

PLANNING AND ZONING COMMISSION

Proposal for a Predevelopment Zoning Grade Plane Standard

A clear and verifiable method for administering Alpine's 35-foot residential building-height limit

To: Town of Alpine Planning and Zoning Commission

From: Planning and Zoning Administrator

Purpose: Discussion and policy direction for the LUDC redesign

Status: Working proposal - subject to Commission, Building Official, engineering, and legal review

Recommended approach: Establish one certified predevelopment zoning grade plane for each proposed building and prohibit the applicable roof measurement from exceeding 35 feet above that fixed elevation. Use finished grade wherever it is lower than the original predevelopment grade so that fill cannot create additional height and excavation cannot be disregarded.

1. Issue

The LUDC permits residential buildings up to 35 feet in height but should state precisely how the starting grade and upper roof point are determined. If height is measured only from post-construction finished grade, an applicant could import fill, construct a raised building pad, and effectively increase the visible elevation of the building above the original terrain. The Code should establish a fixed, documented zoning datum before grading begins.

The IRC grade-plane and basement tests serve building-code purposes, including determining whether a lower level is a basement or a story above grade. They should not control the Town's separate zoning determination of compliance with the 35-foot height limit.

2. Proposed policy

- A Wyoming-licensed professional land surveyor or professional engineer establishes and certifies the predevelopment zoning grade plane.
- The calculation uses elevations measured around the proposed building footprint. At each required measurement location, the applicable elevation is the original predevelopment topography or the proposed finished grade, whichever is lower. Original elevations must be documented before grading, excavation, filling, berming, or construction begins.
- The certified grade plane becomes a fixed project elevation. Fill may be approved when necessary for drainage, flood protection, soil stability, utility service, safe access, or another documented engineering or public-safety purpose; however, approved fill does not raise the zoning grade plane or increase permitted building height unless a specific safety-related adjustment is approved under the Code.

- **Safety-related adjustment.** The Building Official may approve an adjustment to the certified zoning grade plane only when a Wyoming-licensed professional engineer demonstrates that an increased building elevation is the minimum necessary to comply with adopted floodplain requirements or address a documented site-safety condition. The adjustment shall be limited to the minimum additional elevation necessary and shall not be granted solely to increase building height, improve views, or accommodate a preferred architectural design.
- The approved upper roof measurement may not exceed 35 feet above that fixed elevation.
- An as-built survey verifies the constructed grade and roof elevations before final approval or issuance of a certificate of occupancy.

3. How the zoning grade plane would be calculated

The surveyor or engineer would place the proposed building footprint on a predevelopment topographic survey and establish ground elevations around the footprint. Measurements should include every building corner, each change in the footprint, regular intervals along long walls, and locations where the grade changes substantially.

For a simple rectangular building on a uniform slope, averaging the four corner elevations may reasonably approximate the grade plane. For an irregular building, unequal wall lengths, or variable terrain, the professional should use a perimeter-weighted average so that a short wall segment does not receive the same influence as a much longer segment.

Measurement segment	Applicable grade	Weighted contribution
North wall - 50 ft	102 ft	50 x 102
East wall - 30 ft	98 ft	30 x 98
South wall - 50 ft	96 ft	50 x 96
West wall - 30 ft	100 ft	30 x 100

Illustrative weighted calculation: $[(50 \times 102) + (30 \times 98) + (50 \times 96) + (30 \times 100)] / 160 = 99$ feet.

If proposed finished grade at any measurement location is lower than original grade, the lower finished-grade elevation replaces the original elevation at that location in the zoning calculation. This prevents both added fill and selective reliance on a higher original grade from producing unintended additional height.

Important: The LUDC should define the required calculation method. A professional stamp verifies that the calculation follows the Town's standard; it should not leave the substantive method entirely to individual professional judgment.

4. Establishing the 35-foot elevation ceiling

Once the applicable zoning grade plane has been certified, the Town adds 35 feet to determine the maximum permitted roof elevation.

