

HILLSIDE DEVELOPMENT AND DESIGN GUIDELINES

CITY OF CARLSBAD
1998

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I. GENERAL INFORMATION

A. Purpose of Hillside Development Guidelines

These Hillside Development and Design Guidelines provide graphic examples to assist in implementing Carlsbad's Hillside Development Regulations (Chapter 21.95 Carlsbad Municipal Code) The Guidelines highlight the major areas of the Hillside Development Regulations. However, the guidelines do not substitute for a thorough understanding and implementation of the regulations.

B. When is a Hillside Development Permit needed?

A Hillside Development Permit (HDP) is required when a development is proposed on any slope which has a gradient of 15% or greater and a slope height of greater than 15 feet. Development means grading, erecting or constructing on a hillside area.

C. What Types of Development are Exempt?

The following development types do not require a Hillside Development Permit, however, must comply with these Hillside Development and Design Guidelines as well as Chapter 21.95 of the Carlsbad Municipal Code.

1. The development of one single family dwelling unit on a residentially zoned lot.
2. On a single lot, the additional development (i.e.; regrading, slope alteration or building encroachment) of or upon any manufactured slope with a gradient of 40% or greater and an elevational difference (height) of 15 feet or greater which has been previously graded consistent with an authorized grading permit.
3. The development (trenching, utility construction and backfilling) of underground utility systems.

D. How will your Hillside Development Permit be Processed?

It is highly recommended that you, as an applicant, 1) review Chapter 21.95 of the Carlsbad Municipal Code (The Hillside Ordinance) and 2) discuss the Hillside Development with a City Planner before submitting an application for a Hillside Development Permit. The Hillside Development Permit should be submitted concurrently with any permit or application for development of a Hillside area.

Generally the steps involved in reviewing your HDP application are as follows:

1. A Hillside Development Permit application is submitted to the Development Services counter at 1635 Faraday Avenue. The application must be submitted with and reference any other permit application such as a tentative map, site development plan, etc.

2. Information items required:

- a. A completed Hillside Development Permit Application Form;
- b. Slope analysis (see Section 21.95.110 of Carlsbad Municipal Code);

- Identify slopes:
- (1) 0 to less than 15% slope
 - (2) 15% to less than 25% slope
 - (3) 25% to 40% slope
 - (4) Slopes greater than 40%

$$\% \text{ Slope} = \frac{\text{Vertical Distance} \text{ (Contour interval)}}{\text{Horizontal Distance} \text{ (Distance between contour intervals)}} \times 100$$

- c. Slope profile(s);
- d. Assurance of slope analysis and slope profile accuracy;
- e. Show with a site plan, grading plan and building plans and elevations how development fulfills the following Hillside Development and Design Standards (21.95.120);
 - (1) Coastal Zone Requirements (if applicable)
 - (2) Development of manufactured slopes over 40% gradient
 - (3) Volume of grading
 - (4) Slope height
 - (5) Contour grading
 - (6) Screening manufactured slopes
 - (7) Hillside and hilltop architecture
 - (8) Building setbacks
 - (9) Roadway design
 - (10) Hillside drainage
- f. A completed disclosure statement; and
- g. Two copies of a preliminary title report.

3. A development services counter person generally checks your application for completeness. If your application is incomplete, it cannot be accepted. If your application appears complete, it is accepted.
4. The Hillside Development Permit application is typically reviewed, processed, and approved concurrent with the first permit or application you may have with the City for that hillside area.
5. For approval of a Hillside Development Permit the following findings must be made:
 - a. That undevelopable areas of the project have been properly identified.
 - b. That the development is consistent with the Purpose and Intent provisions (Section 21.95.010) of the Hillside Ordinance to:
 - (1) Implement the goals and objectives of the Land Use and Open Space/Conservation Elements of the Carlsbad General Plan.
 - (2) Assure hillside conditions are properly identified and incorporated into the planning process.
 - (3) Preserve and/or enhance the aesthetic qualities of natural hillsides and manufactured slopes by designing projects which relate to the slope of the land, minimizing the amount of project grading, and incorporating contour grading into manufactured slopes which are located in highly visible public locations.
 - (4) Assure that the alteration of natural hillsides will be done in an environmentally sensitive manner whereby lagoons and riparian ecosystems will be protected from increased erosion and no substantial impacts to natural resource areas, wildlife habitats or native vegetation areas will occur.
 - c. That the hillside development complies with the Hillside Development and Design Standards (Section 21.95.120) and substantially conforms to the intent of the concepts illustrated in the Hillside Development and Design Guidelines Manual.
6. If your Hillside Development Permit is denied, you may appeal the decision of:

- a. The Planning Director to the Planning Commission.
- b. The Planning Commission to the City Council.

II. HILLSIDE MAPPING PROCEDURES

The Hillside Mapping Procedures are found in Section 21.95.110 of the Carlsbad Municipal Code. At least three major items are needed to appropriately map and identify a hillside:

A. Slope Analysis

Exhibit 1 illustrates how to show slope classifications.

B. Slope Profiles:

Exhibits 2 and 3 illustrate examples of slope profiles.

C. Total Area of Grading and Grading Volumes

The grading of hillside lands should be kept to a minimum. Exhibits 4 and 5 illustrate clear ways to show the total area of grading and grading volumes.

D. Assurance of Accurate Hillside Mapping

The assurance of accurate Hillside mapping is to be provided by either a registered landscape architect or civil engineer land surveyor.

III. HILLSIDE DEVELOPMENT AND DESIGN STANDARDS

The Hillside Development and Design standards address the following development concepts.

- A. Coastal Zone Hillside Standards
- B. Development of Manufactured Slopes Greater than 40% Gradient
- C. Contour Grading
- D. Screening Manufactured Slopes
- E. Hillside and Hilltop Architecture

