

CRCRC SURVEY ANALYSIS WITH RECOMMENDATIONS ON: BUILDING HEIGHT, BUILDING HEIGHT MEASUREMENT, AND “BULK/TENTING” PLANES

BASED ON:

- Feedback from 2021 Comprehensive Plan Strike Force Survey (See *CRCRC Strike Force Comments Poster*)
- 78 Resident Emails, (69 Indiv.) from Jan-Aug. 2023 (See *Constituent Emails Summary*)
- Research analysis of nearby and other US cities' residential building codes (See attached)
- Careful study of old, new, and permitted homes in Rollingwood (See *RW FAR Property List, RW FAR Table, RW Terracing Examples, RW Active Permits, RW Pending Projects, D. Bench Height Presentation, A. Robinette Height Presentation*)
- Public Workshop Poster Presentation and Comment Cards (See *CRCRC Poster Session*)
- Survey Results Analysis on 274 Respondents (See *CRCRC Q1-Q26 Summaries & Charts*)

According to the 2021 Comprehensive Plan Strike Force Survey responses from over 300 people, about 100 recent emails, public comments to the CRCRC, and the CRCRC Survey, most people welcome thoughtful new development, provided it maintains some amount of context and scale, preserving the “rolling” and the “wood”.

The Strike Force never asked a question, “do you want to change the residential building rules”, there were however a lot of unprompted responses regarding concerns about building trends. About 30% of responses on the 2021 Strike Force Residential Survey - Q3 specifically cited concerns over new building trends, versus 1% of responses in favor of current building trends, the remaining addressed other concerns.

Emails in 2023, regarding potential building code changes, indicate 47% in favor of changes, 28% asking for a limited or careful study, 15% preferring no changes, 10% N/A.

“The building code needs to balance the right of a property owner to do what they want with the need to protect the quality of life and property values of their neighbors.” R/W Resident

Q1 - Are you generally satisfied with the trend of new construction in Rollingwood?

138 (50%) Yes

130 (48%) No

6 (2%) No response

What we generally heard most people say:

- They like thoughtful custom homes that keeps some level of scale and context
- They like the variety, don't want to dictate style or create cookie-cutter homes
- RW is not anti-development
- It's not “just a few people” complaining about bigger homes
- It's not “just a few bad actors” abusing code
- Especially noted is protecting the tree canopy

Q2 - Do you think RW should consider changes to its building codes?

175 (64%) - Yes

80 (29%) - No

20 (7%) - No response

Of the 175 that answered “Yes” to Code Changes:

135 (77%) - want to change reference datum

101 (58%) - said side setback distance was ok

122 (70%) - want building limits along setback

117 (67%) - want tenting

43 (24%) - don't want tenting

Ambiguous “No” or “Blank” Comments:

- *I don't know them well enough to have an opinion.*
- *don't have enough understanding of current codes to answer*
- *Need more oversight and enforcement.*
- *My answer is “maybe”*
- *Not sure (X4)*
- *I think every community should be reflecting on what they want for the future of the community.*
- *Limit density*
- *Honestly, don't know enough about building codes to say*
- *Think homes should not be more than three stories.*
- *Hard to answer this since I am not aware of the building codes.*
- *I just want current rules to be enforced*

Of the 80 that answered “No” to Code Changes:

5 (6%) - said Max. Ht. was too high

24 (30%) - want a diff. reference datum measurement

12 (15%) - want to consider FAR

6 (7%) - said setbacks are too small

21 (26%) - want limits along the setback

15 (19%) - want some form of tenting

Recommend: thorough analysis of responses and comments to various options for code modifications in survey. (See CRCRC - Q2 Summary)

Q3 - Is Rollingwood's maximum residential building height of 35 feet:

175 (64%) - About Right

70 (26%) - Too High

21 (7%) - Too Low

8 (3%) - No Response

Q3 - That said “about right”, comments include:

- *It depends on where the 35 ft start and stop. Need clarity around this*
- *Depends on how it is measured*
- *the place of measurement is important*
- *It really depends on whether it is measured from the ground, or the finished floor elevation. It should be from the ground.*
- *The foundation should be included in this (unless the lot and highest backs onto a canyon or where it wouldn't be overbearing on a neighboring lot).*
- *The problem is not the height per se but the height from what grade?*
- *But: does that include the foundation thickness?*
- *this very much depends on the topography of the property and how the "height" is measured*
- *it depends on where it's measured, everyone seems to take their own advantage and finish new homes above 35' which is not right*
- *the code language needs to be more specific about the point from which the 35 feet is measured. Someone could build up the lot with berms - and then build a house that is (say) 50 feet higher than the street.*
- *But consideration should be made factoring in grade, inappropriate foundation heights and other “cheats” that can get around height regulation.*
- *Problem is that lots are being built up to get to house higher and that is not being penalized.*
- *I certainly wouldn't raise the maximum height; it's plenty high. I might consider slightly lowering it.*

Recommend: MAX HT. - No change, leave at 35ft., but study new ways to measure and enforce height. (See CRCRC - Q3 Summary)

Q4 - Should we look at alternate ways to measure building height, and if so, which options are preferred?

172 (63%) - Yes

89 (32%) - No (11 ambiguous comments)

13 (5%) - No Response

- A lot of “No’s” said to “enforce the rules”, “things were better before”, “builders are exploiting loopholes”, etc.

Recommend: examining alternative ways to measure height in other cities, particularly those of similar size, topography, and economics. (See CRCRC - Q4 Summary; and full research examples below). What we heard was that people are ok with 35ft, which is tall, but really want to cap it at 35ft. In order to do that, we researched codes that offered that option. The other two options in the survey found an average, which still meant an unknown portion and percentage of the building could be above 35ft. We searched for something more uniformly applicable, with a guarantee to cap the height, while still working with highly variable topography.

- 22 (8%) - Option 1 - average of slope
- 26 (9%) - Option 2 - average elevation of building footprint, measured from major corners

75 (28%) - Option 3 - parallel plane

- 151 (55%) - No response

- Of those that didn't respond to Options 1-3, comments appeared to indicate they want something, but they don't know what that is, or even what we are asking exactly.

List of some US cities using “Parallel Plane” to set maximum overall height:

Salt Lake City, UT

Culver City, CA

Tacoma, WA

Oakland, CA

Marin Co, CA

Los Angeles, CA

San Luis Obispo, CA

Sedona, AZ

Arcadia, CA

Buckeye, AZ

Temple City, CA

Recommend: Option 3 - no portion of a building can exceed the maximum height from a parallel line to existing or finished grade, whichever is lower.

FROM MEETING MINUTES FOR CRCRC MEETING MONDAY, MARCH 18, 2024:

Brian Rider moved that we approve 35 feet as the height maximum for the initial purposes contingent on future agreement and action with respect to tenting setbacks, articulations on the sides, and other aspects that go into how to implement a ceiling of 35 feet.

Duke Garwood requested a friendly amendment of “35 feet measured by way of a parallel plane method”. Brian Rider accepted the amendment.

Duke Garwood seconded the motion. The motion carried with 4 in favor and 0 against (1 member had still not arrived at the meeting, another member stepped away from Zoom).

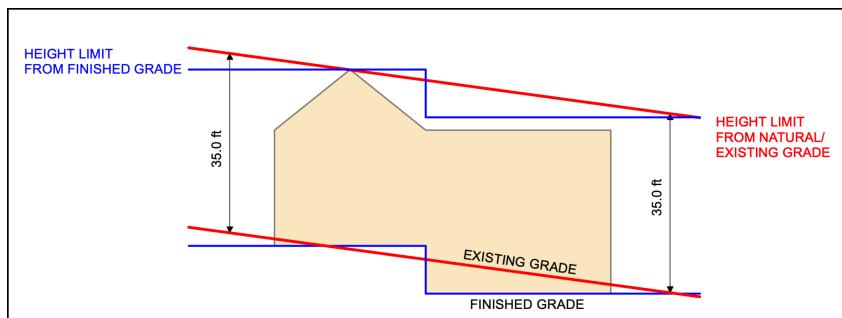
Brian Rider moved to make a supplemental motion that, in considering the building height, that areas of rugged terrain or minor topographic variations with a width of less than 25 feet, including pools and ponds, shall not be included when establishing the imaginary plane for building height maximum purposes.

