Height & Imposing Wall Toolkit

A comprehensive review of 118 municipal height-restriction ordinances across the United States demonstrates that there are many options for the City Council to consider when determining whether, and if so how, to alter Rollingwood's height-restriction ordinance. The purpose of this "toolkit" is to provide policymakers on the Planning & Zoning Commission and City Council with the options available to them in taking on this task. Accompanying this toolkit is a spreadsheet providing summaries of the height ordinances of the 118 municipalities.

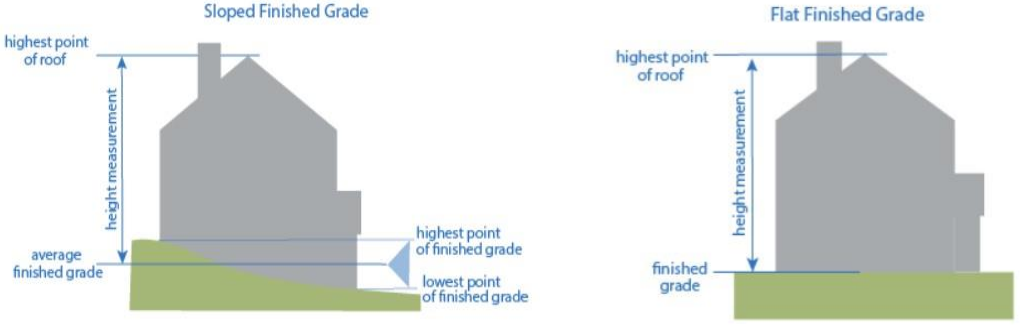
1. Direct Height Restriction Options

The primary tool for regulating residential building heights are direct height restrictions. The overwhelming majority of cities in the United States set their maximum height at 35'. The question, though, is *35 feet from where*? Cities have generally answered that question in three different ways: (1) by defining the measuring point from which height is measured by a single fixed point on a lot; (2) by defining more than one measuring point on a lot; and (3) by defining an infinite set of measuring points on a lot. Option one presents the simplest and easiest to measure and enforce; option two is slightly more complex; option three is the most complex.

A. Fixed Point Options

Fixed-point height ordinances set their reference point as a single point on a lot. This is the easiest to enforce and understand. The location of the fixed point varies depending on a city's particular ordinance.

The overwhelming majority of American cities use a single fixed-point measurement set to the **average** elevation of the building footprint, which takes into account a lot's topography mathematically. Charlottesville, VA, for example, defines "height" as "the vertical distance measured perpendicularly from grade to the highest point on such building or structure. Grade means, with reference to a building or structure: the average level of the ground adjacent to the exterior walls of the building." More examples include Estes Park, CO, Spokane, WA, Sunset Valley and Boerne, TX, Anchorage, AK, Tulsa, OK, Fort Collins, CO, St. Paul, MN, Branson, MO, and Nashville, TN. Bentonville, AR, illustrates its average measurement this way:



Other options for single fixed-point height ordinances include:

- Setting the reference point to the **highest** or highest average elevation of the building area. Examples include Stowe, VT, Lago Vista, TX, Lakeway, TX, New Braunfels, TX, and Hot Springs, AR.
- Setting the reference point to the elevation at the **curb** or **front wall** of the building. Examples include Eureka Springs, AR, Knoxville, TN, Louisville, KY, Boston, MA, Overland Park, KS, and Fort Worth, TX.
- Setting the reference point to the **lowest** or lowest average elevation of the building area. Examples include Abilene, TX and Santa Clara, CA.
- Setting the reference point at the **center** of the building. Examples include Chapel Hill, NC and Little Rock, AR.

Rollingwood's height ordinance is currently a single fixed-point measuring system of one of two options: (1) for lots with less than 10' of slope in the building area, the maximum height is measured from the highest point of natural grade within the building area; or (2) for lots with more than 10' of slope in the building area, the maximum height is measured from ten feet above the lowest point of natural grade within the building area. This means that for lots less than 10' in slope, the maximum height will be set at 35' above the **highest** portion of the building area in a horizontal plane across the entirety of the lot. For lots with more than 10' of slope, the maximum height will be set at 45' above the **lowest** portion of the lot.

