CALCULATING BUILDING HEIGHT

REGULATION REDESIGN BACKGROUNDER

CITY OF VANCOUVER June 2019

ABOUT THE REGULATION REDESIGN BACKGROUNDER SERIES

This backgrounder series is developed for the sole purpose of the Regulation Redesign project, which is the City of Vancouver's first comprehensive review of its land use regulations and policies. The purpose of the project is to simplify regulations, make them more consistent and easier to find. These backgrounder documents are created in order to inform and progress public and staff dialogue for the project, and should only be used for information purposes. The section "What We've Heard" is a compilation of issues, ideas and comments from 770+ members of the public and staff during the various engagement events held in Phase 1 of the project (July 2018 – February 2019).

These documents do not form a part of the City of Vancouver's land use regulation documents.

For more information about the Regulation Redesign Project, visit vancouver.ca/RegRedesign.

A PRIMER ON THE CONCEPTS

Grade

Grade is defined in both the Zoning and Development By-law and Building By-law and is understood as the surface from which building height is measured.

In the Zoning and Development By-law:

- "official established building grades" (as determined by the City Engineer) and "existing grades" are used to calculate height
- "finished grade" is used to determine whether a space is a basement or cellar

In the Building By-law:

- finished grade on the lowest side of the building is used to determine a first storey and building height

Zoning & Development By-law	Vancouver Building By-law
Existing Grade (aka **survey grade**) "The elevation of the surface of the existing undisturbed ground at any point on a site;" **Official Established Building Grade** "The intended elevations of the street or lane along the property line of the site related to City datum, as established by the City Engineer" "The elevation of the surface of the ground at any point on a site" **Finished Grade** "The elevation of the surface of the ground at any point on the site of a completed development between the site boundaries and the buildings. For the purpose of determining a basement or cellar, finished grade means the average elevation of the surface of the ground adjoining a building at all exterior walls of a completed development, as determined by the City Building Inspector;"	**Grade** "the lowest of the average levels of finished ground adjoining each exterior wall of a building, except that localized depressions need not be considered in the determination of average levels of finished ground."

Zoning and Development By-law and the Building By-law: The Zoning and Development By-law regulates land use and development, including building form and massing, building location on a site, and similar provisions to enable good city building. The Building By-law regulates the design and construction of buildings to address issues such as fire, life and health safety, structural and non-structural safety, accessibility and energy efficiency.

Building Height

Building Height is not defined in the Zoning and Development By-law, but refers to the ***vertical distance*** that the building extends above the base surface.

- most district schedules set out the maximum building height permitted for specific forms of development
- in some circumstances increases in building height may be approved by the Director of Planning or Development Permit Board, e.g.:
  - » to accommodate architectural and mechanical appurtenances, and access to infrastructure on the roof
  - » to accommodate passive house features
  - » to accommodate additional floor area that has been approved by the Director of Planning or Development Permit Board
  - » the height, bulk, location and overall design of the building and its effect on the site, surrounding the buildings and streets and existing views
- in some districts building height is impacted by a secondary envelope (e.g. RS) or setback requirements above a specified height (e.g. C-2) or view cones that restrict the maximum height

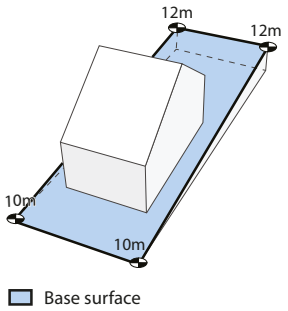
In the Building By-law, building height refers to the ***number of storeys*** contained between the roof and the floor of the first storey.

Zoning & Development By-law

Base Surface

"A hypothetical surface determined by joining the official established building grades at all corners of the site, provided however that where official established building grades cannot be obtained through application to the City Engineer, existing grades shall be used.

For the purpose of measuring the height of a building at any point, the elevation at that point on the base surface shall be determined by interpolating from the official established building grades or, where official established building grades cannot be obtained, from existing grades;"



Vancouver Building By-law

Building Height

"means the number of storeys contained between the roof and the floor of the first storey."

Storey, Half-Storey, First Storey, Basement and Cellar

These concepts refer to different floor/levels. Storey is defined in both the Zoning and Development By-law and Building By-law and is the space between two floors.

- many district schedules limit the number of storeys that are permitted in addition to regulating height

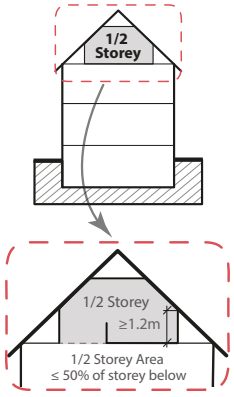
Zoning & Development By-law

Storey

"That portion of a building which is situated between the surface of any floor and the surface of the floor next above it and, if there is no floor above it, that portion between the surface of such floor and the ceiling surface above it. A storey shall not include a basement or cellar."

Half-Storey

"The uppermost level of a building where the floor area, existing, proposed or as may be extended over open-to-below space, and having a minimum ceiling height of 1.2 m, does not exceed 50 percent of the storey immediately below;"



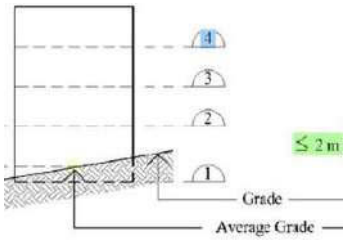
Vancouver Building By-law

Storey

"means that portion of a building that is situated between the top of any floor and the top of the floor next above it, and if there is no floor above it, that portion between the top of such floor and the ceiling above it."