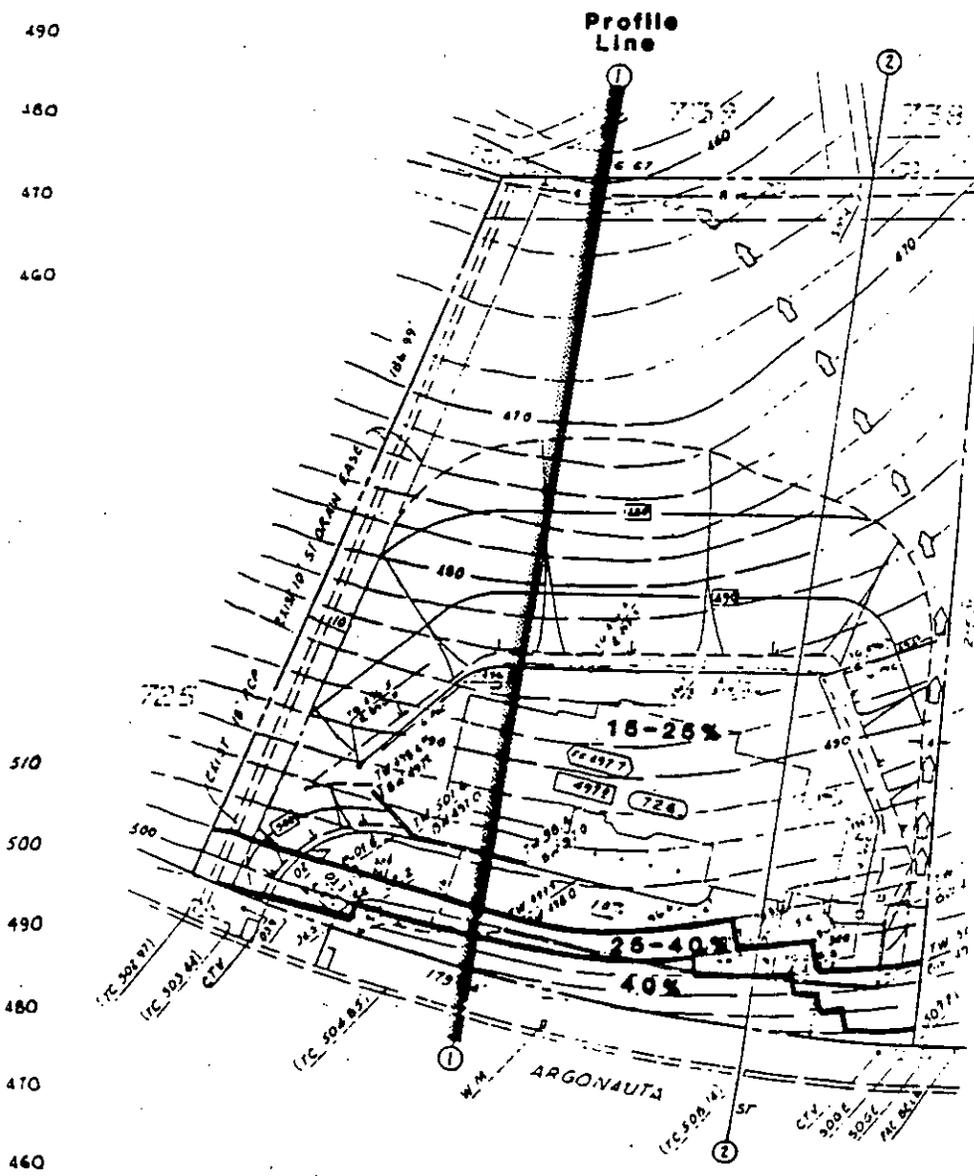
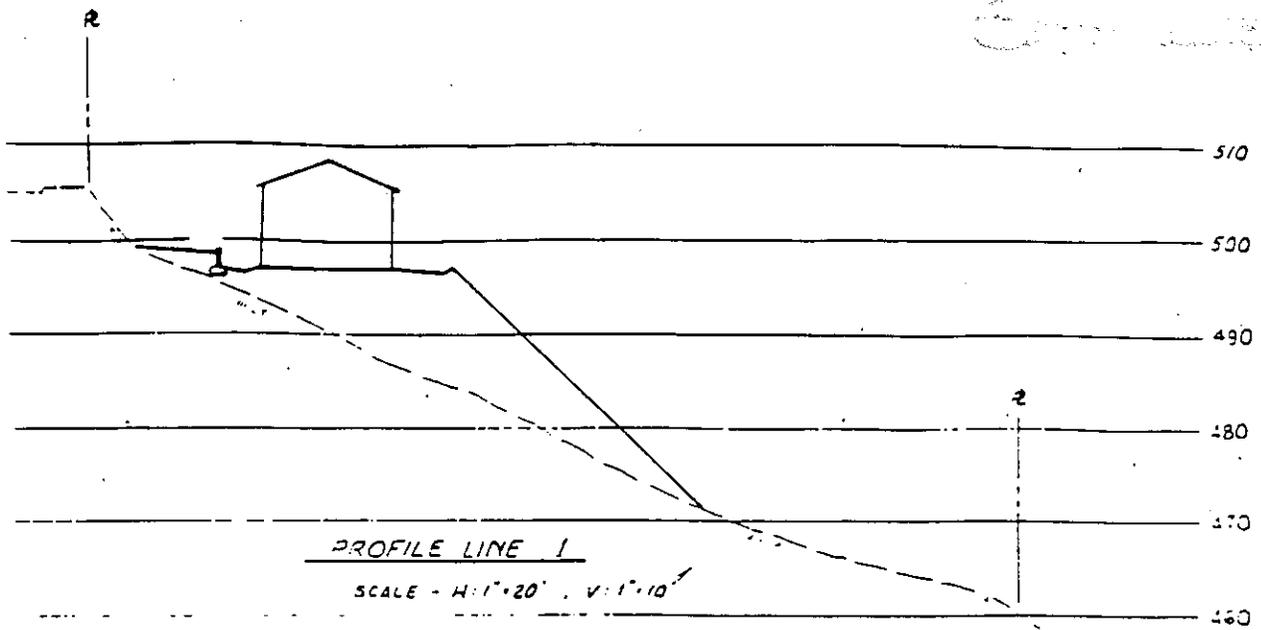
Slope Analysis: The following graphics illustrate ways to show slope classifications.

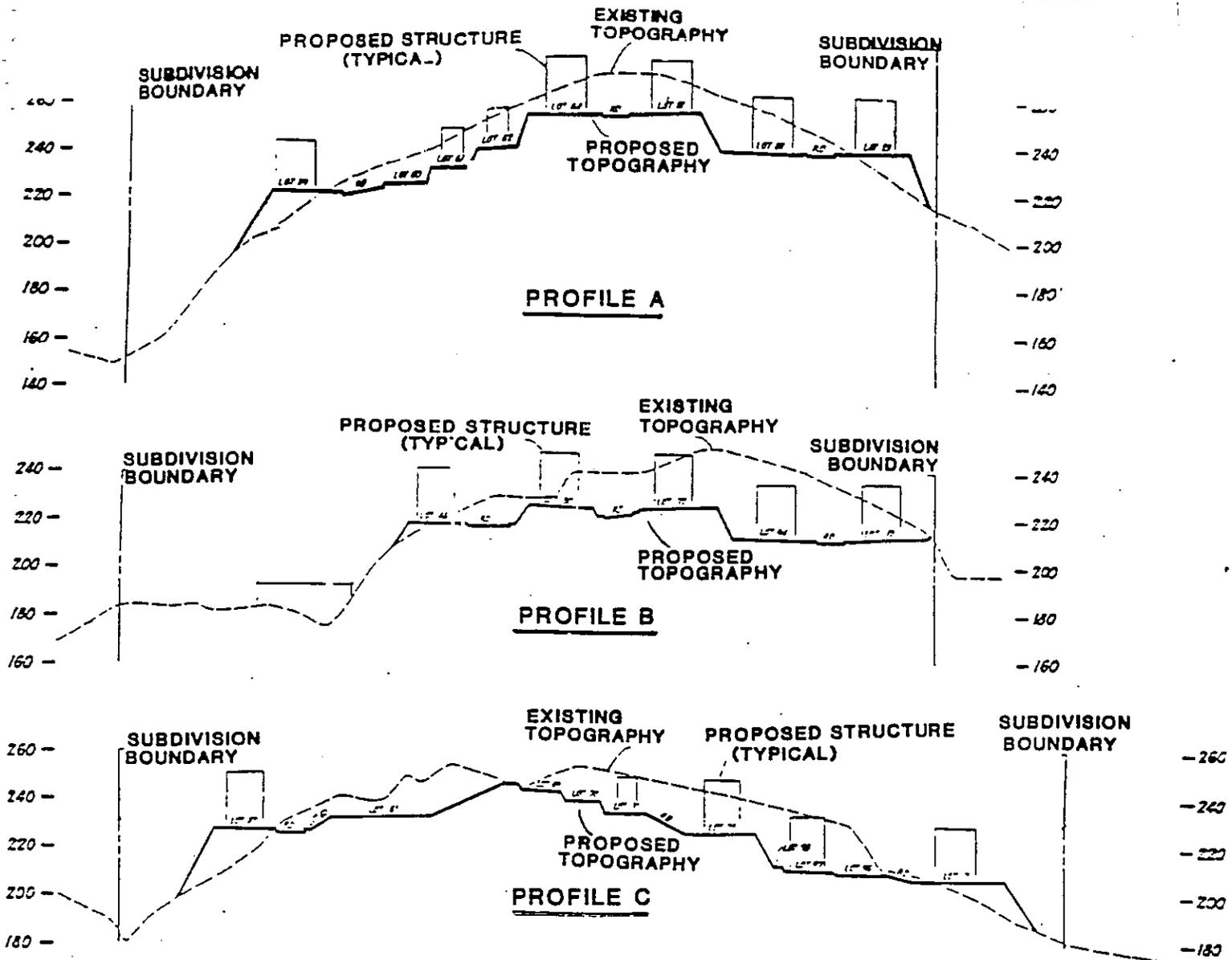


SITE BOUNDARY

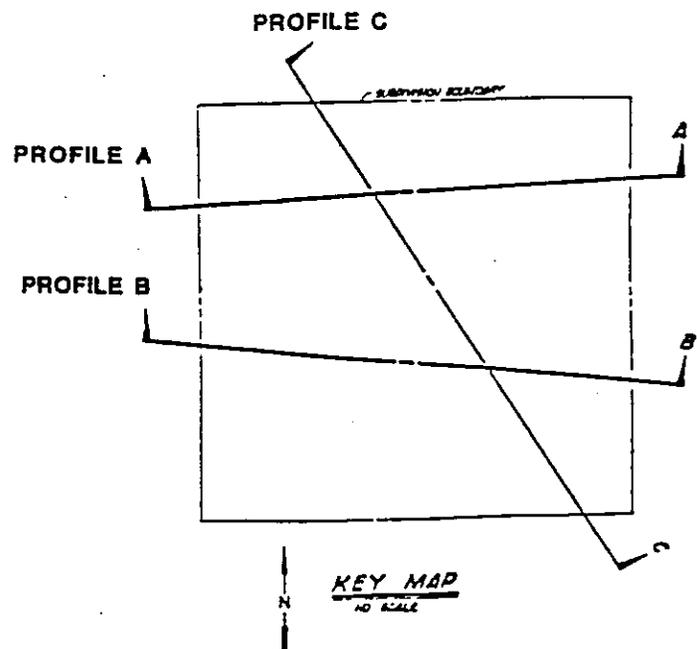
SLOPE PERCENTAGE LEGEND

	AREA
○ 0-less than 15%	18.2ac
● 15-less than 25%	16.1ac
▨ 25-40%	3.5ac
● greater than 40%	<u>2.7ac</u>
	40.5ac TOTAL SITE

