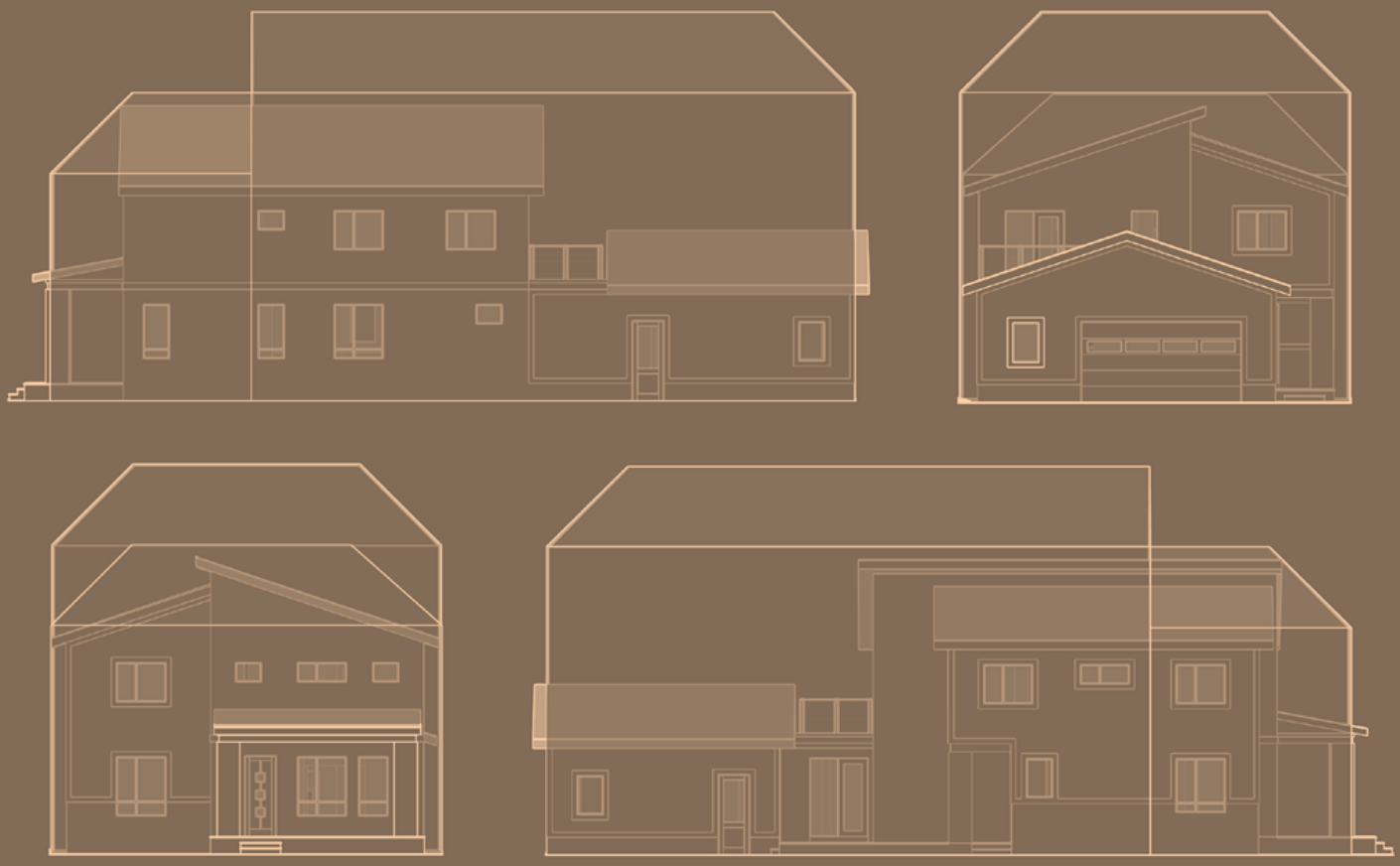
Town of CANMORE



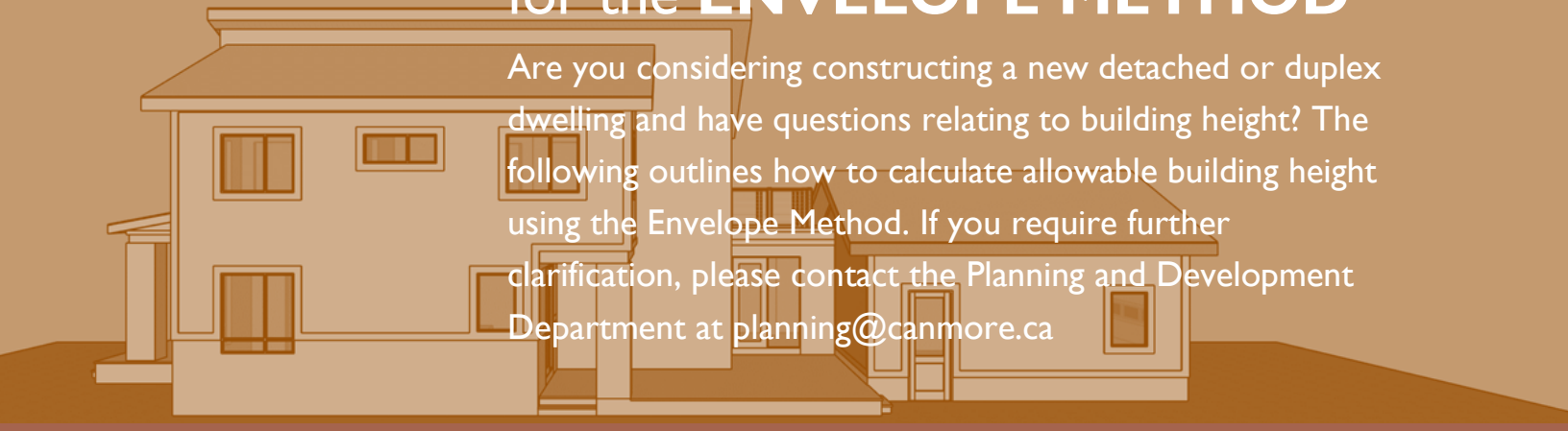
INFORMATION GUIDE:
The Envelope Method

AUGUST 2020

Town of CANMORE

INFO GUIDE

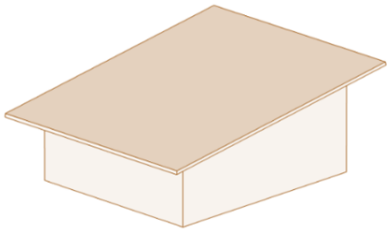
for the ENVELOPE METHOD



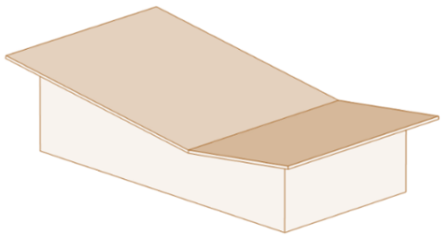
Are you considering constructing a new detached or duplex dwelling and have questions relating to building height? The following outlines how to calculate allowable building height using the Envelope Method. If you require further clarification, please contact the Planning and Development Department at planning@canmore.ca

Introduction

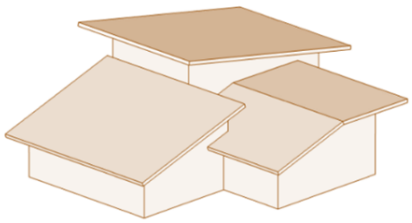
At the Town of Canmore, we use two different means to calculate allowable roof heights. One is called the H_{max} Formula and the other is called the Envelope Method. In cases where a traditional gable style roof is proposed and consists of one pitch (ex. 6:12) throughout all aspects of the roof, the H_{max} method will be used to determine building height. (For more on this, please reference Section 2.9.3 of the Land Use Bylaw.) The Envelope Method calculation shall be used when a building with any other roof style is proposed, as illustrated by the following diagrams.



