

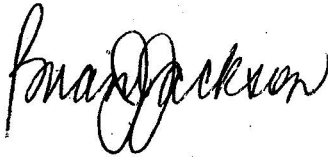


To: Planning Committee
From: Brian J. Jackson
 Director of Development
Re: **Building Height and Half-Storey Building Area**

To Planning - Apr 22, 2008
Date: April 8, 2008
File: 12-8060-20-8204
xr: 12-8060-20-5300

Staff Recommendation

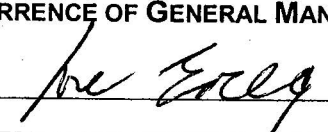
1. That the Staff Report dated April 8, 2008, from the Director of Development regarding Building Height and Half-Storey Building Area, be referred to the Greater Vancouver Home Builders Association (GVHBA) and the Urban Development Institute (UDI) for comment and discussion; and
2. That staff bring forth final recommendations on amendments to the Zoning Bylaw related to Building Height and Half-Storey Building Area, based on input from the GVHBA and UDI.



Brian J. Jackson
 Director of Development

EL/WC:blg

Att.

FOR ORIGINATING DEPARTMENT USE ONLY		
ROUTED TO:	CONCURRENCE	CONCURRENCE OF GENERAL MANAGER
Building Approvals	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	 <hr style="width: 100%;"/>

Staff Report

Origin

At the January 17, 2006 Planning Committee Meeting, the following referral motion was made:

"That the issue of the building height of a Single Family Building be referred to staff to provide appropriate changes to the definitions in the City's Zoning Bylaw..."

At the November 26, 2007 Council Meeting, the following referral motion was made:

"That staff bring forward an amendment to the Building Height definition in the Zoning and Development Bylaw 5300 concurrent with adoption of Flood Plain Designation and Protection Bylaw 8204"

This report is intended to respond to the Planning Committee's request for information on single-family dwelling height specifically as it relates to 2½ storey single-family dwellings, and the recommendation in the Flood Plain Management Bylaw Report to bring forward an amendment to the Building Height definition in the Zoning and Development Bylaw 5300.

Background

Neighbourhood Concern related to a 2½-Storey House at 6140 Tranquille Place

The Planning Committee referral motion was related to a neighbourhood concern about a 2½-storey single-family dwelling under construction at 6140 Tranquille Place. A number of residents submitted a letter and petition to Planning Committee citing concerns about the overall building height of the single-family dwelling under construction. Residents were concerned that the third storey of the single-family dwelling was well above the roofline of most existing two-storey single-family dwellings and the form and character of the house was no different from that of a three-storey building.

Flood Plain Designation and Protection Bylaw

The Flood Plain Designation and Protection Bylaw No. 8204, granted Third Reading on November 26, 2007, requires a minimum **flood plain construction level** ranging from 2.6 m Geodetic Survey of Canada datum (GSC) to 3.5 GSC with the following exemptions:

- for parcels in Area A as shown on Schedule B attached to Bylaw 8204, 0.3 m above the highest level of the crown of any road that is adjacent to the parcel;
- for the Burkeville neighbourhood, 0.3 m above the highest level of the crown of any road that is adjacent to the parcel; and
- for parcels within Steveston Village Area, the same elevation as the city sidewalk adjacent to the parcel.

Attachment 1 provides a reference map illustrating the required Flood Plain Construction Levels identified in the Flood Plain Designation and Protection Bylaw.

The current definition of Building Height in Zoning and Development Bylaw No. 5300 requires that the height of building be determined by the greater vertical distance from:

- the lowest building slab to the highest point on the building; or
- the crown of road to the highest point on the building.

Attachment 2 provides graphical illustrations of how Building Height is currently calculated.

By requiring a minimum **flood plain construction level** above the crown of an adjacent road, as stipulated by the pending Flood Plain Designation and Protection Bylaw, the maximum building height of a single-family house is effectively reduced if the reference to the crown of road is maintained. To address this implication on the calculation of building height, a number of amendments to the Zoning Bylaw are required.

Staff Comments

Zoning Regulations

Single-family zoning districts currently limit building height through a combination of zoning provisions. Most single-family zoning districts permit the construction of a 2½-storey building provided that:

- the maximum building height does not exceed 9 m (29.5 ft.);
- the interior habitable floor area is contained within a residential vertical building envelope which is dependant on a lot's width and depth; and
- the floor area constructed above the second storey does not exceed 50% of the floor area situated immediately below.

