GRADING DESIGN MANUAL

Ordinance 1990-61
Adopted June 5, 1990 by
Pima County Board of Supervisors
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INTRODUCTION
Section 001: Introduction.

A. Purpose:
The purpose of this design manual is to provide direction for grading design in order to comply with Chapter 18.81 of the Zoning Code, reduce the visual impact of excavation and make the final graded land form and development appear natural. Grading is the mechanical modification and sculpturing of the existing land surface to create usable areas for specific land uses, to create special topographic features, or to solve visual and technical problems associated with development. It may involve excavation or filling of the original surface to any depth, or a combination of grading and filling. It includes initial clearing, brushing, and grubbing. Standards and guidelines have been prepared to illustrate more desirable approaches to grading.

B. Perspective:
The Sonoran Desert is a fragile environment. Vegetation takes years to establish itself, because of low rainfall. The soils are the result of deposition and, therefore, highly erodible (see Figure 1). The physical characteristics of Pima County create vistas of both scenic beauty and the built environment. Grading for development can severely scar the land unless appropriate design and revegetation measures are included in a grading plan.

C. Users guide:
1. Regulations versus guidelines:
This manual is structured to provide (a) the specific Chapter citation; (b) pertinent regulations, and (c) alternatives and suggestions to implement the regulations. The regulations (including those at the discretion of the county engineer) are shown in special typeface and are mandatory; the alternatives and suggestions are guidelines.
Sonoran Desert Characteristics

11" Annual Rain

Erosive Winds

Desert Varnish

Easily Damaged Root Systems

Alluvial Soils

Figure 1
2. All development projects shall require a Type 1 or Type 2 grading permit, except as exempted in Sec. 18.81.020-D. In general, small private grading operations do not require a grading permit (although consideration of the materials in this manual is recommended for all grading), major grading for custom home development requires a Type 1 permit (refer to Figure 2), and general grading for larger development projects requires a Type 2 permit (refer to Figure 3).

<table>
<thead>
<tr>
<th>Type 1</th>
<th>Type 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>submit to central permits; grading sketch; cut and fill limits; slope stabilization;</td>
<td>submit to DOT/FCD; grading plan; inventory &amp; assessment; stabilization; topography; drainage devices; soils report; DOT/FCD review; concept approval; resubmittal (if needed); final approval; permit issued.</td>
</tr>
</tbody>
</table>

permit issued.
Type 1 Application Process

1. Type 1 Application to Central Permits: Fee & Application Form, Grading Statement, Grading Sketch
   - Central Permits Distributes to Appropriate Review Departments
   - Reviewed within Five Working Days by PCDOT. Approved?
     - Yes
       - Permit Issued
       - County Inspection Option? (Refer to 18.81.070-B)
         - No
           - Developer's Engineer Provides Inspection and Inspection Certification
         - Yes
           - County Inspects per Inspection Schedule
     - No
       - Returned to Applicant with Written Comments
         - Applicant Modifies and Resubmits

2. Grading Completed. Applicant Calls PCDOT for Final Inspection
   - Grading Approved?
     - Yes
       - Letter of Approval Issued by PCDOT
     - No
       - Applicant Receives Inspection Comments, and Modifies Grading Accordingly

Figure 2
Type 2 Application Process

2 Copies of: Grading Plan, Site Inventory, Soils Report to PCDOT. Application Made and Review Fee Paid

Assurance Required?

Yes

Developer's Consulting Engineer Submits Grading Cost Estimate

Assurance Posted if Required

Yes

Submit Chcked for Adequacy within 5 Days. Adequate for Review?

Yes

Reviewed & Returned to Consulting Engineer with Written Comments within 30 Working Days. Approved?

Yes

Permit Issued. Inspection Schedule Provided if County Inspection Used.

County Inspection Option Used?

Yes

Consulting Engineer Inspection Option Used?

Yes

Consulting Engineer Must Certify Grading

Written Approval Issued by PCDOT with One Year Reinspection and Possible Repair Requirement Assurance Released

Final Inspection One Year after Approval

Grading Acceptable by PCDOT?

Yes

Final Written Acceptance Issued by PCDOT

No

Corrective Work Done by the Developer

No

Written Inspection Comments Provided by PCDOT with Corrective Work Done by Developer

No

County Inspection According to Inspection Schedule Provided by the County Engineer

Grading Work Completed. Developer Requests County Inspection

Grading Approval from PCDOT?

No

Development's Consulting Engineer Does Site Inspection

No

Developer's Consulting Engineer with Written Comments within 30 Working Days. Approved?

No

Reviewed & Returned to Consulting Engineer with Written Comments within 30 Working Days. Approved?
RECOMMENDED TYPE 2
SITE INVENTORY OF EXISTING CONDITIONS
Section 002: Recommended Type 2 Site Inventory of Existing Conditions.

18.81.060-B.13
"For superior project design and grading performance, it is encouraged that the project designer prepare, for project design use, an existing site inventory, identifying and quantifying vegetation, soils, on- and off-site viewshed constraints, slope analysis and drainage."

A. Scope:
Prior to the preparation of a Type 2 grading plan, an on-site inventory and assessment of existing conditions is recommended. The purpose is to identify and quantify existing conditions to alert the grading designer to existing on-site physical, visual and biological constraints, and to consider measures needed to mitigate adverse grading impacts. This inventory is intended to assist the project designer and is not a requirement for approval of a Type 2 grading plan, but shall be considered a special circumstance for preliminary grading approval (refer to 18.81.060-G).

B. Inventory and assessment of existing conditions:
1. Slopes:
Identify on a contour base map and quantify the areas of each of the following slope categories:
   a. 0% to 5%;
   b. over 5% to 15%;
   c. over 15% to 30%;
   d. over 30%; and
   e. rock outcroppings.

2. Vegetation:
Identify, locate and quantify on the contour base map, all saguaro and barrel cactus, and significant stands of:
   a. ocotillo and yucca;
   b. mesquite, ironwood, acacia, blue palo verde, foothill palo verde and hackberry having a crown of a minimum of 15 feet;
   c. crucifixion thorn, hopbush and jojoba.

3. Viewsheds:
A. Identify on the contour base map the:
   1) primary views from the site to off-site features, such as mountain, city, ridge lines and valley; and
   2) off-site views to the site based on the visual exposure from existing development.

B. Viewsheds shall be delineated as foreground, middle-ground and background, with the angle or cone of vision shown from specified areas.

4. Hydrology and drainage:
Identify on the contour base map the drainageways of the site, direction of flow and the 100-year floodplain of drainageways of 100 cubic feet per second or greater.
C. Composite map:
All of the information of Sec. 002-B shall be composited into one transparent map of the same scale as the grading plan, to enable overlay comparisons (refer to Figure 4).
GRADING DESIGN
Section 003: Grading Design

A. General guidelines:

1. Approach to grading design:
   A. Each site presents a unique set of conditions that influences the grading design. A grading concept that would be ideal for one site might be inappropriate for another.

   B. Grading design involves solving complex technical and aesthetic problems. Grading solutions should be an expression of good, skilled design that harmonizes with the existing environment.

   C. There are two distinct approaches to grading design: architectural and natural:

      Architectural grades are parallel and perpendicular with slope, steep, uniform and straight with sharp transitions between existing and new use areas. Forms and shapes are crisply defined and molded to express man's dominance and separation from nature (see Figure 5).

      Natural grading on the other hand is carefully conceived to blend with nature. This approach creates land forms that approximate existing grades with less severe, rounded transitions (see Figure 6).

      The use of these approaches is personal and depends on project design philosophy and the site's opportunities and constraints.

   D. All site development requires at least some remodeling of the earth's surface. The remodeling is specified by the grading sketch or plan, which is the key document in site planning. As the grading plan evolves it may cause the concept to be significantly modified. The skill in which the plan is made will have a major bearing on the technical adequacy of the overall project and its functional, economic and visual success.

   E. Grading design is conceptualizing and subsequently molding land into functional and visually pleasing forms which must successfully relate to other design considerations.

2. Functional reasons for grading:

   A. Direct surface runoff to natural drainage features or flood control systems;

   B. Create local drainage swales;

   C. Create proper pads or gradients for specific structural improvements;

   D. Create circulation routes; or

   E. Solve other technical problems, such as unfavorable subgrade, soil conditions, noise, or wind barriers.

3. Visual guidelines for grading (see Figures 7, 8, 21, 25):

   A. Emphasize existing land form or create interest to a flat site;

   B. Hide undesirable views or enhance existing or potential views;

   C. Relate site to surrounding physical features;

   D. Relate and integrate structures into the site;

   E. Emphasize or control circulation routes;

   F. Create visual illusions by enhancing or subduing size or shape of spaces and structures.
Visual Guidelines for Grading