Duke Garwood suggested changing the word “minor” to “unique”. Brian Rider suggested “which are unusual aspects of a particular property including pools, ponds, existing basements, or garages”. Duke Garwood recommended including “Rock outcroppings and natural drainage ways.”

Brian Rider restated his motion that, in considering building height, that areas of rugged terrain or unusual topographic variations with a width of less than 25 feet, including pools, ponds, existing basements, rock outcroppings, and natural drainage ways, shall not be included when establishing imaginary planes. Duke Garwood seconded the motion. The motion carried with 6 in favor and 0 against.

BUILDING HEIGHT - FINAL

- Maximum permitted building height shall be 35ft.
- The maximum allowable height shall be measured as the vertical distance from the existing grade of the site to an imaginary plane located at the allowed height above and parallel to the grade. Height measurements shall be based on existing topography of the site, before grading for proposed on-site improvements, or finished grade, whichever is lower. [SEE RW: Sec. 101-2. - Adoption of codes (c) (1) and (c) (2)]
- Areas of rugged terrain or minor topographic variations, with a width of less than 25 feet, including pools and ponds, shall not be included when establishing imaginary planes.



Maximum permitted building height shall be measured based on the criteria:

- There shall be no point of any building or structure that exceeds the prescribed height above the existing or finished grade, whichever is lower,
 - All measurements shall be made vertically; i.e., each point of a roof shall be measured to the point of grade that is directly below it--vertical and plumb, or nearest adjacent grade when the high point is inset from the building perimeter.
 - Antennae, chimneys, flues, vents, and similar structures shall not exceed the prescribed height limit by more than three (3) feet.
-

Q7 - Should we consider changes to front, side, or rear setback dimensions

177 (65%) - About Right

- 61 (22%) - Too Small
- 31 (11%) - Too Large
- 5 (2%) - No response

Recommend: *No changes to side setback dimensions at this time. Continue to examine front/corner and rear setback dimensions based on survey comments.*

Q8: Please indicate your general feelings on the new setback projection limits

167 (61%) - About Right

- 33 (12%) - Too Little
- 57 (21%) - Too Much
- 17 (6%) - No response

CRCRC Observation: *The responses highlight the complexity of balancing setback regulations, aesthetic concerns, and practical considerations, with varying perspectives on specific elements like roof overhangs and bay windows. 61% view it as a step in the right direction, but there may need to be additional language to ensure that projections are limited in their length and height based on comment summaries.*

Q9 - Should we consider any limitations on what can be built along a setback: Max. Height, Max length, Side Articulation/Variation; Max Eave Ht.; Max Foundation Ht.

154 (56%) - Yes

- 103 (38%) - No
- 17 (6%) - No response

Recommend: *Consider certain restrictions to reduce the impact of large homes along the setback that can impact neighbors; provide relief to large, flat, uninterrupted facades by examining codes in other cities, and requiring min. changes to the facades.*

Q10 - Should we develop a set of “tenting” rules for RW that restrict building height along a setback?

142 (52%) - Yes

- 112 (41%) - No (23 responded to wanting alternate forms of Setback Bldg. Limitations)
- 20 (7%) - No response

Recommend: *Looking at how some cities try to minimize the impact of new residential construction on surrounding properties by defining an acceptable building area for each lot within which new development may occur. Prescribing side and rear setback planes helps to minimize the impact of new development and rear development on adjacent properties, but still allows a home to reach its maximum height further from adjacent properties*

City of Austin “tenting” rules use an imaginary pole 15 ft. in height along the property line to set the spring point for a 45 degree angle that extends inward, regardless of front/side/rear setback depth. Nothing can be built outside that plane, with some exceptions regarding gable ends, shed roofs, and dormers.

- **Using this geometry, when the height of 15 ft. is applied to the typical setback dimensions in RW, it yields an eave height of:**
 - **25' - 0" along a 10 ft setback**
 - **29' - 4" along a 15 ft setback**

Hypothetically, you can have:
2ft. foundation (generous)
12ft. ground floor (generous)
2ft. floor cavity
9ft. 2nd story
+ _____
25ft. total wall height (not including roofing)

- **When we tested it on numerous home sizes, styles, and topographic conditions in RW, we found that it was both generous and right at the limit of what might create an impact on nearby neighbors.**
- **We also found that the City of Austin “tenting” rules for measurement were cumbersome, and posed additional challenges for some of the more steeply-sloped lots in RW. Based on survey feedback, we concluded that the best option was to set a maximum height along the building setback, similar to the “parallel plane” concept, in that it is more uniformly applicable, and appears to work well on any topography, without creating a tremendous amount of geometric and graphic calculations.**

FROM MEETING MINUTES FOR CRCRC MEETING MONDAY, MARCH 18, 2024:

Brian Rider moved to make a supplemental motion to the 35 foot parallel plane concept that with respect to side walls of buildings, we have a program that requires a limitation of side building height that starts at 25 feet at 10 feet from the property line, and then incrementally goes up such that at 15 feet we would have 30 foot wall height maximum and at 20 feet, we would have reached the 35 foot maximum horizontal plane.

Alex Robinette moved to recommend 25 feet maximum height on a 10 foot setback, add one foot of wall height for every additional horizontal foot from the property line provided that the maximum height does not exceed 35 feet. Brian Rider seconded the motion. The motion carried with 6 in favor and 0 against.

Chair Dave Bench moved that with regard to dormers, 3 feet back from the wall line minimum and they do not exceed maximum heights and are no more than 15 feet cumulative along any

axis measured from outside wall to outside wall. Alex Robinette seconded the motion. The motion carried with 6 in favor and 0 against.

Brian Rider moved to amend the prior motion regarding maximum building height related to the size of the side yard, we intended that height measurement to be measured to the upper most edge of roofing material or parapet. Duke Garwood seconded the motion. The motion carried with 6 in favor and 0 against.

SIDE SETBACK “BULK/TENTING” PLANES - FINAL

- The maximum building height at the residential building perimeter - measured from the adjacent finished grade, to the top of roofing surface or parapet wall - is 25 ft when starting 10 ft from the property line.
- One foot of residential building perimeter wall height can be added for every additional horizontal foot from the property line, provided that the maximum height at the building perimeter does not exceed 35 ft, when measured as above, such that:

BUILDING SETBACK DIMENSION	MAX WALL HEIGHT ALONG SETBACK
10 FT	25 FT
12.5 FT	27.5 FT
15 FT	30 FT
20 FT	35 FT
30 FT	35 FT

- A dormer or shed roof that lies above the perimeter line must be set back a minimum of 3 ft from the residential building perimeter in order to not be included in the maximum perimeter height measurement, and may extend no more than 15ft. horizontally (measured from the outer edge of wall material), without exceeding the maximum overall height of 35ft.
-

RESEARCH/DATA ANALYSIS FROM OTHER CITIES/RESOURCES

CITY OF ROLLINGWOOD

https://library.municode.com/tx/rollingwood/codes/code_of_ordinances?nodeId=PTIILADECO_CH101BUCO_ARTIINGE_S101-2ADCO

(c) The International Building Code adopted herein is amended as follows:

- (1) By adding a new section, Section 110.3.8.1, which follows immediately after section 110.3.8, to read as follows:

Section 110.3.8.1 Pre-development survey and building height verification.

Prior to the issuance of any permit for site development associated with site disturbance and grading or new residential construction, addition or demolition which the Building Official determines may affect the original native ground surface of a property, a survey of the original native ground surface of the site must be prepared and submitted by the applicant. The survey shall meet the requirements provided by the Building Official and must be verified and approved by the city or its representative.

