

SECTION 309. HILLSIDE DEVELOPMENT STANDARDS

A. PURPOSE.

The purpose of this section is to establish regulations for development of land with steep slopes and hillsides to preserve important aspects of the community character while allowing reasonable opportunities for the development. Hillside development standards are intended to minimize possible loss of life and property, to protect watersheds and natural waterways, to minimize soil erosion, to protect public infrastructure investments and to encourage the preservation of community character by retaining natural topographic features and minimizing scarring from hillside construction.

B. APPLICABILITY

The regulations of this Section shall apply to proposed subdivisions, planned area development and development projects on lots of parcels having a natural slope of twenty percent (20%) or greater. This slope is calculated using a minimum run of one hundred feet (100') with a rise greater than twenty (20') over that one-hundred-foot run. Where the standards of this section conflict with other provisions of this Code, the more restrictions shall apply. No grading, cutting, filling, excavating, stockpiling or other site earthwork shall be commenced without first obtaining all necessary and required permits and approvals from the City of Cottonwood or applicable agencies, including Grading Permits, Stormwater Permits and approval of required development applications.

C. EXCEPTIONS.

This section shall not apply to the following activities:

1. Individual single-family residential development on existing lots except where part of a planned development or new subdivision.
2. Clearing and thinning of vegetation for fire control as approved by the Fire Chief, Building Official or other applicable City Officials.

D. ADMINISTRATIVE WAIVER FOR HILLSIDE DEVELOPMENT

1. Purpose. Administrative waivers are intended to provide flexibility with respect to the numerical standards of the Hillside Development Ordinance where proposed development is compatible with surrounding land uses, shown to be in the public interest and consistent with the purposes of the Zoning Ordinance.
2. Applicability. Pursuant to the requirements of this Section, the Zoning Administrator may authorize a waiver of up to 10 percent from any numerical

standard related to the Hillside Development Ordinance, including height, setback, lot coverage, cut and fill quantities, disturbance areas and grading requirements.

3. Application Process.
 - a. Application Submittal. A complete application for an administrative waiver shall be submitted to the Zoning Administrator on a form provided by the City.
 - b. Documentation. Provide copies of the Slope Calculation Analysis for the site along with a complete site plan, photos and other graphic material to document the requested adjustment.
 - c. Timeframe: The zoning Administrator shall have 30 calendar days to approve, approve with conditions or deny the application. A written notification of the decision shall be mailed, or otherwise provided to the applicant within 15 calendar days from the decision.
4. Notification of Surrounding Property Owners. The Department shall mail notice of the request for the Administrative Waiver to all owners of real property within three hundred (300) feet of the subject property within three (3) business days of submittal of the application and provide at least 10 days for response.
5. Conditions for Approval: The Zoning Administrator may authorize an Administrative Waiver when a literal enforcement of the provision(s) of this Section and all amendments thereof, would result in unnecessary property hardship and when evidence is presented demonstrating to the satisfaction of the Zoning Administrator that all of the following conditions are fulfilled:
 - a. The requested modification will not be detrimental to persons residing or working in the vicinity, to adjacent property, to the neighborhood, or to the public welfare in general;
 - b. The granted Administrative Waiver is the minimum development standard modification that will make possible the reasonable use of the land and/or structure;
 - c. Granting the waiver will be based on the physical constraints and land use specifics, rather than on economic hardship claimed by the applicant; and
 - d. Appropriate and specific conditions as may be deemed necessary in order to fully carry out the intent of the Administrative Waiver section of the Zoning Ordinance have been stipulated by the Zoning Administrator.

6. **Appeal.** The applicant may appeal any decision of the Zoning Administrator to the Board of Adjustment in accordance with the standards set forth in Section 306, "Appeals and Variances."
7. **Revocation.** A violation of any condition stipulated by the Zoning Administrator that is not corrected within a specified timeframe shall render the granted Administrative Waiver null and void. An approval shall also be null and void if the use has not commenced or if a grading or building permit has not been obtained for the related work within six (6) months of authorizing the waiver or within any greater or lesser time stipulated by the Administrative Waiver, not to exceed one (1) year.

E. DEFINITIONS

1. **BACKSLOPE** – The excavated slope remaining on the uphill portion of a cut section that provides a transition from the natural hillside to the flat portion of a building site or roadbed.
2. **CONSTRUCTION ENVELOPE** – A specific area defined by the sum of the maximum allowable disturbed area plus the maximum coverage allowed for the lot parcel.
3. **CUT** – The land surface which is shaped through the removal of soil, rock or other materials.
4. **DISTURBED AREA** – That area of natural ground that has been or is proposed to be altered through grading, cut and fill, removal of natural vegetation, placement of material, trenching, or by any means that causes a change in the undisturbed natural surface of the land or natural vegetation.
5. **FILL** – The deposit or relocation of soil, rock or other materials on the site.
6. **FINISHED GRADE** – The final grade and elevation of the ground surface after grading is completed.
7. **GRADE** – The slope of a hillside measured as a ratio of horizontal distance or run to vertical distance or rise (measured as percentage).
8. **GRADING** – Any excavating or filling or combination thereof, including the conditions resulting from any excavation or fill.

