

# Municipality of Anchorage

# G.2

## MEMORANDUM

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**DATE:** December 5, 2016

**TO:** Planning and Zoning Commission

**THRU:** Hal H. Hart, AICP, Planning Department Director *HHH*

**FROM:** *JTS* Terry Schoenthal, Current Planning Division

**SUBJECT:** Case 2016-0151, Text Amendment to Anchorage Municipal Code, Title 21, Establishment of Base Grade and Building Design Standards on Steep Slopes.

### Background:

This proposed text amendment to Anchorage Municipal Code Title 21, addresses building height restrictions for residences constructed on steep slopes and modifies the means of establishing base grade for determining height.

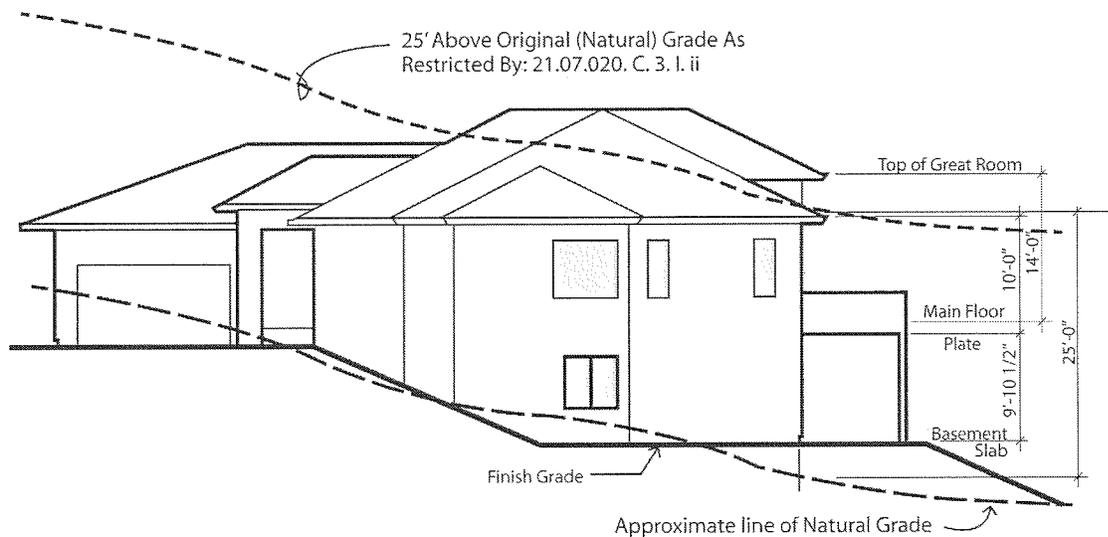
The new requirements, found in Title 21, for construction on steep slopes, originate in the Hillside District Plan, adopted April 13, 2010. To a lesser extent, they can be found in the 2020 Comprehensive Plan. A principal concern of the Hillside District Plan is drainage. Over many years of development on the hillside, natural drainage patterns have been altered, impervious surfaces have increased, and surface flow of stormwater runoff across property lines has resulted in erosion, minor landslides, and glaciation. The Hillside District Plan makes a number of recommendations to address these circumstances and many of those recommendations have been codified in new Title 21.

In addition to addressing drainage issues by limiting site disturbance and a balance of cut and fill, new Title 21 significantly impacted the ability to build homes on steep slopes of a height consistent with their zoning standards. Many of these homes are located in R-5, R-6, R-7, R-8, R-9 and R-10 zoning districts. The allowed building height is 30-feet in the R-5 zoning district and 35-feet in the remaining districts. That height is measured to the mid-point of a sloped roof from an established base grade. By contrast, a home in the same zoning district, constructed on a slope of 20% or greater can only have a height of 25-feet above existing grade at any given point (see attached diagram). Unlike the standard measure for building height, the measurement is taken from the natural grade at any given point, to the top of any portion of the structure at that same point. As a result of these steep slope restrictions, it is nearly impossible to construct even a simple single-story ranch-style home with a walk-out basement when sited on slopes of 20% or greater.

The premise of this code change is that building height is not related to impacts on site drainage and provided that new requirements for site disturbance and grading are maintained, there will be no detrimental impacts on site drainage as a result of this change. The proposed change to design standards for building height will simply allow

homes to be constructed to the heights allowed within the applicable zoning district where the structure is located.

The Hillside District Plan addresses protection of views and building height in Policy 14-P, which is intended to establish standards for ridgetop development. As this policy was expressed in new Title 21, however, all homes on slopes greater than 20% are subject to the 25-foot height restriction above grade. A majority of all homes constructed on the hillside, to date, could not meet this standard.



### **Example of Ranch-Style Home with Walk-Out Basement on a Steep Slope**

The example above shows a generous ranch-style home with a walk-out basement that might typically be found on a large hillside lot. The home steps down with the grade, as deemed desirable in the Hillside District Plan, but cannot come close to meeting the requirements of the height restrictions. A more modest ranch-style home would be equally impacted.

#### **Discussion:**

#### **Establishment of Base Grade (21.06.030 D. Height)**

New Title 21 establishes base grade for the purpose of measuring building height by determining the average of existing grade or finish grade (whichever is lower) around the perimeter at exterior walls. In varying cases it may also require measuring to the lowest point between the structure and the lot line. Because of confusion for how to

determine this, the Planning Director developed a six-page policy guide for how to identify points around the perimeter of the structure as a means of determining the average. A copy of the policy establishing the methodology for determining the grade plan is attached.

This policy has resulted in the need in most cases to obtain a topographical survey, which was not required previously. It was originally intended that topographic information would be available through the Municipality, but that has not been the case. For many new residences, this added cost is in the range of one-thousand dollars. In addition, this method of determining base grade results in a more complicated and time-consuming review of projects.

The proposed change in this amendment allows a choice of methods for determining the grade plane. It is intended to both simplify the requirements of new Title 21, and allow options for determining base grade that were available under old Title 21. The proposed changes will eliminate the need for a topographical survey and simplify review.

This amendment also provides a steep slope alternative method for establishment of base grade that will better allow for walk-out basements without penalty to structure height. From comments received during the comment period, a concern was expressed that in those residential districts that allow 35-foot height (all found within the Class B Districts), homes could be 4 stories tall on the downslope side. For most reviewers, this is not an acceptable alternative. As a result, the amendment limits structures to three stories on the downslope side in Class B Districts. For most residences, this allows two stories with a walk-out basement on steeper slopes.

This method of measurement simplifies both design and review of new buildings and maintains the general fabric of construction that currently exists and has long been successfully implemented.

### **Steep Slope Development (21.07.020 C.)**

Because of builder and homeowner concerns about allowable height of buildings on steeper slopes, the new provisions of Title 21 identified in subsection 21.07.020. C. 3. i. were rescinded by Assembly Ordinance 2016-34S. That ordinance sunsets on December 31, 2016. The Municipal Assembly tasked the Planning Department to work with the Alaska Homebuilder's Association and an Assembly representative to identify a permanent solution. The proposed changes identified in this ordinance will make some of the earlier changes permanent and add another exemption for structures within Class A zoning Districts from steep slope design standards.

#### Applicability (21.07.020 C. 2.)

This text amendment adds a subparagraph c that provides an exemption from steep slope standards for structures in Class A Zoning Districts. This includes all R-1, R1-A, R-2A, R-2M, R-3, R-4, R-4A, and R-5 districts. The reason for this exemption is

that most steep slope sites, where development is allowable, have previously been developed. The steep slope design standards were largely intended for undeveloped areas of the Anchorage hillside and will significantly restrict redevelopment of sloping parcels within Anchorage. Some key provisions that cause the impacts can be found within the “Site Disturbance Envelope” provisions (21.07.020 C. 3. c.). Within the R-3 and R-4 zones, the lot coverage can be up to 60%, yet the allowable disturbance envelope for the entire parcel ranges from 25% to 50%, depending on lot size. These design standards are unworkable for most urban lots. For those urban lots that have steep slopes, the length of the slopes is much shorter than found on the hillside. Development on 30% slopes under the current design standards is virtually prohibited, yet Bootleggers Cove, Campbell Lake, and other locations within the Anchorage bowl already have such development without detriment. This design standard impairs the ability to redevelop urban sloped properties that have previously been developed.