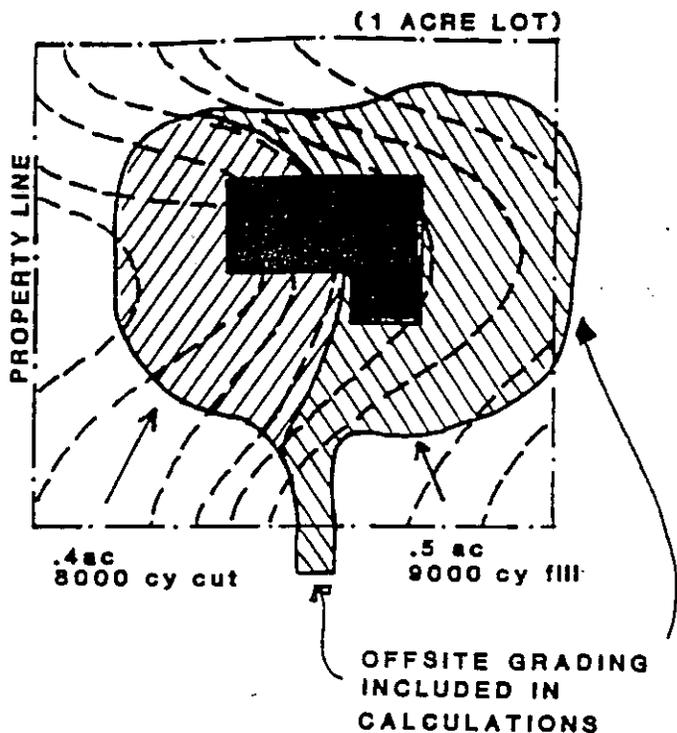




TO BE PREPARED AT SAME SCALE AS TENTATIVE MAP



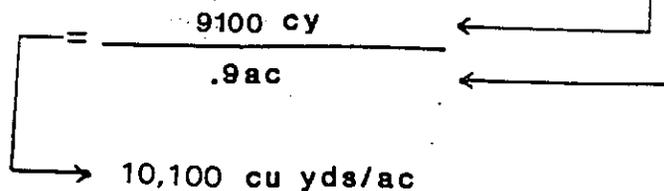
NOT ACCEPTABLE - EXCEEDS 10,000 cy/ac



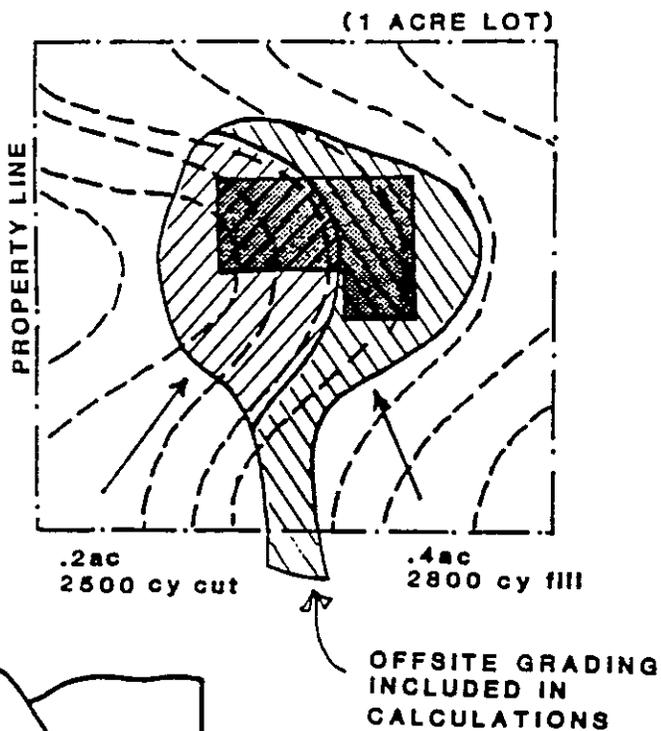
PROPOSED GRADING

- FILL .5ac 9100 cy
 - CUT .4ac 8000 cy
- (Larger of two)

TOTAL SITE AREA: 1ac
TOTAL GRADED AREA .9ac



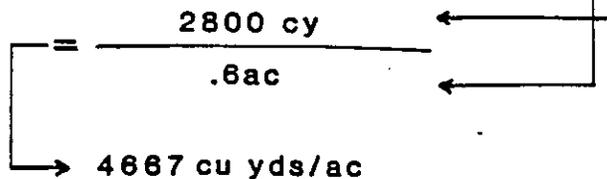
ACCEPTABLE



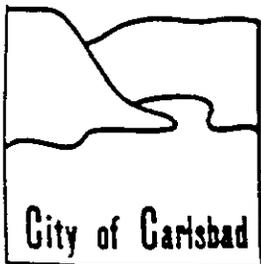
PROPOSED GRADING

- FILL .4ac 2800 cy
 - CUT .2ac 2500 cy
- (Larger of two)

TOTAL SITE AREA 1ac
TOTAL GRADED AREA .6ac



TOTAL AREA
OF GRADING &
GRADING VOLUMES





	<u>CUBIC YDS.</u>	<u>AREA (AC.)</u>
Natural	0	10
Cut	243,587	18
Fill	234,711	12
Export	8,876	40

243,587

30ac

30 ac.

8119 cuyd/graded ac.

- F. Building Setbacks
- G. Roadway Design
- H. Hillside Drainage

The following exhibits illustrate some of these concepts. These illustrations do not include all potential design solutions for meeting the Hillside Development Regulations, however they do show conceptual designs which fulfill the regulations intent. Land planners, site designers, engineers, and architects are encouraged to explore additional design solutions that fulfill the intent, purpose and specific requirements of Carlsbad's Hillside Development Regulations.

A. Coastal Zone Hillside Standards

Carlsbad's Local Coastal Program (LCP) and Chapters 21.38 and 21.201 - 21.203 of the Carlsbad Municipal Code implements the California Coastal Act. As shown on Exhibit 6, Carlsbad's Local Coastal Program is divided into six segments. Certain segments of Carlsbad's LCP require additional conservation of hillside areas. Wherever LCP hillside restrictions differ from Carlsbad's Hillside Development Regulations, the more restrictive aspect of each regulation shall be met. All segments except the Agua Hedionda segment and the Village Redevelopment segment have the same Hillside Development restrictions. The following regulations are taken directly from Carlsbad's Local Coastal Program.

For Agua Hedionda segment the following special requirements must be met:

Policy 4.4 Recognizing the unique environmental features of the lagoon and its environs and the sensitivity of the area to soil erodibility and sedimentation, development shall be regulated as follows:

- a. Development on existing subdivided lots having all of their area in slopes of 25% or greater shall be permitted, but grading shall be limited to minimal site preparation for pole-type footings. Driveway/parking areas shall be limited in size and shall be restricted to an area adjacent to the local streets. On-site vegetation shall not be disturbed beyond the minimal area needed to be cleared for the construction process, which shall be clearly delineated on approved site plans.
- b. Development, grading and landform alteration in steep slope areas (25%) shall be restricted. Exceptions may include encroachments by roadways and utilities necessary to reach developable area. The maximum allowable density shall be calculated on the total lot area, although this may be modified through setbacks, plan review, or other requirements of this plan and applicable city regulations.
- c. Use of the Planned Development (PD) Ordinance and cluster development shall be required in areas containing environmentally sensitive resources, extensive steep slope areas and significant natural landform features.