Required value	Illustrative elevation
Certified zoning grade plane	99 ft
Maximum permitted height	+35 ft
Maximum permitted roof elevation	134 ft

Even if the applicant later imports 15 feet of fill, the approved maximum roof elevation remains 134 feet. Grading does not reset the zoning datum.

5. Commission policy choice: mean roof or absolute highest point

The Commission should decide what point on the roof must remain within the 35-foot limit. Two common approaches produce different results for pitched roofs.

Option	How measured	Policy effect
A. Mean roof height	From zoning grade plane to the average elevation between the eave and ridge of the highest roof surface.	Allows the ridge to extend above 35 feet. Preserves greater roof-design flexibility.
B. Hard overall height	From zoning grade plane to the highest point of the roof or structure.	No part of the roof exceeds 35 feet, subject only to stated exceptions. Provides the clearest visual-height limit.

How average roof height is calculated

For a symmetrical pitched roof, the mean roof elevation is generally calculated halfway between the eave elevation and ridge elevation:

$$\text{Mean roof elevation} = (\text{eave elevation} + \text{ridge elevation}) / 2$$

Example: an eave at elevation 126 feet and ridge at elevation 142 feet produces a mean roof elevation of 134 feet. If the zoning grade plane is 99 feet, the mean-roof height is 35 feet even though the ridge is 43 feet above the grade plane.

For flat, shed, mansard, gambrel, or multiple roof forms, the Code must specify the applicable roof surface and method. Plans should identify both the proposed mean-roof elevation and the absolute ridge or highest-point elevation so the Town can evaluate either policy consistently.

Staff observation: If the Commission's intent is that a residence should never present more than 35 feet of total vertical building mass above the approved zoning grade plane, Option B - hard overall height - is the more direct and administratively clear standard.

6. Required plan documentation

The Code should require the following information in a form acceptable to the Town:

- A predevelopment topographic survey prepared and certified by a Wyoming-licensed professional land surveyor or professional engineer;
- A coordinated grading, excavation, and fill plan showing the limits, depth, and extent of excavation and fill; cut-and-fill quantities; building-pad and finished-floor elevations; retaining walls and slopes; drainage patterns and facilities; erosion and sediment controls; soil stabilization measures; and the relationship of proposed grading to property lines, rights-of-way, utilities, neighboring properties, and the certified zoning grade plane;
- Existing and proposed contours;
- Existing and proposed elevations at every building corner;
- Additional perimeter elevations at regular intervals and wherever grade changes substantially;
- The calculated predevelopment zoning grade plane and supporting calculation table;
- Proposed finished-grade elevations, identifying each location where finished grade is lower than original grade;
- Proposed mean-roof and ridge or absolute highest-point elevations;
- A permanent survey benchmark tied to the elevations shown on the approved plans; and
- An as-built survey before final approval or issuance of a certificate of occupancy, confirming the finished grades, mean-roof elevation, ridge/highest-point elevation, and compliance with the approved maximum elevation.

Professional preparation of grading plans

The grading, excavation, and fill information may be incorporated into a coordinated site and grading plan set rather than submitted as a separate document. The plan should be prepared and certified by a Wyoming-licensed professional engineer when grading supports a building or foundation; involves substantial fill or excavation; creates or affects a steep slope; requires retaining structures; alters established drainage; may affect neighboring property, utilities, or a right-of-way; involves questionable soils or geotechnical conditions; or is offered to justify a safety-related grade-plane adjustment.

7. Draft LUDC language for discussion

Predevelopment Zoning Grade Plane

The elevation established and certified by a Wyoming-licensed professional land surveyor or professional engineer from documented predevelopment ground elevations surrounding the proposed building footprint. Measurement points shall include all building corners, changes in building footprint, regular intervals along exterior walls, and locations of substantial grade change. The grade plane shall be calculated using a perimeter-weighted average unless the Administrator approves another method demonstrated to be equally or more accurate. At each measurement location, the applicable elevation shall be the original predevelopment grade or the proposed finished grade, whichever is lower.