These zoning districts do not restrict the size of an unenclosed exterior deck (i.e. no covering roof) although the minimum building setback regulations are applicable.

Half-Storey Building Area

Zoning Bylaw No. 5300 currently defines Half-Storey as:

"Half-Storey" means a habitable space situated wholly under a roof the wall plates of which on at least two opposite exterior walls are not more than 0.6 m (1.968 ft.) above the floor of such **storey**, and which does not have a floor area which exceeds 50% of the floor area of the **storey** situated immediately below it.

The **Half-Storey** definition is referenced in a number of zoning districts (both single-family and multiple residential). The intent was to enable a limited amount of floor area to be provided above the second floor of a residential building, provided that this floor area is concealed within the roof forms of the building. The **"Residential Vertical Envelope (Lot Width)"** and **"Residential Vertical Envelope (Lot Depth)"** provisions further restrict where this floor area may be located on the lot in relation to the minimum setbacks requirements. Staff agree that the intent of the **Half-Storey** may not be achieved under the current definition.

Analysis

Half-Storey Definition

Staff have reviewed a number of recent building plans with a half-storey on the top floor and have examined the implications of the potential problem areas on single-family development. To ensure the intent of the **Half-Storey** definition is maintained, staff recommend that the existing definition be revised to:

"Half-Storey" means the uppermost **storey** of a **building** meeting the following criteria:

- i.) the **habitable space** is situated wholly under the framing of the roof;
- ii.) the **habitable space** does not exceed 50% of the **storey** situated immediately below;

- iii.) the top of the exterior wall plates is greater than 0.6 m (2 ft.) above the floor of such **storey** on a maximum of two opposite exterior walls;
- iv.) the top of the exterior wall plates is not greater than 0.6 m (2 ft.) above the floor of such **storey** on any two adjacent exterior walls.

The proposed definition is more specific that the height of the exterior wall plates is measured from the top of the exterior wall to the floor of the half-storey and not just the height of the exposed portion of the exterior wall. In addition, the exterior wall plate that may exceed 0.6 m (2 ft.) must be on opposite exterior walls and not side-by-side or adjacent as currently interpreted.

The “**Residential Vertical Envelope (Lot Width)**” and “**Residential Vertical Envelope (Lot Depth)**” provisions further restrict where the floor area may be located on the lot in relation to the minimum setbacks requirements. Staff believe that the proposed **Half-Storey** definition will help ensure that a 2½-storey building does not take the form of what is actually a three-storey building.

Building Approvals Department will develop an Information Bulletin on the revised Half-Storey definition to ensure the building community is aware of the bylaw changes.

Building Height Definitions

With the introduction of a minimum **flood plain construction level** as required by the Flood Plain Designation and Protection Bylaw, the building height is compressed. Therefore, staff propose that the height of building be related to the **finished site grade**, instead of the lowest slab elevation or the crown of the adjacent road. In addition, to calculating building height in relation to the finished site grade staff also suggest revising the existing building height definition to enable building height to be determined slightly different for various roof pitches.

Finished Site Grade

The most common construction practices used to meet minimum flood plain construction levels are to raise the grade of the site, build a crawl space on existing grade, or a combination of the two. Changing the existing grade is not always feasible or desirable because it could exacerbate drainage problems and pose a negative impact on existing trees. In areas with a high **flood Plain construction level** and a low existing road elevation, raising the site grade simply by landfill may cause a substantial impact on City’s roads, utilities, existing trees, and neighbouring properties. Therefore, although **finished site grade** is generally defined as the average elevation of the finished ground, different sets of restrictions are recommended for areas within and beyond the “exempted area” as defined in the Flood Plain Designation and Protection Bylaw and large planning initiatives such as West Cambie and Terra Nova, where minimum habitable building elevations have already been established in the Area Plans and road elevations raised.

