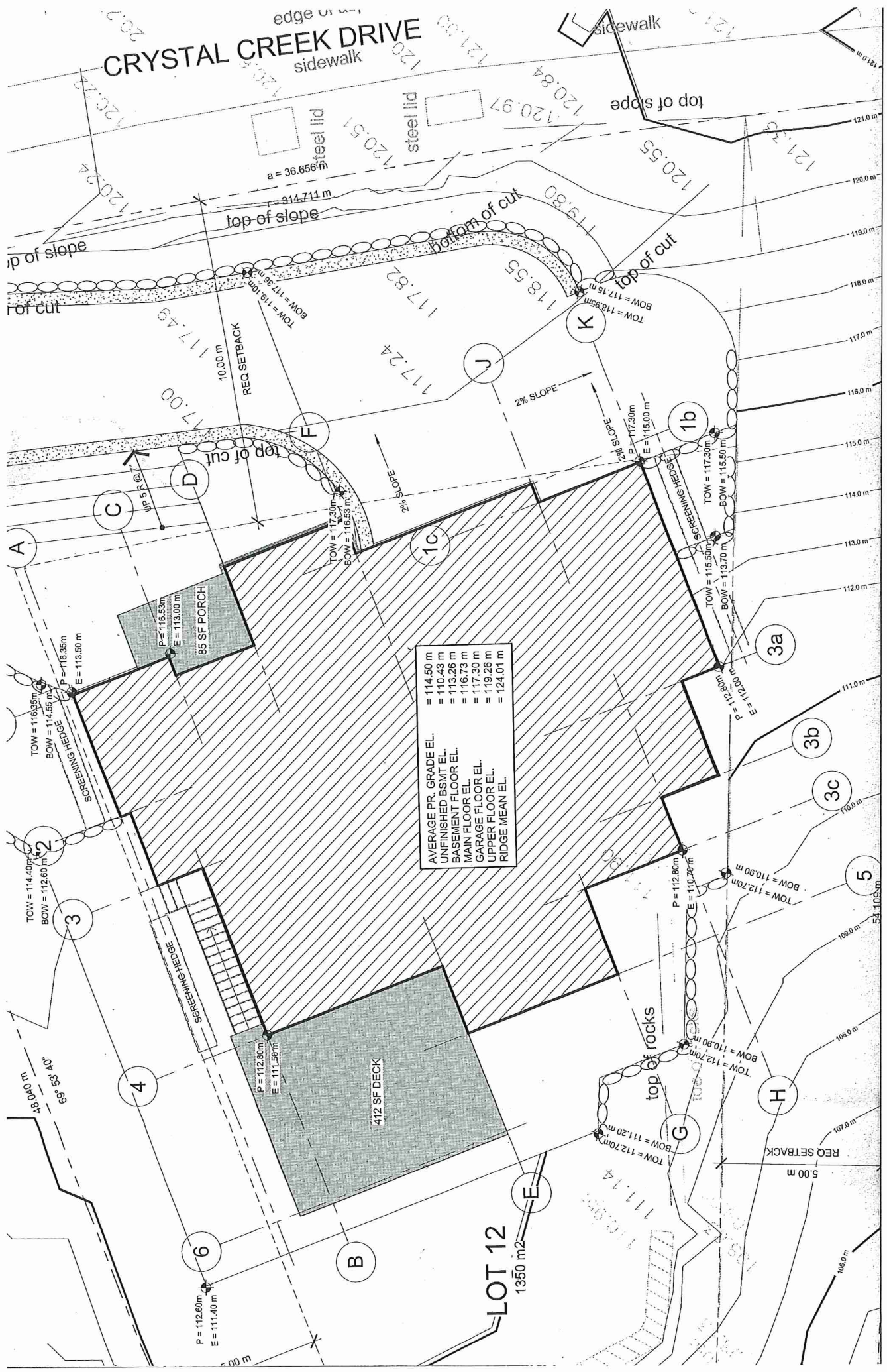
Wall

shown

be used to
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CHARG	
BF263	
BT266	
BA227	
BA365	
BA365	
BA484	
BA484	