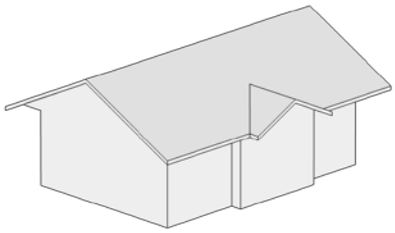
Single Pitch Roof



Reverse Pitch Roof



Multiple Pitch Roof
(with two or more different roof pitches, excluding roofs above cantilevers and dormers)



Gable Roof
(uses the H_{max} method)

Key Terms

Before reviewing this guide, you may wish to familiarize yourself with the following terms which appear throughout this document and are foundational to the discussion of the Envelope Method:

Building height means the vertical distance between any grade-point, as defined by the Land Use Bylaw, and the highest point of a building excluding a ventilating fan, skylight, steeple, chimney, smoke stack, exterior firewall, parapet wall, flagpole, antenna, or similar device not structurally essential to the building.

Grade means the elevation of the existing ground in an undisturbed natural state or an approved design grade as described in a development grading plan approved by the Town of Canmore.

Grade-point means the point(s) on a site which are used to measure the maximum permitted height of a building from grade. Where grade points have not been established as part of an approved comprehensive grading plan, the location of grade points shall be determined by the Development Authority.

Detached Dwelling means a detached building containing one principal Dwelling Unit.

Dwelling unit means a self-contained room or suite of rooms not available for public use, which normally provide sleeping, washing, sanitary and kitchen facilities, and which is intended for residential use, as opposed to vacation use. A dwelling unit shall not include more than one room which, due to its design, plumbing, equipment, and furnishings is or may be used primarily as a kitchen. Examples of this include upper cupboards, a full size fridge, a stove using 220V, and other aspects that may define a kitchen. A dwelling unit is characterized as a place in which a person or persons may reside as their primary or secondary residence, with the intent and ability to arrive and leave at their discretion, with the intent to remain for an undetermined or indefinite period (except in accordance with a tenancy agreement under the Residential Tenancies Act or the Mobile Home Sites Tenancies Act) and with the intent to return to the dwelling unit following absences for such reasons as vacations. A dwelling unit does not include a Shared Ownership Accommodation.

District means an area of land designated on the Land Use District Maps for which a specific set of land uses and rules have been set forth in the Land Use Bylaw or, in the case of a Direct Control District, are determined by Council.

Duplex Dwelling means a single building containing two Dwelling Units either side-by-side with a common wall extending from the foundation to roof, or one above the other, each having a separate entrance.

Dormer means a roof structure containing a window that projects vertically above the plane of a pitched roof for the purposes of providing light and headroom within a half-storey or a loft.

Loft means the floor space above the eaveline and within the pitch of the roof of a building. The floor area of a loft measured to the walls or where the rooflines meet the floor, shall not exceed 60% of the area of the floor below the loft.

Yard, front means the yard which extends between the side boundaries of a site and in depth from the front property line of the site to the front of the principal building. In the case of a corner site the narrower of the two boundary lines abutting the street may be considered the front yard. In circumstances where the front yard is not clearly defined, the Development Authority may determine what constitutes the front yard.

Yard, rear means the yard which extends between the rear property line of a site and the rear yard setback as prescribed in the district. In circumstances where the rear yard is not clearly defined, the Development Authority may determine what constitutes the rear yard or yards.

Yard, side means the yard which extends between a side property line of a site and the side yard setback as prescribed in a land use district. In circumstances where a side yard is not clearly defined, the Development Authority may determine what constitutes the side yard(s) of a site.

Step One: Understand the Formula

The heights of the building envelope are calculated using the four following formulae:

1) **Hf1** = f_{ave} + 9.5m + $\frac{8\ (b_{ave} - f_{ave})}{L}$

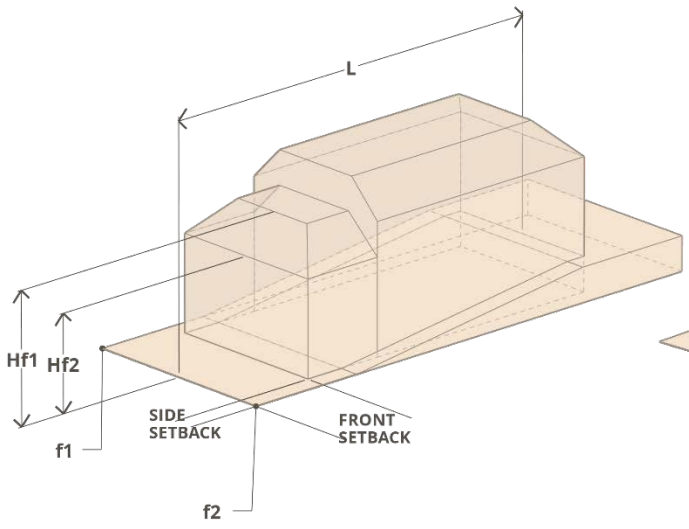
2) **Hb1** = f_{ave} + 9.5m + $\frac{12\ (b_{ave} - f_{ave})}{L}$

3) **Hf2** = Hf1 - 2.5m

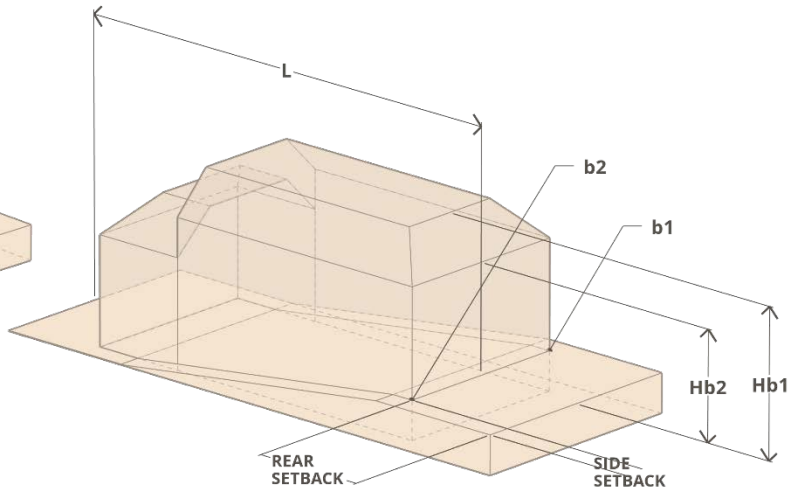
4) **Hb2** = Hb1 - 2.5m

The components of these equations are defined as follows:

- *Hf1* and *Hb1* are the maximum heights of the front and rear portions of the building envelope, measured from f_{ave} and b_{ave};
    - f_{ave} is the average of *f1* and *f2*;
        - *f1* and *f2* are the elevations at the front property corners;
    - b_{ave} is the average of *b1* and *b2*; and
        - *b1* and *b2* are the elevations on the side property lines at the rear yard setback;
- *Hf2* and *Hb2* are the heights from which the top 45-degree building envelope setback is calculated;
- *L* is the distance between the midpoints of the front property line and the rear setback line.