#### Building Design Standards (21.07.020 C. 3. i.)

This amendment calls for the elimination of most of this section. The first sub-paragraph of this section requires all foundations of structures to be designed by a professional engineer, architect or other qualified professional. In discussions with the structural engineering review staff at the Municipality of Anchorage, it was stated that such a requirement should generally be found in Title 23 and not in Title 21. Throughout the Anchorage Bowl, home designers have long done a good job of designing foundations and that work is double checked by building safety, when a permit is requested. An exception to this occurs outside of the Municipal Building Safety Service Area (BSSA), where no engineering stamp is required and where no added review takes place. Because there is no review, foundations for buildings outside of the BSSA will still require design by a registered engineer.

The second sub-paragraph requires that no portion of a structure on slopes greater than 20% can be higher than 25 feet above existing grade at that same point. Elimination of this requirement will mean that allowable building heights will default to the requirements for each individual zoning district.

The Municipal Planning Department finds that there are a number of slope development protections found in new Title 21 that did not exist in old Title 21, particularly on the hillside. These include:

- Establishment of a site-disturbance envelope for new development (maintained for hillside development)
- Limits on cutting, grading, and filling;
- Requirements prohibiting modification of natural grade to establish a favorable basis of grade plane;
- Restrictions on retaining walls; and
- Requirements to maintain natural drainage patterns.

These protections are far more important to meeting the goals of the Hillside District plan for slope protection than height restrictions imposed by new Title 21.

### **Agency and Public Comments:**

This proposed Title 21 text amendment was sent to all Community Councils and reviewing agencies within the Municipality of Anchorage. The following agencies, Community Councils, and individuals responded:

- Rabbit Creek Community Council
- Municipality of Anchorage, Building Safety Department
- Comments from “1539 Investments LLC”
- Municipality of Anchorage Long-Range Planning Division

### **Rabbit Creek Community Council:**

The Rabbit Creek Community Council identified 7 points for which they would like responses and the Planning Department is currently in the process of preparing those responses. In addition the Council provided images of slope failures that have resulted from drainage problems. Drainage is obviously a key concern to the council. The Building safety department, in their comments acknowledged that there is no relationship between building height and drainage. The proposed changes in this text amendment specifically address building height and have no relationship to drainage.

New Title 21 has a number of protections, unrelated to building height that remain firmly in place on the hillside that were not found in old Title 21. These include requirements for slopes greater than 30%, limited site disturbance envelopes for the larger parcels found on the hillside, limitations on cutting, grading and filling, limitations on raising or lowering natural grade, requirements for retaining walls, and requirements for protection of natural drainage patterns. These all play a significant role in solving drainage problems of the past.

Perhaps the strongest tool in addressing drainage issues is “Policy and Procedure #5”, which is well-enforced by the Private Development Department of the Municipality. This policy basically states that any subdivision on the hillside must provide a detailed site and drainage plan. That plan must identify all site drainage for every parcel and also requires that the finish grade for each garage is provided for each unit to be built. This plan is held by the Zoning Department and as permits for each house are submitted, the finish grade must correspond to that identified on the subdivision site plan. The best way to address drainage issues is not on a site by site basis, but rather at the broader subdivision level.

The Building Safety Department notes that topography should be provided and they are correct. It is provided at the subdivision level and topographic survey should not be required again as each lot is developed. The low point and the high point, within five feet of the building envelope can easily be staked and the average determined. That average then determines allowable building height.

The Council notes that if review, using the new system is “problematic”, the building department should provide more training to reviewers. In answer, the reviewers don’t

need additional training, but they do need additional time to make this review. A copy of the guidance for determining natural grade is included. The real question is: Do we get good value from the added time needed to make this more detailed review? In our review, we do not believe that to be the case.

The Council also expresses concern that is if we allow the daylight basement and still allow 35 feet of height, we can potentially have homes that are four stories high on the downslope side. This concern was also raised by the Building Safety Department. In response, we modified the code text to allow a maximum of three stories in the Class B zoning districts (rural areas). In the Class A zoning districts, the problem does not really exist.

The Council states, in comment 5 that designs for all foundations should require a civil engineering seal. This concern was brought to the building safety department and the response was that any such requirement (because it is a safety requirement) should be found in Title 23 and not in Title 21. The Building Safety Department noted that it is not found in Title 23 because there has never been a problem.

**Building Safety Comments:**

A key statement found in the Building Safety comments is the first sentence, “It is true that building height does not affect drainage.” Beyond that, the comments note that with a daylight basement homes on much of the hillside could be four stories tall for much of the hillside. Code text was modified, based on this and other comments regarding the potential for higher homes. It should be noted that under Old Title 21 the height allowance in the R-6 zone (most of the hillside) was unrestricted. It is now 35-feet and no more than three stories on the downslope side.

As to the issue of simplicity, the Planning Department concurs with the Building Safety Department. Base grade could be determined any number of ways in a simple fashion. We have identified a means that maintains the average method for determining base grade, but with an effort to simplify the means of determining the average grade.

**Comments from 1539 Investments:**

The comments from this investment group, who are seeking to redevelop a site in the Bootlegger Cove area substantiate the problems of redevelopment on steep slope sites within the urban area of Anchorage.

**Comments from Municipality of Anchorage Long Range Planning:**

The Long-Range Planning Department along with the Director have been actively involved in shaping the ordinance text to address establishment of base grade and allowable building height. Their comments are attached.

**STAFF RECOMMENDATION:**

Municipal Planning Staff recommends approval of this proposed Title 21 Text Amendment.

**SUGGESTED FINDINGS:**

The following findings are provided as a starting point for development of a resolution. The Commission is welcome to delete, modify or use these findings as best suits the commission's decision.

1. A principal concern of the Hillside District Plan and of Hillside residents is site drainage. The Planning and Zoning Commission finds that building height is not related to site drainage and should be considered separately from drainage issues.
2. The Planning and Zoning Commission finds that the current method of measuring average grade for the purpose of establishing base grade has a level of complexity that adds time and expense for the applicant and time for the reviewer. Identification of a simpler means of determining base grade is desirable. The proposed alternatives for determining an average grade provide both simplicity and flexibility in establishing that grade.
3. The Planning and Zoning Commission finds the requirement that limits height to 25-feet on slopes greater than 20% is unnecessarily restrictive and limits even those homes seeking to use slope adaptive design principals. The proposed elimination of this requirement will allow heights to those identified in the underlying zoning district and will restrict building heights on the downslope side of the structure to three-stories for the hillside area. These are stronger requirements than those of Old Title 21.
4. The Planning and Zoning Commission finds that the steep slope requirements are not conducive to redevelopment in Class A zoning districts (urban areas) and removal of these requirements for the urban areas will not result in detriment to safety or welfare.

**ATTACHMENTS:**

1. Assembly Ordinance
2. Director's Policy Z-15-01 Calculations of Grade Plan
3. Agency and Public Comments

Assembly Ordinance  
PZC Case 2016-0151

Submitted by: Chair, at the Request of the Mayor  
Prepared by: Planning Department  
For reading:

ANCHORAGE, ALASKA  
AO NO. 2016-

AN ORDINANCE OF THE ANCHORAGE MUNICIPAL ASSEMBLY AMENDING ANCHORAGE MUNICIPAL CODE (NEW CODE) SUBSECTION 21.06.030 D. 4, ESTABLISHMENT OF GRADE PLANE FOR BUILDING HEIGHT AND 21.07.020. C. 3. I. STEEP SLOPE BUILDING DESIGN STANDARDS, TO ESTABLISH A SIMPLIFIED METHOD FOR DETERMINING BASE GRADE AND TO ALLOW CONSTRUCTION IN STEEP SLOPE AREAS TO THE SAME HEIGHT STANDARDS AS THE UNDERLYING ZONING DISTRICT ALLOWS.