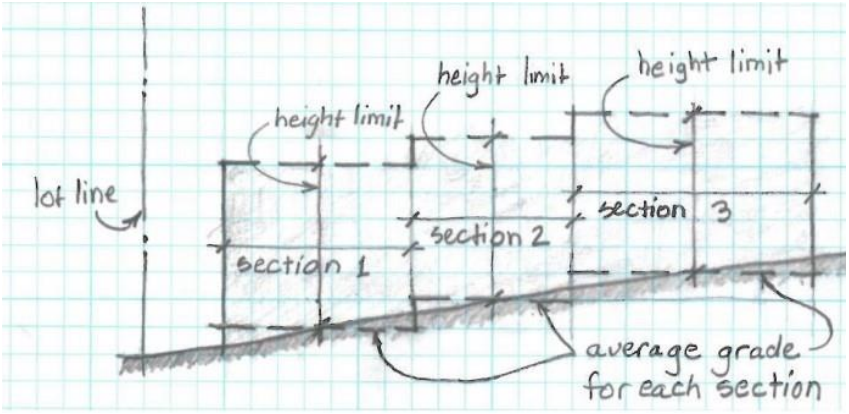
This measuring system does two things. First, it establishes where the base of the house will sit on the lot (assuming the homeowner builds to the 35' height limit). For a lot with a less than 10' slope, the base of the house will roughly sit at the top of the hill. For a lot with more than 10' slope, the base of the house will move downward to roughly sit 10' above the bottom of the hill.

Second, it provides a slope adjustment on a sliding scale. Lots with no change in elevation in the building area do not get any slope adjustment. For lots with 5' of slope in the building area, there is a 5' slope adjustment. For lots with 9' of slope in the building area, there is a 9' slope adjustment. Importantly, this adjustment only permits additional height *beneath* the measuring point. **At no point is a home permitted to exceed 35' above the highest natural grade of the building area.** (Note: this last fact was not always true. A prior version of the ordinance, recently amended by Council, in some circumstances permitted additional "bonus" height to be added *above* the highest natural grade of the building area.)

The moment the buildable area hits 10' of slope, the sliding scale stops and can produce no additional feet of slope adjustment regardless of how steep a lot's slope is. The measuring point, however, shifts to 10' above the bottom of the hill. Those 10' define the available slope adjustment for steeply sloped lots.

B. Multi-Point Options

A few cities have employed a multi-point method in which a building is divided into **segments**, and each segment has its own height limit–typically based on average elevation of the segment. This creates a "terraced" look while also taking into account topography. Cities that use multi-point methods include Fredericksburg, TX, Albuquerque, NM, Colorado Springs, CO and, for sloped lots, Burlington, VT. Raleigh, NC and Seattle, WA give the homeowner the option to select between using the lot-average method or the segment-average method. In Seattle, if the owner chooses the segment-average method, the "maximum height for each section of the structure is measured from the average grade level for that section of the structure, which is calculated as the average elevation of existing lot grades at the midpoints of the two opposing exterior sides of the rectangle for each section of the structure." Seattle illustrated its method in this diagram:



C. Infinite-Point Option (Parallel Plane)

Another option used by a very small minority of municipalities is an infinite-point height-restriction method, which, as described, independently measures the maximum height at every location within the building area. This method is sometimes called the "**parallel plane**" method because it involves two parallel planes: (1) the natural slope of the lot; and (2) an imaginary plane rising a set number of feet above the natural slope of the lot. The home must be built between the two planes.