“**Finished Site Grade**” means:

- i.) In Area ‘A’ indicated on Schedule ‘A’ to Division 100 attached to and forming part of this Bylaw the average ground elevation identified on a **lot-grading** plan approved by the City. The average ground elevation must not exceed 0.6 m (2 ft.) above the highest elevation of the crown of any **public road** abutting the lot;

- ii.) In Area 'B' indicated on Schedule 'A' to Division 100 attached to and forming part of this Bylaw the average ground elevation identified on a **lot** grading plan approved by the City. The average ground elevation must not exceed:
- (a) 0.6 m (2 ft.) above the highest elevation of the crown of any **public road** abutting the **lot**; or
 - (b) where the average ground elevation calculated pursuant to (ii)(a) above is more than 1.2 m (4 ft.) below the required **Flood Plain Construction Level** the average ground elevation may be increased to 1.2 m (4 ft.) below the required **Flood Plain Construction Level**.

The **Finished Site Grade** definition addresses the requirements of the Flood Plain Designation and Protection Bylaw but does require that a lot grading plan, approved by the City as part of a Building Permit submission be used to determine finished site grade.

Lot Grading Plan

In response to the pending adoption of the Flood Plain Designation and Protection Bylaw and the on-going perimeter drainage and fill deposit issues, the Building Approvals Department will be requiring a lot grading plan as part of the Building Permit review process. Through the review of a lot grading plan, staff will be able to limit the quantity of fill permitted and address any potential negative physical impacts on City's roads, utilities, existing trees and neighbouring properties. This lot grading information will control the amount of fill to be deposited on a property and will be used to determine the average **finished site grade** of a property.

The Building Approvals Department will develop an information bulletin on Lot Grading Plans to ensure the building community is aware of the new requirements.

Building Height

To allow some flexibility in how building height is calculated, staff are also proposing to amend the existing Building Height definition to enable building height to be calculated slightly different depending on the roof pitch.

"Building Height" means the vertical distance between **finished site grade** and:

- i) the highest point of a **building** having a flat roof;
- ii) the mid-point between the eave line and ridge of a roof having a roof pitch greater than 4-to-12 and not exceeding a roof pitch of 12-to-12, provided that, the ridge is not more than 1.5 m (5 ft.) above the mid-point;
- iii) the highest point of a **building** having a roof pitch other than those identified in (ii.) above; or
- iv) the greater of the measurements referred to in (i.), (ii.) and (iii.) above in the case of a **building** with more than one type of roof.

The revised building height definition enables height to be determined differently for flat vs. pitched roofs. It would also enable certain pitched roofs to project slightly beyond the maximum height indicated in each zoning district to address minor height variances (**Attachment 3**). The primary implication of this suggested approach to calculating building height is specific to single-family homes, as the height of multiple-family and commercial buildings will be addressed through a Council issued Development Permit and industrial buildings primarily

employ flat roof designs. Residential buildings would still be required to comply with the **residential vertical envelopes**, which focus the massing of a building in relation to the minimum building setbacks.

Housekeeping Amendments

In addition to the new definitions of **Half-Storey**, **Finished Site Grade**, and **Building Height** discussed above, it is necessary to amend or create a number of associated definitions to clarify the intentions of the new definitions. These associated “housekeeping amendments” include:

- Minor amendments to the **Residential Vertical Envelope** definitions to allow design flexibility for slope roofs;
- Defining **Flood Plain Construction Level** as it relates to the **Finished Site Grade** definition;
- Defining **Habitable Space** as it relates to the revised Half-Storey definition;
- Defining a **Crawl Space** and excluding a Crawl Space from the **Floor Area Ratio** calculation. The proposed crawl spaces definition limits the vertical clear height of a crawl space to less than 1.2 m (4.0 ft.); and
- Amending the Single-Family Housing District (R1-0.6) to remove the current reference to a crawl space with a maximum height of 0.914 m (3 ft.).

Attachment 4 provides a summary of the proposed revision to the zoning bylaw definitions related to building height and half-storey building area.

Financial Impact

The Building Approvals Department will develop a Half-Storey Information Bulletin and a Lot Grading Plan Bulletin to provide staff and public guidance on how the revised definition will affect future Building Permit applications. It is anticipated that the development of this brochure can be accommodated within the existing operating budget.

Conclusion

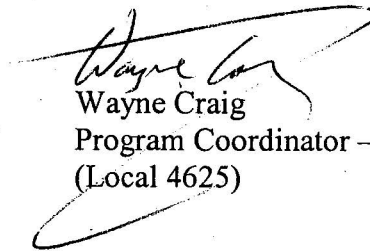
Planning Committee and Council have asked staff to examine the issue of single-family dwelling height specifically as it relates to 2½-storey single-family dwellings. Staff have reviewed the zoning provisions related to Building Height and Half-Storey, and have identified that some definitions in the Zoning Bylaw should be amended or added.