FRONT

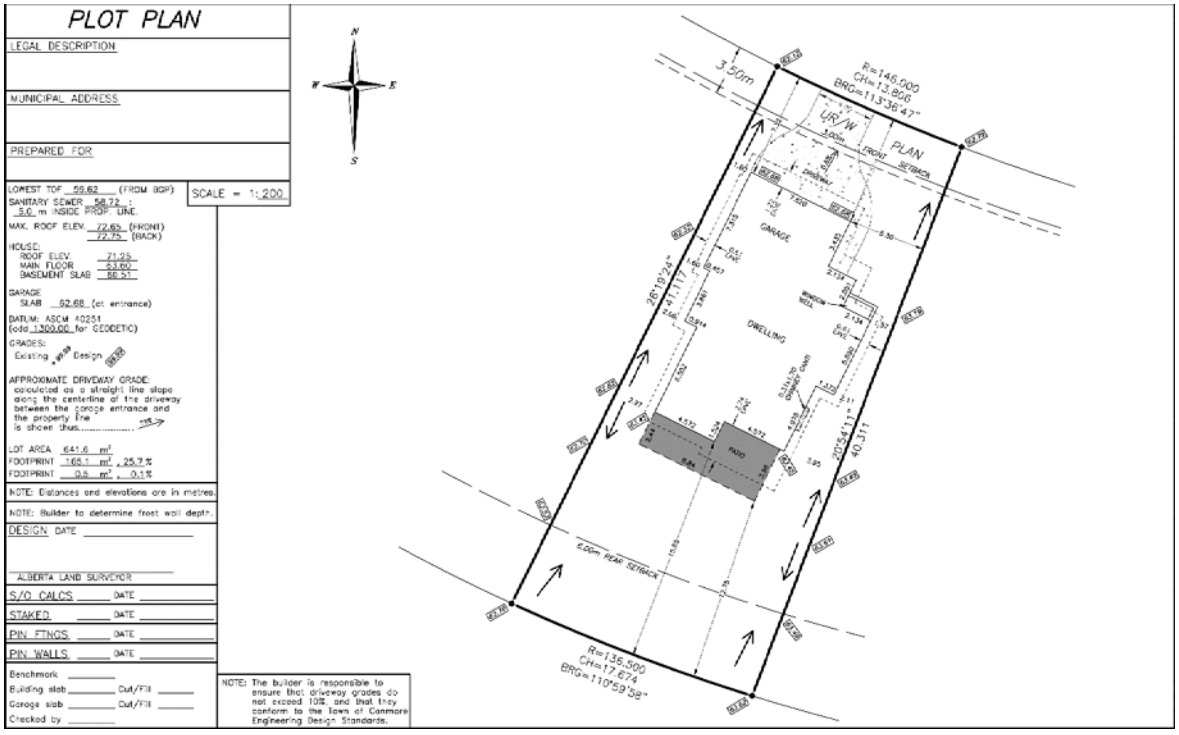


REAR

Step Two: Determine the Existing Grade

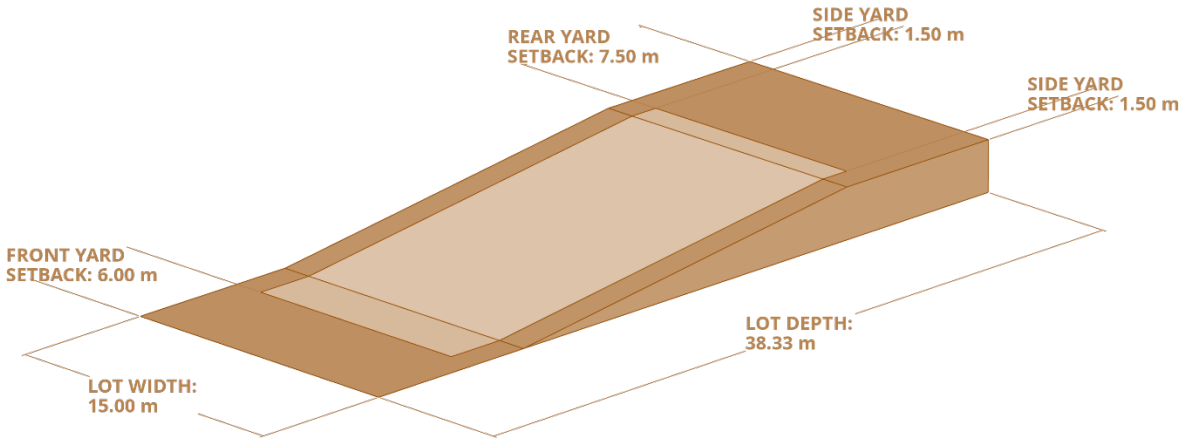
A professionally-surveyed plan is required to identify your lot's existing grade. (See sample Plot Plan below for reference.) In situations where the proposed grade is to be modified (higher or lower than existing), building height shall be measured from the existing grade.

In cases where the site is located in a high groundwater area or subject to a high flood elevation (see Section 7, Overlay Districts in the Land Use Bylaw), height shall be measured from the minimum groundwater or flood elevation level. If you're unsure if your property is located within a high groundwater area or is subject to flooding, please contact the Planning Department for clarity.