CRYSTAL CREEK DRIVE

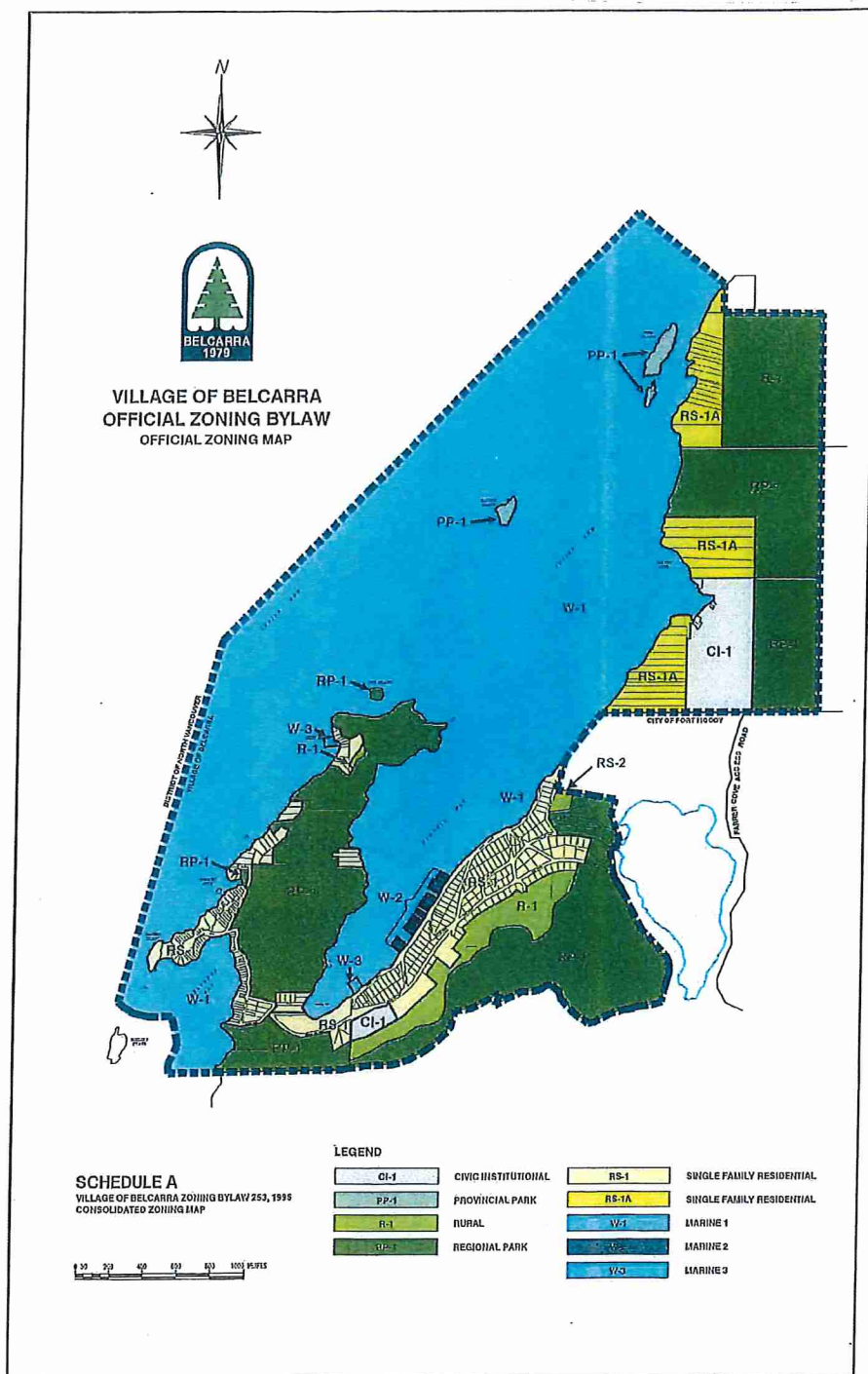


AVERAGE PR. GRADE EL.	= 114.50 m
UNFINISHED BSMT EL.	= 110.43 m
BASEMENT FLOOR EL.	= 113.26 m
MAIN FLOOR EL.	= 116.73 m
GARAGE FLOOR EL.	= 117.30 m
UPPER FLOOR EL.	= 119.26 m
RIDGE MEAN EL.	= 124.01 m

Belcarra - existing zoning map (for reference)

Schedule A
Village of Belcarra Zoning Bylaw 253, 1996
Consolidated Zoning Map

5.2



Belcarra - zoning areas for consideration (excluding Crown Lands)

- RS-1 - Inland Residential Zone
- RS-2 - Waterfront Residential Zone
- RS-3 - Waterfront Residential Zone (No Road Access)
- RM-1 - Duplex and Four-Home Zone*
*not prezoned



Belcarra - zoning areas for consideration (close-up)