Add Interest to a Flat Site

Integrate Structures to their Site and Surrounding Features

Subdue Sizes of Structures

Hide Undesirable Views

Control Circulation Routes

Figure 7
4. Visual perception factors relating to grading:
Since a source of community concern relating to grading is visual impact, the following visual perception factors are to be considered in grading design:
A. Convex or concave forms are generally more pleasing to the eye than straight planes. Concave forms generally appear lighter and more elegant;
B. A rise in grade is dramatic and gives a feeling of expansion or vastness, but reduces circulation ease;
C. The steeper the slope next to a level area, the greater the spatial break between the two planes (see Figure 8.C);
D. Valleys afford a complete visual composition. Open or rounded valleys are expansions; steeper and angular valleys appear secluded;
E. Downward or declining land forms give a sense of refuge, confinement, protection, privacy and harmony with the forces of gravity;
F. Horizontal or open, flowing space provides for easy, safe movement and free choice of direction, but often results in monotony;
G. Symmetrical planes indicate man's control of the landscape. Symmetrical land forms require precision in detail and bold forms to succeed;
H. Asymmetric round forms often depict freedom and bring man into harmony with nature;
I. An axial plane becomes highly directional, orderly and dominating, but often monotonous. It is not conducive to relaxation, appreciation of nature or freedom of choice;
J. Flowing shapes and continuous form and space connote a feeling of relaxation;
K. Flat sites are monotonous and usually convey a rather neutral landscape quality;
L. Circulation routes that loop and switch back along a steep grade reduce the apparent height and length of climb. Conversely, circulation routes that travel in a straight, unbroken climb increase the apparent distance and height and are more tiresome in ascent;
M. Retaining walls create a more formal feeling than natural slopes;
N. A sudden change in level is a classic way to introduce surprise and variety;
O. A slope upward from a building will appear cramped unless extensive concave grading is done. The view uphill is foreshortened, reducing the apparent size of outdoor space;
P. A cross-fall slope presents a great design challenge. Buildings appear to slip sideways unless they are designed to blend with the slope;
Q. Straight lines are strong, bold, and lead forward; horizontal lines are subtle and exude peace and quiet, restfulness; diagonal or zigzag lines are busy, active, dynamic, erratic and many directional; curved or rolling lines are calm and tranquil.
Different Visual Effects
Created by Varying Slope and Horizon Line

(a) Implied Space
(b) Defined Space
(c) Well Defined Space

Equal Width

Figure 8

Buildings Sited to Conceal Slope

Approximate Building Height Contour Line

Maintain Integrity of Natural Slope

Figure 9
B. Specific techniques:

1. Building height contour line:

20.81.030-B.1

*A contour elevation line set at the existing grade elevation, plus the maximum building height permitted by site rezoning conditions or this (zoning) code and 50% of the additional height added by permitted fill* (see Figure 10);

A. The overall objective of the building height contour line is to encourage buildings to cascade up or down natural grade, minimizing unsightly mass grading and blending into the natural terrain;

B. The intent is to prevent the creation of cut and fill elevations that would enable any building height to penetrate above the building height contour line. This means grading design demonstrates sensitivity to natural topography and drainage by integrating building siting and height into the natural terrain through slope-adaptive foundations;

C. Special attention is to be given to cut and fill slopes relating to side, front and rear lot treatment, to minimize grading and the creation of unsightly large, level areas. This can be accomplished by using varying configurations and architecture (refer to Figure 11), such as:

1) full split pads;
2) rolled or sloping pads;
3) stepped footings;
4) walled pads;
5) cantilevered, pole and earth-sheltered building foundations.
Integration of Building to Natural Terrain Through Slope Adaptive Foundation

- Full Split Pad
- Stepped Footing
- Rolled or Sloping Pad
- Walled Pad
- Cantilevered Foundation

Figure 11
2. Retaining walls:
A. A retaining wall (refer to Figure 17) is a grade change device that allows the greatest vertical change in elevation in the shortest horizontal distance. They are the most expensive method for accommodating grade change, but may be necessary where space is at a premium or where use of walls is an integral part of the site design;
B. Although there are hundreds of varieties of retaining walls, they can, for the most part, be classified as gravity or cantilever. Gravity walls depend on mass to achieve stability. Cantilever walls are nearly always made of reinforced concrete since they are formed in a structural T or L shape, utilizing much of the weight of the backfill to help achieve stability.

3. Terraces:
Terraces provide a series of relatively flat intermediate levels to accommodate a change in grade. The reasons for terracing may be visual, functional or structural. The use of terracing eliminates a large ugly bank by dividing it into a series of smaller ones which make it easier to control erosion, drainage and revegetation.

4. Revegetation:
A. Revegetation for visual enhancement, or erosion and sediment control, is an integral part of grading activity;
B. Slopes steeper than 3:1 that will not readily support soil binding plants, plant material may have to be held in place with mechanical structures,

Undulating Transition to Natural Area

![Diagram of Undulating Transition to Natural Area](Figure 12)
such as retaining walls or stone blankets;
C. Sites that are marginal for stabilization with vegetation alone can be successfully held in place by a combination of mechanical and vegetative means;
D. In the process of establishing vegetation in areas of low soil productivity, the following minimum slope and surface requirements shall be followed as preconditions for revegetation:
   1) slopes no greater than 3:1;
   2) designed for stability;
   3) designed for control of surface and ground water;
   4) designed for quick establishment of vegetation;
   5) on long slopes, a system of bench terraces or diversions may be needed to reduce effective slope length.
E. Establishment: once established, desert plants can survive with little or no supplemental irrigation. It is important, however, to give young plants the special attention they require to become properly rooted to assure their success.
F. Planting: the cool autumn months of October and November are the best time to plant most desert species. The stress from heat and water loss is lower than during the summer months, yet temperatures are high enough to stimulate new growth. Also, winter precipitation is an important source of moisture for young plants. Winter and spring planting can also give satisfactory results. Although new top growth may be negligible, critical root systems are developing underground.
   The water-holding capacity, aeration and general texture of most desert soils can be improved by the addition of approximately 1/4 to 1/3 organic matter, by volume, to the soil. Finely shredded nitrogen-stabilized fir bark is a good organic additive. Sawdust and other coarsely ground wood products should be composted first otherwise, their natural decomposition in the soil will tie up valuable nitrogen, an element essential to plant growth, rendering it unavailable for nutrient uptake by plants. Because of the high salt content of manures, they should be used sparingly and only as a supplement to other organic additives. Fresh manures should never be used.
G. Watering: the first few months for newly planted trees are critical. They must receive adequate irrigation to encourage deep rooting. The soil around the root zone should not be allowed to go completely dry, but it should not be kept saturated. Good drainage is essential. To survive, roots require oxygen just as they do water. Irrigate slowly and deeply to leach away harmful salts and to build up a moisture reservoir that the plant roots can grow into. If a watering well is used at the base of the plant, its diameter should be equal to the spread of the plant. At first, irrigation may be as often as every few days in hot weather. Gradually water less often, but deeply, until the plant is maintaining itself well for long periods of time. It must be emphasized that no single irrigation schedule can be given for all species of plants under all circumstances. In general, desert plants may
Slope Treatments

THIS

Variety in Undulating Slope Bank Creates Pleasing Roadscape

NOT THIS

Straight Slope Bank Heightens Monotony of Roadway Landscape

THIS

Round Off Cut Edges to Conform to the Natural Grade

NOT THIS

Unnatural Cut Slope Edges

THIS

Variety in Slope Bank Gradients Creates a Natural Appearance

NOT THIS

Engineered Slope Banks Look Forced and Unnatural

Figure 13
be irrigated heavily as often as once every few weeks throughout their first hot season (May-September). They seldom need any irrigation during winter months except during prolonged droughts. By the second summer most well-established plants will survive with little supplemental irrigation. To promote faster growth, however, plants may be watered every three to five weeks throughout their growing season, depending on the water requirements of the plant.

5. Berms:
A berm is a carefully formed earth mound used for special design effect. In most cases berms are naturalistic or free-flowing. Berms are usually 2:1 or 3:1, but not so steep as to promote erosion or inhibit plant life. They can be very effective on flat sites where vertical relief is needed. The main disadvantage is that they need a considerable amount of horizontal room as compared to a fence or retaining wall.

6. Conformance with natural terrain:
A. The overall shape, height, and grade of any cut or fill slope should be designed to simulate the existing natural contours and scale of the natural terrain of the site (see Figures 13, 16):
   1) where cut or fill slopes over 5 feet in height exceed 100 feet in length, the contours of the slope should be curved in a continuous, undulating fashion with varying radii to reflect the natural terrain (see Figure 12);
   2) slopes should have variable gradients.
B. The angle of the graded slope should be gradually adjusted to the angle of the natural terrain.
C. Sharp angular forms should be rounded and smoothed to blend with the natural terrain. The crest of any slope should be rounded (see Figure 14, 15), unless sharp, angular forms exist in the surroundings or a design contrast is desired.

7. Architectural treatment:
Where appropriate, buildings should be sited to conceal graded slopes (see Figure 9).
Rounded Slope Detail

Round the Top 5 Feet of Slope

Figure 14

Rounded Crest of Slope

THIS

NOT THIS

Figure 15
Conformance with Natural Terrain

THIS

NOT THIS

Figure 16
GRADING CONSTRUCTION
Section 004: Grading Construction.

A. Clearing, brushing and grubbing:
   1. The first step in actual grading is the clearing, brushing or grubbing of only those areas of the project site which later will be constructed upon, landscaped or surfaced.
   2. Existing vegetation and areas that are to remain undisturbed shall be protected by flagging, roping or other physical means that will visually warn grading or construction equipment away from these areas.
   3. The contractor shall maintain adequate grading supervision during the clearing, grading or brushing to ensure that only those areas to be graded in accordance with the grading permit are disturbed.
   4. Dust control in accordance with Sec. 005-A shall be maintained during clearing, brushing or grubbing, and until revegetation or site stabilization has occurred.
   5. Interim drainage control using surface or subsurface drainage devices may be required by the county engineer.