Step Three: Identify the Yard Setbacks

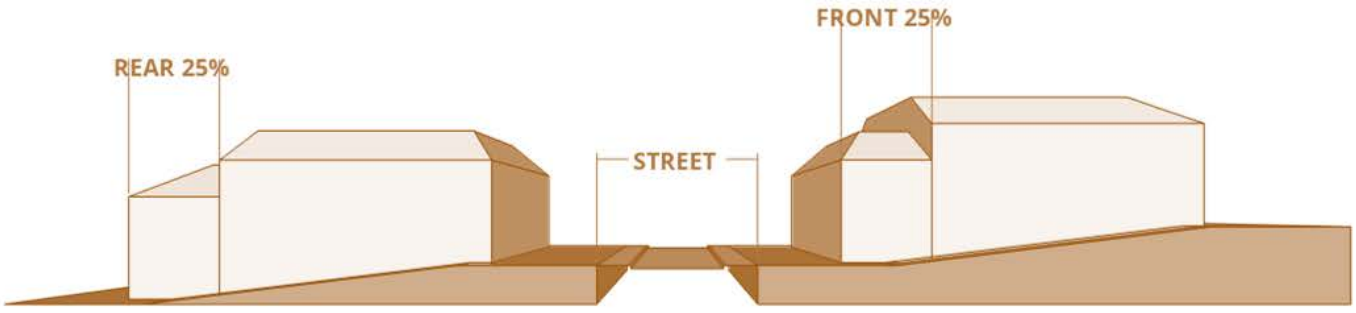
Review the applicable residential land use district in Section 3 of the Land Use Bylaw to identify the applicable yard setbacks as it relates to your property.



Step Four: Determine Your Site's Slopes

If the property is a sloping site, the envelope must be 'stepped' to reflect this change in grade. This means that if your property is located on a downsloping site, the rear 25% of the envelope will be required to be lowered. If your property is located on an uphill site, the front 25% of the envelope will be required to be lowered.

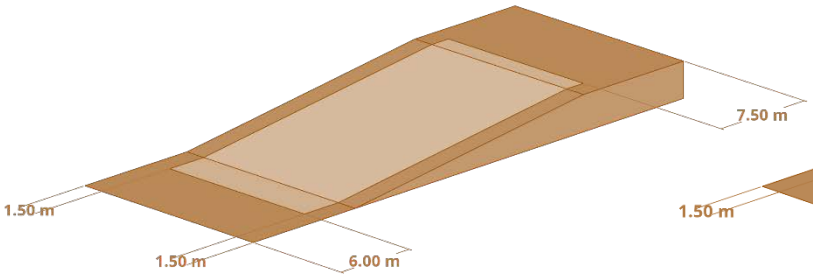
The exact amount that the envelope is lowered is based on the formula outlined in Step One, which considers the grades of the site. A current surveyors plan (not older than 2yrs) will assist in identifying the current and required grades to confirm the building height on sloping sites.



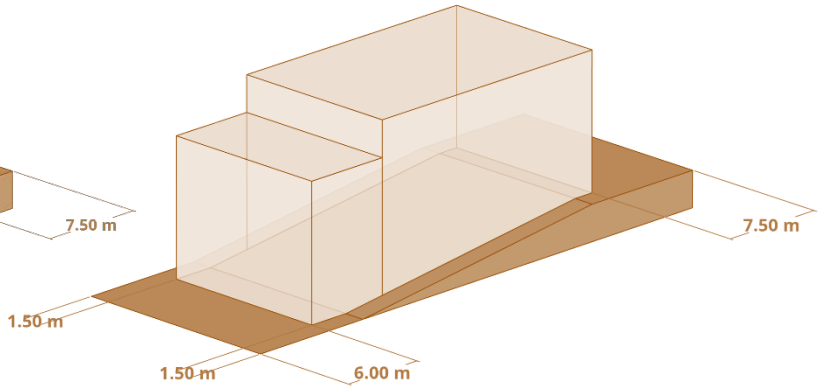
UPSLOPING SITE **DOWNSLOPING SITE**

Step Five: Create the Initial Envelope

Using the existing grade as your base and the yard setbacks as your length and width constraints, draw a box (NOTE: two boxes are required for a sloping site) with a height equaling the maximum height allowed in the land use district. This will form the initial envelope, as illustrated below.