(PLANNING AND ZONING COMMISSION CASE 2016-0151)

**WHEREAS**, unintended consequences of the new Title 21 prevent building a home style recommended for steep slopes in the Hillside District Plan; and

**WHEREAS**, limits on home height leads to a larger footprint to attain the desired home size in contradiction to preferred practices on steep slopes; and

**WHEREAS**, new Title 21 generally requires a topographical site survey to establish the base grade for measurement of building height; and

**WHEREAS**, review of site information for approval of site plans has proven to be difficult and time consuming for plan reviewers; and

**WHEREAS**, there is a simpler measurement solution that does not require a topographic survey and reduces the effort of review, while meeting the special needs for steep slope development; and

**WHEREAS**, new Title 21 has significant protections for steep slope development compared with old Title 21 that include: 21.06.030D. 5. a, Establishment of Grade, Existing Grade, 21.07.020 C. 3. c, Steep Slope Development Standards, Site Disturbance Envelope, 21.07.020 C. 3. e, Steep Slope Development, Standards, Raising or Lowering Natural Grade, and 21.07.020 C. 3. g, Steep Slope Development, Standards, Natural Drainage Patterns; and

**WHEREAS**, new Title 21 called for foundations to be designed by a professional engineer, architect or other qualified professional and that provision was rescinded with AO No. 2016-34S, but will take effect again on December 31; and

**WHEREAS**, it has been determined that adequate protections exist without the need for an engineering stamp within the Municipal Building Safety Service Area (BSSA) through building safety reviews; and

1 **WHEREAS**, the building standards for steep slope development, identified in new Title 21,  
2 were rescinded by AO No. 2016-34S, As Amended, and that ordinance will sunset on  
3 December 31, 2016; and

4  
5 **WHEREAS**, the Municipal Planning Department in conjunction with local designers, builders,  
6 and homeowners has developed a permanent solution that supports the Hillside District Plan  
7 goals of protecting steep slopes, while allowing building heights consistent with underlying  
8 zoning;

9  
10 **THE ANCHORAGE ASSEMBLY ORDAINS:**

11  
12 **Section 1.** Anchorage Municipal Code (new code) Section 21.05.010 is hereby amended to  
13 read as follows (the remainder of the section is not affected and therefore not set out):

14  
15 **21.06 DIMENSIONAL STANDARDS AND MEASUREMENTS**

16  
17 \*\*\* \*\*

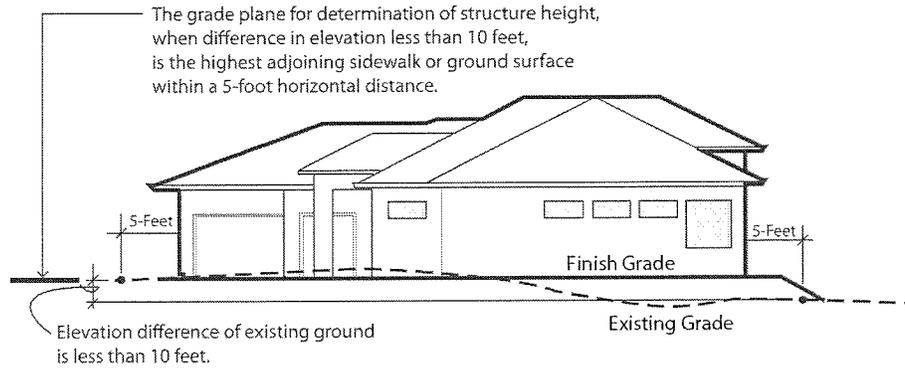
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19 **21.06.030 D. HEIGHT**

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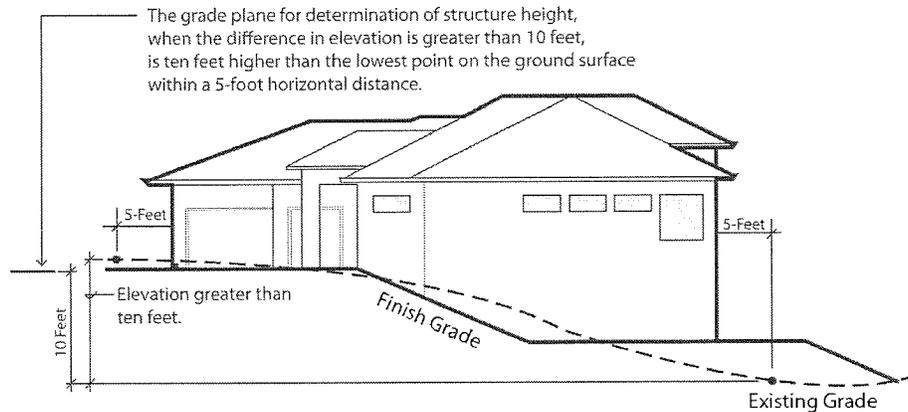
- 22  
23 4. **Grade Plane**  
24 [THE GRADE PLANE FOR DETERMINATION OF STRUCTURE  
25 HEIGHT SHALL BE THE AVERAGE OF EXISTING OR FINISHED  
26 GRADE, WHICHEVER IS LOWER, ABUTTING THE STRUCTURE AT  
27 EXTERIOR WALLS. WHERE THE GRADE SLOPES AWAY FROM THE  
28 EXTERIOR WALLS, THE GRADE PLANE SHALL BE ESTABLISHED  
29 BY THE LOWEST POINTS WITHIN THE AREA BETWEEN THE  
30 BUILDING AND THE LOT LINE, OR, WHERE THE LOT LINE IS MORE  
31 THAN SIX FEET FROM THE BUILDING, BETWEEN THE BUILDING  
32 AND A POINT SIX FEET FROM THE BUILDING.]

33 The grade plane for determination of allowable height shall be selected by  
34 one of the following three methods, as best suites the applicant's needs.

- 35 a. The elevation of the highest adjoining sidewalk or ground surface  
36 within a five-foot horizontal distance from the exterior wall of the  
37 building when such a sidewalk or ground surface is not more than  
38 ten feet above the lowest grade. (See diagram below)
- 39 b. An elevation ten feet higher than the lowest grade when the  
40 sidewalk or ground described in subsection 4.a., above is more  
41 than ten feet above the lowest grade. (See diagram below)



**Example a.**  
Basis of height measurement when the difference between the low point and the high point is less than 10 feet.

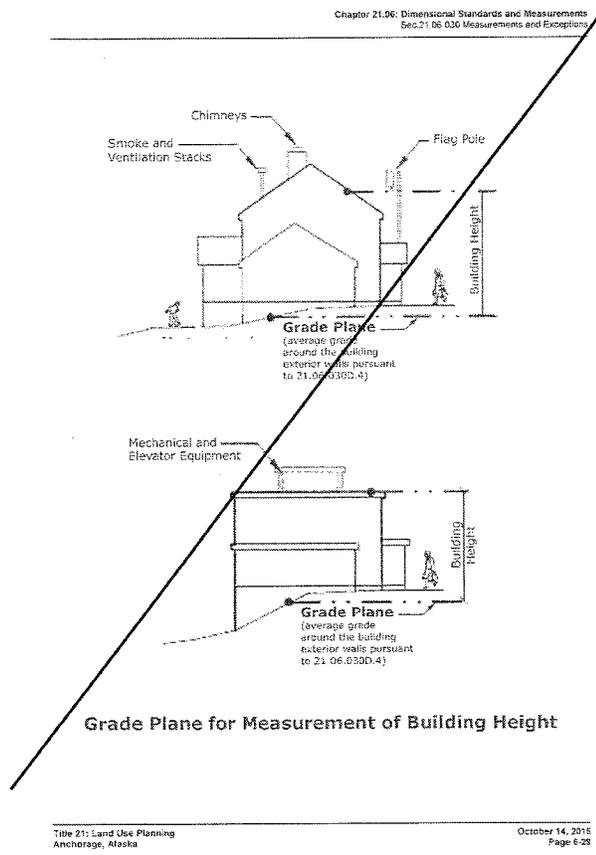


**Example b.**  
Basis of height measurement when the difference between the low point and the high point is greater than 10 feet.

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c. The average midpoint of existing grades in the near vicinity of the structure. This shall be determined by identifying the lowest point and the highest point of the existing grade within five feet of the proposed exterior walls outside of the structure and averaging the two elevations At the applicant's option, the average may be determined by using multiple evenly spaced points around the perimeter of the structure to determine the average grade. This condition may occur when using only two points to determine the grade plane does not accurately reflect an average of topographic conditions of the site.