B. Cut or fill slopes:
   18.81.040-C
   *All exposed cut or fill slopes shall be revegetated or stabilized*
   1. Grading of cuts or fills (refer to Figure 18):
      A. Cut or fill slopes shall be no steeper than 1.5:1, unless stabilized or otherwise provided for in the approved soils report;
      B. Cut or fill slopes 3:1 or less steep shall be revegetated in accordance with Sec. 005-B;
      C. Cut or fill slopes steeper than 3:1 shall be protected by approved measures in accordance with Sec. 005-D;
   2. Fill slopes for Type 1 grading permits:
      When a Type 1 grading permit is approved without an accompanying soils report, fill shall be placed in accordance with the following criteria:
      A. Such proposed slopes shall not have an adverse effect on adjacent properties;
      B. Fill slopes shall not be contiguous to a public or private roadway. Refer to Sec. 004-G for setback requirements;
      C. Fill shall be placed in vertical lifts of no more than eight inches in uncompacted depth and then rolled with a rubber-tired vehicle or dozer tracks for a minimum compaction effect;
      D. The finished fill shall be less than 15 feet in height and shall be revegetated or protected in accordance with Sec. 005;
      E. Erosion or drainage control devices may be required in accordance with Sec. 005-C.
   3. Fill slopes for Type 1 with a soils report, and Type 2 grading: Fill slopes shall be treated in accordance with Sec. 005 and the design recommendations of the approved grading plan and soils report.
Common Grading Terms

- Lined Drainage Swale or Ditch
- Berm to Direct Water Off Slope
- Fill Slope
- Fill Compacted to Specifications
- Subsurface Discharge Pipe
- Original Ground Surface
- Drainage Swale or Ditch
- Weep Hole
- Cut Slope
- Retaining Wall

Figure 17

Comparison of Slopes

- Steep Slopes Over 3:1 Require Mechanical Stabilization
- Slopes No Greater than 3:1 Require Vegetation

Figure 18
C. Cuts:
1. Type 1 grading excess cut disposal:
   A. The disposal site location, amount of spoils (in cubic yards) and haul route for the off-site disposal of grading cut or fill spoils material (such as soil, rock, organic material or debris) shall be identified within the Type 1 grading statement;
   B. When unanticipated spoils occur, the permit holder shall provide the above information to the county engineer for review and approval prior to the disposal of any spoils material.
2. Type 2 grading excess cut disposal:
   As provided for in the grading plan.

D. Fill:

1. Import of fill:
   The import of fill shall be clearly noted in the grading statement or grading plan.

2. Composition:
   All imported fill shall be free of boulders greater than twelve inches in diameter and any detrimental organic material or refuse debris.

3. Fill compaction:
   *When required by the grading design manual, fill shall be compacted and soil tested*

   A. Fill compaction shall conform to the design and recommendations of the approved plans, soils report and this section. Recommended compaction equipment for fill is conventional vibratory, sheepfoot or rubber-tired rollers. *Jumping jacks*, *vibrating turtles* or similar small mechanical compaction equipment are recommended for tight areas such as foundation trenches;
   B. The county engineer may require soil tests to be taken by an approved testing agency upon completion of any compaction work.
   C. For projects requiring a Type 2 grading permit, the civil engineer or soils engineer of the developer shall provide written certification of the placement and compaction of fill.

4. Fill within a right-of-way or slope easement:
   Fill shall be placed in increments no greater than eight inches in uncompacted depth per lift and shall be compacted to 95% density, per Arizona Department of Transportation test methods 225, 226, 227, 230, or 231 and 232, or as recommended in the soils report or plans approved by the county engineer.

5. Fill related to structures:
   Fill upon which structures are to be built shall be placed and compacted according to local building code criteria and the county building code, Chapter 15.29.
6. Excess material disposal:

18.81.040-L

The off-site disposal of excess material shall be approved by the county engineer.

E. Terracing:

18.81.040-D

"Terracing to control surface drainage and debris on cut or fill slopes may be required"

1. Terraces:
Terraces shall be required for cut and fill slopes greater than 15 feet in height and shall be located at vertical intervals of not greater than 15 feet (see Figures 19 and 20).

2. Terrace bench:
The width of a terrace shall be a minimum of six feet and shall be graded to drain towards the toe of the upper slopes and into an approved drainage control device, and then conveyed to an acceptable outlet, as determined by the county engineer.

3. Stabilization:
A. Terraces shall be stabilized in accordance with Section 005-D;
B. Erosion and drainage control devices may be required by the county engineer, based on the approved soils report, grading plan or grading sketch;
C. The terrace bench shall be revegetated with approved grasses, shrubs or trees to help control surface drainage and reduce erosion potential, in accordance with Sec. 005-B.

F. Stabilization:
All exposed graded areas shall be stabilized to prevent erosion. Stabilization shall include the measures of Sec. 005.

G. Setbacks:
The following minimum setbacks shall be increased by the county engineer if considered necessary for safety or stability, or to prevent possible damage from water, soil or debris:

1. Top of cut slope:
The top of cut slopes shall be made not nearer to a site boundary line than one fifth of the vertical height of cut, with a minimum of two feet and a maximum of ten feet. The setback may need to be increased for any required interceptor drains.

2. Toe of fill slope:
The toe of fill slope shall be made not nearer to the site boundary line than one-half the height of the slope, with a minimum of two feet and a maximum of twenty feet.
Terracing Makes It Easier to Control Erosion, Drainage and Revegetation

Figure 19

Figure 20
3. Buildings:
Buildings shall be set back from the toe and top of slopes in accordance with the county building codes (Title 15), Illustration 18.81-3 or the approved soils report. This shall not reduce the required building setback from property line.

4. Rights-of-way:
The required setback of a slope toe adjacent to a public right-of-way may be reduced with the approval of the county engineer, if there will be no adverse effect and:
   a. easements are not required; or
   b. retaining walls are used.

H. Roadway construction:
1. Roadway-related clearing, brushing, grubbing, grading and cut or fill slopes for public and private roadways shall conform with Chapter 18.81 and this manual.
2. Erosion protection:

   18.81.040-H.1

   "The shoulders of a paved public or private roadway shall be protected against erosion wherever curbing or constructed spillways are not provided. Shoulders shall be protected against drainage erosion by the use of "V" ditches, drainage swales or other designs that will accommodate the velocity and amount of flow anticipated, as determined by approved hydrology methods approved by the county engineer;"
GRADING MITIGATION
Section 005: Grading Mitigation.

A. Dust control:

18.81.040-L.1

"During grading, and until revegetation or stabilization has taken place, dust shall be minimized through application of approved dust controls."

1. The frequency of application, quantity and types of palliatives shall be specified at the time of grading application and shall be incorporated into the approved grading plan or sketch. The county engineer may make site inspections to determine the adequacy of dust control and may require modified mitigation measures, if necessary, due to inadequate dust control.

2. Dust control permit:

All dust mitigation shall comply with Title 17, "Air Quality Control", of the county code. A dust control permit shall be obtained from the county air quality control district of the Department of Environmental Quality, prior to any grading activity.

3. Recommended dust control methods:

A. Acceptable dust controls:

1. Magnesium chloride: this product does not have adverse effects on plant life and is presently a low-cost treatment;

2. Lignum sulphate: this product does not have adverse effects on plant life;

3. Water: the use of water to control dust may be employed during or after grading, as may be approved by the county engineer;

4. Ground cover: a ground cover of decomposed granite, wood chips or other decorative landscape materials may be used in conjunction with revegetation on graded areas other than on slopes or areas subject to vehicular or pedestrian traffic.

B. Unacceptable dust controls:

Any product that would have an adverse effect on human, animal or plant life, or cause property damage.

C. Generally unacceptable dust controls:

1. Motor oil or oil treatment, due to its residual nature, leaching characteristics and adverse effects on plants and groundwater.

2. Sodium chloride, due to its residual nature and adverse effect on plant life.

B. Revegetation:

18.81.040-B. C

1. Graded areas that are to be revegetated according to an approved plan shall be revegetated with approved plant-list species appropriate to the site and its surrounding native habitat. Appropriate, in this sense, means that revegetation will be done, to the extent practical, with the same species and density present on undisturbed adjacent or nearby sites.

2. Exposed slopes with a slope ratio of 3:1 or flatter shall be revegetated, to include the planting of one-gallon desert trees on ten-foot centers.
Visual Interest Created by Varying Landforms and Use of Plant Material

THIS

Terracing Used to Soften Highway Cuts

NOT THIS

TYPICAL TANGENT SECTION

THIS

Topographical Undulations Should Create and Enhance Vistas and Screen Undesirable Views

NOT THIS

TYPICAL CURVE SECTION

Figure 21
and the planting of seeds for desert shrubs, grasses and trees upon the entire exposed slope, to resemble the natural desert environment. Seeds may be raked into the soil with appropriate mulch material, or hydro-seeding methods approved by the county engineer may be used. (See Figure 22).

3. The substitution of large specimen cacti for trees shall not exceed 50% of the number of desert trees required.

4. Refer to the landscape design manual for recommended revegetation species. Use those species that are compatible with the site, soils and conditions in which they will be planted.

5. During the effective period of the grading permit, any graded area that becomes overgrown with weedy species (e.g., Russian thistle, telegraph plant, desert broom, ragweed, pigweed, or burro brush) shall be controlled in order to prevent the spread of such species onto adjacent properties.

6. Terraces shall be revegetated with approved grasses (e.g., grama grass), shrubs (e.g., white brittlebush) and such trees and cacti which would help control surface drainage and reduce erosion potential.

7. The survival of revegetation shall be enhanced by appropriate irrigation and other maintenance procedures needed to establish the plants. A waiver may be obtained in accordance with Section 18.81.090.

C. Erosion and drainage control:

1. Erosion and drainage control measures may include:
   a. Revegetation;
   b. Stabilization;
   c. Surface and subsurface drainage structures;
   d. Temporary or permanent dust palliatives.