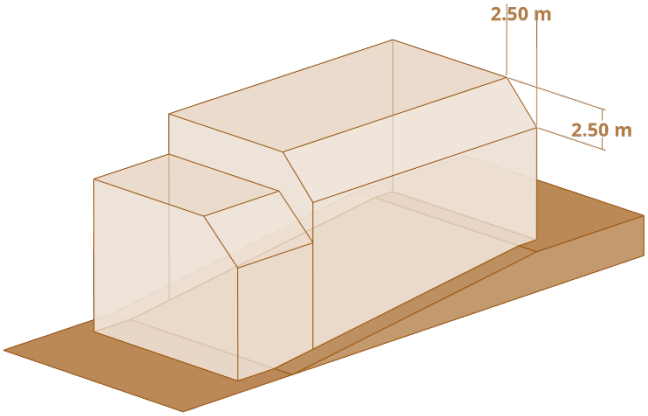
EXISTING GRADE
(Includes Building Footprint)



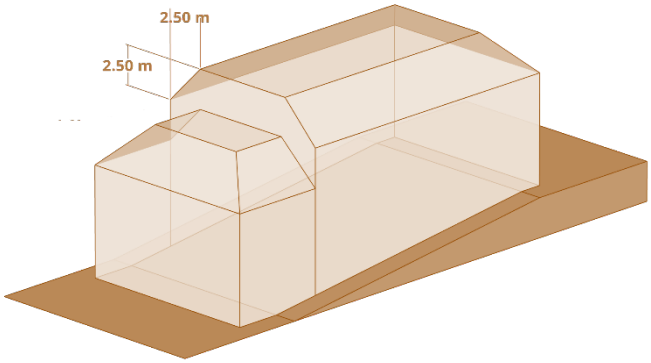
INITIAL ENVELOPE
(Includes Two Boxes for a Sloping Site)

Step Six: Apply Chamfers

Measure 2.5m from the top of the envelope down all sides and create a chamfer, or a 'cut' at a 45-degree angle at all top edges along the outside of the initial envelope, as illustrated below.



INITIAL CHAMFER
(Illustrates the First 45-Degree Angle Chamfer)



FINAL ENVELOPE
(Illustrates Chamfers Applied to All Relevant Edges)

