

ATTACHMENT A

Discussion Guide for Engineered Grading Plan Thresholds

Companion to the Proposed Predevelopment Zoning Grade Plane Standard

To: Town of Alpine Planning and Zoning Commission

From: Planning and Zoning Administrator

Purpose: Commission discussion and direction regarding when grading plans must be engineered

Status: Policy discussion guide; example thresholds are not proposed for adoption without technical and legal review

Question for the Commission: What objective conditions should require a grading plan prepared and certified by a Wyoming-licensed professional engineer, rather than a basic grading plan prepared for routine administrative review?

1. Why objective thresholds are needed

The proposed zoning grade-plane standard requires the Town to understand both the land that existed before development and the grading that will occur during construction. A basic grading plan may be sufficient for routine, low-risk work. More complex grading should receive professional engineering because it can affect structural support, slope stability, drainage, neighboring property, streets, utilities, and the accuracy of the Town's building-height determination.

Objective triggers give applicants predictable requirements, help staff route applications consistently, and reduce reliance on case-by-case judgment. The Code should still include a limited professional-review trigger for unusual site conditions that cannot reasonably be captured by numeric thresholds.

2. Recommended two-level review framework

Level 1 — Basic grading plan

Require a basic grading plan for every new principal building and any other project subject to the zoning-height standard. At minimum, it should show:

- Existing and proposed contours and elevations;
- The building footprint, building-pad elevation, finished-floor elevation, and certified zoning grade plane;
- The location, depth, and general extent of proposed cut and fill;
- Drainage direction and proposed drainage facilities;
- Proposed slopes and retaining walls; and

- Property lines, rights-of-way, utilities, easements, and adjoining improvements that may be affected.

Level 2 — Engineered grading plan

Require a grading plan prepared and certified by a Wyoming-licensed professional engineer whenever one or more adopted trigger conditions are present. The engineer should address the applicable grading, drainage, structural-fill, slope-stability, retaining-wall, soil, erosion-control, and off-site-impact issues.

3. Preliminary threshold matrix for Commission discussion

Important: The numbers below are discussion-level starting points. The Commission should request recommendations from the Town Engineer and Building Official before placing final thresholds in the LUDC or engineering standards.

Trigger category	Illustrative starting point	Reason for engineering review
Cut or fill depth	More than 2 feet of vertical change within or near the building area.	Deeper grading can affect bearing, stability, drainage, and height verification.
Structural fill	Any fill placed beneath a building, foundation, retaining structure, or required emergency-access route.	Requires suitable material, controlled placement, compaction, and testing.
Total earthwork volume	More than 50 cubic yards of combined cut and fill.	Captures broad grading that may be shallow but extensive.
Slopes	Creation or substantial alteration of a slope steeper than 3 horizontal to 1 vertical (3H:1V), or exceeding a stated vertical height.	Steeper or taller slopes may require stability, erosion, and drainage design.
Retaining walls	A wall over 4 feet measured from the bottom of the footing to the top, or any wall supporting a surcharge.	Wall loading may be increased by buildings, driveways, slopes, water, or adjacent improvements.
Drainage	Any work that materially changes the direction, concentration, volume, velocity, or discharge point of runoff.	Drainage impacts can occur even when earthwork quantities are small.
Boundary or right-of-way	Significant cut, fill, retaining, or drainage work within a distance established by the Town from a property line or right-of-way.	Protects neighboring property, roads, utilities, drainage facilities, and public infrastructure.

Trigger category	Illustrative starting point	Reason for engineering review
Soils or groundwater	Unstable, expansive, compressible, undocumented, saturated, or otherwise questionable soil or groundwater conditions.	Site-specific investigation may be necessary for safe support and drainage.
Off-site impacts	Any reasonable potential to affect adjoining property, roads, utilities, drainage systems, or other infrastructure.	Provides a safety valve for unusual conditions not captured by a numeric threshold.
Safety-related grade adjustment	Any request to raise the certified zoning grade plane or building elevation for flood protection or another documented safety need.	Engineering is needed to establish necessity, minimum adjustment, and impacts.

4. What the example thresholds mean

Cut-and-fill depth and volume

Depth and volume measure different risks. A two-foot fill over 100 square feet is approximately 7.4 cubic yards, while the same depth over 10,000 square feet is approximately 741 cubic yards. A project can therefore involve a modest depth but a very large volume, or a deep localized cut with a modest total volume. Using both triggers is more reliable than using either one alone.

Structural fill

Fill supporting a building, foundation, retaining structure, or critical access route should generally be engineered regardless of quantity. The plan may need to specify acceptable material, lift thickness, moisture conditioning, compaction standards, testing frequency, and unsuitable-soil removal. The Building Official and project design professional should coordinate these requirements with the applicable building code and geotechnical recommendations.

Slopes and retaining walls

A 3H:1V slope and a four-foot retaining-wall threshold are recognizable discussion benchmarks, but they should not be treated as automatically appropriate for every Alpine site. Soil type, groundwater, snowmelt, wall surcharge, terracing, proximity to property lines, and the consequences of failure may justify engineering below a numeric threshold. Retaining-wall height should be measured consistently, including the footing where required by the adopted standard.

Drainage and off-site impacts

Drainage should be an independent trigger because a small amount of grading can redirect or concentrate runoff. The off-site-impact trigger should allow the Administrator, Building Official, Public Works, or Town Engineer to require professional review when reliable information indicates a material

risk. To maintain predictability, the decision should be documented in writing and identify the specific condition requiring engineering.

5. Recommended implementation safeguards

- Require a basic grading plan for every new principal building and other projects subject to the zoning-height standard.
- Require an engineered grading plan whenever any adopted objective trigger is met.
- Require engineering automatically for structural fill, significant drainage changes, questionable soils or slopes, and safety-related grade-plane adjustments.
- Allow professional review for an unusual off-site risk only through a written determination identifying the relevant facts.
- Authorize Town Engineer review at the applicant's expense when the Town determines that independent review is reasonably necessary.
- Coordinate final thresholds with the Building Official, Town Engineer, Public Works, floodplain requirements, and the Town's engineering standards.
- State whether small accessory structures or minor grading may use simplified documentation when no trigger is present.

6. Direction requested from the Commission

1. Should a basic grading plan be required for every new principal building?
2. Which conditions should automatically require a Wyoming-licensed professional engineer?
3. Are 2 feet of cut/fill, 50 cubic yards, a 3H:1V slope, and a 4-foot retaining wall appropriate starting points for technical review?
4. Should the Code establish a specific setback distance from property lines and rights-of-way as an engineering trigger?
5. Which Town officials may invoke the unusual-condition trigger, and should a written determination be required?
6. Should the Town Engineer be authorized to review complex plans at the applicant's expense?
7. Should simplified requirements apply to small accessory structures or minor grading that meets no trigger?

Suggested next step: Use the Commission's policy direction to obtain technical recommendations from the Town Engineer and Building Official, then return with final threshold language coordinated with the LUDC and engineering standards.