2. It is recommended that grading be phased so that prompt revegetation or construction can control erosion. Only those areas which will later be resurfaced, landscaped, or built on should be disturbed. Resurfacing of parking lots and roadways should take place as soon as practicable.

3. The preservation of natural drainage courses shall be in accordance with applicable county policies or regulations. (See Figure 23).

4. During construction, drainage and erosion control devices shall be used, as required by the grading permit, to control runoff from construction sites.

D. Stabilization:

1. Alternative methods:
   Alternative methods of stabilization may be approved by the county engineer provided that it can be demonstrated that the proposed method will provide resistance to soils loss.

2. Seeding:
   Seeding may be used as an interim mitigation measure. Seeding shall consist of the planting of an approved seed mix incorporating the methods of Section 005-B.2. Seeding is intended for use in areas to be constructed on or regraded in the future.
Seeding and Erosion Control Techniques

Wood Fiber Hydromulch

Drilled Seed with Straw Mulch

Jute Matting Application

Figure 22
3. Rip-rap:
A. Exposed slopes with a slope steeper than 3:1 shall be rip-rapped with native rock or stone that blends in with the natural setting:
B. Rip-rapping may be used on all exposed slopes in combination with, or in lieu of, revegetation;
C. Rock or stone of four inches to eight inches in diameter ($d_{50} = 6''$) shall be hand-placed and shall cover the entire exposed slope, filling all voids not occupied by trees or shrubs. It shall not encroach upon a floodplain nor upon adjacent properties;
D. If an exposed slope steeper than 3:1 ratio consists of soil material that is categorized as nonerodible, the county engineer may allow revegetation in lieu of rip-rapping, provided that data prepared by a registered soils or foundation engineer substantiating the nonerosive qualities of the exposed slope has been submitted to the county engineer, and provided the developer guarantees by covenant a two-year survival rate or replacement on all plantings.
E. Grouting or similar treatment may be required if soil characteristics mandate its use and shall be colored to appear the same as the rip-rap it augments. The rock shall be washed clean of all grout or shall be hand-placed in the grout, to present clean exposed rock faces;
F. Construction fabrics may be required beneath the rip-rap to prevent soil erosion.

4. Retaining walls:
A. Retaining walls shall comply with the county building code and be designed by a qualified professional engineer registered in Arizona;
B. The height of a retaining wall shall not exceed 15 feet. The color shall be consistent with the surrounding area.
C. Weep holes and other subsurface or surface drainage devices shall be provided, if required by the nature of the wall, the site or its soils or drainage characteristics.
(See Figure 24)

5. Drainage devices:
A. All hydrology design, sizing and flow calculations shall conform to methods used by and available from the county engineer;
B. Generally, slope drainage devices should be lined with concrete, gunite, rip-rap, grouted rip-rap or other approved designs, to minimize erosion caused by the velocity of intercepted flows;
C. Slopes may require drainage devices when water drainage patterns approach crests (tops) of slopes, toes (bottoms) of slopes or flow down the face of slopes. These devices may require collection and routing;
D. Slope drainage devices shall be designed to accommodate the 25-year flow or greater (not to exceed the 100-year flow), as determined by the county engineer. Their design and location shall be shown on the grading plan;
E. All intercepted drainage shall be routed to an acceptable outlet, as determined by the county engineer, which may include natural or
Grading within a Floodplain Requires Compliance with the Floodplain Ordinance

Retaining Wall Drainage

15' Maximum

Figure 23

Figure 24
man-made drainage facilities that are sized adequately to collect and convey the additional flow routed to them without adverse effects to up- or downstream properties. The proposed drainage routing shall comply with the county Floodplain and Erosion Hazard Management Ordinance and be approved by the county engineer.
F. Drainage and erosion control devices should be used when necessary, as determined by approved grading plans or soils reports, or grading sketches;
G. During the months of July through September, the effect of storm runoff on adjacent land uses and unstabilized banks shall be considered and mitigated through the use of approved structures or other measures, when required by the county engineer (see Figure 26).
6. Temporary or permanent erosion, sedimentation and siltation devices:
   A. Such devices shall be provided when soils conditions and grading design necessitate their use as determined by the county engineer;
   B. These devices may include temporary designs, such as straw bale dikes, siltation fences or similar devices;
   C. Permanently designed traps or basins shall be provided when soils conditions and grading design necessitate their use, as determined by the county engineer.

E. Surface drainage control structures:
   "Cut and fill slopes shall be provided with approved surface drainage for stability and erosion protection of affected properties"
   "Surface drainage interceptors shall be provided at the top of cut and fill slopes where there is surface runoff and erosion potential"
   "Drainage slopes to protect foundations shall be provided"

1. The following or similar devices may be designed for sediment and erosion control, cut and fill slope surface drainage and erosion control, surface drainage interceptors, for both temporary or permanent drainage and erosion control: drainage swales, lined or unlined "V" ditches (according to their use), earth berms for drainage diversion, or other similar devices that will serve the same function, as approved by the county engineer.
2. On slopes, such devices shall be located at the top and toe (see Figures 19, 30). The devices shall be located at the toe of the upper slope and shall be graded to cause the flow to collect within these facilities;
3. If natural or existing drainage routes are blocked during grading activity, drainage devices shall be used to intercept and route any blocked drainage;
4. Drainage slopes to protect foundations:
   Provide positive drainage away from foundations for all structures.
5. Erosion and drainage control for utility equipment:
   The installation and protection of utility equipment pads in and around sloping grades shall be considered in project design.
Plantings Soften the Visual Impact of Barrier Walls

Avoid Construction During the Rainy Season When Erosion Will Be Worst

Diversion Channel Around Construction Site
Straw Bale Siltation Interceptor

Temporary Paved Asphalt Drop Chute
Flow Collection Devices

Lined or Unlined "V" Ditches

Lined or Unlined swales

Earth berm Placement

Figure 30
F. Subsurface drainage control structures:

18.81.040-1.6
"Subsurface drainage for stability and protection of affected properties from ground water seepage may be required"

1. Subsurface drainage devices shall be used when the soils of the cut and fill slopes require subsurface water collection and drainage routing, as determined within the approved soils report.

2. Subsurface drainage devices may consist of various catch basin designs, french drain systems or other similar designs, and conveyance systems, such as concrete, metal or other suitable pipe material (see Figure 31).

3. These drainage devices shall be sized to collect and convey all expected subsurface drainage to an acceptable drainage outlet. The design and location of all such devices shall be shown on the grading sketch or plan.

G. Type 2 interim drainage control systems:

18.81.040-H.2
"Interim drainage control devices shall be provided in accordance with the grading design manual"

All interim drainage systems shall be designed to function adequately through the short time they are to serve and shall require the approval of the county engineer. The ten-year flow is generally acceptable (see Figures 27, 28, 29).

H. Site stabilization:

18.81.040-B
"All graded areas not revegetated, stabilized or constructed on upon expiration of the grading permit shall be revegetated or stabilized within 60 days of permit expiration"

For site stabilization methods, refer to Sec. 005D of this manual. The treatment of these graded areas shall require the approval of the county engineer.
Typical French Drain

Figure 31

Undulating Retaining Wall of Varying Height

Figure 32
GRADING DOCUMENTS
Section 006: Grading Documents.

A. Type 1 grading sketch:
   1. Plan preparation:
      The applicant shall prepare a grading sketch as follows:
      A. The sketch shall be drawn on a site plan at a scale no smaller than
         1" = 100', on one sheet of paper no smaller than 8½" x 11" and no larger
         than 24" x 36";
      B. All cuts and fills (including the location and quantity of any imported fill)
         shall be clearly shown on the sketch. Percent of slope and method of
         treatment shall be shown for all slopes. Natural open space shall be clearly
         delineated;
      C. The grading permit application and fee, along with two copies of the
         grading sketch and statement shall be submitted to the central permits
         division and distributed (if necessary) to applicable review agencies;
      D. Within five days of submittal, the permit (if approved) and one copy
         each of the sketch and statement shall be returned. If the application is
         determined to be inadequate, the applicant may submit, without additional
         fees, an amended sketch or statement;
      E. If the site is subject to the Hillside Development Overlay Zone (Chapter
         18.61) or the Floodplain and Erosion Hazard Management Ordinance, a
         more detailed sketch or analysis may be required;
      F. Slope drainage devices may be required to be shown on Type 1 grading
         sketches, when the county engineer determines they are needed.
   2. Soils report:
      A soils report may be required by the county engineer to supplement a
      Type 1 grading sketch when technical concerns arise during the review of
      the sketch relative to the proposed control measures or design for one or
      more of the following:
      a. Dust pollution;
      b. Soil stability;
      c. Structural design;
      d. Erosion vulnerability;
      e. Development of hazardous terrain (defined as a land surface
         which is underlain by a geologic hazard such as an active fault,
         consists of unstable soils, or is subject to flood hazards);
      f. Stormwater discharge;
      g. Siltation effects.

B. Type 2 grading plan:
   1. Plan preparation:
      A. Plans shall be drawn to scale upon substantial paper. The plans shall be
         of sufficient clarity to indicate the nature and extent of the proposed work,
         and conformance with this manual and Chapter 18.81 of the zoning code.
      B. The first sheet of each set of plans shall give the location of the proposed
         grading, the name, address and telephone number of the owner, the
person and firm (if any) by whom they were prepared, and of a subconsultant or associate (if any).
C. Plan dimensions shall be 24 inches by 36 inches.
D. A checklist for plan preparation shall be prepared by the county engineer within a reasonable time of ordinance adoption.