There are no Coastal Zone Hillside Standards within the Village Redevelopment Segment.

For all other segments of Carlsbad's LCP the following policy regulates the development of hillsides:

Any development proposal that affects steep slopes (25% inclination or greater) shall be required to prepare a slope map and analysis for the affected slopes. The slope mapping analysis shall be prepared during the CEQA environmental review on a project-by-project basis and shall be required as a condition of a coastal development permit.

1) Slopes Possessing Endangered Species and/or Coastal Sage Scrub and Chaparral Plant Communities:

For those slopes mapped as possessing endangered plant/animal species and/or coastal sage scrub and chaparral plant communities, the following policy language would apply:

- a) Slopes of 25% grade and over shall be preserved in their natural state, unless the application of this policy would preclude any reasonable use of the property, in which case an encroachment not to exceed 10% of the steep slope area over 25% grade may be permitted. For existing legal parcels, with all or nearly all of their area in slope area over 25% grade, encroachment may be permitted; however, any such encroachment shall be limited so that at no time is more than 20% of the entire parcel (including areas under 25% slope) permitted to be disturbed from its natural state. This policy shall not apply to the construction of roads on the City's Circulation Element or the development of utility systems. Uses of slopes over 25% may be made in order to provide access to flatter areas if there is no less environmentally damaging alternative available.
- b) No further subdivisions of land or utilization of Planned Unit Development shall occur on lots that have their total area in excess of 25% slope unless a planned Unit Development is proposed which limits grading and development to not more than 10% of the total site area.
- c) Slopes and areas remaining undisturbed as a result of the hillside review process, shall be placed in a permanent open space easement as a condition of development approval. The purpose of the open space easement shall be to reduce the potential for localized erosion and slide hazards, to prohibit the removal of native vegetation except for creating firebreaks and/or planting fire retardant vegetation and to protect visual resources of importance to the entire community.

2) All other Steep Slope Areas:

For all other steep slope areas, the City Council may allow exceptions to the above grading provisions provided the following mandatory findings to allow exceptions are made:

- a) A soils investigation conducted by a licensed soils engineer has determined the subject slope area to be stable and grading and development impacts mitigatable for at least 75 years, or life of structure.
- b) Grading of the slope is essential to the development intent and design.
- c) Slope disturbance will not result in substantial damage or alteration to major wildlife habitat or native vegetation areas.
- d) If the area proposed to be disturbed is predominated by steep slopes and is in excess of 10 acres, no more than one third of the total steep slope area shall be subject to major grade changes.
- e) If the area proposed to be disturbed is predominated by steep slopes and it less than 10 acres, complete grading may be allowed only if no interruption of significant wildlife corridors occur.
- f) Because north-facing slopes are generally more prone to stability problems and in many cases contain more extensive natural vegetation, no grading or removal of vegetation from these areas will be permitted unless all environmental impacts have been mitigated. Overriding circumstances are not considered adequate mitigation.

3) Required Runoff Control Plan:

No development shall be permitted except pursuant to submittal of a runoff control plan prepared by a licensed engineer qualified in hydrology and hydraulics; such approved plans shall assure that there would be no increase in peak runoff rate from the developed site over the greatest discharge expected from the existing undeveloped site as a result of a 10-year frequency storm. Runoff control shall be accomplished by a variety of measures, including, but not limited to, onsite catchment basins, detention basins, siltation traps, and energy dissipators, and shall not be concentrated in one area.

4) Required Drainage or Erosion Control Facility Maintenance Arrangements:

Development approvals shall include detailed maintenance arrangements for providing the on-going repair and maintenance for all approved drainage or erosion-control facilities.

5) Installation and Timing of Permanent Runoff and Erosion Control Devices:

All permanent run-off control and erosion-control devices shall be developed and installed prior to or concurrent with any onsite grading activities.

6) Required Open Space Easements on Undeveloped Slopes:

All undevelopable slopes shall be placed in open space easements as a condition of development approval.

Items 3-6 may be required of all development that requires grading. Carlsbad's Hillside Development Regulations recognize that the Hillside Conservation Policies of Carlsbad's LCP segments must be met in addition to the requirements of Chapter 21.95.

B. Manufactured Slopes of Greater than 40% Gradient which are Greater than 15 in Height

Manufactured slopes of greater than 40% gradient which are greater than 15 feet in height are regarded as important aesthetic (visual) resources in that they provide vertical open space separation between developed pads and developed pads and roadways (See Exhibit 7). For this reason, the development of buildings upon such downhill manufactured slopes which are visible from roadways or adjoining properties is prohibited. However, for residential and non-residential uses, limited development upon such uphill perimeter manufactured slopes would be permitted and for non-residential uses limited development upon downhill perimeter manufactured slopes would be permitted as shown on Exhibits 8 - 10.

C. Contour Grading

Contour grading creates manufactured slopes in a rounded, undulating pattern that blend into and mimic the surrounding natural hillside. Exhibits 11 and 12 illustrate an acceptable contour grading concept along with an unacceptable manmade slope. The emphasis of the contour grading standard is to create contour graded slopes in areas where they would be visible (i.e., along Circulation Element roadways, collector streets and useable open space areas).

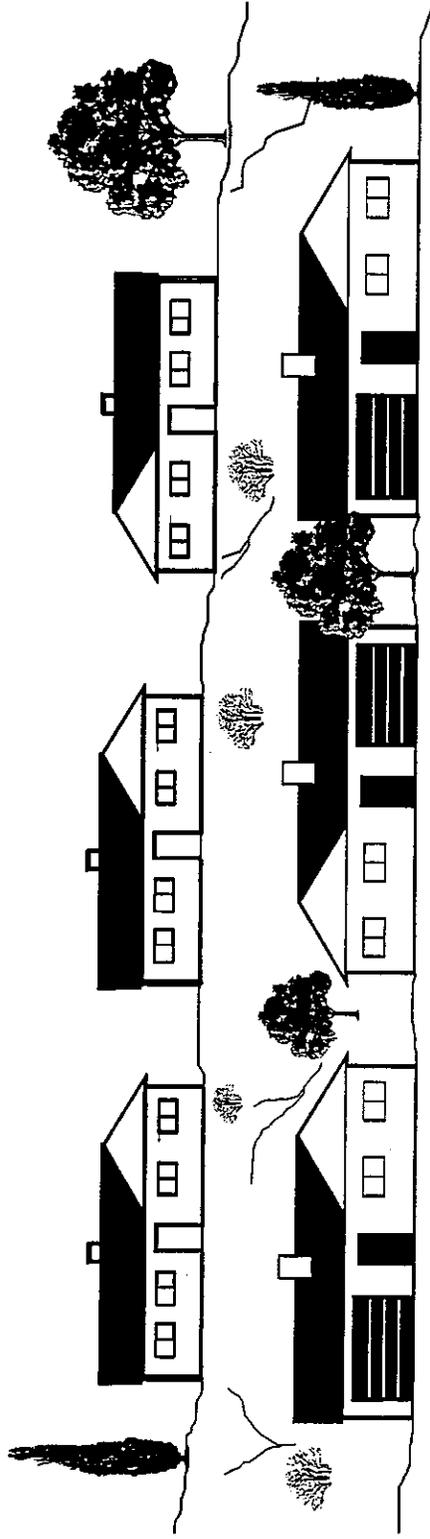
D. Screening Manufactured Slopes

The screening of manufactured slopes is of considerable importance. Exhibits 13 and 14 illustrate the use of a variety of landscape materials to soften the appearance of the manufactured slope. Another way to accomplish this includes using the building itself as a screening devise.