In addition to the survey of the original native ground surface prior to any site development, any residential structure that is proposed to have a height within five feet of the maximum height allowed in the respective zoning district must have a height and elevation verification performed by the city or its representative prior to passing the framing inspection, showing the original native ground surface and proposed building height.

(d) The International Residential Code adopted herein is amended as follows:

- (1) By adding a new section, Section R109.1.5.2, which follows immediately after section R109.1.5.1, to read as follows:

Section R109.1.5.2 Pre-development survey and building height verification.

Prior to the issuance of any permit for site development associated with site disturbance and grading or new residential construction, addition or demolition which the Building Official determines may affect the original native ground surface of a property, a survey of the original native ground surface of the site must be prepared and submitted by the applicant. The survey shall meet the requirements provided by the Building Official and must be verified and approved by the city or its representative.

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AMERICAN PLANNING ASSOCIATION:

<https://www.planning.org/pas/reports/report237.htm>

Basic Assumptions that apply to RW, "Height regulations have these principal purposes":

- Protection of view
- Protection of the character of the neighborhood
- Protection of light and air

Biggest concern is "side yards" and "adjacent lots":

Beginning with the Lot

Starting with the lot, principal public concern is with parts of residential buildings closest to those on adjacent lots. This is usually at the inner edges of side yards, which becomes one critical point in providing light and air between buildings. Height here should be kept low.

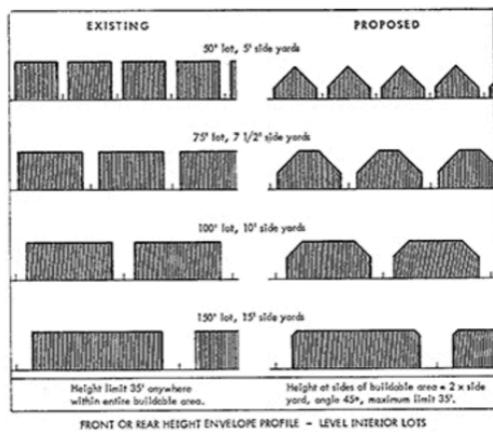
"To vary the pattern, height at edges of buildable areas, light plane, or maximum height over any portion of the lot could be changed. As an added refinement, length of building might be considered in setting side-yard requirements."

"In residential districts, it is sometimes suggested that limiting number of stories is a way to regulate population density. But there are far more effective means."

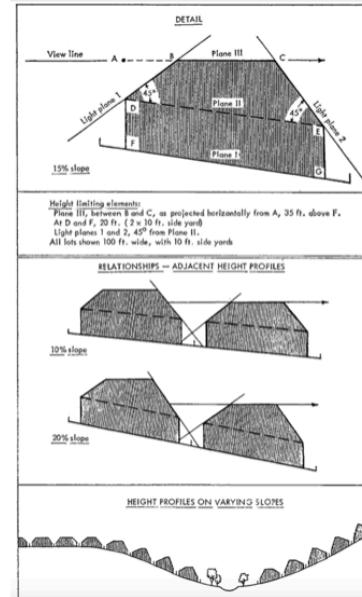
CRCRC NOTES:

1. Could potentially limit eave height of side yards, and/or the length that an elevation may extend at the maximum allowable height.
2. Want to encourage variety (projections/insets/material changes) along the side elevation so that you are not staring at a large flat wall, especially if it is light colored and highly reflective.

For Flat Lots:



For Sloping Lots:

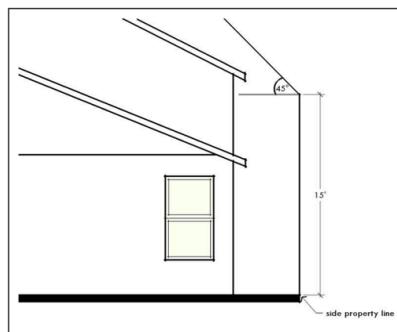


AUSTIN, TX

HEIGHT MEASUREMENT:

https://library.municode.com/tx/austin/codes/land_development_code?nodeId=TIT25LADE_CH25-2ZO_SUBCH_APTER_FREDECOST_ART2DEST_S2.6SEPL

- *32 feet for development located outside the 100-year floodplain; and*
- *35 feet for development located in the 100-year floodplain.*
- *Height shall be the lower of natural grade or finished grade, and measured vertically from the average of the highest and lowest grades adjacent to the building:*
- *for a flat roof, the highest point of the coping*
- *for a mansard roof, the deck line*
- *for a pitched or hip roof, the gabled roof or dormer with the highest average height; or*
- *for other roof styles, the highest point of the building.*
- *For a stepped or terraced building, the height of each segment is determined individually.*
- *Side Setback Plane - uses a tent in two different ways depending on flat or sloped lot.*



2.7. - SIDE-WALL ARTICULATION

https://library.municode.com/tx/austin/codes/land_development_code?nodeId=TIT25LADE_CH25-2ZO_SUBCH_APTER_FREDECOST_ART2DEST_S2.7SIWAAR

Except as provided in subsection 2.7.2, if a side wall of a building is more than 15 feet high and is an average distance of less than nine feet from an interior lot line, the sidewall may not extend in an unbroken plane for more than 36 feet along a side lot line without a sidewall articulation that meets the requirements of this section.

- A. To break the plane, a sidewall articulation must:
 1. be perpendicular to the side property line, at least four feet deep, and extend along the side property line for at least 10 feet, as shown in Figures 18 through 20;
 2. extend the entire height of the first floor of an addition to, or remodel of, an existing one-story building;
 3. extend the entire height of the second story of an addition to, or remodel of, a two or more story building;
 4. extend to the height of the top floor of a newly constructed building; and
 5. extend evenly upward for its entire height.
- B. A sidewall articulation cannot:
 1. create patios or decks or be screened from view; or
 2. serve as an eave or gutter.
- C. Sidewall articulation required under this section may be satisfied by horizontal articulation, such that each story above the first story is setback further from the property line by at least nine feet and extends along the side property line for at least 10 feet.
- D. For purposes of subsection 2.7.1, wall height:
 1. excludes side gables; and
 2. is measured from the lower of natural or finished grade adjacent to the structure up to the first floor wall plate, which is the lowest point of the existing first floor ceiling framing that intersects the exterior wall.

WESTLAKE HILLS, TX

<https://ecode360.com/40398940?highlight=build,height,heights&searchId=19247195155363312#search-highlight-40398940-0>

HEIGHT MEASUREMENT:

No part of any principal structure shall rise more than the maximum height shown on the schedule of regulations contained in section 22.03.281, above natural ground grade or original grade directly below. If the average natural slope in the area directly below the foundation of the principal structure is 25% or greater, then no part of any principal structure shall rise more than 32' above natural ground grade directly below.

EXPOSED FOUNDATIONS:

Foundations with 4 vertical feet or more exposed must be concealed with dense, evergreen vegetative buffers if the exposed foundation is readily visible from any street or property.

ASPEN, CO

https://library.municode.com/co/aspen/codes/municipal_code?nodeId=TIT26LAUSRE_PT400DEPERI_CH26.41_0REDEST_S26.410.030SIMIDUST

SIDE-WALL ARTICULATION:

Sec. 26.410.030. Single-family & duplex standards (edited)

- (1) Articulation of Building Mass (Non-flexible).
 - b. Intent. *This standard seeks to reduce the overall perceived mass and bulk of buildings on a property as viewed from all sides. Designs should promote light and air access between adjacent properties. Designs should articulate building walls by utilizing multiple forms to break up large expansive wall planes. Buildings should include massing and articulation that convey forms that are similar in massing to Aspen residential buildings.*
 - d. Options. Fulfilling at least one of the following options shall satisfy this standard:
 1. Maximum Sidewall Depth. A principal building shall be no greater than fifty (50) feet in depth, as measured from the front-most wall of the front façade to the rear wall.
 2. Off-set with One-Story Ground Level Connector. A principal building shall provide a portion of its mass as a subordinate one-story, ground floor connecting element. The connecting element shall be at least ten (10) feet in length and shall be setback at least an additional five (5) feet from the sidewall on both sides of the building. The connecting element shall occur at a maximum of forty-five (45) feet in depth, as measured from the front-most wall of the front façade to the rear wall.
 3. Increased Side Setbacks at Rear and Step Down. A principal building shall provide increased side setbacks at the rear of the building. If the principal building is two (2) stories, it shall step down to one story in the rear. The increased side setbacks and one story step down shall occur at a maximum of forty-five (45) feet, as measured from the front-most wall toward the rear wall. The increased side setbacks shall be at least five (5) feet greater than the side setbacks at the front of the building. See Figure 7.