2. Drainage patterns:
Grading plans shall show existing and proposed flows affecting all slope crests, toes and faces, as well as all anticipated subsurface drainage that may affect these slopes.

C. Soils report:

18.81.060-C
The soils report shall contain all geotechnical engineering information and recommendations applicable to the project.

1. The geotechnical information shown in the soils report shall contain, at a minimum, the:
   a. Soil stability of all proposed cut and fill slopes;
   b. Angle of shear and maximum recommended slope ratio of all proposed cuts or fill;
   c. Erosion vulnerability of all graded areas and created slopes;
   d. Stormwater siltation potential of soils for all graded areas and created slopes;
   e. Description of soil constraints on the structural design of all foundations, footings and walls;
   f. Recommended compaction treatment of all fill areas;
   g. Identification of any potentially hazardous geotechnical areas where construction is proposed;
   h. Recommended treatment for stability, erosion and siltation control of all graded areas and created slopes.

2. The soil classification and design bearing capacity shall be shown on the grading plan for all areas where structures are proposed, unless the foundations of the structures conform with Table 29-A of Chapter 15.29 of the county building codes.
INSPECTIONS
Section 007: Inspections.

A. Type 1 Inspection procedures:
The county engineer may conduct spot checks during grading and shall perform a final inspection to ensure compliance with the grading sketch and permit conditions prior to final grading approval.

B. Type 2 Inspection procedures:
1. Projects using the county inspection process shall be provided by the county engineer an inspection schedule at the time of preliminary grading plan approval or issuance of a grading permit. The county engineer shall determine the type and frequency of inspections listed on the inspection schedule, based on the scope and complexity of the proposed grading.
2. The county engineer may inspect grading at points of completion in addition to those listed on the inspection schedule.
3. Inspection schedule:
   18.81.070-A.1
   "All grading which requires a permit shall be inspected by the county engineer in accordance with the grading permit."
   The inspection schedule shall require inspection and approval by the county engineer upon completion of each stage, which may include:
   a. Existing site conditions;
   b. Clearing, brushing or grubbing;
   c. Creation of cut or fill slopes;
   d. Placement of slope protection;
   e. Revegetation;
   f. Retaining walls;
   g. Construction of slope drainage devices.
4. Soils inspection:
The civil engineer or soils engineer of the developer shall provide all necessary inspections of soils and shall provide written certification to the building official that the foundation sub-base requirements have been met, prior to any foundation inspections.
5. Final inspection of rough grade:
Upon completion of rough grading, and within two working days of a request for inspection, the county engineer shall inspect rough grading for substantial conformance with the grading permit and the approved plan:
A. If acceptable, the grading assurances shall be released and a certificate of substantial grading conformance shall be issued;
B. If unacceptable, the grading shall be brought into substantial conformance, or a stop-work order shall be issued until such time as a revised grading plan has been approved. Rough grading may then be completed.
6. Final grading inspection:  
Upon completion of all grading required by the grading permit, and within two days of a request for inspection, the county engineer shall inspect the final grading and issue a certificate of final grading approval or require necessary corrective action prior to issuance of the certificate. At that time the project shall be scheduled for any re-inspections required by conditions of the grading permit or final grading approval.
Section 008: Appeals.

Appeal Process

1. Request for Waiver or Interpretation Review
2. Appealed to Technical Review Committee. Heard within 60 Days
   - Granted
   - Denied
   - Adjacent Properties within 300 Feet Notified
     - No
     - Yes
       - Opponent Appeals within 15 Days?
         - Yes
           - Proponent Appeals within 15 Days?
             - No
               - Waiver or Interpretation Granted
             - Yes
               - Appeal to Superior Court
         - No
           - Opponent Appeals?
             - Yes
               - Proponent Appeals?
                 - No
                   - Waiver or Interpretation Granted
                 - Yes
                   - Appeal to Superior Court
           - No
             - Proponent Appeals?
               - Yes
                 - Appeal to Superior Court
               - No
Section 009: Bibliography.

Section 002: Type 2 site inventory of existing conditions.

Miller, James D.  "Urban Forestry: Handbook of selected trees for southwestern urban environments".

Untermann, Richard K.  "Grade Easy".
CHAPTER 18.81
GRADING STANDARDS

Sections:

18.81.010: Purpose and interpretation.
020: Applicability and exemptions.
030: Definitions.
040: General grading performance standards.
050: Submittals and procedures: Type 1 (grading sketch).
060: Submittals and procedures: Type 2 (grading plan).
070: Inspections and performance defaults.
080: Enforcement and penalties.
090: Administrative modification.
100: Waivers and interpretation review.
110: Illustrations.

18.81.010 Purpose and interpretation.

A. Purpose:
1. The purpose of this chapter is to protect the public health, safety, general welfare, and aesthetics by regulating grading (including initial clearing, brushing or grubbing, and subsequent excavating or filling) on private and public land, including county-owned land, within the unincorporated area of Pima County.
2. It establishes grading standards designed to:
   a. Regulate the development of potentially hazardous terrain;
   b. Conserve the general visual character of grading sites and settings;
   c. Enhance the value of new development; and
   d. Conserve the value of existing, affected properties.
3. The guidelines and standards of this chapter and the Grading Design Manual have been prepared in the context of Pima County’s specific desert environment. They are intended to complement the applicable provisions of Chapter 18.61 (Hillside Development Overlay Zone) and the Floodplain Management Ordinance, and not to authorize any grading activity prohibited by this chapter or any county ordinance.

B. Interpretation:
1. This section shall be used as a guide whenever a conflict arises in the interpretation or enforcement of this chapter. The design, implementation and mitigation of grading regulated by this chapter (refer to Section 18.81.020) shall
be reviewed prior to the issuance of any grading permit, to ensure compliance with the guidelines of this section and the specific standards and requirements of this chapter.

2. The design and implementation of all grading shall:
   a. Minimize scars and other adverse visual impacts resulting from cut and fill;
   b. Blend with the natural contours of the land;
   c. Conserve the natural scenic beauty and vegetation of the site;
   d. Be for purposes other than enabling buildings to penetrate the building height contour line; and
   e. Restrict the areas and volumes to the minimum necessary to implement the planned development.

3. In all grading projects, measures shall be taken to:
   a. Ensure that graded hillside, slopes or other areas subject to erosion are stabilized;
   b. Reduce the erosion effects of stormwater discharge, preserve the flood-carrying capacity of natural or constructed waterways by limiting soil loss, and protect drainageways from siltation;
   c. Minimize dust pollution and surface water drainage from graded areas during grading and development; and
   d. Ensure that development activity is designed and implemented to minimize adverse impacts and include appropriate restorative measures.

(Ord. 1986-187 § 1 (part), 1986)

18.81.020 Applicability and exemptions.

A. Scope:
   1. All development projects shall require a Type 1 or Type 2 grading permit, except as exempted in subsection D of this section. In general, small private grading operations do not require a grading permit; major grading for custom home development requires a Type 1 permit, and general grading for larger development projects requires a Type 2 permit.
   2. County development projects shall abide by the requirements of Section 18.81.040, general grading performance standards, of this chapter. The board of supervisors may grant a special exception at a public hearing to a requirement of said section for a county development project.

B. Type 1 (grading sketch) permit applicability: A Type 1 grading permit is required for:
   1. Single dwelling residential development on a single lot with a development envelope of fourteen thousand square feet or greater.
   2. Nonresidential development which does not require a subdivision plat or development plan.
   3. Stockpiling of between one hundred cubic yards and fifty thousand cubic yards of material.

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4. Grading which requires a permanent cut or fill slope greater than five feet in height and steeper than a 3:1 slope, or grading on slopes of fifteen percent or greater.

5. New pavement of more than three thousand square feet.

C. Type 2 (grading plan) permit applicability: A Type 2 grading permit is required for:
   1. Residential development which requires a subdivision plat or development plan.
   2. Nonresidential development which requires a subdivision plat or development plan.
   3. Stockpiling of more than fifty thousand cubic yards of material.

D. Exemptions: The following activities are exempted from this chapter:
   1. Residential development on a single lot, with a development envelope of less than fourteen thousand square feet;
   2. The subsequent expansion, by less than twenty-five percent and not violating the spirit of this chapter, of an exempted or approved graded area;
   3. The clearing, brushing or grubbing of an area of less than fourteen thousand square feet or for activities exempted in this subsection;
   4. Stockpiling of less than one hundred cubic yards of material;
   5. Resurfacing or maintenance of an existing paved surface;
   6. New pavement of less than three thousand square feet;
   7. Individual sewage disposal system with a county health department permit;
   8. Excavation below finished grade for a basement, foundation, wall or swimming pool authorized by a building permit or zoning construction permit (refer to Section 18.01.030E, General provisions);
   9. Cemetery graves;
   10. Refuse disposal site controlled by other regulations;
   11. Exploratory excavation under the direction of a soil engineer or engineering geologist, provided all excavation is properly backfilled;
   12. Archaeological exploration conducted under state permit by a qualified archeologist;
   13. Removal of selected individual plants for storage and replanting;
   14. Underground utility installations under a paved roadway surface or a continuously-maintained unpaved roadway surface;
   15. Grading for the maintenance of an existing private access, road or driveway, provided that it either existed prior to adoption of, or was established in conformance with, this chapter. Proof of such may be required by the county engineer;
   16. Grading for an appurtenant access or utility easement;
   17. Land uses under statutory exemption (refer to Section 18.01.030C, General provisions).

(Ord. 1986-187 § 1 (part), 1986)

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18.81.030 Definitions.