1 **DELETE FIGURES FOR “GRADE PLANE FOR MEASUREMENT OF BUILDING HEIGHT”,**  
2 **PAGE 6-29**  
3



4 **Section 2.** Anchorage Municipal Code (new code) Section 21.07.020. C. 2. is hereby  
5 amended to read as follows (the remainder of the section is not affected and therefore not set  
6 out):

7 \*\*\*      \*\*\*      \*\*\*

8 **2. Applicability**

- 9
- 10 a. Except as noted in subsection 2.b. and 2.c. below, any lot with an average  
11 slope of 20 percent or greater, or where adverse conditions associated  
12 with slope stability, erosion, or sedimentation are present as determined  
13 by the municipal engineer, shall comply with the standards of this  
14 subsection 21.07.020C. Lots being subdivided shall comply with chapter  
15 21.08, including subsection 21.08.030H., *Subdivisions on Slopes*, if  
16 applicable.
- 17 b. This section applies to naturally occurring steep slopes and not to those  
18 that result from human activities, such as gravel extraction.
- 19 c. Buildings within Class A zoning Districts (21.08.050 B) are exempt from  
20 these requirements.



Director's Policy  
Z-15-01  
Calculations of  
Grade Plane

# MUNICIPALITY OF ANCHORAGE

Community Development Department



Planning Division

## Director's Policy Z-15-01

### Calculation of Grade Plane for Measurement of Building Height under Title 21

**Code Reference:** *AMC 21.06.030D.3. through D.6.*, in the "New" Title 21 effective on 1-1-2014

#### Table of Contents:

1. Purpose
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4. Calculation Option B: Building Composed of Building Segments
5. Submittal Requirements for Elevation Drawing and Topographic Survey
6. Placement of Sample Points
7. Additional Information

#### 1. Purpose

The objectives of this policy are to:

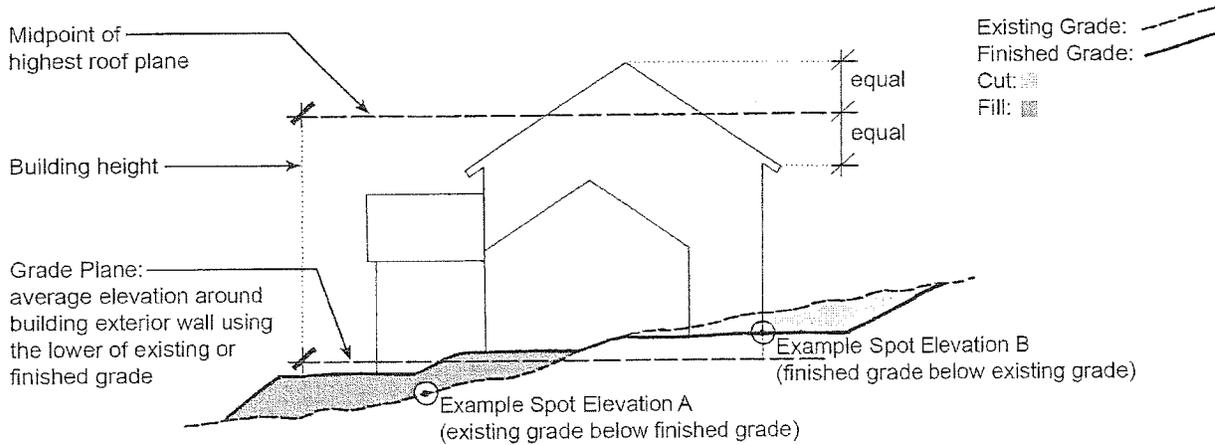
- Provide a clear and consistent set of methods by which to calculate grade plane for measuring building height;
- Provide clarity of interpretation of terms used in the Title 21 provisions; and,
- Identify survey information required on the applicant's submittal.

These clarifications are needed to provide guidance for applicants, fair and consistent interpretation and application of the building height measurement provisions and ensure clear documentation of the relationship of structure height to existing and proposed grade.

#### 2. General

Structure height is measured from the average grade at the exterior walls of a structure to the midpoint of the highest roof plane. Average grade is the "grade plane" used for measuring building height, and is calculated from spot elevations taken at sample points around the building perimeter.

The spot elevations used for calculating grade plane are either the existing grade level prior to any land-disturbing activity or the planned finished grade after completion of the development, whichever is lower. For example, where existing grade is lower in elevation, the pre-existing topography is used to provide the spot elevation.



**Fig. 1. Grade Plane = the Average Grade around the Exterior Walls**

**Exterior Walls.** Exterior walls for calculating average grade are those walls of the building enclosing interior spaces. This includes garages and cantilevered portions of the structure. This does not include features such as exterior porches or decks, or building wall segments that are less than 30-inches in height above finished grade.

**Multiple Structures.** If there are multiple structures on a lot, grade plane is calculated separately for each structure.

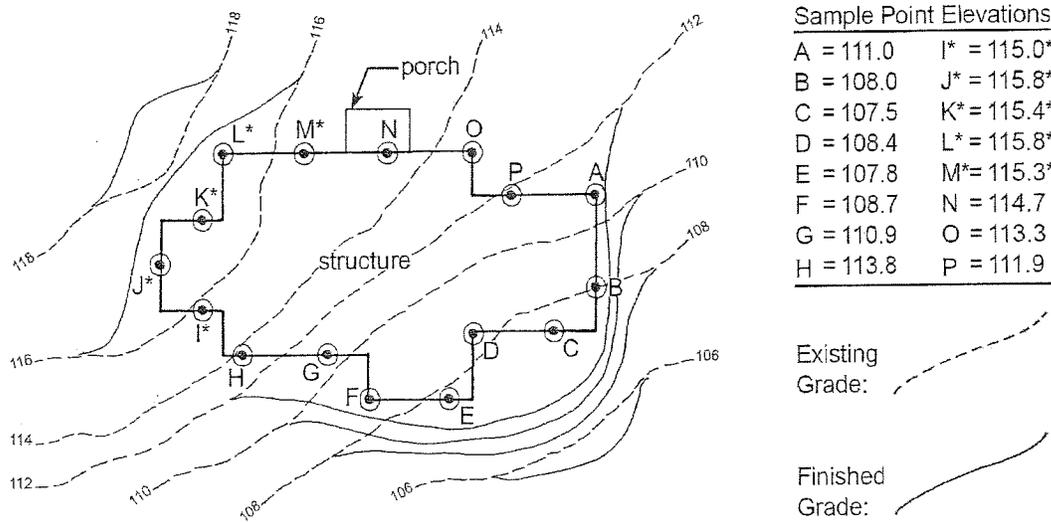
**Calculation Methods.** There are two options for calculating grade plane. The first option calculates the average grade around the entire structure. The second option divides a structure into segments and calculates the average grade separately for each segment to better address topographic conditions.

Sections 3 and 4 below provide details for calculation options A and B.

### **3. Calculation Option A: Average Grade of Entire Building**

In the first calculation option, the grade plane is calculated as the average elevation of sample points located every 10-feet, measured horizontally, around the entire perimeter of the exterior wall of the structure. Steps 1 – 4 below summarize how to determine average grade.

**Fig. 2. Determining Average Grade**



\* asterisks indicate sample point elevations using finished grade, finished grade being lower than existing grade at those points.

**Step 1:** Provide an accurate drawing of the building wall perimeter on the site that shows both the existing and proposed finished grade elevations. See section 5, *Submittal Requirements: Elevation Drawing and Topographic Survey*, for specific instructions.

**Step 2:** Show sample points on the drawing every 10-feet or less, measured horizontally, around the entire perimeter of the exterior wall of the structure. See section 6, *Placement of Sample Points*, below.

**Step 3:** For each sample point, provide spot elevations of the topography, using the lower of either the existing grade level or finished grade level. See Figure 1, *Grade Plane*.