The proposed amendment to Zoning Bylaw No. 5300 will also address the potential building height issue resulting from the increase of minimum habitable elevations as proposed in the Flood Plain Designation and Protection Bylaw No. 8204.

Prior to implementing the proposed amendments to the Zoning Bylaw, it is recommended that this Staff Report be referred to the Greater Vancouver Home Builders Association (GVHBA) and the Urban Development Institute (UDI) for comment and discussion. Once comments from GVHBA and UDI have been received, staff will bring forward a Staff Report detailing the recommended amendments to the Zoning Bylaw.



Edwin Lee
Planning Technician – Design
(Local 4121)

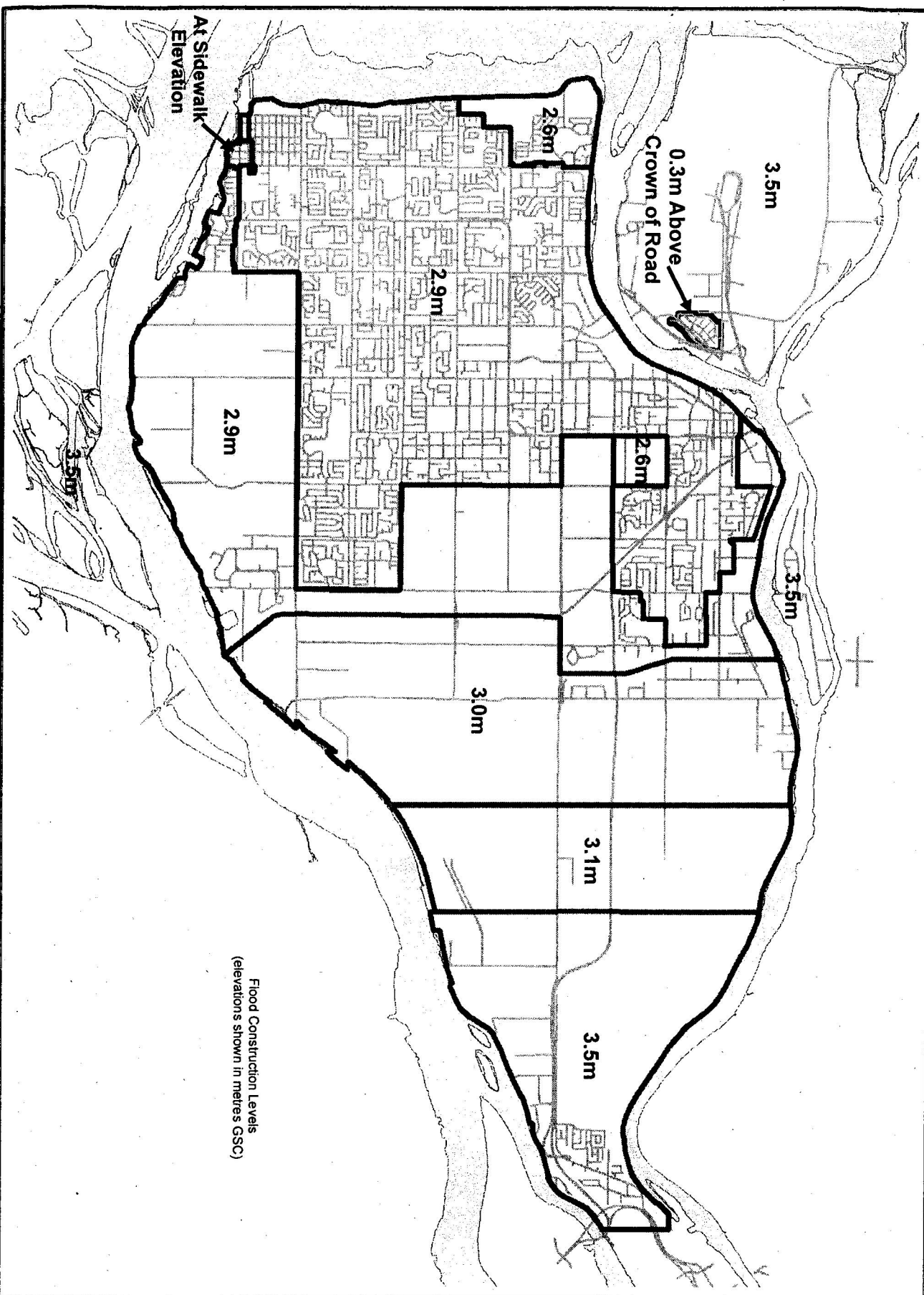


Wayne Craig
Program Coordinator – Development
(Local 4625)