ARCADIA, CA (Similar to San Luis Obispo, CA)

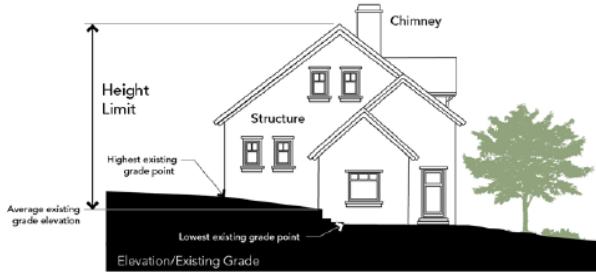
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HEIGHT MEASUREMENT:

- a. Structure Height. *Structure height shall be measured from the average level of the highest and lowest existing grade elevation points of that portion of the site covered by the building, to the highest portion of the roof (excluding chimneys), except as otherwise specified by this Development Code. "Existing grade" shall be established by the Director, consistent with lots in the immediate*

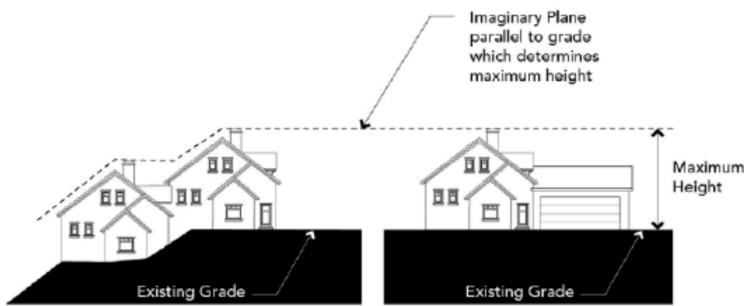
vicinity. See Figure 3-1 (Measurement of Structure Height: Flat Ground Level and Slopes of Less than 20 Percent).

Figure 3-1
Measurement of Structure Height: Flat Ground Level and Slopes of Less than 20 Percent



- b. **Structure Height on Slopes with 20 Percent Grade.** For lots with an average slope of 20 percent or greater, structure height shall be measured from the adjacent existing grade to the topmost point of the roof (excluding chimneys), except as otherwise specified by this Development Code. The maximum allowable height shall be measured as the vertical distance from the existing grade of the site to an imaginary plane located the allowed number of feet above and parallel to the grade. "Existing grade" shall be established by the Director, consistent with lots in the immediate vicinity. See Figure 3-2 (Measurement of Structure Height: Slopes of 20 Percent or Greater).

Figure 3-2
Measurement of Structure Height: Slopes of 20 Percent or Greater



SAN LUIS OBISPO, CA (Similar to with same graphics as Acadia, CA)

[https://sanluisobispo.municipal.codes/Code/17.70.090\(B\)](https://sanluisobispo.municipal.codes/Code/17.70.090(B))

HEIGHT MEASUREMENT:

Adds one foot of setback to every foot of additional height you want to add above 35ft., with a maximum of 45ft.

Height is the vertical distance from the highest point of the structure to the average of the highest and lowest points where the vertical plane of the exterior wall would touch natural grade level of the site, except that finished grade instead of natural grade shall be the basis for height measurement when...(1a.) a site is graded or filled to conform the elevation of the building site with that of adjoining developed sites.

SIDE-WALL ARTICULATION:

Exterior Wall Surfaces.

- a. Single-story and small-scale elements, setbacks, overhangs, roof pitches, and/or other means of horizontal and vertical articulation shall be used to create shade and shadow and break up otherwise massive forms to minimize the apparent size of exterior wall surfaces visible from public rights-of-way.
- b. Large flat building planes are prohibited; the spatial arrangement of the building, including roof overhangs, shall be used to achieve alternating light and dark building surfaces that will blend with similar contrasts found in the surrounding natural vegetation.

SEDONA, AZ:

<https://sedona.municipal.codes/SLDC/2.24.E>

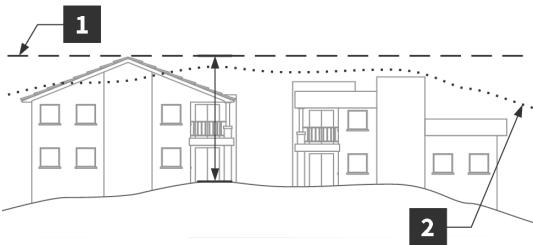
HEIGHT MEASUREMENT:

2. Parallel Plane

An imaginary plane that parallels the existing natural terrain, measured vertically from any point of the building or structure to natural grade. No part of a building or structure, exclusive of the exceptions in Section 2.24.E(3) and/or the alternate standards in Section 2.24.E(4), shall exceed 22 feet in height as measured from this plane. (See "2" in Figure 2-6.)

e. Areas of rugged terrain with a width of less than 25 feet shall not be included when establishing imaginary planes.

Figure 2-6: Building Height



(2) Maximum Overall Building or Structure Height

In addition to the maximum height requirements as stated in Section 2.24.E(1)d, **Plane Requirements**, the maximum overall height of any building or structure shall not exceed 40 feet measured vertically from the highest parapet or roof ridge to the natural or finish grade at the lowest point adjacent to the building exterior, excluding posts and masonry piers supporting decks or patios. This maximum height limitation applies to flat, gable, and pitched roofs, but shall not apply to the other generally established exceptions set forth in Table 2.7. (See Figure 2-7.)

Figure 2-7: Maximum Overall Building Height



SIDE-WALL ARTICULATION:

b. Wall Plane Relief and Reduced Light Reflectance Values (LRV)

1. An applicant may be eligible for greater height limits than otherwise established in this Code, as measured by the established imaginary plane in Section 2.24.E(1)d.2, provided the proposed development accumulates credits for unrelieved building planes or light reflectance values pursuant to Table 2.9, below. Each credit point earned is valued at one-half foot in greater height eligibility. Credit points can be earned by complying with either the largest unrelieved building plane requirement and/or the LRV percentage reduction.

2. The maximum additional height allowed through any single wall plane relief or reduced light reflectance value alternate standard, or combination of wall plane relief and reduced light reflectance value alternate height standards, shall not exceed five feet.

POULSBO, WA

<https://cityofpoulsbo.com/wp-content/uploads/2017/02/HeightMeasurement.pdf>

Building Height is the vertical distance measured from the average elevation of the finished grade at an exterior building wall or building segment to the highest point of the building wall or building segment. The overall building height shall be calculated as the average of all building sides.

STEP 1: Determine the number of outside building walls (see below).

STEP 2: Calculate the height of each primary building wall. Measure the finished grade directly beneath the outside face to the highest point of the primary wall

STEP 3: Calculate average height of building. Once each primary building wall's height has been calculated, the overall building height is determined as an average of all building walls.

BELLEVUE, WA

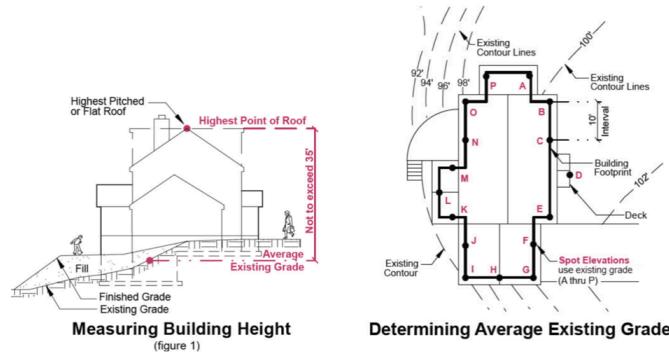
<https://bellevuewa.gov/city-government/departments/development/zoning-and-land-use/zoning-requirements/building-height>

HEIGHT MEASUREMENT:

- Uses average existing grade as reference datum, determined by taking point elevations every 10ft
- Building height max is 35ft.