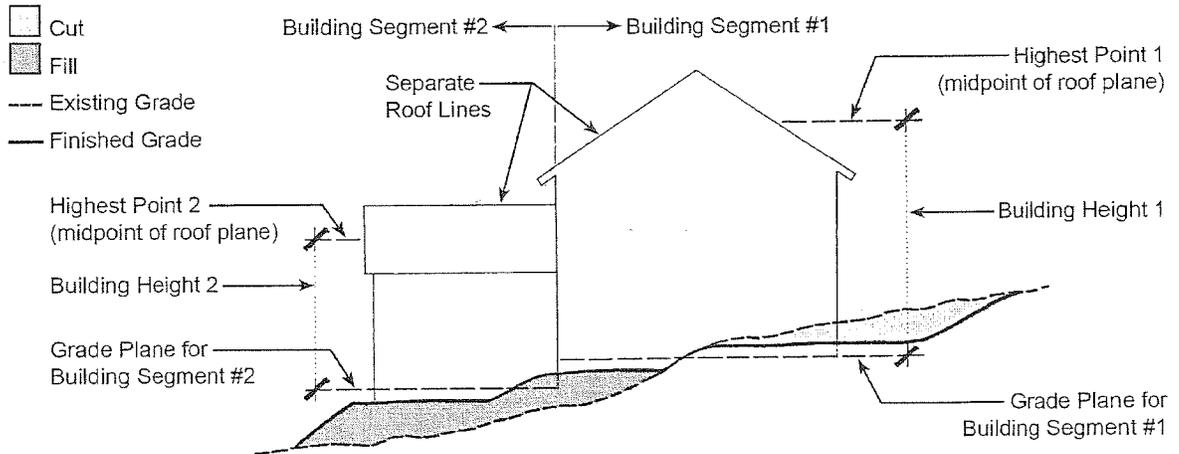
**Step 4:** Add up all of the spot elevations, and divide the sum by the quantity of those spot elevations. The formula, as applied to Figure 2 above, is:

$$\text{Average Grade} = \frac{\text{Sum of Spot Elevations A through P}}{\text{Number of Spot Elevations (ie., 16)}}$$

#### 4. Calculation Option B: Building Composed of Building Segments

Calculation Option B is an alternative for determining average grade in cases where there is a sloping site and the proposed structure is composed of distinct building segments having separate roof planes. This enables structures to better respond to the topography of sloping sites while still conforming to the regulatory height limits. The intent is to allow a structure to adjust the points at which grade is measured so that portions of the structure can “step up” with the slope.

For the purposes of Option B, a "building segment" means a part of a building with an exterior wall and a roof plane separate from the other parts of the same building, with a vertical difference of at least three feet.



**Fig. 3. Distinct Segments of a Building**

To determine average grade for each building segment, show on the plan the line or lines that distinguish each individual building portion. Number the building segments. Show sample points spaced evenly at intervals of every 10-feet or less around the perimeter of the structure as in Calculation Option A. Do not provide spot elevations on the common wall between the distinct portions of the building.

Starting with segment #1, add up all of the spot elevations on the exterior wall of that segment, using the lower of either existing or finished elevation. Divide the sum by the quantity of those spot elevations for that segment. This gives the average grade for building segment #1. Repeat the process for each numbered segment.

The height of each distinct segment of the structure is then measured from the grade plane for that distinct segment.

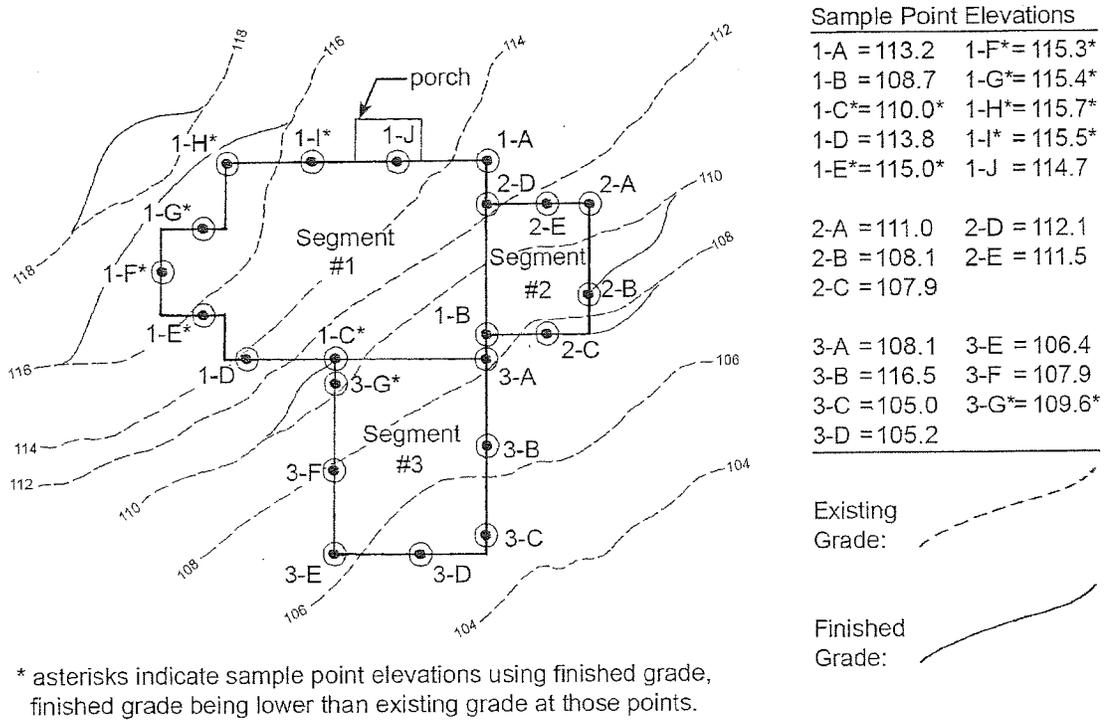
The formula, as applied to Figure 4 below, is:

$$\text{Average Grade of Segment \#1} = \frac{\text{Sum of Spot Elevations 1-A through 1-J}}{\text{Number of Spot Elevations (ie., 10)}}$$

$$\text{Average Grade of Segment \#2} = \frac{\text{Sum of Spot Elevations 2-A through 2-E}}{\text{Number of Spot Elevations (ie., 5)}}$$

(Repeat for each building segment.)

**Fig. 4. Determining Average Grade for Separate Building Segments**



**5. Submittal Requirements for Elevation Drawing and Topographic Survey**

For both calculation options, the required survey shall include spot elevations for the sample points around the building perimeter and at the lot corners, and topographic data in one or two foot contours for all portions of the lot disturbed by clearing, excavation or related construction activity.

The topographic contours shall depict both existing and finished grade. The contour line types used for existing and finished grade need to be easily distinguishable, and shall utilize the following: existing grade in a dashed line, finished grade in a solid line, and the exterior wall in a heavy solid line.

The spot elevations provided shall show the lowest of either the existing or finished grade.

For the purpose calculating grade plane for measurement of building height under title 21, the survey may use assumed elevations / relative datum to establish its base elevation.

**Exception to Topographic Contours.** For the purposes of calculating grade plane, if the entire project site meets all of the following characteristics, then contour lines are not required and the survey need depict only the spot elevations:

- Finished grade will remain within 2-feet of existing grade; and
- The slope of any disturbed areas on the site is no more than five percent; and
- No proposed structure is within five feet of the by-right height limit, as measured in title 21.

This exception is not an exemption from other submittal requirements of topographic contour information, such as may be required by other sections of title 21 or other codes or regulations.

## 6. Placement of Sample Points

Sample points should be spaced evenly at intervals no greater than 10-feet, measured horizontally, moving clockwise around the building wall perimeter.

**Window Wells:** Window wells, light wells, cellar or basement access walkways, and similar appurtenances below grade are not included in the calculation of grade plane, provided they have an inside dimension of 120 square feet or less (including stairs or ramps). Where the distribution of sample points at 10-foot intervals results in the placement of a sample point in a window well, that sample point is skipped, and its spot elevation is not counted.

## 7. Additional Information

AMC Title 21 Section 21.14.040, *Definitions*, including the following terms:

- Grade
- Grade, Existing
- Grade, Finished
- Grade Plane
- Grading
- Land-Disturbing Activity

Approved:

Date:

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Jerry T. Weaver, Jr., Director  
Community Development Department

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This document is intended to provide guidance in applying certain Land Use Code regulations and is for informational use only. It cannot be used as a substitute for the Land Use Code or for other municipal codes.

# Agency and Public Comments



## Rabbit Creek Community Council

1057 W. Fireweed Ln, #100, Anchorage, AK 99503



November 18, 2016

Terry Schoenthal  
MOA Planning Department &  
Planning & Zoning Commission  
PO Box 195560  
Anchorage, AK 99519

RE: #2016-0151, Comments on Title 21 Amendments for Slope Design and Height

The Council discussed this case at our November 10<sup>th</sup> meeting where 49 people were in attendance. By unanimous consent, the members agreed to submit the following questions and concerns.