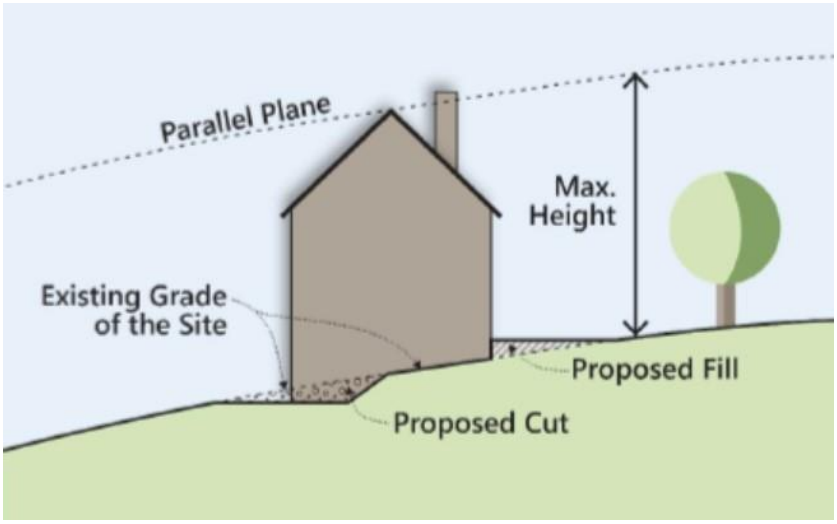
The parallel-plane method has two significant drawbacks. First, the method significantly reduces the buildable area of sloped lots (because one cannot build a sloped floor). As such, it is the most restrictive option for measuring building height. A current member of the CRCRC noted this drawback of the parallel-plane method:

> *"Just talking to an architect friend of mine [who] was saying that … I'm not sure people really understood how restrictive that is, and that* ***it would be very difficult to build houses on sloped lots****."*

Second, the method seems to get very complicated, very quickly–as evidenced by cities that have adopted complex and sometimes confounding parallel-plane ordinances. The language is often dense and difficult to understand, and it seems extremely unlikely to be strictly enforced as that would require a building official to be able to accurately determine, after concrete is poured and a home built, how high every inch of the rooftop is relative to the natural grade immediately beneath it. The question ought to be asked to our building official: *how would you determine, once a house is built, whether a particular portion in the middle of a home conforms to the parallel plane?*

Because the parallel-plane method mathematically reduces buildable volume on sloped lots, cities that use the method ordinarily include adjustments for sloped lots. Oakland, CA, provides additional height to sloped lots depending on the particular lot's slope. Laguna Beach, CA gives 5 additional feet depending on the lot's slope. Marin County, CA, gives up to 10 additional feet depending on setbacks.

Cities that have adopted the parallel-plane method include West Lake Hills, TX, Laguna Beach, CA, and Oakland, CA. Temple City, CA illustrates the parallel-plane in this diagram:



D. Hybrid/Mixed Options

Unsurprisingly, there are some height-restriction ordinances that do not fall neatly into a single category, but are nonetheless worth understanding and considering.

For example, Honolulu, HI's ordinance incorporates both the high-point method and the parallel-plane method. A high-point horizontal plane is set at an elevation of 25' above at the highest point of a boundary of the buildable area. A second plane, the "parallel plane," is set at 30' above grade at all locations. If the planes ever cross, the parallel plane governs. If not, the high-point plane governs.

Denver, CO has its own approach. Generally speaking, it creates two independent "base" planes–one providing the height limit to the front portion of the lot and a second providing the height limit for the back portion of the lot. Each is, loosely speaking, based on averaging.

Asheville, NC is another unique approach. Generally, Asheville's height limit is set at 40' above the average grade. For sloped lots on mountainsides, however, Asheville lowers the uphill facade to 30'. However, it raises its height limits on sloped lots significantly (in fact, above 40') if the homeowner uses paint with a low light-reflectivity value or grants a vegetative easement on the downhill side.

Some cities differentiate between lots that slope downhill from the street and lots that slope uphill from the street. San Francisco, CA, for example, provides that for lots sloping away from the street, the measuring point is at the curb at the centerline of the house for the first 100' deep. For lots sloping upward away from the street, the measuring point is at the curb at the centerline of the house for 10', but steps upward based on a formula.

2. Additional Height Regulation & Softening Tools

A. Number of Feet

The simplest lever to "pull" when determining height restrictions is the numerical height. The overwhelming majority of communities in the United States use a 35' maximum height. Some cities are more and a few are less. But, **generally speaking, a 35' maximum height is the standard maximum height across the entirety of the United States**. Rollingwood's current code sets the height limit at the standard 35' height limit.