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- Attachment 1: Flood Construction Levels – Reference Map
- Attachment 2: Existing Building Height Calculations and Building Height Calculation After Adoption of the Flood Plain Designation and Protection Bylaw
- Attachment 3: Building Height Calculations for Different Roof Types
- Attachment 4: Proposed Zoning Bylaw Definitions Related to Building Height

RICHMOND
Flood Construction Levels - Reference Map



Flood Construction Levels
 (elevations shown in metres GSC)

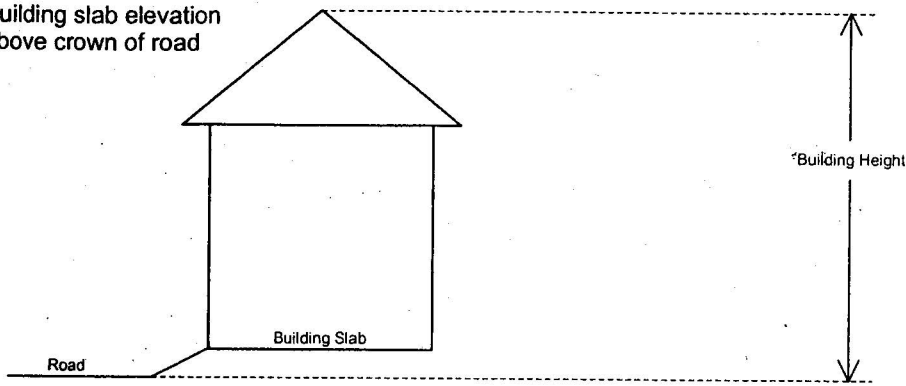
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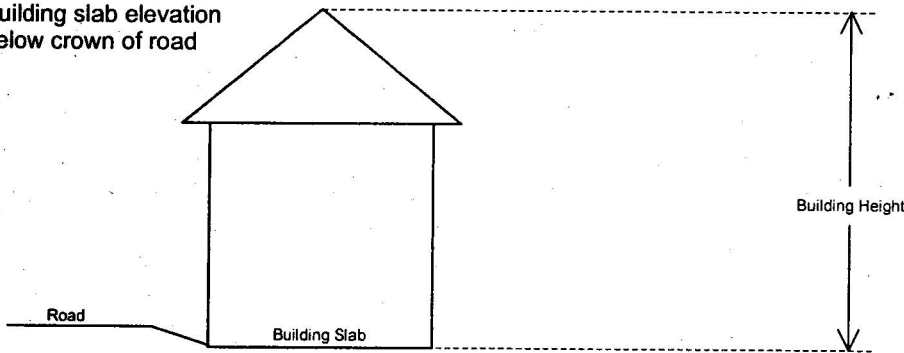
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Building Height Calculation Method as Currently Defined

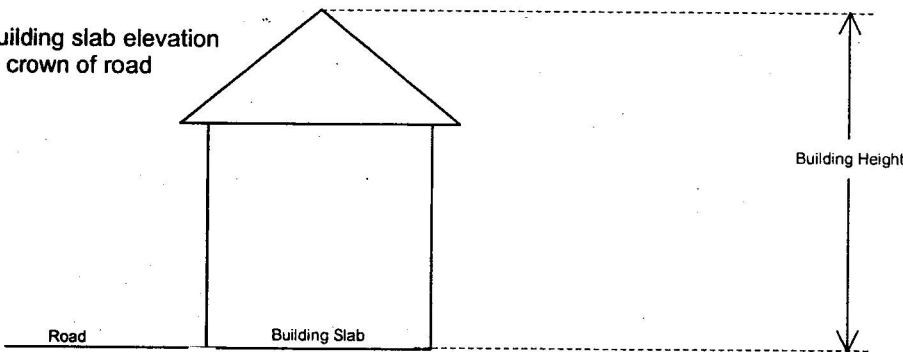
Building slab elevation above crown of road