A. General usage: The definition and usage of terms in this chapter are as contained within this code, except that the definition and usage of terms describing drainage are as contained within the county Floodplain Management Ordinance.

B. Definitions: For purposes of this chapter only, the following words and terms shall mean:
1. Access road: A road within one mile of the grading site, designated on the approved grading plan, and used, during grading, for the transport of grading equipment, hauling of fill and other equivalent traffic to and from the grading site.
2. Approval: Written notice by the county engineer approving the design, progress or completion of work.
3. Approved plan: The most current grading sketch or grading plan which bears the authorized signature of approval of the county engineer.
4. Approved testing agency: A facility which is equipped to perform and certify the tests required by this chapter and whose testing operations are controlled and monitored by a civil engineer.
5. Borrow: Earth material acquired from an off-site location for use in grading a site.
7. Building height contour line: A contour elevation line set at the existing grade elevation, plus the maximum building height permitted by site rezoning conditions or this code and fifty percent of the additional height added by permitted fill. Refer to Illustration 18.81-1.
9. Envelope, building:
   a. A dwelling unit and all attached roofed structures, including carports or patio ramadas;
   b. For nonresidential development, the building envelope shall be the main building and all attached roofed structures.
10. Envelope, development: The sum of the areas of the permit holder’s land to be graded, including the building envelope, accessory buildings, and areas of related parking, driveways, swimming pools, walls and other accessory structures, but excluding individual sewage disposal systems.
11. Erosion: The wearing away of the ground surface as a result of the movement of wind, water or ice.
12. Excavation: The artificial (i.e., mechanical, manual, blasting or other such) means for removal of earth material.
13. Final inspection: Field inspection conducted by the county engineer prior to project acceptance or release of assurances (if required).
14. Grade: The vertical location of the ground surface.
15. Grade, existing: The actual, current ground surface as of the date of adoption

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of the ordinance codified in this chapter.
16. Grade, finished: The final grade conforming to the approved grading sketch or plan.
17. Grade, rough: The stage at which grading substantially conforms with the approved grading sketch or plan.
18. Grading: The initial clearing, brushing or grubbing, and subsequent excavating or filling, of a site.
19. Grading permit: An official document issued by the county engineer authorizing the grading activity specified by the grading permit conditions.
20. Grading permit conditions: The specifications and requirements of the approved grading sketch or grading plan, grading statement, soils report or other documents necessary for grading permit approval.
21. Grubbing: The removal of trees and other large plants by their roots.
22. Inspector: A person authorized by the county engineer or building official to perform inspection on grading work.
23. Retaining wall: A wall designed to withstand lateral and hydrostatic pressures and built to keep earth from sliding, and which is two feet or greater in height from the lowest point of earth at the foundation to the top of the wall.
24. Revegetation: Placement of living plant material on sites or cut and fill slopes where the natural vegetation has been removed.
25. Site: Any lot or parcel of land, or contiguous combination of lots and parcels under the same ownership or unified control, where grading is to be performed.
26. Slope: An inclined ground surface, the inclination of which is expressed as a ratio of horizontal distance to vertical distance (refer to Illustration 18.81-2).
27. Soil: Naturally occurring deposits overlying bedrock.
28. Stabilization: Treatment with mitigation measures in accordance with the grading design manual, and approved by the county engineer, that contribute to the erosion or siltation resistance, or the structural strength, of a graded area.
29. Stockpile: The storage of uncompacted earth material.

(Ord. 1986-187 § 1 (part), 1986)

18.81.040 General grading performance standards.

A. Scope:
1. The performance standards of this section are general grading performance requirements. A companion grading design manual elaborates minimum performance standards referenced by this section and includes non-regulatory guidelines for superior grading performance.
2. The grading design manual shall be adopted and amended in accordance with Section 18.01.070 (General Provisions). The commission may hold the preliminary and public hearings concurrently. The technical review committee (refer to Section 18.99.040, Review Committees) shall provide a recommendation prior to commission public hearing.

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B. Site revegetation and stabilization: All graded areas except those to be used for agriculture or livestock purposes, not revegetated, stabilized or constructed on upon expiration of the grading permit shall be revegetated or stabilized within sixty days of permit expiration in accordance with the grading design manual, and furthermore, in cases where the purpose of the grading permit is not met, shall be designed to restore the native vegetative community.

C. Slopes: All exposed cut or fill slopes shall be revegetated or stabilized in accordance with the grading design manual and the approved grading sketch or plan.

D. Terracing: Terracing to control surface drainage and debris on cut or fill slopes may be required in accordance with the grading design manual. The width of a terrace shall be a minimum of six feet.

E. Fill: Fill shall be compacted and soil tested in accordance with the grading design manual.

F. Setbacks: The following setbacks shall be increased by the county engineer if considered necessary for safety or stability, or to prevent possible damage from water, soil or debris:
   1. Top of cut slope: The top of cut slopes shall be made not nearer to a site boundary line than one fifth of the vertical height of cut, with a minimum of two feet and a maximum of ten feet. The setback may need to be increased for any required interceptor drains.
   2. Toe of fill slope: The toe of fill slope shall be made not nearer to the site boundary line than one-half the height of the slope, with a minimum of two feet and a maximum of twenty feet.
   3. Buildings: Buildings shall be set back from the toe and top of slopes in accordance with the county building codes (Title 15), Illustration 18.81-3 or the approved soils report. This shall not reduce the required building setback from property line.
   4. Rights-of-way: The required setback of a slope toe adjacent to a public right-of-way may be reduced with the approval of the county engineer, if there will be no adverse effect and:
      a. Easements are not required; or
      b. Retaining walls are used.

G. Building height: The finished grade and building pads shall be established so that the maximum building height shall not exceed the building height contour line (refer to Illustration 18.81-1).

H. Drainage control systems:
   1. Permanent systems:
a. Erosion control shall be constructed and maintained to prevent erosion of slopes, and cleared, brushed, grubbed or graded areas, in accordance with the grading design manual.
b. Where cut slopes are not subject to erosion due to the erosion-resistant character of the native materials, erosion control may be omitted upon approval by the county engineer.
c. Erosion control devices to prevent erosion or sediment deposition on off-site property may be required in accordance with the grading design manual.
d. The shoulders of a paved public or private roadway shall be protected against erosion wherever curbing or constructed spillways are not provided, in accordance with the grading design manual.
e. Surface drainage:
1) Cut and fill slopes shall be provided with approved surface drainage for stability and erosion protection of affected properties in accordance with the grading design manual;
2) Surface drainage interceptors shall be provided at the top of cut and fill slopes where there is surface runoff and erosion potential in accordance with the grading design manual;
3) Drainage slopes to protect foundations shall be provided in accordance with the grading design manual;
f. Subsurface drainage: Subsurface drainage for stability and protection of affected properties from ground water seepage may be required in accordance with the grading design manual.

2. Interim systems: Interim drainage control systems shall be provided in accordance with the grading design manual.

I. Import and export of earth material:
1. Loading of earth material shall occur only within the time limits of subsection J of this section, and dust palliatives shall be applied in accordance with the grading design manual.
2. The transportation of earth material on public rights-of-way shall be in a manner that minimizes blowing soil and other hazards.

J. Hours of grading:
1. Grading equipment operation within one half mile of a structure occupied by humans shall not be conducted between sunset and seven a.m.
2. Normal equipment maintenance involving lights, motors or generators, and occurring within six hundred feet of a structure occupied by humans, shall not be conducted between nine p.m. and seven a.m.
3. The county engineer may allow grading equipment operation or maintenance during other hours if such operations are not detrimental to the health, safety or welfare of the inhabitants of the structure.
4. Permitted hours of operation or maintenance may be shortened by written notice, if the county engineer finds a substantial adverse effect on the health,
safety or welfare of the surrounding community.

K. Restrictions of vehicles:
   1. No vehicles shall be driven over "natural open space areas", as designated on the approved grading sketch or grading plan.
   2. Points-of-entry to the site during grading shall be only as designated on the approved grading sketch or grading plan.
   3. For Type 2 permits, access roads to the site during grading shall be only as designated on the approved grading plan.

L. Additional requirements:
   1. During grading, and until revegetation or stabilization has taken place, dust shall be minimized through application of approved dust controls in accordance with the grading design manual.
   2. Public right-of-ways, sidewalks and other improvements shall be maintained during grading in a neat and clean condition, free of loose soil, construction debris and trash.
   3. Debris, fill or equipment shall not be stored within a public right-of-way without the written approval of the county engineer.
   4. Cut or fill material in excess of that allowed by the grading permit shall be disposed of in accordance with the grading design manual.

   (Ord. 1986-187 §(part), 1986)

18.81.050 Submittals and procedures: Type 1 (grading sketch).

A. Scope: A Type 1 application for a grading permit requires a completed grading permit application, grading sketch and grading statement. A survey sealed by a registered land surveyor is not required.

B. Grading sketch requirements:
   1. The existing and proposed finished grade of the area to be graded, based on spot elevations or two-foot contour interval maps;
   2. The extent of graded areas, shaded and labeled "graded area" and, where structures are to be constructed:
      a. The existing grade at the primary building corners and proposed finished floor elevations; and
      b. The proposed building heights, shown to conform to the building height contour line requirements;
   3. The location of proposed mitigative measures, such as revegetation or retaining walls;
   4. The exterior boundaries of the site;
   5. Access roads and points-of-entry to the grading site.