B. Number of Stories

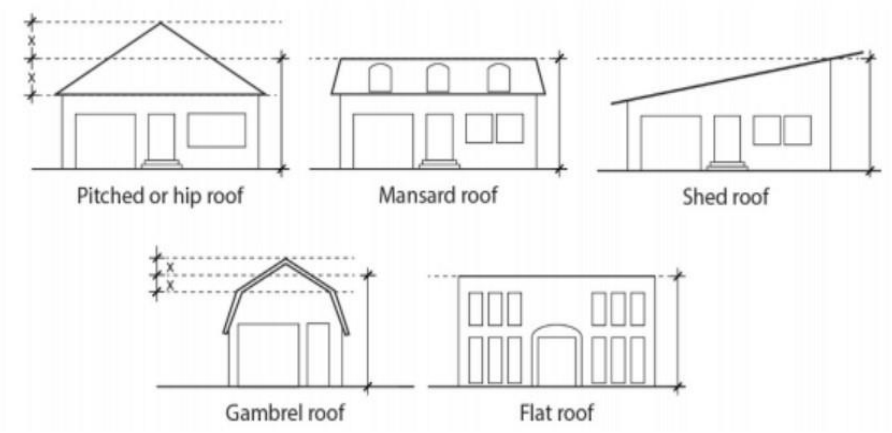
A very large number of cities have a second height limit tied to the maximum number of stories a home can be built. The typical maximum-stories limitation is 2.5 stories. Rollingwood's current code does not include a maximum number of stories.

C. Roof Differentiation

A third easy lever to "pull" is differentiating between types of roofs. Many cities treat all roofing styles the same such that the maximum height is measured from grade level to the top portion of any style roof.

The majority, however, treat pitched roofs more favorably than flat roofs (because homes with flat roofs are far more bulky than homes with pitched roofs). Some provide two different maximum-height numbers–one for pitched roofs and one for flat roofs. Culver City, CA, for example, has a height limit of 26' for flat roofs and 30' for pitched roofs. Most cities that differentiate between roof style provide that the maximum height is measured to either the top of

a flat roof or the midpoint of a pitched roof. Portland, OR, illustrates its differentiation this way:



Rollingwood's ordinance is in the minority in not differentiating based on roof style. Differentiating between pitched and flat roofs would discourage flat roof designs and encourage less "bulky" home designs.

D. Wall Articulation

Another important and likely non-controversial option for reducing the "imposing" and harsh nature of exterior walls is to require that flat walls be broken up architecturally. This can either be done as a requirement for any exterior wall (like Las Vegas, NV) or it can be done in the form of "bonus" height for walls that are articulated (like Sedona, AZ).

Documents from the March 18, 2024 meeting of the CRCRC include a recommendation to implement side-wall articulation requirements:

SIDE-WALL ARTICULATION - FINAL

If a side-wall of a building is more than **15 ft. high**, the sidewall may not extend in an unbroken plane for more than **40 ft. in length** (CoA is 36ft) along a side lot line without a sidewall articulation that meets the requirements of this section. (Or, every 50 ft. of a first floor wall that is 18 ft. tall or greater.)

A. To break the plane, a sidewall articulation must:

- be perpendicular to the side property line, at least 3 ft. deep (CoA is 4ft.), and extend along the side property line for at least 10 ft.; *Include graphic*
- extend the entire height of the first floor of an addition to, or remodel of, an existing one-story building; flat decks and patios are not permissible;
- extend the entire height of the second story of an addition to, or remodel of, a two or more story building.

B. Alternate means of articulation within the same 15 ft. x 40 ft. plane, may include, but are not limited to:

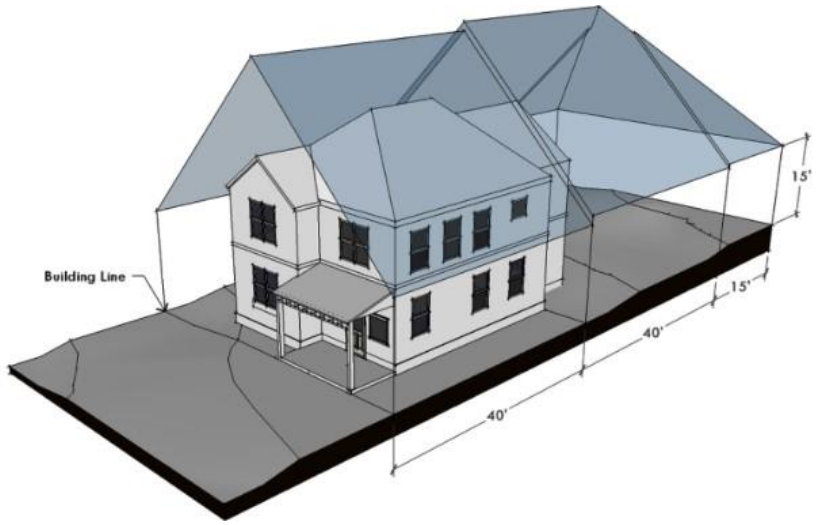
- clear change in building materials for a minimum of 10ft., horizontal and vertical;
- windows that are recessed at least 6 in. as measured from face of veneer to face of glass, and that are a minimum of 30 sq. ft. in area.