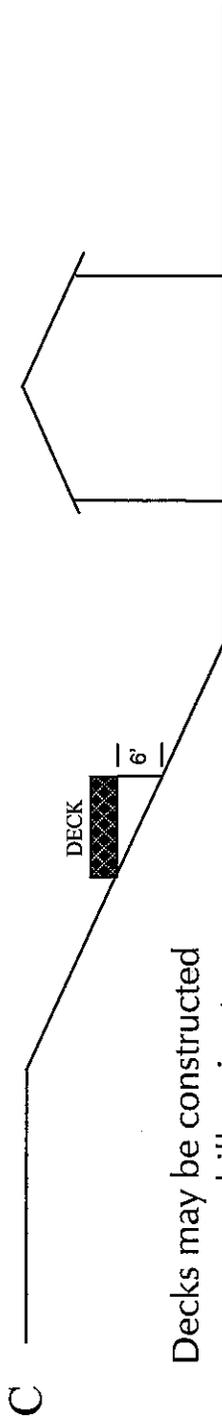
E. Hillside and Hilltop Architecture

Hillside and hilltop architecture should be customized to specific hillside conditions. It is strongly recommended that the project architect begin conceptual design work only after becoming fully aware of both the specific hillside site and the Hillside Development Regulations. A preliminary review by staff of the conceptual design is also recommended before any final design is submitted.

Manufactured Slopes Provide Vertical Separation Between Developed Pads

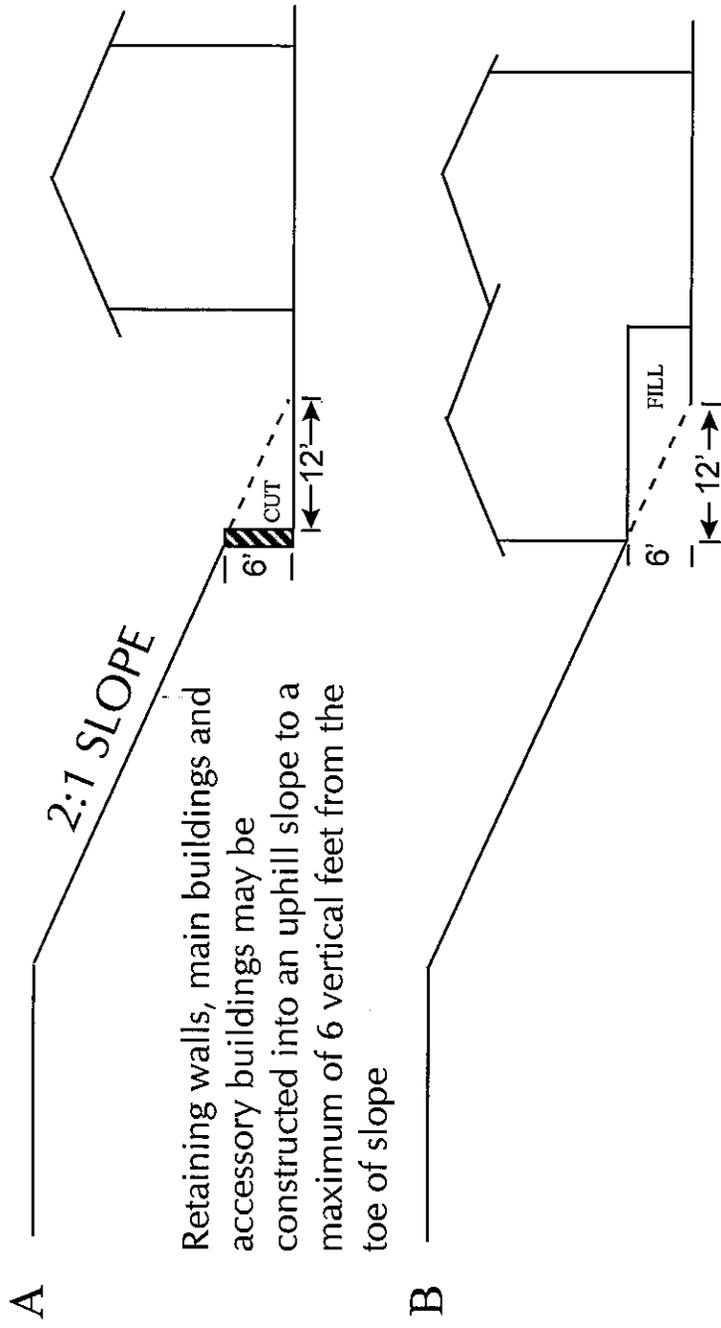


Permitted Residential And Non-Residential Development Of Uphill Perimeter Manufactured Slopes

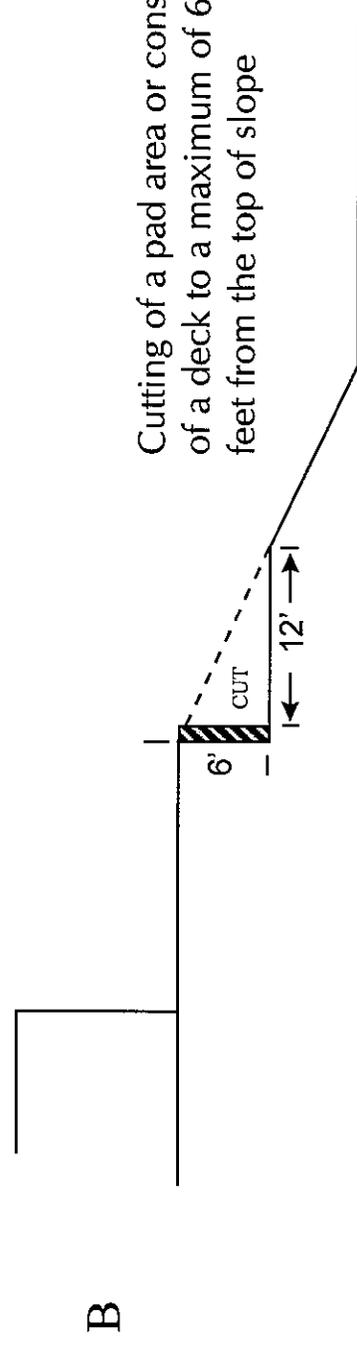
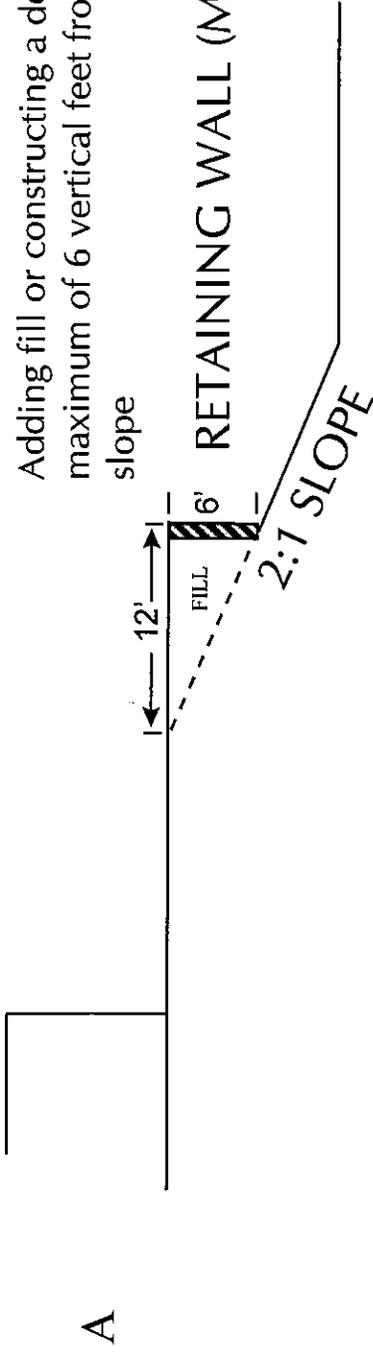


Decks may be constructed upon an uphill perimeter manufactured slope up to the required building setback of the underlying zone