The Council requests that Planning staff respond to these specific concerns and questions by December 1st so that we can prepare comments by the Assembly submittal deadline. Additionally, we request a 2-month delay of the December 31, 2016 sunset date until answers to our questions, including comparison studies, can be completed.

1. Change title language. The language states that height standards for steep slope areas should be the same as the underlying zoning district. The HDP and the comprehensive plan call for site development to respond to the natural conditions: steep slopes and other constraints require different guidelines and techniques within same zoning district. Blocking this adaptive approach for steep slope development would violate HDP policies (14-I, J, M).

The HDP p. 6-24, sidebar, states “As is demonstrated by this report, Anchorage lags behind most U.S. cities in establishing specific standards to guide hillside development.” Most other cities with developed hillsides have specific standards for such growth with deviations for specific situations. Anchorage has already had serious slope collapses (see attached photos) and Title 21 should create more protective slope standards, not reduce them.

2. Clarify what the maximum allowable residential height would be under the proposed method vs. the current method. It appears the proposed code change would allow 45-foot tall residences or taller compared to the 25-foot height currently allowed on steep slopes and 35-foot height currently allowed on lesser slopes (under 20% gradient).

If the code change allows building heights on steep slopes to exceed the 35-foot-heights of low-gradient lots, this would contradict HDP design objectives of buildings that follow the slope.

3. Provide a clear comparison, including diagrams, of the methods for determining base grade for building height (without doing a topographical survey). What is the difference in allowed building height for each method? What are the design outcomes for each method?
4. Provide a cost comparison for both methods of calculating base grade. Regardless of costs, Title 21 states that changes are not to be made because of economic hardships for costs or for special interests.

5. Revise section 2.1.i to specifically state that steep slope foundations shall be engineered by a civil engineer. It is our understanding that architects do not have the qualifications to design such foundations. The term “. . . other qualified professional” is not specific enough; it can be loosely interpreted and should also be deleted.
6. Provide documentation for the Planning Memo (October 10, 2016) statement that “plan reviewers have difficulty reviewing site information”; and if there is a demonstrated difficulty, provide training. The Council understands through informal inquiries that the reviewers DO understand the information. Changing the code because reviewers cannot understand the calculations is a simplistic solution which does not serve the public interest in building standards. A better solution, if difficulties do exist, would be to instigate training.
7. Retain the “Statement of Purpose”. Retain this section to ensure fair and reasonable application. Without Purpose Statements, codes can easily be interpreted in different ways.

We would appreciate your response by Thursday, December 1 in order to submit comments.

Sincerely,

Adam Lees, Chair

Cc: Hal Hart, Suzanne Fleek-Green, HALO



2004: Prominence Pointe washout



2009: Portugal Pl. washout

# MUNICIPALITY OF ANCHORAGE



Planning & Development Services Dept.  
Development Services Division

Building Safety

## MEMORANDUM

### Comments to Miscellaneous Planning and Zoning Applications

**DATE:** November 7, 2016

**TO:** Terry Schoenthal, Manager, Current Planning

**FROM:** Ron Wilde, P.E.  
Structural Plan Reviewer  
Building Safety  
343-8371

**SUBJECT:** Comments for Case 2016-0151  
Proposed code amendment revising Grade Plane

It is true that the height of buildings does not affect drainage.

However, there are a few things in this memo that could use further discussion.

#### THE PROPOSAL ALLOWS THREE-STORY STRUCTURES

The net effect of this proposed amendment is to allow an extra story for houses cut into a slope. A ranch style is by definition a single-story structure. A ranch style house with a walkout basement is simply a two-story house cut into a slope. It is not a ranch style house at all.

The memo says that “for most residences, this allows two stories with a walk-out basement on steeper slopes.” That means it allows a three-story building. A walk out basement is simply another story.

#### SIMPLICITY

If simplicity is the goal, the height dimension does not need to be 10 feet. It could be, for instance, 5 feet. Or the high elevation and the low elevation could be averaged. The purpose for using 10 feet is to specifically allow an extra story.

#### TOPOGRAPHIC SURVEYS

One of the stated problems is that a costly topographic survey is currently needed. First of all, topographic information is required to design the house. Further, subdivision Grading and Drainage Plans showing the topography are already required and available. These are reviewed by the muni’s Private Development group.

Drainage is a real problem with sloped lots. All steep slopes should have topographic information so that final slopes can be specifically designed to appropriately drain the free water that is generated by impervious surfaces such as roofs and paving.

The need for topographic information should not be a reason to change how the grade plane is determined.

# 1539 Investments, LLC

An Alaska Limited Liability Company

November 21, 2016

Mr. Hal Hart, Director  
Municipality of Anchorage Community Development Department  
P.O. Box 196650  
Anchorage, AK. 99519-6650

Subject: Support of Amending Anchorage Municipal Code (New Code) Regarding Steep Slope Development Case 2016-0151

Dear Mr. Hart:

We are writing this letter in support of the proposed amendment to the Anchorage Municipal Code (AMC) (New Code) Regarding Steep Slope Development that would limit to which zoning districts these requirements would be applicable. It is our understanding that the proposed ordinance would exempt higher-density residential districts, including Mixed-Residential (R-3) District from being subject to the steep slope design standards found in AMC 21.07.020. As the owner representatives of four parcels zoned R-3 District, located in Downtown Anchorage (Original Townsite Subdivision, Block 91, Lots 5A, 6A, 7A, and 8A), we have recently been working with Bettisworth North Architects and Planners on a possible residential development project. Our plan is to replat the four lots into two parcels which would allow for a two- or four-plex development on one smaller parcel (approximately 8,380 square feet) and a possible 17-unit multi-family development on one larger parcel (approximately 24,920 square feet). In a meeting with the Municipality of Anchorage (MOA) Current Planning Division, it was brought to our attention that steep slope standards (AMC21.07.020) may apply to at least two of our parcels, although the slope was man-made and is not reflective of the natural environment.

Given the already existing challenges of doing an infill project with limited available square footage and designing within Title 21 standards, the application of this standard would prohibit our ability to move forward with our proposed plan – it would reduce the number of units that could be constructed rendering a multi-family residential development cost prohibitive. Furthermore, if AMC 21.07.020 is determined to be applicable to our parcels, at least two of the parcels (5A and 6A) would effectively be undevelopable. The attached site plans demonstrate the impact that AMC 21.07.020 would have on the development of our parcels – essentially taking offline almost 17,000 square feet of potential land for residential development. The goals and policies of the adopted Anchorage Bowl Comprehensive Plan (Anchorage 2020), as well as the proposed goals and policies of the Anchorage 2040 Comprehensive Plan update, identify a real need for increased-density residential developments, especially within and near the City Center Intensity land use, near major employment districts, and accessible to transit facilities, all of which apply to our parcels.

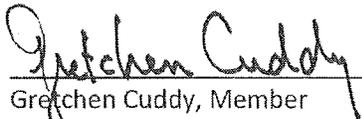
# 1539 Investments, LLC

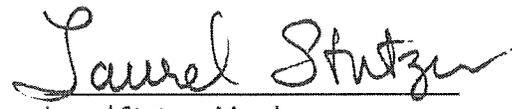
An Alaska Limited Liability Company

These parcels have been owned by the previous generation of our family since the 1950's and we believe that the assessed value assigned to this property during those many years was done so without regard to the development impact of AMC 21.07.020. Application of the steep slope standard not only deprives us of reasonable use of our land as reflected in the assessed value all those past years, but it would also result in loss of future property tax revenue to the MOA through a smaller development or, in the extreme case, no development at all.

We appreciate your consideration of our support of Case 2016-0151. If you have any questions or would like to discuss these comments in more detail, please do not hesitate to contact us.