Rollingwood's ordinance does not currently impose wall-articulation requirements.

E. Tenting

Although applied significantly less frequently than other height-restriction tools, employing "bulk planes"--sometimes called "setback planes" or "tenting"--is a way to reduce the "bulk" of buildings by cutting out (in three dimensions) the corners of a lot's 3D building "envelope." Cities that have imposed bulk-plane restrictions include Austin, TX, Chapel Hill, NC, and Salt Lake City, UT. Bulk planes, like the parallel-plane method, can get complicated quickly–especially as applied to sloping lots (because the bulk planes too will rise and fall with the slope of the lot).

Austin's ordinance imposes both side and rear bulk planes in Zoning Code Subchapter F, Section 2-6. The bulk planes effectively remove, from the buildable envelope, a "tent" on top of the structure. Austin's ordinance includes a diagram of the 3D bulk-plane regulation:



Rollingwood's code does not currently impose a bulk plane or "tenting" requirement. There is a legal question concerning whether a municipality that is not a home-rule city may impose bulk planes. *See* Tex. Local Gov't Code Sec. 211.003 (authorizing only home-rule cities to "regulate the bulk of buildings"). Given the complexity of the "parallel plane" method and how it is often prescribed as providing a 3D envelope between two "planes," its legality too might be questioned under the Local Government Code.

F. Grade

A direct height-restriction ordinance such as a fixed-point, multi-point, or "parallel plane" limitation inevitably must provide the point or series of points from which the distance to the top of the structure is measured. Some cities tie the measuring point to a point on the natural ground of the buildable area; others tie the measuring point to the finished grade of a building. Tying the measuring point to the natural ground will typically lower the height of a building, as foundations generally sit on top of the natural ground.

Rollingwood's current code defines the grade to which height is pinned as the "original native ground."

3. Equity and Exceptions

A. Slope Adjustments

The impacts of height restrictions on flat lots are easy to understand. Where ground is flat (or effectively flat), imposing a 35' limit measured by the distance between natural ground and a rooftop is simple and predictable: the homeowner gets 35', no more and no less, and everyone gets to build his or her home within the same buildable envelope. Everything is fair.

The same is not true once slope is factored in. Because one cannot build a slanted floor, a strict 35' limit on a sloped lot measurably reduces the buildable envelope on the lot–leaving portions of the envelope unbuildable. In this way, a height-restriction tool that may work for all flat lots may work poorly, and unfairly, on sloped lots.

No doubt because of this, **nearly every municipality in America incorporates some form of adjustment for slope into its height-limit ordinance.**

Some height-restriction ordinances adjust for slope automatically. For example, the most typical form of height-restriction ordinance–the single fixed measuring point based on "average" lot elevation–mathematically and automatically provides an adjustment for sloped lots. If a lot slopes an average of 6 feet, for example, the measuring point will be placed at the midpoint of the elevation change, leaving a 3-foot height adjustment. The mathematical calculation of averaging also serves to limit the slope adjustment. A multi-point height-restriction based on the average of each segment would perform the same mathematical calculation for each segment, providing an automatic slope adjustment (and an automatic limitation of the slope adjustment) as to each segment.