CRCRC Notes:

1. Allowing a flat roof to go to 35ft. has too many impacts which could be mitigated by eave height restrictions
2. Flat roofs that represent a very small percentage of the overall, as in a tower, may reach max height

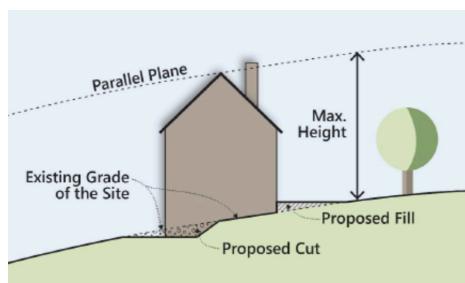


TEMPLE CITY, CA

https://codelibrary.amlegal.com/codes/templecityca/latest/templecity_ca/0-0-0-36437

HEIGHT MEASUREMENT:

1. Structures will not exceed the maximum allowable height for the zone in which the structure is located in compliance with the development standards of each zoning district, except as provided in Exceptions to Height Limits in all Zones below.
2. The max allowable height will be measured as the vertical distance from the existing grade of the site to an imaginary plane located the allowed number of feet above and parallel to the grade not including rooftop appurtenances.

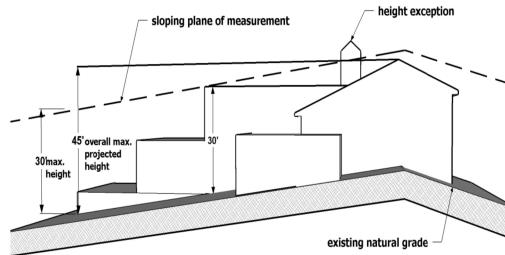


BUCKEYE, AZ

https://library.municode.com/az/buckeye/codes/code_of_ordinances?nodeId=CD_ORD_CH7DECO_ART5DEDE_STGU

HEIGHT MEASUREMENT:

For development within the Hillside Areas, the height of structures shall be determined by the following and not by the definition of "building height" as described in Article 10, Definitions:



No part of any structure shall penetrate an imaginary plane (the "Sloping Plane of Measurement"), the height of which is 30 feet measured vertically from the highest ridge or parapet of the building to the existing natural grade directly beneath that point. Minor topographic variations may be excluded from those measurements if those areas are less than 25 feet in width. Exposed building walls measured in a vertical plane shall not exceed a height of 30 feet measured from the lowest point of the wall to the top of the wall. In addition, the overall projected height will be measured from the lowest wall improvement attached to the main structure to the highest ridge or parapet, and be limited to 45 feet. Exceptions to the maximum height requirements are allowed for architectural features that are less than ten percent of the entire roof area. The height measurements in Hillside Areas are depicted in Figure 5.2-A above.

LOS ANGELES, CA

https://planning.lacity.gov/Code_Studies/BaselineHillsideOrd/Height%20and%20Story%20Handout.pdf

HEIGHT MEASUREMENT:

What is an Envelope Height?

Envelope height (otherwise known as vertical height or "plumb line" height) would be the vertical distance from the grade of the site to an imaginary plane at the roof structure or parapet wall located directly above and parallel to the grade as illustrated in the figure to the right.

Measurement of the envelope height would originate at the lowest grade within 5 horizontal feet of the exterior walls of a building or structure and terminate at the highest elevation of the building pad. At no point shall any given section of any part of the proposed building or structure exceed the maximum envelope height.

What is an Overall Height?

The overall height would be measured from the lowest elevation point within 5 horizontal feet of the exterior walls of a building or structure, to the highest elevation point of the roof structure or parapet wall, as illustrated in the figure to the right.

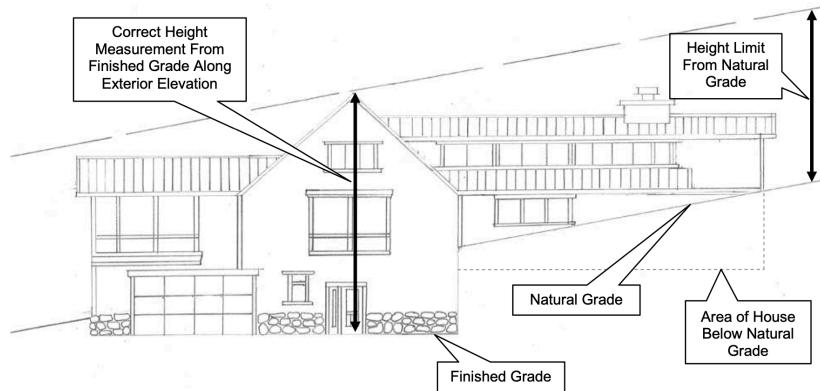
The block contains two diagrams. The top diagram shows a cross-section of a building on a hillside. A blue horizontal line represents the 'Imaginary Plane Parallel to Grade'. The vertical distance from the ground level to this plane is labeled 'Max. Envelope Height'. The bottom diagram shows a similar cross-section with a vertical arrow labeled 'Overall Height' pointing from the lowest point of the foundation up to the highest point of the roof.

MARIN COUNTY, CA

https://www.marincounty.org/-/media/files/departments/cd/planning/currentplanning/publications/factsheets/height_fact_sheet_3_5_09_dwa_vcp.pdf

HEIGHT MEASUREMENT:

- Due to the greatly varying topography of Marin County, height measurements are based on grade.
- "Grade" is defined as the ground elevation used as the basis for measurement of allowed structure height where grade is the elevation of the natural or finished grade at the exterior surface of the structure, whichever is more restrictive, and the elevation of the natural grade within the footprint of the structure.



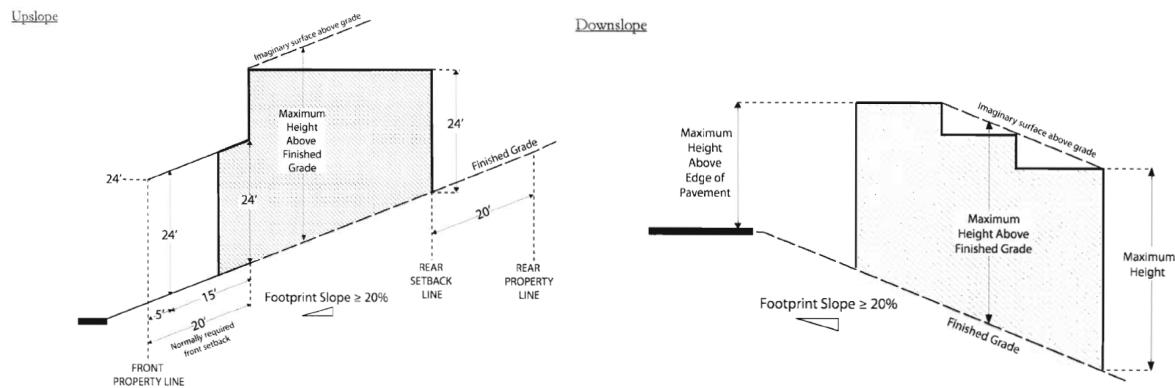
OAKLAND, CA

https://library.municode.com/ca/oakland/codes/planning_code?nodeId=TIT17PL_CH17.13RHHIREZORE_17.13.05PRDEST

HEIGHT MEASUREMENT:

3. The building height is measured from finished or existing grade, whichever is lower.

Illustration for Table 17.13.05 [Additional Regulation 2]
*for illustration purposes only



BELMONT, CA

http://belmont-ca.granicus.com/MetaViewer.php?view_id=1&clip_id=97&meta_id=7967

SETBACK (Bulk) PLANES

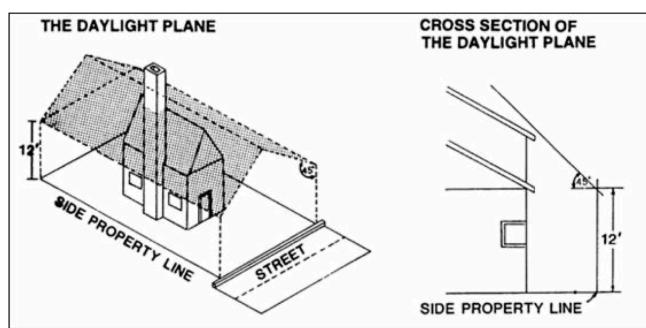
The Residential Design Criteria (RDC) is a companion document to the Zoning Ordinance. The RDC provides objective, measurable, or quantifiable criteria (standards) for the regulation of building bulk for single-family residential development.