Building slab elevation below crown of road

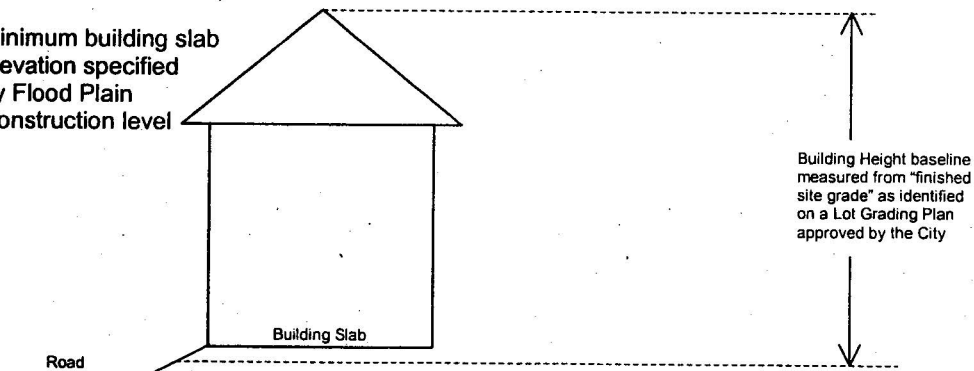


Building slab elevation at crown of road



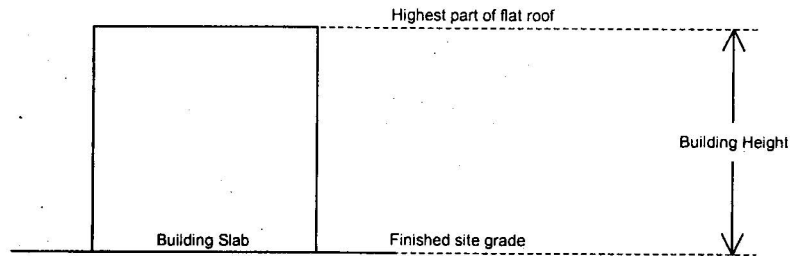
Building Height Calculation Method Proposed

Minimum building slab elevation specified by Flood Plain Construction level

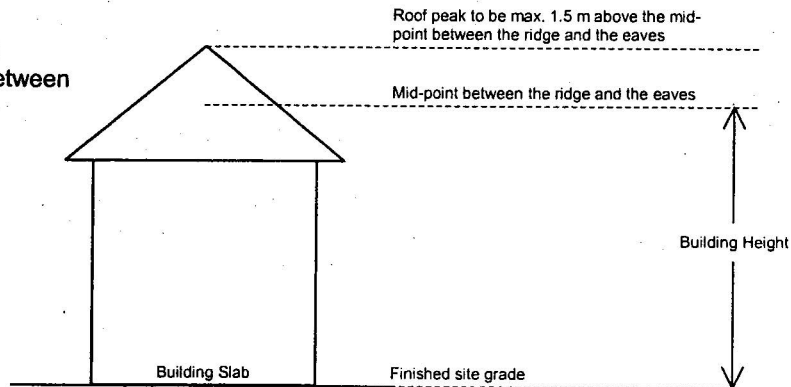


Building Height Calculation Examples After Proposed Change to Building Height Definition

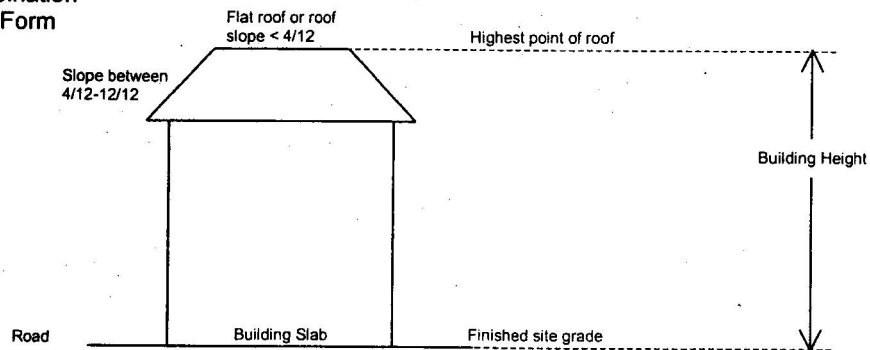
Flat Roof



Sloped Roof with slope between 4/12-12/12



Combination Roof Form



Proposed Zoning Bylaw Definitions Related to Building Height

- **BUILDING HEIGHT**

“**Building Height**” means the vertical distance between **finished site grade** and:

- i.) the highest point of a **building** having a flat roof;
- ii.) the mid-point between the eave line and ridge of a roof having a roof pitch greater than 4-to-12 and not exceeding a roof pitch of 12-to-12, provided that, the ridge of the roof is not more than 1.5 m (5 ft.) above the mid-point;
- iii.) the highest point of a **building** having a roof pitch other than those identified in (ii.) above;
- iv.) the greater of the measurements referred to in (i.), (ii.) and (iii.) above in the case of a **building** with more than one type of roof.

- **CRAWL SPACE**

“**Crawl Space**” means an interior **building** space at or below **finished site grade**, between the underside of the floor system next above and the top of the floor slab on the ground surface below, having a vertical clear height less than 1.2 m (4.0 ft.).

- **FLOOD PLAIN CONSTRUCTION LEVEL**

“**Flood Plain Construction Level**” means the minimum elevation level identified in *Flood Plain Designation and Protection Bylaw No 8204*, as amended.

- **FINISHED SITE GRADE**

“**Finished Site Grade**” means:

- i.) In Area ‘A’ indicated on Schedule ‘A’ to Division 100 attached to and forming part of this Bylaw the average ground elevation identified on a **lot** grading plan approved by the City. The average ground elevation must not exceed 0.6 m (2 ft.) above the highest elevation of the crown of any **public road** abutting the lot;
- ii.) In Area ‘B’ indicated on Schedule ‘A’ to Division 100 attached to and forming part of this Bylaw the average ground elevation identified on a **lot** grading plan approved by the City. The average ground elevation must not exceed:
 - (a) 0.6 m (2 ft.) above the highest elevation of the crown of any **public road** abutting the lot; or
 - (b) where the average ground elevation calculated pursuant to (ii)(a) above is more than 1.2 m (4 ft.) below the required **Flood Plain Construction Level** the average ground elevation may be increased to 1.2 m (4 ft.) below the required **Flood Plain Construction Level**;

- **HABITABLE SPACE**

“**Habitable Space**” means any interior **building** space designed or intended to be used for living, sleeping, eating or food preparation, including living room dining room, bedroom and **kitchen**.

- **FLOOR AREA RATIO**

“**Floor Area Ratio**” means the figure obtained when the total area of the floors of the **buildings** on a **lot**, measured to the outer limits of the **building** or **buildings**, is divided by the area of the **lot**. A **crawl space** is not included in the calculation of the **floor area ratio**.

- **RESIDENTIAL VERTICAL ENVELOPE (LOT DEPTH)**

“**Residential Vertical Envelope (Lot Depth)**” means a vertical envelope located in compliance with the minimum **front yard** setback requirement for the **lot** in question. It is calculated from the base level from which the **building height** is measured for the **lot**, and is formed by planes rising vertically 4 m (13 ft.) to a point and then extending upward and away from the required yard setback at a rate of two units of vertical rise for each single unit of horizontal run to the point at which the planes intersect.

- **RESIDENTIAL VERTICAL ENVELOPE (LOT WIDTH)**

“**Residential Vertical Envelope (Lot Width)**” means a vertical envelope located parallel to and 1.2 m (4 ft.) from the **side property lines** of the **lot**. It is calculated from the base level from which the **building height** is measured for the **lot**, and is formed by planes rising vertically 6 m (20 ft.) to a point and then extending inward and upward at an angle of 45° from the horizontal to the point at which the planes intersect.

- **STOREY, HALF**

“**Half-Storey**” means the uppermost **storey** of a **building** meeting the following criteria:

- i.) the **habitable space** is situated wholly under the framing of the roof;
- ii.) the **habitable space** does not exceed 50% of the **storey** situated immediately below;
- iii.) the top of the exterior wall plates is greater than 0.6 m (2 ft.) above the floor of such **storey** on a maximum of two opposite exterior walls;
- iv.) the top of the exterior wall plates is not greater than 0.6 m (2 ft.) above the floor of such **storey** on any two adjacent exterior walls.