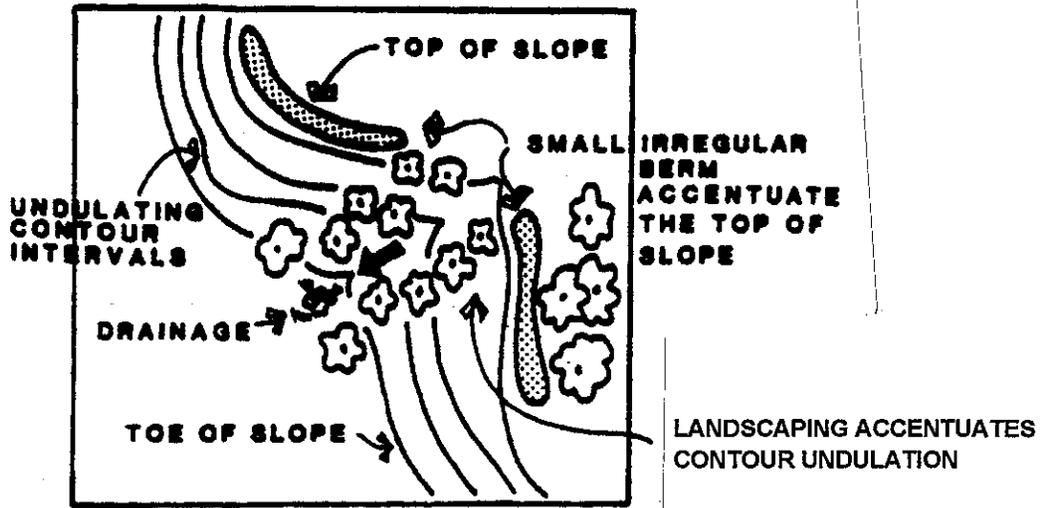
Permitted Residential And Non-Residential Development Of Uphill Perimeter Manufactured Slopes



For Non-Residential Uses Only Permitted Development Of Downhill Perimeter Manufactured Slopes

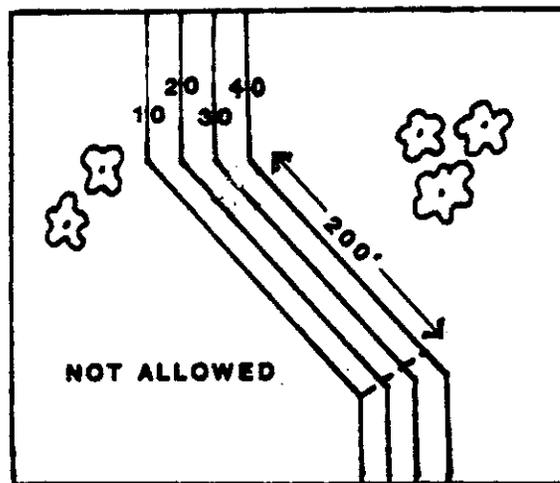


ACCEPTABLE



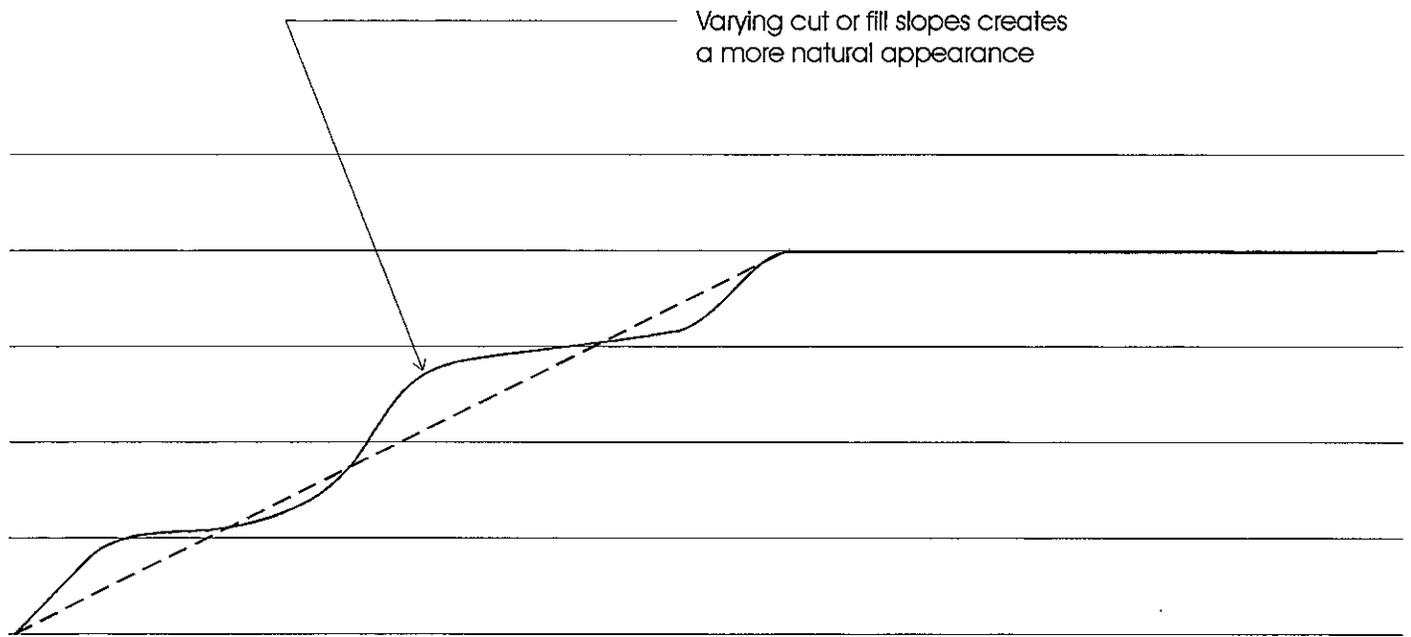
UNDULATING MANMADE SLOPE SIMULATES CONTOURS OF A NATURAL SLOPE

NOT ACCEPTABLE



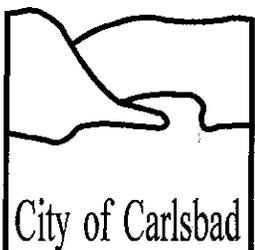
STRAIGHT UNNATURAL SLOPES ARE DISCOURAGED. STRAIGHT, FLAT MANUFACTURED SLOPES GREATER THAN 20' HIGH AND 200' IN LENGTH ARE NOT ALLOWED ALONG OR WHERE VISIBLE FROM MAJOR ROADS OR USEABLE PUBLIC OPEN SPACE AREAS.

CONTOUR GRADING



Not to scale

Where cut or fill conditions are created, the gradient of the slopes should be varied, rather than left at a constant angle which may be unstable or create an unnatural or "manufactured" rigid appearance



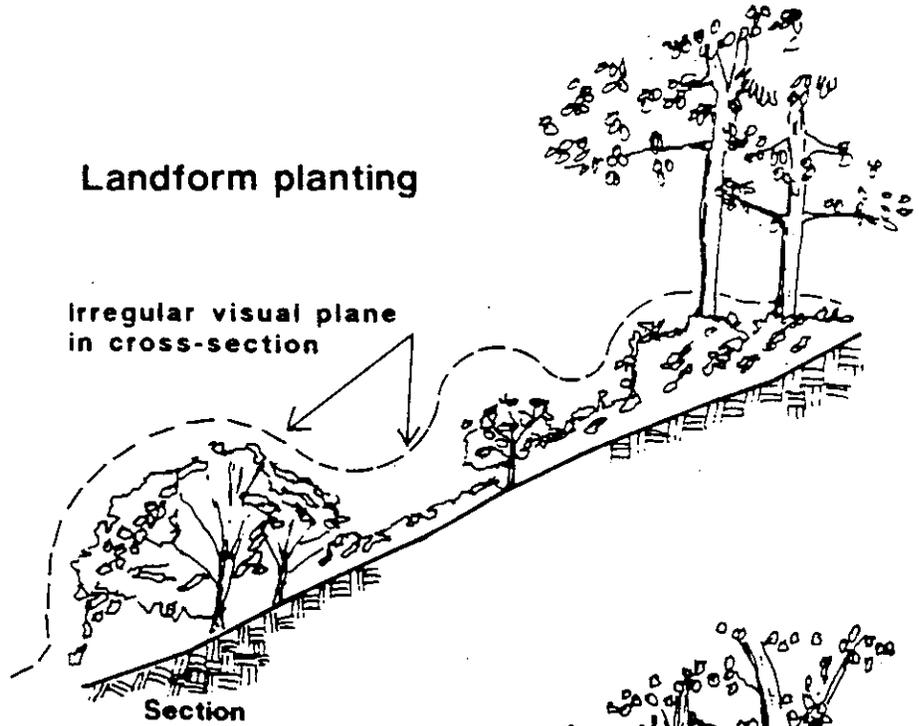
Landscaping

1. Natural landform planting should be used to soften manufactured slopes, reduce the impact of development on steep slopes or ridgelines, and provide erosion control.