Section 2 - Implementation of RDC Standards

Projects within the scope of the RDC must employ one or more RDC Standards (daylight planes, prescribed articulation, and second story stepbacks) to address building bulk on all affected building elevations.

Section 3 – Daylight Plane

(a) Daylight Plane for Side Yards. Except as provided in (a)(2), a structure may not extend above or beyond a side yard daylight plane projecting into the parcel at a 45 degree angle from each side property line from an initial height specified



Section 4 - Prescribed Articulation

(a) Front and Street-Facing Building Facades. Front and street-facing building facades must be articulated a minimum of 50% of the wall area.

(b) Rear and Interior Side-Facing Building Facades. Rear and interior side-facing building facades must be articulated a minimum of 30% of the wall area

(c) Minimum Design Standards for Specific Features.

(1) Projection, offset, or recess of the building wall must be at least 2 feet in depth.

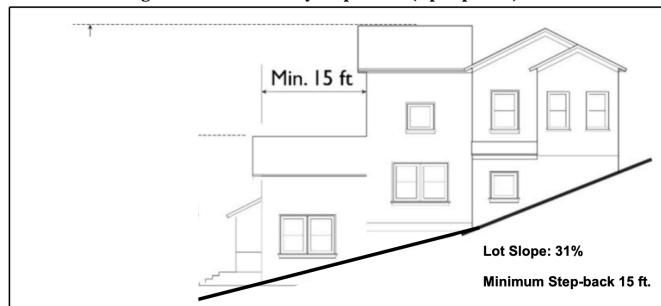
(2) Projection of bow, greenhouse or garden windows must be at least 8 inches in depth at the farthest point from the exterior walls of the home.

(3) Projection of bay windows must be at least 10 inches in depth measured at the farthest point.

(4) Projection of dormers must be at least 2 feet in depth measured at the farthest point from the exterior walls or roof surface of the home.

(7) Window Trim at least one inch in depth around windows, or window recessed at least two inches from the plane of the surrounding exterior wall.

Figure 8 – Second Story Step-backs (Upslope Lot)

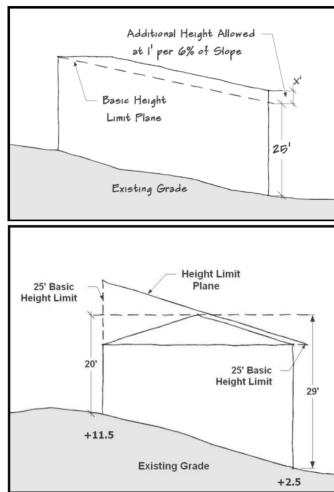


TACOMA, WA

<https://www.tacomapermits.org/tip-sheet-index/residential-height>

HEIGHT MEASUREMENT:

- *The height limit within the VSD is the vertical distance between existing grade and a plane essentially parallel to the existing grade.*
- *One foot of additional height is allowed on the lower corners of a building for every six percent of slope on sites located within the VSD.*

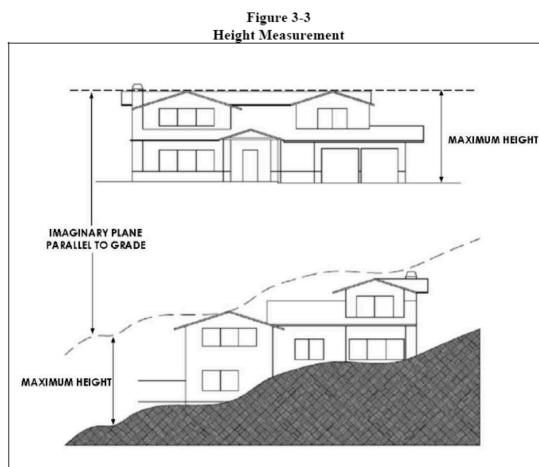


CULVER CITY, CA

https://codelibrary.amlegal.com/codes/culvercity/latest/culvercity_ca/0-0-0-51470

HEIGHT MEASUREMENT:

B. *Height Measurement. The maximum allowable height shall be measured as the vertical distance from the existing grade of the site to an imaginary plane located the allowed number of feet above and parallel to the grade. See Figure 3-3 (Height Measurement) at top of next page. "Existing Grade" shall be established by the Director, consistent with parcels in the immediate vicinity, and shall not be, nor have been, artificially raised to gain additional building height.*



SALT LAKE CITY, UT

<http://www.slcdocs.com/Planning/Planning%20Commission/2011/November/00055.pdf>

HEIGHT MEASUREMENT:

It is hoped that the proposed changes will provide a simpler and straight forward way of measuring height in residential and commercial zones. Currently, established grade is defined as that grade which existed after the final subdivision or site development activity was completed. The problem with this definition is that most subdivisions in the City were completed more than 50 years ago. Therefore, it is very difficult to identify that grade. The new definition would define established grade as that which exists at the time the applicant begins the proposed work on the lot. It also provides the Zoning Administrator authority to interpolate topographic lines, in cases where the established grade is not apparent. This feature would be used in cases where a house or building with a basement was removed and a new structure built in its place.

Currently, the height of exterior walls and dormers is regulated in the ordinance without reference to a definition. This has led to confusion on how to apply the rules (does one measure wall height from finished grade or established grade?). These definitions will clarify how these two elements are measured, and standardize application of the rules during permit review.

Finished Grade:
The final grade of a site after reconfiguring grades according to an approved regrading site plan related to the initial most recent building permit activity on a site.

Established Grade:
The grade of a property prior to the most recent proposed development or construction activity. On developed lots, the Zoning Administrator shall estimate established grade if not readily apparent by referencing elevations at points where the developed area appears to meet the undeveloped portions of the land. The estimated grade shall fit into the elevation and slopes of adjoining properties without creating a need for new retaining wall, abrupt differences in the visual slope and elevation of the land, or redirecting the flow of run-off water.

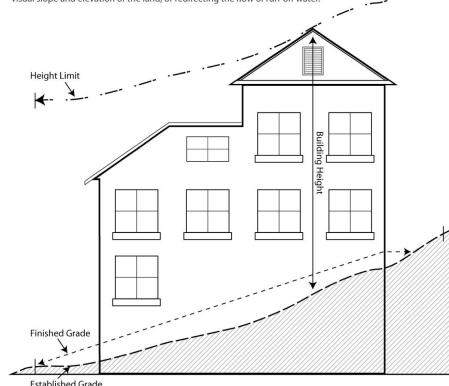
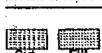
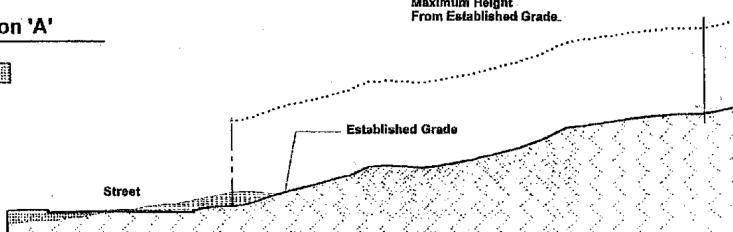


Illustration 'A'



Maximum Height From Established Grade.