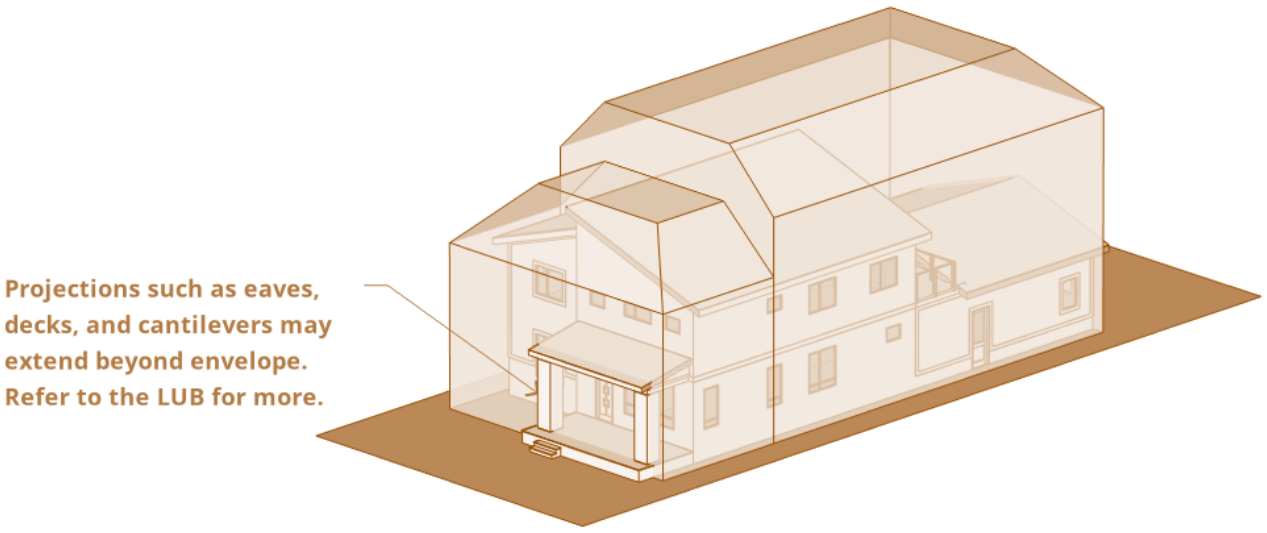
Step Seven: Verify Your Design

The envelope is now ready to use to help define the massing of your building. When ready, place your building design within the envelope to verify its compliance, as illustrated below.

Keep in mind that all of the building structure must be contained within the envelope, with the exception to eaves, decks and cantilevers.

Dormers must comply with the envelope restrictions although the eaves of a dormer may project outside of the envelope. NOTE: Where projections are proposed, they must not exceed the allowable amounts as described in the Setback Regulations (Section 2 of the Land Use Bylaw).

Accessory buildings (sheds, detached garages, etc.) are not required to conform to the restrictions of the building envelope.

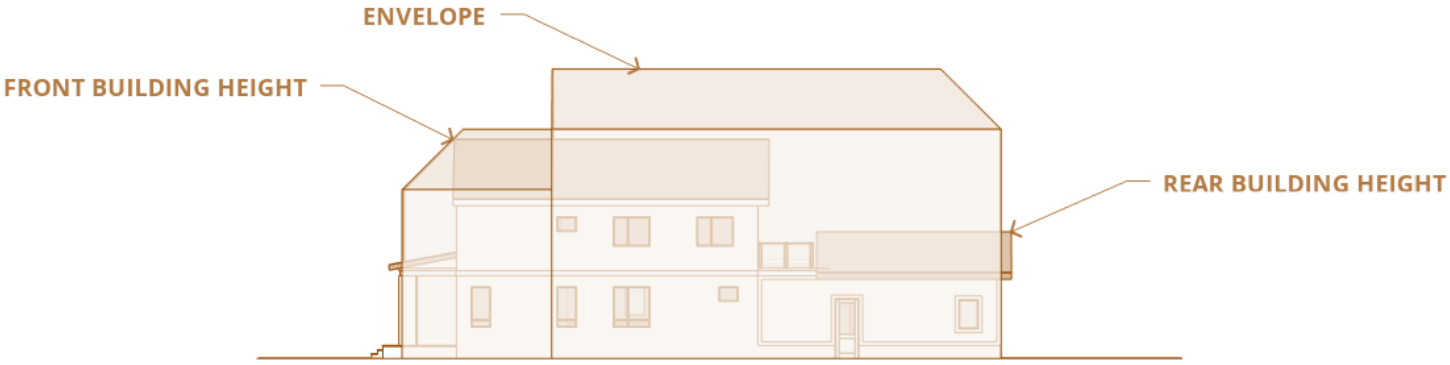


Step Eight: Produce Drawings for Submission

When submitting your permit plans, ensure that each elevation and section drawing of your building shows the envelope, the building within the envelope, the proposed height(s), and any projections beyond the envelope, as illustrated below.

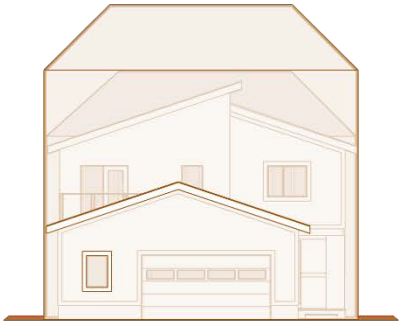
An envelope must be shown for each building elevation (front, rear, both sides).

Producing a 3D model of the envelope method is not necessary for most permit applications. However, if a variance is proposed, one may be required by the Development Officer to fully understand the scope of the proposed variance.



SIDE VIEW

FRONT VIEW



REAR VIEW

Town of
CANMORE

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