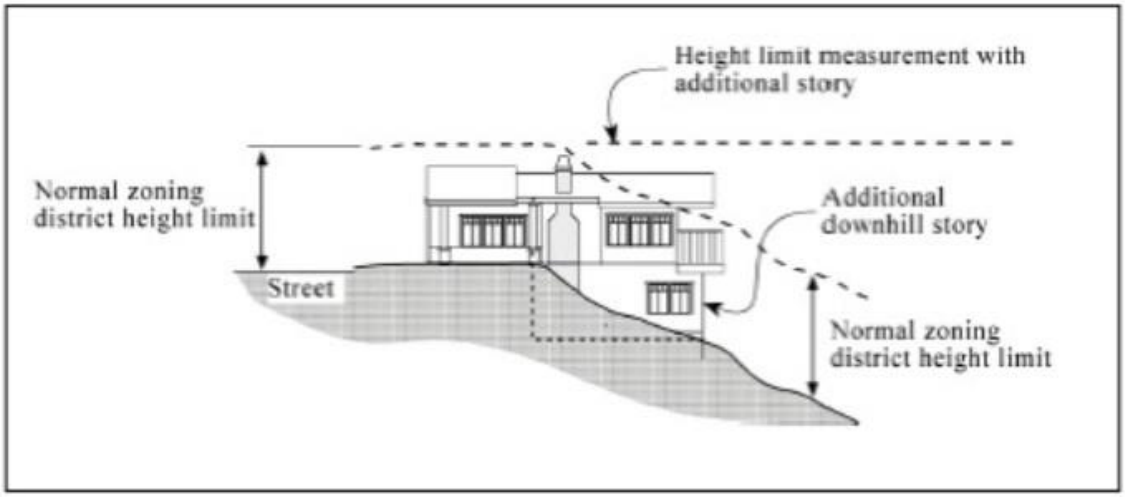
Likewise, a height ordinance that places the measuring point at the highest elevation on a lot automatically provides an adjustment for sloped lots. If a lot slopes 6 feet, the measuring point will be placed at the top of the slope, leaving a 6-foot height adjustment beneath the measuring point. A "highest" elevation measuring point does not automatically limit the slope adjustment. As a result, a large number of communities with "highest" elevation measuring

points also limit the number of stories a building can have–typically 2.5 or 3 stories, maximum. Madison, WI limits the automatic slope adjustment to 15% greater than the defined numeric maximum height. Rollingwood's current ordinance limits the height adjustment to one foot for each foot of lot slope up to 10 feet.

Because the "parallel plane" method significantly reduces the buildable envelope for sloped lots (but has no impact on flat lots), the majority of the relatively small number of American cities that employ the method also incorporate some form of adjustment for sloped lots. For example:

- Laguna Beach, CA imposes a parallel-plane method with up to 5' feet of slope adjustment, excludes full basements from the maximum-height calculation, and incorporates an express special exception;
- Los Angeles, CA imposes a parallel-plane method in some areas of the City but increases the height limit 5 to 6 feet for lots with greater than 25% slope;
- Oakland, CA imposes a parallel-plane method but increases the height for sloped lots by 6, 8, or 10 feet depending on slope;
- Salt Lake City, UT imposes a parallel-plane method with a mathematical formula to calculate the slope adjustment: the downhill exterior wall height may be increased by one-half foot (0.5') for each one foot (1') difference between the elevation of the average grades on the uphill and downhill faces of the building;
- Sedona, AZ imposes a complicated method that includes a parallel plane but adds 5 feet for pitched roofs and adds another 5 feet for wall articulation and light-reflectance mitigation; and
- Tacoma, WA imposes a parallel-plane method on its view-sensitive district but increases the height limit on the downhill side of the slope at the rate of one foot for each 6 percent of slope.

Chico, CA imposes the parallel-plane method but allows for the building of an entire additional story on the downside of a qualifying sloped lot as illustrated in its zoning code in this diagram:



B. Exceptions for Walls Facing Non-Residential Areas

Another potential exception is for those walls that do not face other residential buildings given that height regulations on walls facing non-residential areas do not present the same problems as those facing other homes. Maple Ridge, British Columbia, for example, has a bulk-plane ("tenting") ordinance that excludes from regulation those walls facing dedicated parkland.

C. Screening/Greenbelt Easements

Finally, an option for mitigating the impact of residential building walls on downhill neighbors is to require–or reward–vegetative buffers or easements. Asheville, NC's hillside building-height rules provide significant slope adjustments for property owners that grant the City a vegetative easement on the downslope side of a hill.