Established Grade

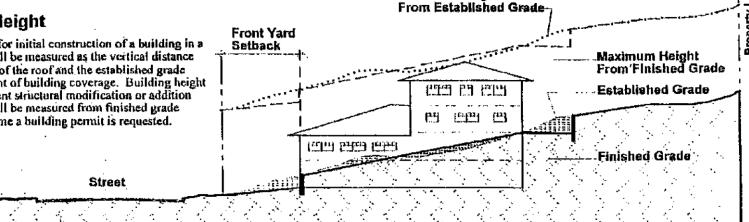
"The natural topographic grade of undisturbed areas on a site or the grade that exists after approved subdivision site development activity has been completed prior to approval for building permit construction activity."

Building Height

Building height for initial construction of a building in a floodplain zone shall be measured as the vertical distance between the top of the roof and the established grade at any given point of building coverage. Building height for any subsequent structural modification or addition to a building shall be measured from finished grade existing at the time a building permit is requested.

Maximum Height From Established Grade

Front Yard Setback



Finished Grade

"The finished grade of a site after reconfiguring grades according to an approved re-grading plan related to the initial building permit activity on a site."

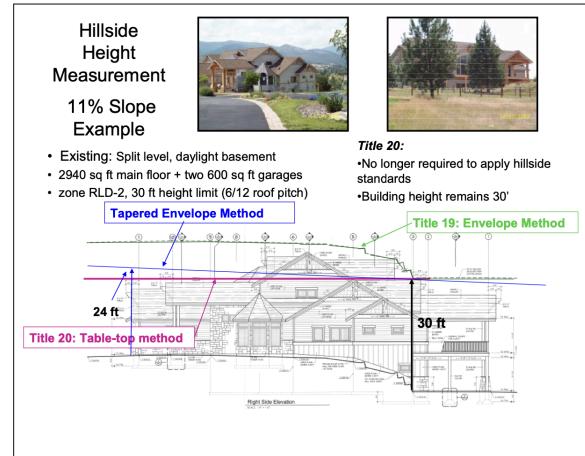
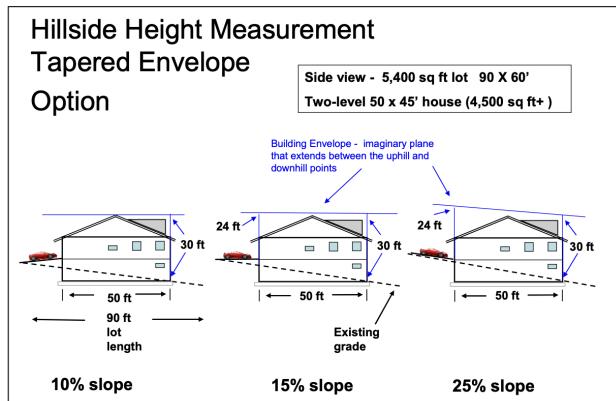
MISSOULA, MT

[http://www.ci.missoula.mt.us/DocumentCenter/View/2113/-Duncan-Associates-Hillside-Recommendations?bidId=HEIGHT MEASUREMENT:](http://www.ci.missoula.mt.us/DocumentCenter/View/2113/-Duncan-Associates-Hillside-Recommendations?bidId=HEIGHT%20MEASUREMENT)

3. The "tapered envelope" method, which is identical to the "envelope" method except that the top imaginary plane tapers down on the uphill end rather than running parallel to the lower plane (see illustration, p. 3).

Our original draft ordinance recommended use of the so-called "tabletop" method for all properties—flat lands, hillsides and everything in between. This recommendation was based on our belief that the new ordinance should include a uniform, predictable, reasonable and transparent formula for regulating and measuring building height.

We continue to believe that the building height measurement method presented in Sec. 22.110.060 of the proposed ordinance is the right approach...citywide. It will, we believe, be easiest to measure and administer. It is transparent, predictable and intuitive in that it treats all parts of the building the same, except for minor vertical projections such as chimneys and antennas (as opposed to the current approach of measuring only halfway up a pitched roof, as if the top portion of the roof was invisible). While this recommended approach is certainly not liberal, it does seem reasonable. It will require that some buildings on some sites be "stepped" to follow the slope of the site and may pose an obstacle to some building types/designs in hillside areas, but existing (5-foot) allowance for additional building height for steeply pitched roofs and the ever-present possibility of obtaining relief through the zoning variance process should help mitigate those concerns.



ST. PAUL, MN

<https://www.stpaul.gov/sites/default/files/Media%20Root/Planning%20%26%20Economic%20Development/Sidewall%20Articulation%20NPC%2005-18-16.pdf>

SIDE-WALL ARTICULATION:

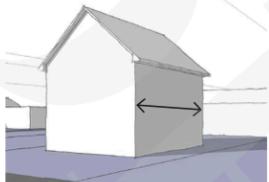
SIDEWALL ARTICULATION FACT SHEET **DRAFT**

11/17/15

Sec. 66.234. Sidewall Articulation

For R1-R4 residential districts in planning districts 14 and 15, excluding property with local heritage preservation site or district designation, sidewall articulation is required for building faces that exceed thirty-five (35) feet in length. Articulation shall be in the form of a structural projection of at least one (1) foot in depth and six (6) feet in length, and must extend from grade to the eave.

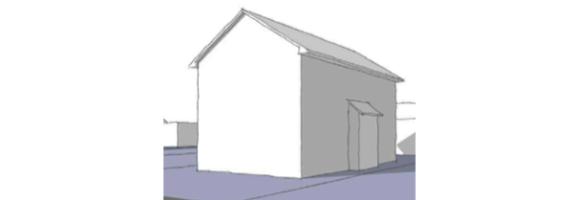
MEETS REQUIREMENT



- Overall length less than 35' without articulation

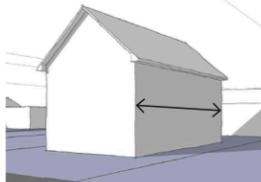


- Overall length greater than 35' and with projection greater than 1' deep and 6' wide

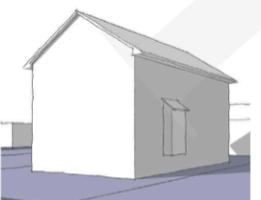


- Projection extends from grade to eave
- Edge of projection is the footprint of the structure and must meet setback requirement

DOES NOT MEET REQUIREMENT



- Overall length greater than 35' without articulation



- Projection does not extend from grade to eave
- Edge of projection is not the footprint (gas fireplace insert, bay window) and can extend into setback (63.106)
- This projection is allowed, but does not fulfill articulation requirement

LAGUNA BEACH, CA

http://lagunabeachcity.granicus.com/MetaViewer.php?view_id=&clip_id=38&meta_id=3454

Residences should be designed at an appropriate scale with respect to the existing natural and built environment. The mass and scale of proposed residences need to be compatible with existing development in the surrounding neighborhood.

Design Articulation

Within the allowable building envelope, the appearance of building and retaining wall mass should be minimized. Articulation techniques including, but not limited to, separation, offsets, terracing and reducing the size of any one element in the structure may be used to reduce the appearance of mass.

Spatial Definition

Space that is designed in a meaningful way conveys a sense of human scale, creates value and positively contributes to the City's distinctive character. A sense of scale can be conveyed through a structure's massing, articulation, architectural details, building materials, landscaping and site orientation.

Balance of Indoor and Outdoor Space

Successful residential designs effectively integrate outdoor and indoor living spaces. Careful consideration is given to the design of outdoor living spaces that demonstrate respect for view equity and privacy issues.

Integration with Natural Environment

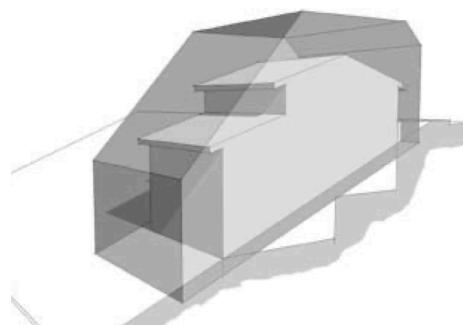
Development and landscape projects should respond to soil conditions, topography, privacy considerations and view opportunities and constraints. The natural context varies dramatically; this is part of the city's unique character.