First Storey

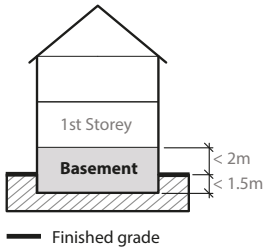
"means the uppermost storey having its floor area not more than 2 m above grade."



Zoning & Development By-law

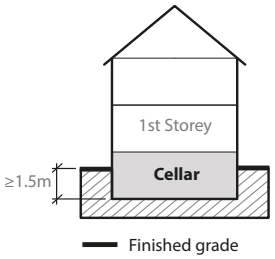
Basement

"A space between two floors, with the lower floor located less than 1.5 m below finished grade and the floor surface of the storey above located not more than 2.0 m above finished grade"



Cellar

"A space between two floors with the lower floor located 1.5M or more below finished grade."



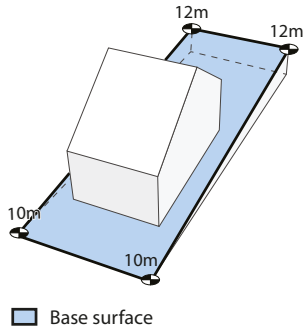
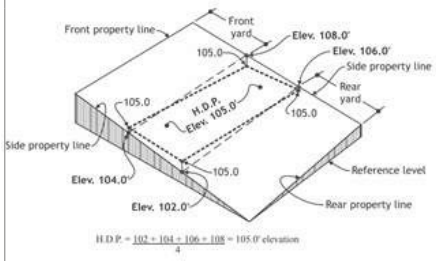
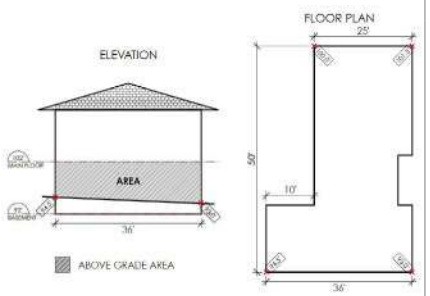
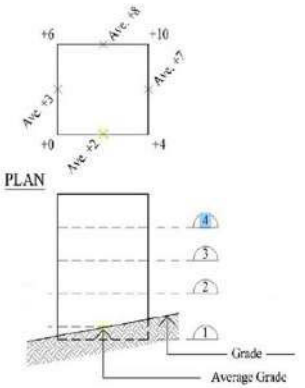
Vancouver Building By-law

Basement

"means a storey or storeys of a building located below the first storey."

CITY OF VANCOUVER METHODS FOR BUILDING HEIGHT

The following are the various methods of calculating grades for building height in the Zoning and Development By-law and Building By-law:

	Z&D BASE SURFACE	Z&D HORIZONTAL DATUM PLANE	Z&D AVERAGE FINISHED GRADE	VBBL METHOD
		 Source: RS-6 Explanatory Notes		
Method	A hypothetical surface determined by joining the building grades at all corners of the property	Average of the existing grades at intersections of front and rear setbacks at the side property lines	Average finished grade of all sides of the building	Average finished grade on the lowest side of the building
Where is it used?	The primary method for calculating height for zoning purposes	Used by Vancouver RS-6 , laneway house and garages	Used to calculate 1st storey, primary and secondary envelopes in Vancouver. Also used in Coquitlam, North Vancouver (City and District), Richmond, Surrey, Victoria and West Vancouver	For calculating building height and storeys for Building Permit. Used by the Vancouver Building By-law, which is based on the BC Building Code
Notes	• More responsive to a variety of terrain • For sites with existing lower grades than the base surface, the average existing grade of all sides of the proposed building may be used	• Easier to calculate than base surface while mainaining a reasonable control of height • More responsive to neighbouring context	• Easy to calculate, no interpolating • Easier for applicants working in other municipalities	• Easy to calculate, no interpolating

WHAT WE'VE HEARD

Issues

Inconsistency between Zoning and Development By-law and VBBL

- grade measured differently
- no partial/half storey in VBBL - determining the number of floors determines Part 3 vs Part 9 requirements

Inconsistency within Zoning and Development By-law

- height is measured differently in RS zones (e.g. base surface vs horizontal datum plane)

Lack of clarity

- not clear how to determine grade in calculating height
- complicated
- some zones do not have an upper limit (additional height may be permitted by the Director of Planning or Developmental Permit Board)

Ideas

Consistent measurements

- use VBBL methodology to determine number of floors
- use simple and consistent height measurement across zones – horizontal datum plane is easiest

Enable flexibility

- more flexibility for sloped sites and grade changes
- more flexibility for rooftop patios and amenity decks
- add 10% flexibility to height
- remove view cones and height restrictions
- get rid of administrative bulletin on "Official Established Building Grades" and have staff trained and able to waive grades

Increase height allowance

- increasing height by even 3 ft. would reduce cost (excavation, sump pump) and impact on environment (excavation, risk of future pump failure and future replacement)
- remove view cones

Improve clarity

- height should be clear – no part of a building may protrude beyond a certain height or plane
- eliminate height relaxations (e.g. section 10.11 Relaxation of Limitations on Building Height - venting skylights)
- a no exceptions rule is the most clear
- clarify upper height for C-2