C. Grading statement: A written grading statement shall be submitted with an
application for a grading permit. The statement shall include, where applicable:
1. A description of stabilization, erosion and drainage control measures.
2. The off-site disposal location and estimated quantity of earth material and vegetation to be removed from the site during grading;
3. Estimated starting and completion dates;
4. A description of the dust control method to be used during grading and until revegetation or stabilization has been completed.

D. Documents preparation:
1. Documents shall be prepared in accordance with the grading design manual; and
2. Information shall conform with rezoning conditions (when applicable) and shall be consistent with the rezoning site analysis (refer to Section 18.91.030F, Rezoning Procedures) and other applicable regulations.

E. Application:
1. The grading permit application, grading sketch and other required materials shall be submitted for review to the central permits division of the county planning and development services department.
2. When desired, a letter of intent to exercise the inspection certification option (refer to Section 18.81.070B) shall be submitted with the application.
3. The grading permit application shall be completed and signed by the owner or authorized representative.
4. Fees are payable to the county treasurer in accordance with the fees schedule adopted by county ordinance.

F. Application review:
1. The grading sketch and statement shall be reviewed for consistency with the applicable regulations and standards, and, if approved, a grading permit shall be issued within five working days of application.
2. If determined inadequate, the application shall be returned within five working days and the owner may resubmit, without additional fees, an amended grading sketch or statement.
3. The county engineer shall require the plans and specifications be modified to make them consistent with this code or other applicable regulations. A grading permit may be issued with additional conditions.

G. Grading permit issuance and expiration:
1. Issuance: Grading permits are issued by the county engineer. A copy of the grading permit and approved grading sketch shall be kept in an easily accessible location on the site.
2. Expiration: A grading permit shall be null and void if the authorized work has not been completed within one year of permit issuance.

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H. Grading permit extension and reapplication:
   1. Extensions: Upon written request by the permit holder, the county engineer may approve a single one-hundred-eighty-day time extension of a grading permit.
   2. Reapplication: Reapplication for a grading permit may be made in accordance with this chapter. Assurances or additional conditions may be imposed by the county engineer on a permit, as a consequence of reapplication.

I. Changes to grading permit:
   1. Hazardous conditions: If drainage problems, flood hazards or other hazards occur that were not considered at the time the permit was issued, the county engineer shall require that any substantial engineering modifications be submitted in a report and that the grading design be modified.
   2. Nonhazardous conditions: If unanticipated nonhazardous conditions are encountered during grading and are beyond the scope of the grading permit, the permit holder may submit the necessary engineering modifications in a report to be reviewed and approved by the county engineer.
   (Ord. 1986-187 § 1 (part), 1986)

18.81.060 Submittals and procedures: Type 2 (grading plan).

A. Scope: A Type 2 application for a grading permit requires a completed grading permit application, grading plan, grading statement and soils report. Where applicable and not otherwise submitted, drainage improvement plans shall be required also.

B. Grading plans requirements:
   1. The existing and proposed finished grade contours, or sufficient spot elevations (except as amended in subdivision 2 of this subsection) of the area to be graded, at a minimum of two-foot contour intervals for slopes up to fifteen percent. Slopes over fifteen percent shall be shown in accordance with Chapter 18.61 (Hillside Development Overlay Zone).
   2. The extent of graded areas, shaded and labeled "graded area," and, where structures are to be constructed:
      a. Spot elevations may be shown for the finished grade within the building envelope;
      b. All building pads, showing the existing grade at the primary building corners and proposed finished floor elevations; and
      c. The proposed building heights, shown to conform to the building height contour line requirements.
   3. The general topography for one hundred feet, or as specified by the county engineer, outward from sites greater than five acres; the county engineer may determine that such information is necessary for smaller sites.
   4. A description of the mitigation methods, specifying elevations, dimensions, quantities and locations, to be used during grading and until revegetation or

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stabilization has been completed.
5. The exterior boundaries of the site, the basis of bearing and a benchmark to establish the vertical datum.
6. The extent and manner of preserving, relocating, clearing and disposing of vegetation.
7. The final ground cover, revegetation (if any), erosion control and proposed methods for cut or fill stabilization, based upon the soils report (refer to subsection C of this section).
8. Access roads, haul routes and points-of-entry to the grading site.
9. Where drainage improvement plans have not been submitted separately or where interim drainage conditions exist because of project phasing, plans for:
   a. Drainage or other protective devices to be constructed as part of the grading;
   b. The drainage area and estimated runoff of the area served by drains.
10. A general description of potential paleontological, archaeological or historical resources, and proposed mitigation measures from a qualified archaeologist or archaeological institute.
11. The off-site disposal location and estimated quantity of earth material to be removed from the site during grading.
12. Estimated starting and completion dates for each grading phase.
13. For superior project design and grading performance, it is encouraged that the project designer prepare for project design use an existing site inventory, identifying and quantifying vegetation, soils, on-and off-site viewshed constraints, slope analysis and drainage.

C. Grading statement: Refer to section 18.81.050.C.

D. Soils report:
1. The report shall contain all geotechnical engineering information and recommendations applicable to the project, in accordance with the grading design manual, and shall be sealed by the soils engineer prior to submittal.
2. The civil engineer or qualified registrant responsible for preparing the grading plan shall incorporate all report recommendations into the plan and statement.
3. Approved report recommendations shall become conditions of the grading permit.
4. The civil engineer or soils engineer of the developer shall be required to provide written certification to the building official that the foundation sub-base requirements have been met.

E. Documents preparation:
1. Documents shall be prepared in accordance with the grading design manual.
2. Information shall conform with rezoning conditions (when applicable) and shall be consistent with the rezoning site analysis (Refer to Section 18.91.030F, Rezoning Procedures) and other applicable regulations.
3. Grading plan preparation: The plan shall be prepared by, or under the direction of, a civil engineer or qualified registrant (who may consult with, or
submit information in conjunction with, a landscape architect or other qualified person with expert knowledge of the subject).

F. Application:
1. The grading permit application, grading plan and other required materials shall be submitted to the county department of transportation for distribution to the applicable county review agencies.
2. When desired, a letter of intent to exercise the inspection certification option (refer to Section 18.81.0708) shall be submitted with the application.
3. The grading permit application shall be completed and signed by the owner or authorized representative.
4. Fees are payable to the county treasurer in accordance with the fees schedule adopted by county ordinance.
5. At the discretion of the county engineer, grading assurances may be required in the form of a performance bond or other security acceptable to the county engineer. The assurances shall be applied only to:
   1) eliminate potential hazardous conditions; or
   2) mitigate the effects of dust, drainage, erosion, visual scars or hazardous conditions, in accordance with the grading design manual;

G. Application review.
1. Grading plans and related submittals shall be reviewed concurrent with the tentative plat or development plan review process for the project;
2. Plans and reports shall be reviewed for consistency with applicable regulations and standards, and the approved rezoning site analysis (if required). If determined inadequate, they shall be returned within five working days.
3. Written review comments shall be provided to the applicant within twenty working days for the first submittal, and within five working days of each resubmittal, until approved and permits issued.
4. Prior to approval of the grading plan, the county engineer shall inspect the site to determine that the submittals are current and reflect existing conditions.

H. Preliminary grading:
1. Preliminary grading approval: A preliminary grading permit for clearing, brushing, grubbing, preliminary excavation or filling may be issued in special circumstances at the discretion of the county engineer, provided:
   a. The county engineer finds that the proposed grading is consistent with this chapter and code;
   b. The county engineer finds that the proposed grading will not have an adverse effect on the existing site and surrounding area;
   c. Preliminary grading shall occur in accordance with an approved preliminary grading plan, and shall occur no less than twenty feet from the boundaries of the future development envelope, exclusive of approved points-of-entry; and
   d. Preliminary grading assurances have been provided in accordance with

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subdivision 2 of this subsection.

2. Preliminary grading assurances:
   a. When approval has been granted for preliminary grading, grading assurances shall be posted in an amount not to exceed the approved preliminary grading cost estimate made by a civil engineer;
   b. The assurances shall be applied only to:
      1) eliminate potential hazardous conditions; or
      2) mitigate the effects of dust, drainage, erosion, visual scars or hazardous conditions, in accordance with the grading design manual;
   c. The assurances shall be released by the county when the preliminary grading has been inspected and received the written approval of the county engineer. Final approval of a grading permit shall not require the release of the assurances in the event of preliminary grading noncompliance.

I. Grading permit issuance and expiration:
   1. Issuance: Grading permits shall be issued by the county engineer no earlier than at the time of written staff approval of the tentative subdivision plat or development plan. A copy of the grading permit and approved grading plan shall be kept in an easily accessible location on the site.
   2. Expiration: A grading permit shall be null and void if the authorized work has not been completed within one year of permit issuance.

J. Grading permit extension and reapplication:
   1. Extensions: Upon written request by the permit holder, the county engineer may approve a single one-hundred-eighty-day time extension of a grading permit.
   2. Reapplication: Reapplication for a grading permit may be made in accordance with this chapter. Assurances or additional conditions may be imposed by the county engineer on a permit, as a consequence of reapplication.

K. Changes to grading permit:
   1. Hazardous conditions: If drainage problems, flood hazards or other hazards occur that were not considered at the time the permit was issued, the county engineer shall require that any substantial engineering modifications be submitted in a report and that the grading design be modified.
   2. Nonhazardous conditions: If unanticipated nonhazardous conditions are encountered during grading and are beyond the scope of the grading permit, the permit holder may submit the necessary engineering modifications in a report to be reviewed and approved by the county engineer.

(Ord. 1986-187 § 1 (part), 1986)
18.81.070 Inspections and performance defaults.