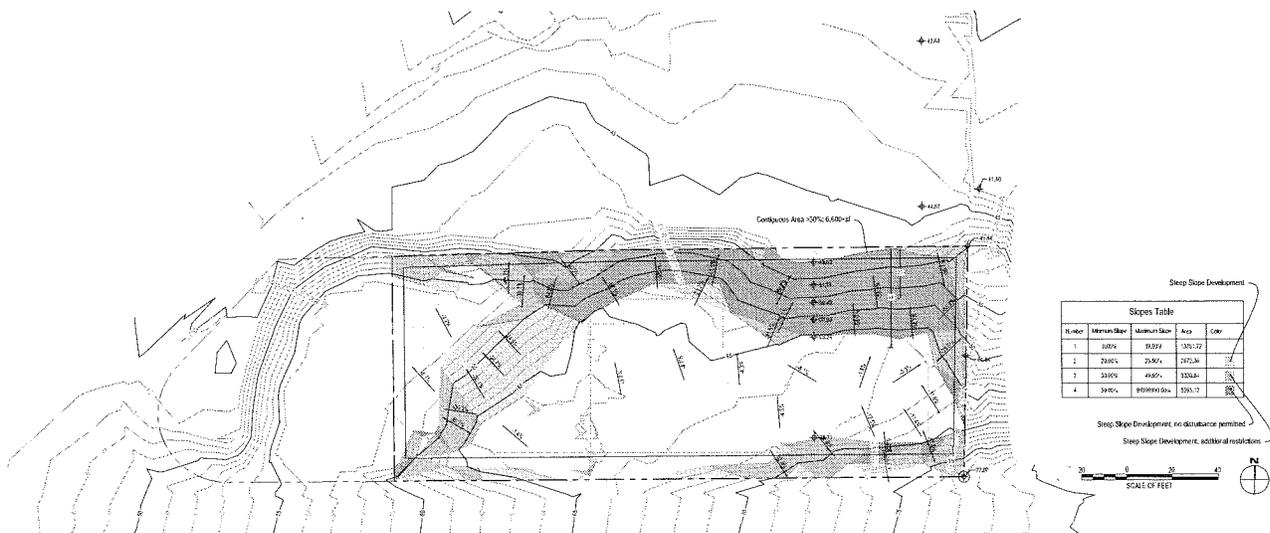
Sincerely,

  
Gretchen Cuddy, Member  
1539 Investments, LLC  
[cckarluk@gmail.com](mailto:cckarluk@gmail.com)

  
Laurel Stutzer, Member  
1539 Investments, LLC  
[akteacher@gci.net](mailto:akteacher@gci.net)

Attachment(s): As stated

cc: Terry Schoenthal, Current Planning Manager  
Tyler Robinson, Planning and Zoning Commission Chair



COMBINED PARCELS 5A, 6A, 7A



# Municipality of Anchorage

## Long Range Planning Division

### MEMORANDUM



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**Date:** November 28, 2016

**To:** Terry Schoenthal, Manager, Current Planning Section

**Thru:** *CW* Carol Wong, Manager, Long-Range Planning Division

**From:** Tom Davis, Senior Planner

**Subject:** Case 2016-0151, Ordinance Amending Title 21 to address: Measurement of Grade Plane for Building Height, and Steep Slope Building Height.

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Long-Range Planning Division has reviewed the recently revised draft ordinance amending the new Title 21, which includes objectives to simplify the method for determining grade plane for measuring building height, and to allow construction in steep slope areas to use the same height standards as the underlying zoning district allows, and has the following recommended changes to the draft ordinance.

#### **1. Steep Slope Foundation Design By a Licensed Engineer**

The Municipality should, for areas outside the Building Safety Service Area, preserve the engineering requirement that buildings on steep slopes have a foundation which has been designed by a professional engineer. While the requirement is redundant to the required structural engineering review within the Building Safety Service Area, deleting the foundation engineering provision as applied in hillside areas outside the Building Safety Service Area is in conflict with the policies of the Comprehensive Plan and the public safety, health, and welfare.

The foundation provision was adopted by the Assembly including approval by the Assembly Title 21 Rewrite subcommittee after much research, analysis, and public process. This was reaffirmed by OECD in a recent rationale for this provision as part of its AIM 39-2016 regarding AO 2016-34, which also temporarily addressed foundation engineering.

Both the Anchorage 2020-Anchorage Bowl Comprehensive Plan and the Hillside District Plan directed standards be established for development on slopes in order to “provide instruction on how to adapt structure and lot design for sloped environments” (Anchorage 2020, page 105). Among other reasons, Hillside development regulations protect persons and property from natural hazards including landslides and earthquake induced ground failure on steep slopes, to maintain natural resources and features that are valued by the community, to minimize erosion and sedimentation.

Building plans for single-family and two-family homes are not required to be designed by an engineer. This is not an issue for steep slope structures that are inside the Building Safety Service Area (BSSA), because buildings inside the BSSA are required to have structural engineering review for compliance with the building code (AMC Title

23). However, outside the BSSA, there is no required review or inspection of new homes for compliance with Title 23. The vast majority of steeply sloped areas within the Municipality are outside the BSSA. To remedy this, the provision in Title 21 requiring an engineer to design the foundation and structure to be located on a steep slope offers some protection to the property owner. In fact, soils on steep slopes do present an engineering problem for foundation design that is not found on level sites. In the case of level sites, the force of the soils on each side of the building foundation tend to hold the building in place. On a steep slope, the weight or force of the soils from the uphill side pushes on the foundation built into the slope, and there is nothing on the downhill side of the home to hold the home in place.

Consultations with the Building Official and Land Use Permit review staff noted that a foundation engineering design is outside the professional scope of an architect and thus the word “architect” should be removed from the provision. In addition, the municipal Geotechnical Advisory Commission, which advises officials on geotechnical safety matters in development and engineering, should have an opportunity to comment on the proposed ordinance to the Planning and Zoning Commission.

Recommendation: Replace the language in Section 2 of the ordinance with the following:

*i. Building Design Standards*

The purpose of the building design standards is to [MINIMIZE SITE DISTURBANCE, AVOID EXTREME GRADING REQUIRED BY LARGE BUILDING PADS ON STEEP SLOPES, AND] reduce the risk of damage from natural hazards on steep slopes.

i. All buildings and structures outside of the municipal Building Safety Service Area shall have a foundation which has been designed by a professional engineer[, ARCHITECT, OR OTHER QUALIFIED PROFESSIONAL].

[II. AT ANY GIVEN POINT, THE HEIGHT OF THE STRUCTURE SHALL NOT EXCEED 25 FEET ABOVE THE ORIGINAL (NATURAL) GRADE.]

## **2. Steep Slope Building Height**

Long-Range Planning does not object to deleting the 25-foot limitation on the height of structures on steep slopes—if the ordinance is revised to follow the recommendations in part 3 of this memo, to keep the “average elevation” method for determining grade plane available in Title 21.

The intent of the Steep Slope Development standards includes to encourage buildings that integrate into the natural terrain, protect visually significant / prominent natural features, such as ridgelines and rock outcroppings, and in general maintain the areas’ visual character such as called for in the Hillside District Plan. The Comprehensive Plan calls for sensitive hillside architecture that decreases the impacts and visibility of new development. But it is confusing to code users that the 25-foot limit is measured differently from the rest of Title 21. The generally applicable “average elevation” method of measuring grade plane seems adequate to address the policy intent. It also provides an option that enables buildings to step up with the natural terrain.

Recommendation: No objection to deleting the 25-foot limitation on the height of structures, if the recommendations of part 3, below, are followed.

### 3. Grade Plane Measurement

The Municipality should retain the new Title 21 code's "average elevation" method, which averages the elevation of sample points around the building, for measuring grade plane as an option for designers and builders. Testing on three sites by Long-Range staff indicates that the ordinance's proposal to change the by-right averaging method to just two reference points near the building will be likely to establish an artificially low grade plane for many applicants. Likewise, the proposed "steep slope" method reverts to an old Title 21 method which was inaccurate and did not adequately discourage berming up around a building to exaggerate its grade plane elevation.

The averaging-around-the-building method in the new Title 21 hinges on publicly available topographic survey data, so builders do not need to hire a surveyor. The topo survey data was previously available from the Municipality, at the time of new Title 21 adoption. Then, at some point soon after implementation of the new Title 21, another department of the Municipality made the decision to remove the topo data from public use. The municipal surveyor and GIS center are currently working on making topographic data publicly available again. Once the topo data is available again, the "average elevation method" using points around the building footprint should be the preferred method. It is the accurate, modern, and consistent way of determining building height. Despite claims otherwise, it is easy to use once learned and is applied across the United States including in Anchorage's building code. Applicants in Anchorage have learned and are using the new method. There are no reports it has increased zoning review times in a way that affects staff or applicants.

