SLOPE/DENSITY ANALYSIS AS PERTAINS TO		Revised	1
GENERAL PLAN LAND USE CATEGORIES	S-1	08/13/85	4

PURPOSE

To describe the methods for determining the maximum number of dwelling units which may be permitted in major and minor subdivisions, and to assist users in interpreting General Plan density requirements as applied to any given subdivision. Non-Urban, Special Purpose, and Agricultural Designations are stated in terms of parcel size and determining an overall yield by way of this policy is permitted only in conjunction with Policy 1.3 or 1.4 of the Regional Land Use Element.

BACKGROUND

The application of a variety of interpretations and techniques to the analysis of density is confusing; thus, methods to be used by both project applicants and Departmental staff in making a slope/density analysis of a subdivision have been adopted.

POLICY

It is the policy of this Department that the adopted methods of slope/density analysis are to be used by applicants and Department staff when determining the number of dwelling units that may be permitted in a subdivision.

DEFINITIONS

1. Area, A is the total area within the exterior lot lines, expressed in acres, to be used in Formula (1). When isolated steep areas are excluded from the analysis, reduce the total area by the sum of the isolated steep areas (Zoning Ordinance Section 4115).

2. Average Slope of a given area is an average of all natural slopes within that area, and is calculated by use of Formula (1). This average slope is the slope criteria of the Land Use Element, County General Plan.

3. Density, Residential, the number of dwelling units that may be permitted is expressed as the number per residential acre. Policy 2, Land Use Element, County General Plan, serves as a guide to the specified residential density (Zoning Ordinance Section 4110).

4. Density Designator, one of the development regulations for the zone, is expressed as a decimal notation, i.e., 0.5, 0.25, 0.125, and specifies 1 dwelling

5. Isolated Steep Areas are portions of the terrain characterized by excessive, abrupt slopes, including bluffs and canyons, unusable as building sites and are unique geologic features not characteristic of the majority of the property. The intent of this section is to allow exclusion of unique geographical features which would distort the computation of the average slope of the property. Such areas within a project being analyzed for maximum density may be excluded from the average slope analysis provided that the area excluded is also excluded from the total area in calculating the maximum number of dwelling units.

6. Maximum Number of Dwelling Units permitted within the exterior lot lines of the site is equal to the total site area, expressed in acres, multiplied by the density designator. The maximum number of dwelling units may be computed by utilizing the "rounding up" method provided in Section 4115 of the San Diego County Zoning Ordinance.

SLOPE/DENSITY ANALYSIS METHODOLOGY

1. Average Slope Formula - The average slope, in percent, for a given area is the product of the selected contour interval and the sum of the length of each selected contour interval divided by the area in square feet.

$$S = \frac{I \times L \times 100}{A \times 43{,}560}$$

Where S = Average existing land slope, in percent.

I = Interval, in feet, of the topographic map contour lines. Normally, contour interval "I" would not exceed five feet. For County maps at 200 foot scale showing only 25 foot intervals, use 25 feet for "I".

L = The sum, in feet, of the length of the contour lines, at the selected contour interval "I".

A = The total area, in acres, of the parcel.

Computations for area and contour lines will be made from either a San Diego County Engineer 200 foot/inch scale topographic map or a topographic map prepared by a registered civil engineer or a licensed land surveyor.

2. Method A for use on projects where slopes are relatively uniform, see Example No. 1.

   This methodology is only to be used for (1) Residential Designation. The Non-Urban, Special Purpose, and Agricultural Designations must also comply with Policy 1.3 or 1.4 of the Regional Land Use Element if an overall yield is desired.

   A. Compute the average slope for the entire project.

   B. Select the density designator as determined by the average slope.

   C. Find the maximum number of dwelling units by multiplying the area (acres) by the density designator.

3. Method A (Modified) - Optional. See Example No. 2.

   A. Isolated steep areas may be excluded from the calculations for the average slope.

   B. The isolated steep slope areas must also be excluded from the area in calculating the maximum number of dwelling units.

4. An alternative method to be used where the slopes within the project vary from relatively easy (moderate) slopes to excessive slopes are given in Method B.

5. In Non-Urban and Agricultural Designations where Policies 1.3 and 1.4 are not used, Method B shall determine individual parcel sizes.

   Method B for use on a lot-by-lot analysis. See Example No. 3.

   A. Compute the average slope of each lot.

   B. Select the density designator as determined by the average slope.

   C. Find the maximum number of dwelling units by multiplying the area of each lot by the density designator for each lot, and

   D. Determine that the size of each lot as proposed is not less than that permitted by density.

   E. Isolated steep areas may be excluded from the calculations for the average slope.

LOT DESIGN

This slope/density analysis procedure gives the theoretical maximum number of dwelling units that can be permitted pursuant to the San Diego County General Plan in a given project. The Code of Regulatory Ordinances, The Zoning Ordinance, the County Groundwater Policy where applicable, and other design requirements must be followed in determining the actual size and number of lots permitted.

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Deputy Director

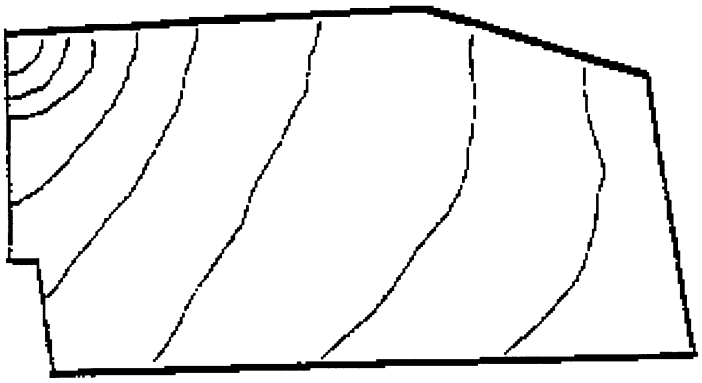
Attachments

CODES POLICIES\S-1;dld

ATTACHMENT
POLICY S-1

EXAMPLE 1, Using Method A, for a subdivision in land use designation of Non-Urban Residential, Estate.