THIS

Landform planting

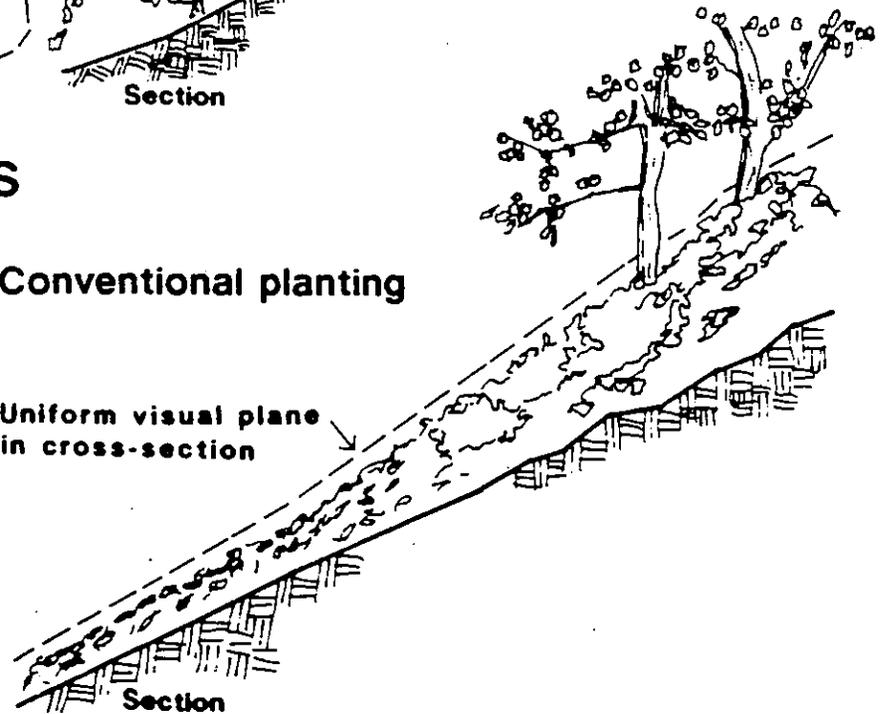
Irregular visual plane
in cross-section

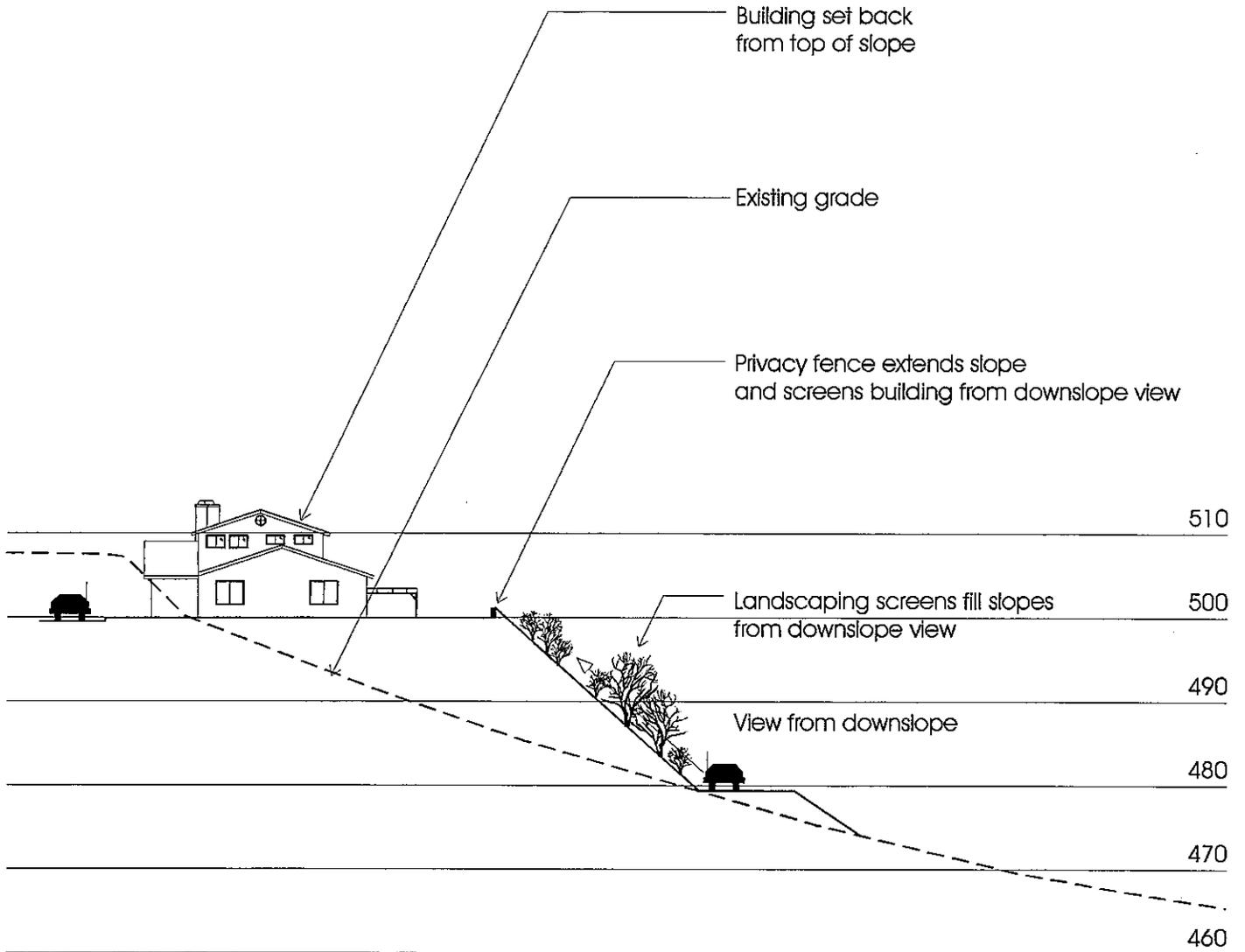


NOT THIS

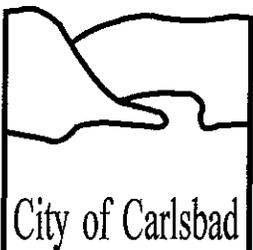
Conventional planting

Uniform visual plane
in cross-section





Not to scale



Exhibits 15 and 16 illustrate the architectural concepts of the Hillside Development Regulations. As a general rule, buildings should be designed or terraced to follow the dominant slope of the land. Some techniques which should be considered to accomplish this include:

1. Split pads, stepped footings and grade separations;
2. Multiple storied building which step away from the dominate slope face; and
3. Roof slopes which are oriented in the same direction as the slope.

The following architectural elements should be avoided:

1. Gabled roof ends on downhill slopes;
2. Large roof overhangs and cantilevers on downhill slopes;
3. Large rigid vertical facades on downhill slopes; and
4. Overhanging decks on downhill slopes.

F. Building Setbacks

Buildings which are proposed for development on hilltops and on pads that are created on hillsides should be sufficiently setback from the downhill slope to mitigate the visual impact of vertical building forms on hillside landforms. Measures which should be incorporated into project design to achieve this objective include the use of adequate slope edge building setbacks and multi-level roof planes which parallel the downhill slope. All buildings that are developed on hilltops or upon pads created on downhill perimeter slopes (greater than 15 feet in height) shall be setback so that the building does not intrude into a .7 foot horizontal to 1 foot vertical imaginary diagonal plane that is measured from the edge of slope to the building (See Exhibit 17). Exhibit 18 identifies the maximum permitted building height that can be achieved relative to the building's setback from edge of slope for a .7 foot horizontal to 1 foot vertical imaginary diagonal plane.

G. Roadway Design

Roadway design can have a pronounced impact on hillsides. Hillside sensitive roadways do not greatly alter the physical and visual character of a hillside by creating large notches in ridgelines or by defining wide, straight alignments. Instead, hillside sensitive roadways follow natural hillside landforms. This approach is both cost effective and aesthetically pleasing by eliminating the need for extensive grading.