Grading, Excavation, and Fill Plan

An application subject to the building-height standard shall include a coordinated grading, excavation, and fill plan showing all proposed grading, excavation, filling, berming, retaining walls, slopes, drainage improvements, erosion and sediment controls, soil stabilization measures, existing and proposed contours, building-pad elevations, finished-floor elevations, and cut-and-fill quantities. The plan shall distinguish original predevelopment grade from proposed finished grade, identify where finished grade will be higher or lower than original grade, and demonstrate how proposed grading relates to the certified zoning grade plane and building-height calculation. Where grading may affect structural support, drainage, slope stability, soils, utilities, rights-of-way, or adjoining property, the Town may require the plan to be prepared and certified by a Wyoming-licensed professional engineer.

Safety-Related Fill and Adjustment

Fill may be approved when necessary for drainage, flood protection, soil stability, utility service, safe access, or another documented engineering or public-safety purpose and shall be shown on the approved grading, excavation, and fill plan. Approval of fill does not by itself modify the certified zoning grade plane or increase permitted building height. The Administrator may approve a limited adjustment only when a Wyoming-licensed professional engineer demonstrates that an increased building elevation is the minimum necessary to comply with adopted floodplain requirements or address a documented site-safety condition. Any adjustment shall be limited to the minimum additional elevation necessary and shall not be granted solely to increase building height, improve views, or accommodate a preferred architectural design. The Town Engineer may review the request at the applicant's expense, and adjustments exceeding a threshold established by the Code shall require approval by the Board of Adjustment.

Building Height - Option A: Mean Roof

Building height is the vertical distance from the certified predevelopment zoning grade plane to the mean elevation of the highest roof surface. For a pitched roof, mean roof elevation is the average of the eave and ridge elevations. No grading, filling, berming, retaining wall, or other artificial alteration of the land shall increase the permitted building height.

Building Height - Option B: Hard Overall Height

Building height is the vertical distance from the certified predevelopment zoning grade plane to the highest point of the roof or structure. No portion of a building or structure shall exceed 35 feet above the certified predevelopment zoning grade plane, except for projections expressly exempted by this Code. No grading, filling, berming, retaining wall, or other artificial alteration of the land shall increase the permitted building height.

Verification

The approved maximum building elevation shall be shown on all site, grading, and building plans. Before final approval or issuance of a certificate of occupancy, the applicant shall submit an as-built survey prepared and certified by a Wyoming-licensed professional land surveyor or professional engineer demonstrating compliance with the approved grade-plane and building-height elevations.

8. Additional implementation decisions

- Determine whether chimneys, vents, antennas, mechanical equipment, solar equipment, and similar projections are exempt and establish maximum projection limits.
- Establish the amount of a safety-related grade-plane adjustment that may be approved administratively (by Building Official) and the threshold requiring Board of Adjustment approval.
- Establish objective thresholds for engineered grading plans, including cut-and-fill depth or volume, slopes, retaining walls, drainage, soils, and off-site impacts. [See attachment A- Discussion Guide for Engineering Grading Plan Thresholds](#)
- Establish when a certified survey is required, including whether simplified requirements should apply to small accessory structures.
- Coordinate the final language with the Building Official so zoning-height review remains distinct from IRC grade-plane and story-classification review.
- Identify the Town official responsible for reviewing calculations and whether complex cases require Town engineering review at the applicant's expense. [I believe this should be the Building Official](#)
- Establish enforcement authority when grading occurs before the original topography is documented, including use of historic surveys, subdivision grading plans, neighboring elevations, photographs, or other reliable evidence at the owner's expense.

9. Recommended Commission direction

Staff recommends that the Commission direct the LUDC consultant to prepare building-height provisions based on a certified predevelopment zoning grade plane, using proposed finished grade where lower than original grade, together with coordinated grading, excavation, and fill-plan requirements. Safety-related fill should not automatically raise the zoning datum, but the Code may allow a narrowly defined adjustment for the minimum elevation necessary for floodplain compliance or a documented site-safety condition. The Commission should also select mean-roof height or a hard overall-height limit and provide direction regarding projections, professional-plan thresholds, and limited exceptions.