The terrain has relatively uniform slopes throughout the parcel.



Area = 69 Acres
Contour Interval = 5 Ft.
L = 144,270 Ft.

METHOD A

$$\text{Average Slope, } S = \frac{I \times L}{A} \times 100$$

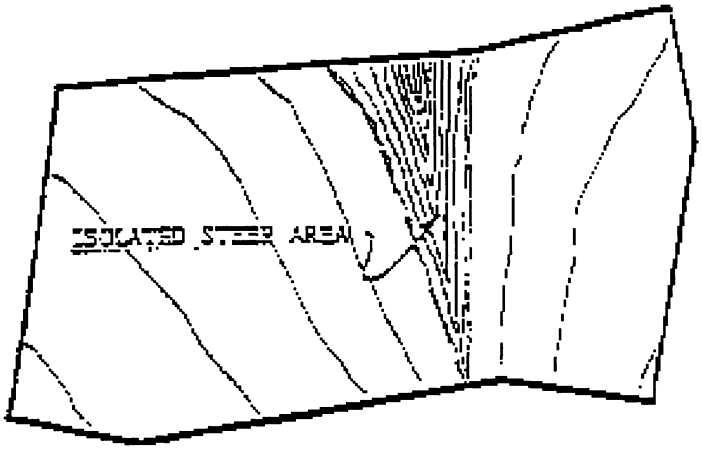
$$= \frac{5 \text{ ft.} \times 144{,}270}{69 \times 43{,}560} \times 100 = 24\%$$

For an average slope less than 25%, use density designator of 0.5

Therefore, maximum number of DUs = Area x Density = 69A x 0.5 = 34.5
or
34 DUs

EXAMPLE 2, Using Method A (Modified) with exclusion of an isolated steep area, for a subdivision in land use designation of Non-Urban Residential, Estate.

A very steep-sided drainage feature divides terrain with otherwise relatively uniform slopes.



Area = 54 Acres
Contour Interval = 5 Ft.
L = 127,020 Ft.

Isolated Steep Area = 8A

METHOD A (Modified)
Excluding Isolated Steep Area

Calculation, Excluding Isolated Steep Area:

Area = 46 Acres L = 92,175 Ft.

$$\text{Average Slope, } S = \frac{5 \times 92{,}175}{46 \times 43{,}560} \times 100 = 23\%$$

For an average slope less than 25%, use density designator of 0.5
Therefore, maximum number of DUs = 46A x 0.5 = 23 DUs

Calculation, without exclusion of isolated steep area:

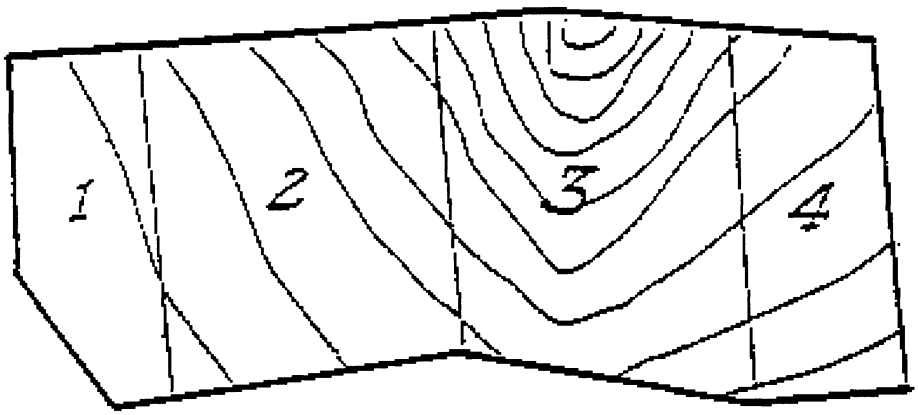
Area = 54 Acres

$$\text{Average Slope, } S = \frac{I \times L}{A} = \frac{5 \times 127{,}020}{54 \times 43{,}560} \times 100 = 27\%$$

For an average slope in excess of 25.1%, use density designator of 0.25
Therefore, maximum number of DUs = 54 x 0.25 = 13.5
or
13 DUs

EXAMPLE 3, Using Method B in land use designation of Non-Urban Residential, Estate.

The terrain slope varies below and above 25%.



METHOD B

Contour Interval = 5 Feet

LOT	AREA, ACRES	L, FT.	S %	DENSITY	DUs	MIN. LOT SIZE
1	2.1	3110	17	0.5	1.05	2
2	4.0	9060	26	0.25	1.00	4
3	4.3	13112	35	0.25	1.08	4
4	2.6	5436	24	0.5	1.30	2

$$S_1 = \frac{5 \times 3110}{2.1 \times 43560} \times 100 = 17\%$$

$$S_2 = \frac{5 \times 9060}{4.0 \times 43560} \times 100 = 26\%$$

$$S_3 = \frac{5 \times 13112}{4.3 \times 43560} \times 100 = 35\%$$

$$S_4 = \frac{5 \times 5436}{2.6 \times 43560} \times 100 = 24\%$$

For an average slope of 0-25% use density designator of 0.5
For an average slope in excess of 25.1% use density designator of 0.25