In the interim, until the topo data is available again, Long-Range Planning supports adding back the old Title 21's "reference datum point" method of determining grade plane, as an interim option for builders. The proposed ordinance brings back a modified version of the old method calling it the "Steep Slope Method". The old method should remain available until the Municipality makes its topographic survey data publicly available again, and provides training to familiarize and phase in use of the new method.

The new "average elevation" method is essential for some infill/redevelopment projects, such as in parts of Downtown, because the old Title 21 method can substantially overestimate building height on some sites with significant slopes. For example, in 2015 the Director of OECD sought Planning staff to find a way to allow development projects in the Downtown CBD to use the "average elevation" method of the new Title 21. Downtown is still under the old Title 21 and therefore subject to the old "reference datum method". OECD was attempting to help a design firm which was preparing a mixed-use redevelopment project in Downtown. The firm documented that the old code's method inaccurately added ten feet vertically to its project's grade plane elevation for measuring building height, as compared to the new code's method. The old code forced the three-story base podium of the building design to be located completely below sidewalk level of the adjoining street at the top of the bluff, basically losing a story and thwarting the podium building design making the project concept infeasible. The OECD Director and Planning and Legal staff strove to find a way to make the new code's method available to the applicants and to Downtown projects in general.

During the Title 21 Rewrite project, because of the flaws and loopholes in the old method, the Building Safety Division advised the Planning Department to incorporate the new method into the new Title 21. Planning, Building Safety, Permit Review, and Municipal Surveyor staff collaborated to adapt the widely used “average elevation method” into the new Title 21. The new Title 21 sought to implement the Comprehensive Plan, and catch Anchorage up to the more accurate, consistent, fair, and modern method for measuring building height.

**Averaging Method Boiled Down to Two Points.** The proposed ordinance’s way of boiling down the averaging method from multiple points around the building perimeter to just two points reduces the accuracy, and in several test cases artificially lowers the applicant’s available building height. Four tests by Long-Range staff indicate averaging just the lowest and highest point yields a lower base grade than averaging around the building perimeter. For example, in the case of the downtown site example, it would yield a base grade more than 4 feet lower than the adopted method and would therefore likely to present the same problem for the applicant as they did under old Title 21 method. Likewise, tests of the building in Figure 1 and the three building segments in Figure 2 of the Director’s Policy for calculating grade plane under the new Title 21, indicate that using just the lowest and highest point around the building yields a lower base grade than the adopted method under the new Title 21 in each of the four cases.

**Old Title 21 Method.** The old Title 21 method, or “reference datum point” method, was used widely around the country for decades under the old Uniform Building Code (UBC). When the Municipality updated its building code to the International Building Code (IBC) in 2000, it switched to the “average elevation” method, which is now widely used across the U.S. By adopting the new Title 21 in 2013, Anchorage brought its zoning ordinance back into synch with its building code and modern practices in general.

A primary advantage of the old method was that it used only two reference points to establish the grade elevation, so it was far easier than any other method in the old days before computers and digital topographic data. However, the old code’s reference datum point method had many disadvantages compared to the modern IBC method:

- The old method is the least accurate measurement of building height, because it applies one reference location to represent the elevation for an entire lot. It is measured in most cases from the highest adjoining ground surface (“point A”). This yields an often unrealistic measure of building height that is inconsistent between lots with different topographies. The greater the slope or variation in elevation, the less accurate and consistent it becomes.
- In many cases the old method substantially underestimates the actual building height at the downhill end of the slope. Building Safety reported it allows buildings that are 9 feet taller on the downhill side than zoning would intend. This conflicts with the intent of the *Anchorage 2020 Comprehensive Plan* and *Hillside District Plan*.
- The old method creates inconsistencies in height of buildings between adjacent lots, based on the difference between one reference datum point and another just one lot over.

- The old method does not specify whether the applicant should use existing or finished grade. It unintentionally encourages the applicant to use finished grade if the development project regrades the site so that the finished grade is higher than existing grade at either the higher or lower point.
- Since IBC superseded the UBC in 2000 as Anchorage’s building code, the old Title 21 method is out-of-synch with the building code on which it was originally based, and an objective of the Title 21 Rewrite was consistency between municipal codes.

### **Adopted New Title 21 Average Elevation Method Around the U.S.**

Most communities across the U.S. now calculate the average elevation around the footprint of a building to establish the reference datum from which to measure the building height. The International Building Code (IBC), in effect in Anchorage since 2000, provides a nationally tested and locally adopted version of this method.

Most zoning ordinances use the more restrictive of pre-existing or finished grade—i.e., whichever is lower (the more restrictive)—to calculate grade plane. This works well with the averaging method and makes it even more difficult to attempt to “game the system” by berming up around a building.

The new code method is a more accurate and consistent measure of building height on slopes than the UBC because it bases grade plane on the *average* elevation of the ground level around the exterior walls, as opposed to the highest adjoining ground surface. It is precise. There is less room for opposing interpretations that could lead to conflicts and wasted time at the land use permit counter.

In spite of the initial reactions by some, with a proper implementation roll-out cities successfully implement the new way by making it simple and efficient to use. The municipal land use permit review staff helped write the user guide and reported after implementation that the system works. Many permits have come in and applicants have figured it out and are using it. It applies just one average grade elevation, which is the average of a selected number of datum points around the building. It averages out complex slopes or cross-slopes. Building Safety review staff also originally recommended using it for its simplicity based on their experience.

### **Director’s Policy for Calculating Average Grade Plane.**

The staff analysis for the proposed draft ordinance documented claims that confusion about how to average existing or finished grade plane resulted in a six-page Director’s Policy Z-16-01 for how to determine the points around the building under the new system. In fact, the part of the Director’s Policy showing how to determine average grade plane is only one page long, including illustrations (Section 3 of the Directors Policy). An alternative method as a second option for the choice of designers takes two additional pages (Section 4 of the Director’s Policy). The alternative method allows designers to cascade their building form down the terrain of a slope—a flexible, aesthetic option not available to designers under the old code, or under the proposed two-point averaging method proposed in the ordinance. Most of the remaining pages are devoted to code references that had to be placed there because this was the first Director’s Policy created for the new Title 21. The Director’s Policy can be shortened and simplified.

**Publicly Available Topo Data.** The “average elevation” method does depend on the builder having publicly available topographic data available, so the builder can measure average grade plane without having to hire a surveyor incurring cost. The Municipality is currently working to restore publicly available topography data to make the system economical again for homebuilders.

Since the topo data problem is only temporary, replacing the modern “average elevation” method, or boiling it down to two reference datum points, or permanently bringing back the old Title 21 method would throw the proverbial baby out with the bathwater. It would step backward to more inaccurate methods, provide fewer options for designers on sloping terrain, and may actually thwart multi-story redevelopment project concepts on certain kinds of sites.

Recommendations:

1. Replace the amendment language in Section 1 of the draft ordinance with the following. (Note: 4.b. is recommended as proposed in the draft ordinance.)
  4. **Grade Plane**

The grade plane for determination of structure height shall be established using one of the two following methods. Option b. shall be available as provided below at least until the Municipality restores publicly available topographic survey data for use in option a.

    - a. **Average Elevation Method**

The grade plane for determination of structure height shall be the average of existing or finished grade, whichever is lower, abutting the structure at exterior walls. Where the grade slopes away from the exterior walls, the grade plane shall be established by the lowest points within the area between the building and the lot line, or, where the lot line is more than six feet from the building, between the building and a point six feet from the building.
    - b. **Reference Point Method on Steep Slopes**

{As provided in the revised draft ordinance under “Steep Slope Method”}
2. Replace Director’s Policy Z-16-01 (explanation for how to measure average grade plane around a building) with a shorter, simpler version of its Calculation Option A, which allows builders to use fewer points around the building. State that, until the Municipality restores publicly available topo survey data, builders may use just two reference datum—the highest and lowest point. Even for the longer-term, after free topo data is available, the directors’ interpretation rules in some communities allow as few as four points.

Secondly, provide a simplified version of Calculation Option B from Director’s Policy Z-16-01 available to applicants as a separate, new stand-alone Director’s Policy, to preserve the new code’s option for builders to cascade a building with separate roof planes down the hillside of a sloping site. This option implements Anchorage 2020 and the Hillside District Plan and is not available under the old Title 21 or the simple averaging method.