The Hillside Development Regulations recognize that Circulation Element Roadways have specific design standards that when in conflict supersede the Hillside

Acceptable

Not Acceptable

Exterior materials and colors are harmonious with the tone and texture of the natural hillside

Small block wall extends berm height

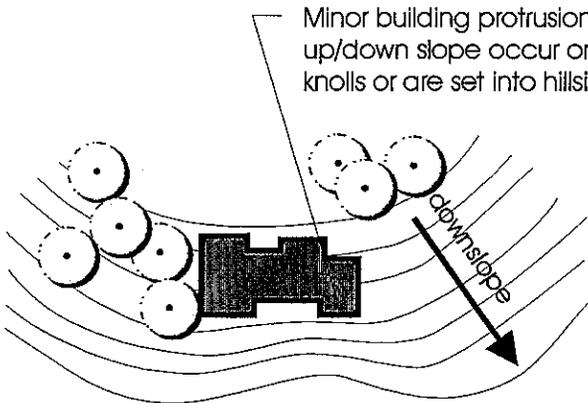
Roof plane parallels slope

Panoramic view

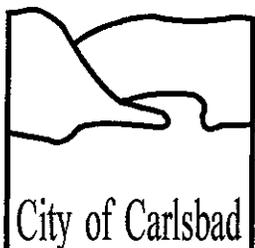
Small irregular berms and landscaping screens views from below

Multiple storied building steps away from slope face

Minor building protrusions up/down slope occur on knolls or are set into hillside



Building is parallel with contours



City of Carlsbad

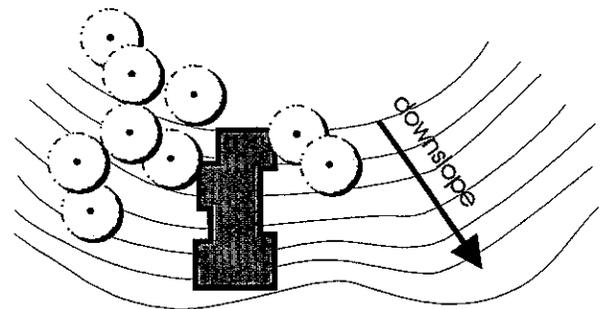
Excessive roof overhang results in additional visual bulk

Avoid large vertical facades

Avoid large gabled ends on downhill slopes

Avoid building over downhill slopes

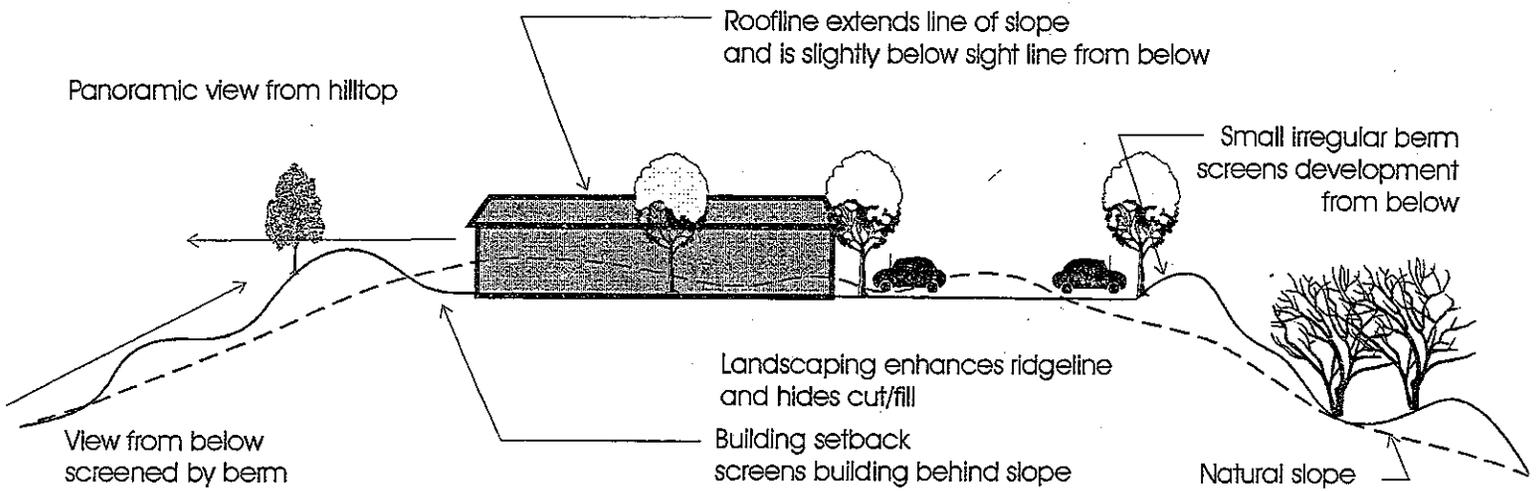
Bulky vertical architecture



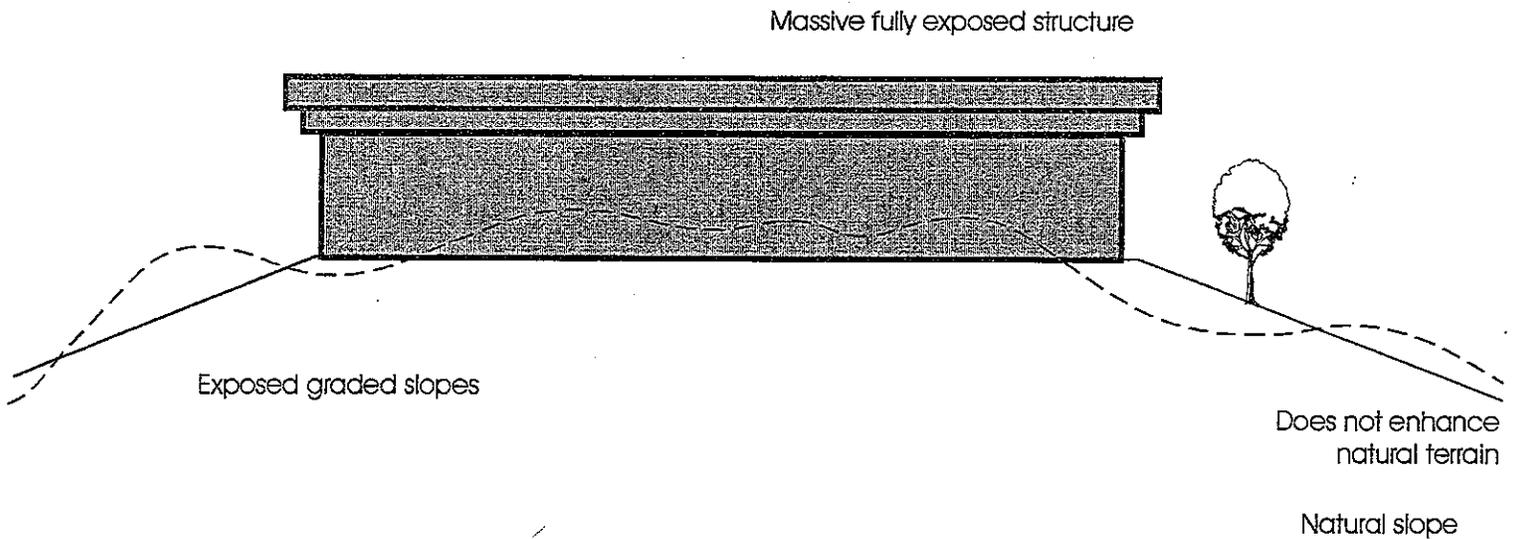
Building is perpendicular to contours

Hillside Architecture

Acceptable



Not Acceptable



Maximum Building Height/Building Setback For A .7 Foot Horizontal: 1 Foot Vertical Diagonal Plane

Bldg. Setback (Ft.)	Max. Building Height (Ft.)
6	8.57
7	10.0
8	11.42
9	12.85
10	14.28
11	15.71
12	17
13	18.57
14	20
15	21.42
16	22.85
17	24.28
18	25.71
19	27.14
20	28.57
21	30
22	31.42
23	32.85
24	34.28
25	35.71
26	37.14

Development Standards. Circulation Element Roadway Design Standards ensure public safety on these higher volume and speed roadways. Collector streets are similarly exempted from Hillside Development Standards in that their design is frequently determined by the alignment and grade of the intersecting Circulation Element Road. However, low volume internal roadways can readily comply with the Hillside Development Standards without impacting public safety. In some instances the City's Public Works design standards allow appropriate design flexibility to address a hillside condition.

H. Hillside Drainage

Hillside development should to the extent possible utilize and enhance natural hillside drainage networks. Drainage benches on slopes must vary in width to allow augmented landscaping to provide additional screening. Contour grading, hillside drainage and landscaping can many times be combined to "recreate" a heavy landscaped hillside ravine.