Integration with Neighborhood

Respect for a neighborhood's architectural context and character is common practice. While individual residential designs are unique, the various neighborhoods throughout the City have a sense of interrelatedness.

Respect for Neighbors

Each property is an expression of individual tastes and needs, yet respect for adjacent neighbors and the surrounding neighborhood is paramount. The placement of buildings and the design of outdoor uses should acknowledge similar interests of abutting properties and demonstrate a sense of community within the neighborhood.



Sec. 26.410.030. Single-family & duplex standards (edited)

(1) *Articulation of Building Mass (Non-flexible).*

- b. *Intent.* This standard seeks to reduce the overall perceived mass and bulk of buildings on a property as viewed from all sides. Designs should promote light and air access between adjacent properties. Designs should articulate building walls by utilizing multiple forms to break up large expansive wall planes. Buildings should include massing and articulation that convey forms that are similar in massing to Aspen residential buildings.
- d. *Options.* Fulfilling at least one of the following options shall satisfy this standard:
 1. *Maximum Sidewall Depth.* A principal building shall be no greater than fifty (50) feet in depth, as measured from the front-most wall of the front façade to the rear wall.
 2. *Off-set with One-Story Ground Level Connector.* A principal building shall provide a portion of its mass as a subordinate one-story, ground floor connecting element. The connecting element shall be at least ten (10) feet in length and shall be setback at least an additional five (5) feet from the sidewall on both sides of the building. The connecting element shall occur at a maximum of forty-five (45) feet in depth, as measured from the front-most wall of the front façade to the rear wall.
 3. *Increased Side Setbacks at Rear and Step Down.* A principal building shall provide increased side setbacks at the rear of the building. If the principal building is two (2) stories, it shall step down to one story in the rear. The increased side setbacks and one story step down shall occur at a maximum of forty-five (45) feet, as measured from the front-most wall toward the rear wall. The increased side setbacks shall be at least five (5) feet greater than the side setbacks at the front of the building.

BOULDER, CO

<https://bouldercolorado.gov/sites/default/files/2021-03/guide-side-yard-bulk-plane.pdf>

SETBACK (Bulk) PLANES

Side Yard Bulk Plane:

The purpose of the side yard bulk plane is to ensure that buildings step down towards neighboring properties in order to enhance privacy, preserve some views, and allow visual access to the sky for lots adjacent to new development.

Does the side yard bulk plane apply to my property?

- Side yard bulk plane applies to all:
 - Residential principal and accessory buildings in **RR-1, RR-2, RE, and RL-1** zoning districts
 - Principal and accessory buildings used for single family land use in the **RMX-1** zoning district

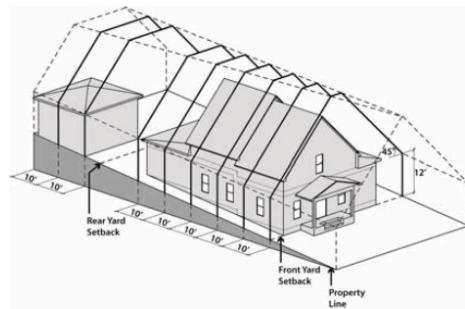
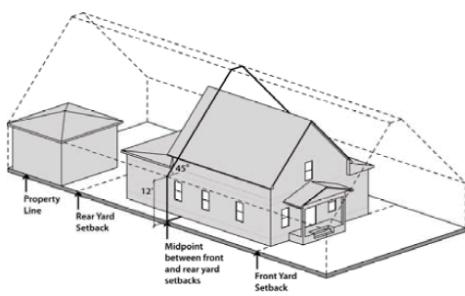
What is the side yard bulk plane, and how is it measured?

- The bulk plane begins at a point **12 feet** above the side property line of a lot, and then rises at a **45 degree angle** until it reaches the maximum permitted height.



- The bulk plane can be measured one of two ways:
 - For generally flat sites, the **grade level point method** allows the bulk plane to be measured at one time, at the midpoint of the side property line.

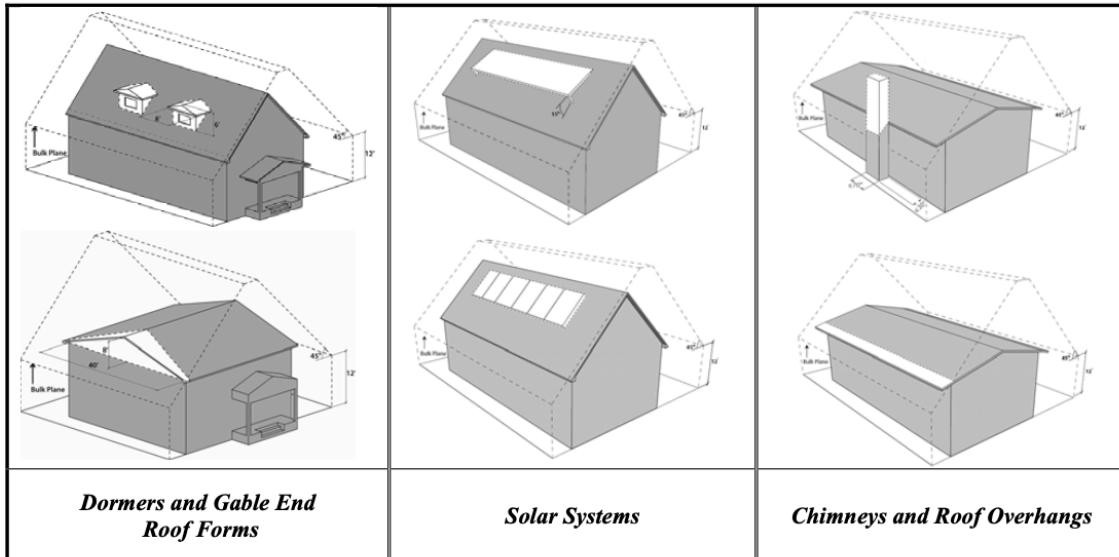
OR
 - For generally sloping sites, the **parallel point method** allows the bulk plane to be measured from a series of points taken at 10 foot intervals along the side property line.



***Note that this document is intended to provide supplemental information, and not meant to replace Ordinance No. 7684.*

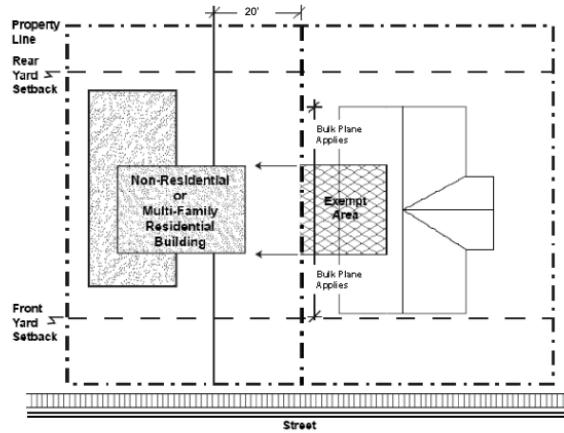
What if a part of my building extends above the side yard bulk plane?

- There are several elements of a building that are permitted to extend above the bulk plane as allowed encroachments per 9-7-9(d).



Are there any additional circumstances when side yard bulk plane would not apply to my lot?

- Lots with an **average width less than 45 feet** do not need to demonstrate compliance with the side yard bulk plane.
- Lots **less than 4000 square feet in area** do not need to demonstrate compliance with the side yard bulk plane.
- If your property is **adjacent to a lot that includes either a nonresidential land use or two or more dwelling units in a building** within 20' of the shared property line, the bulk plane does not apply for the length of the building that is within 20' of the shared property line.



***Note that this document is intended to provide supplemental information, and not meant to replace Ordinance No. 7684.*