A. General inspections:
   1. All grading which requires a permit shall be inspected by the county engineer in accordance with the grading permit:
      a. The inspection schedule shall be prepared in accordance with the grading design manual. Fees shall be based on the inspection schedule and payable to the county treasurer in accordance with the fees schedule adopted by county ordinance;
      b. The permit holder shall provide notification twenty-four hours prior to an inspection request, or as specified on the grading permit;
      c. The county shall provide an inspector within two working days of the requested time.
   2. If the county engineer finds site conditions are not as stated in the approved grading permit conditions, the county engineer may order work authorized by the grading permit to stop until a revised grading sketch or plan has been approved.
   3. Whenever grading work requiring county inspection is concealed by additional work without first having been inspected, the county engineer may require by written notice, that such work be:
      a. Exposed, for inspection by the county; or
      b. Certified by the project civil engineer as being in conformance with applicable regulations.

B. Inspection certification option:
   1. The owner may retain a civil engineer to:
      a. Perform the required grading construction inspections; and
      b. Certify, upon notification of completion, that grading has been performed in conformance with approved plans and permit conditions.
   2. The owner shall submit a letter of intent to invoke the certification option, which shall include a written agreement of certification responsibility from a civil engineer, with the grading permit application.
   3. Inspection fees are waived, with the exception of the final grading inspection fee.
   4. The civil engineer shall maintain project logs and records consistent with accepted engineering practice for a minimum of three years after project completion.
   5. The county engineer may periodically inspect the grading to determine that adequate control is being exercised by the civil engineer.
   6. The county engineer shall conduct a final inspection and the owner shall be liable for any corrective action deemed necessary.

C. Final inspection of rough grade:
   1. All rough grading shall be completed in accordance with the grading permit prior to final rough grade inspection by the county engineer.

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2. The final inspection shall be conducted by the county engineer prior to issuance of a certificate of substantial grading conformance or release of grading assurances (if required). The permit holder shall provide a minimum of twenty-four hours' notice to the county engineer when any phase of rough grading is ready for final inspection.

3. The county engineer may approve completed rough grading prior to completion of related work in cases of extreme hardship or where grading has been designed to be completed in phases, provided that no hazards exist and a performance bond has been posted to ensure completion of remaining grading work of that phase.

4. The soils report and certification of sub-base requirements shall be submitted to the building official prior to any foundation inspections.

D. Final grading inspection:
   1. All required grading work shall be completed in accordance with the grading permit prior to final grading inspection by the county engineer and issuance of a certificate of final grading approval.
   2. Where the conditions of a grading permit include the establishment of vegetation or other final site grading work that extends beyond the expiration of the grading permit, the county engineer shall make a post-grading inspection within six months of permit expiration or as required by the grading permit.

E. Maintenance of revegetation: The maintenance of revegetated areas shall be in accordance with Section 18.73.080 (Landscaping, Buffering and Screening Standards).

(Ord. 1986-187 § 1 (part), 1986)

18.81.080 Enforcement and penalties.

A. Grading permit enforcement:
   1. The enforcement of this chapter and conditions of the grading permit shall be in accordance with this section and Chapter 18.95 (Compliance and Enforcement).
   2. When the county engineer determines a substantial noncompliance with the conditions of the grading permit, the county engineer shall issue a stop-work order and hold in abeyance, by written notice, the county review of other submittals related to the development project and the issuance of county permits for any aspect of the development project until remedial actions have received the written approval of the county engineer.

B. Stop-work orders:
   1. Whenever the county engineer determines that grading does not comply with this chapter or the grading permit conditions, or that the soil or conditions are not as stated on the permit, the county engineer may order the work stopped by written notice served on any person engaged in doing or causing such work to

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be done.
2. Any such person shall immediately stop such work until authorized by the county engineer to proceed with the work.

C. Penalties:
1. Failure to obtain grading permit: Unless exempted by this chapter (refer to Section 18.81.020D), failure to obtain a grading permit prior to commencement of grading shall be a violation of this code. However, the county engineer may issue an exception permit if the county engineer finds that an emergency existed which made it impossible first to obtain a permit.
2. Violations: A violation shall result in issuance of a stop-work order and penalties in accordance with Section 18.95.040 (Compliance and Enforcement). Payment of fine shall not relieve any person from complying with the requirements of this chapter. (Ord. 1986-187 § 1 (part), 1986)

18.81.090 Administrative modification.

A. Quantifiable requirements of Section 18.81.020B Type 1 (grading sketch) permit applicability, Section 18.81.040 general grading performance standards, and Section 005 grading mitigation of the grading design manual, may be modified up to a maximum of twenty percent by the county engineer when it is demonstrated that an unusual site or use condition exists and when such adjustment will not result in a danger to persons or property.

B. In determining whether to grant the adjustment, the county engineer shall follow the board of adjustment standards for granting variances set forth in Section 18.93.030.B, and enumerated below:
1. The strict application of the provision would work an unnecessary hardship;
2. The unnecessary hardship arises from a physical condition that is unusual or peculiar to the property and is not generally caused to other properties in the zone;
3. The unnecessary hardship does not arise from a condition created by an action of the owner of the property;
4. The variance is the minimum necessary to afford relief;
5. The variance does not allow a use which is not permitted in the zone by the code;
6. The variance is not granted solely to increase economic return from the property;
7. The variance will not cause injury to or adversely affect the rights of surrounding property owners and residents;
8. The variance is in harmony with the general intent and purposes of the code and the provision from which the variance is requested;
9. The variance does not violate state law or other provisions of pima county ordinances;

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10. No condition attached to the variance by the board is personal to the appellant.

18.81.100 Waivers and interpretation review.

A. Waivers:
   1. Scope: A waiver from a provision of this chapter may be granted by the technical review committee (refer to Section 18.99.040, Review Committees) when the strict application of the provision would require work by the permit holder detrimental to the purposes of this chapter and cause an unnecessary hardship which substantially limits the preservation and enjoyment of property rights.
   2. Standards: A waiver shall not be granted unless:
      a. The hardship is not generally caused to other properties subject to the provision;
      b. The waiver is the minimum necessary to afford relief;
      c. The waiver will not be materially detrimental to the rights of owners and residents of other affected properties; and
      d. The waiver is in harmony with the intent and purposes of this code and the provision of this chapter from which the waiver is requested.
   3. Conditions: Conditions may be imposed on a waiver that will:
      a. Secure the intent and purposes of this code and the provision of this chapter from which the waiver is granted; and
      b. Provide adequately for the protection of surrounding property owners and residents.
   4. Application: The request for waiver shall be made on a form provided by the planning and development services department and shall be heard within sixty days. Hearing fees shall be required.
   5. Review and notice: The committee shall hold a hearing on the waiver request and, within five working days, notice of the decision shall be mailed to all property owners within three hundred feet of the grading site. Failure to provide notice shall not invalidate an action of the committee.
   6. Appeal: A decision of the committee may be appealed within fifteen days of the decision to the board of adjustment in accordance with Chapter 18.93.

B. Interpretation review:
   1. Scope: Upon request by an affected person who believes there has been a misinterpretation, the technical review committee shall review an interpretation of a provision of this chapter made by a county official.
   2. The request for review shall cite:
      a. The disputed interpretation made by the county official; and
      b. The words alleged to have been misinterpreted.
   3. Application: The request shall be made on a form provided by the planning and development services department and shall be heard within sixty days. Hearing fees shall be required.

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4. Review and notice: The committee shall hold a hearing on the waiver request and, within five working days, notice of the decision shall be mailed to all property owners within three hundred feet of the grading site. Failure to provide notice shall not invalidate an action of the committee.

5. Appeal: A decision of the committee may be appealed within fifteen days of the decision to the board of adjustment in accordance with Chapter 18.93.

C. Appeal to superior court: Appeal from a decision of the board of adjustment may be made to the superior court by the owner or affected persons.

(Ord. 1986-187 § 1 (part), 1986)

18.81.110 Illustrations.
See Illustrations 18.81-1, 18.81-2 and 18.81-3.
(Ord. 1986-187 § 1(part), 1986)
Illustration 18.81-1
Building Height Contour Line

maximum building height plus 1/2 x

building height contour line

existing grade

added fill

x'
Setbacks

H/2 but 2' min. and 20' max.

H/5 but 2' min. and 10' max.

natural or finish grade

refer to section 18.81.040F.1 and 2

Setbacks

H/2 but need not exceed 15' max.

refer to section 18.81.040F.3
THE FOLLOWING HAS BEEN ADDED TO 18.81.080 Enforcement and Penalties:

D. Special Investigation and Special Investigation Fee; Work without a Permit.
   1. Special Investigation. Whenever work for which a grading permit is required is done without a grading permit, a special investigation shall be made by the development services department before a grading permit may be issued to determine whether to allow such grading to remain without remediation and to confer retroactive approval. In the event the special investigation determines that remediation is required, it may be made a condition of the issuance of a grading permit and may be required even if the application for a grading permit is denied.
   2. Special Investigation Fee. The development services department shall assess a special investigation fee in accordance with the development services fee schedule, in addition to the permit fee, whether or not a permit is then or subsequently issued. Payment of the special investigation fee is required prior to the issuance of a grading permit or any other permit for the property on which the special investigation fee is assessed. The payment of the special investigation fee shall not exempt the property on which the special investigation fee is assessed from compliance with all other provisions of this code nor from any penalty prescribed by law.

THE FOLLOWING HAS BEEN DELETED FROM 18.81.020 B. TYPE 1 (GRADING SKETCH) PERMIT APPLICABILITY:

5. New pavement of more than three thousand square feet.