9. **HILLSIDE DEVELOPMENT AREA** – Building areas, other than sloped areas within washes and rivers, with a building site slope of twenty percent (20%) or greater, measured as a vertical rise of twenty (20) feet in a horizontal distance of one hundred (100) feet.
10. **NATURAL GRADE** – The grade and elevation of the ground surface in its natural undisturbed state.
11. **NATURAL OPEN SPACE** – Areas that are essentially unimproved and left in a natural state without developed structures, roads or similar development but that may contain recreational trails, perimeter fencing or similar minor features.
12. **PREVAILING GRADE** – The average steepness of a hillside over its entire length.
13. **RETAINING WALL** – A wall used to retain material but not to support or to provide a foundation or wall for a building.
14. **SITE DISTURBANCE ACTIVITY** – Any action which results in a cutting of the natural soil grade, creation of an un-natural soil fill or movement of a significant natural landscape feature. Such activity may include, but not limited to the following activities: digging, trenching, filling, drilling, grading or clearing.
15. **SLOPE CALCULATION ANALYSIS** – A detailed study of the topography and slope of a development site, parcel or property. The study shall include a detailed graphic showing all slope areas on the site utilizing the methodologies established in this Ordinance and shall be composed of graphic, numerical and narrative information.
16. **SPILL SLOPE** – Earth or other material that is pushed or allowed to fall, flow or run down a slope as a result of excavation activities or natural process of erosion to change the natural appearance and topography of the site.

F. APPLICATION REQUIREMENTS

1. **Slope Calculation Analysis:** Provide a Slope Calculation Analysis and related Map where the property contains slopes 20% or greater, as defined by this Ordinance.
2. **Grading and Drainage Plan:** An overall excavation, grading and drainage plan shall be prepared in accordance with sound professional engineering practices and to address minimum standards adopted by the City. Said plans shall be prepared and certified by a professional engineer registered in the State of Arizona. If any drainage structures or culverts are involved, it will be necessary to include calculations for peak flows for a 100-year storm to establish appropriate drainage facilities, cross-

sections and details. Where feasible, storm water diverted from its original drainage pattern shall be returned to its natural course before leaving the property.

3. Hillside Development Site Plan. Detailed development site plans and landscape plans shall be submitted with each hillside development application and shall include, but not be limited to, the following:
 - a. Submit site plan on 24" by 36" sheet. Site plan must be submitted with a topographic survey prepared by a civil engineer or registered land surveyor. Scale of the site plan shall be not less than 1" = 20'-0".
 - b. Show topographic contours at two (2) foot intervals. Five (5) intervals may be allowed for very steep slopes if approved by the City Engineer. Indicate existing contours with dashed lines.
 - c. This map shall show limits of excavation and fill, slope of cut and fill, and total cubic yards of excavation and fill for the building site, roads, and driveways. Show the location, length and height of retaining walls, fences and other attachments.
 - d. For disturbed (or graded) areas, including removal or natural vegetation, show the proposed method of final treatment, including riprap, concrete, groundcover, or vegetative coverings.
 - e. Show how drainage is altered, and if so, how it is redirected to original channel and show that the requirements regarding storm water runoff and drainage have been met. Show the location and grade of all drainage channels, swales, drainpipes, culverts and similar drainage features. Indicate flood zones on site plan with grade or elevation of each level.
 - f. Show cross sections at two (2) or more locations perpendicular to the contours through each building or structure giving percentage of slope at each and showing exact heights of structures at each existing contour. Location of the cross-sections shall be clearly shown on the topographic map.
 - g. For proposed driveways, indicate total average grade from lowest point to highest and show grade of steepest portions of driveway within fifty (50) foot sections.
 - h. Show location of all proposed utility lines, or septic tank or sewage disposal areas.

- i. Provide address or property location information, property dimensions and name, address, telephone number and contact information for applicants, property owners and preparer of application materials.
4. Data Table. Provide a table on the plan which provides the following information:
 - a. Gross area of lot shown in square feet.
 - b. Area of lot that hillside in square feet. Indicate slope category. If separate areas are shown, break out the areas by size in square feet and slope category.
 - c. Area of hillside on lot that has been previously disturbed in square feet, if applicable.
 - d. Area of hillside on lot that is proposed to be disturbed shown in square feet. Indicate separate areas, if applicable.
5. The Community Development Director, or designee, may require an accurate three-dimensional rendering; showing the existing and proposed finished appearance of the site. A computer-generated model in a three-dimensional format is acceptable.
6. Prior to the commencement of any construction or development activity on the hillside site, including clearing, grading, excavating or movement of any material, all applicable required plans and approvals shall be issued by the City.

G. SLOPE CALCULATION ANALYSIS

1. All applications for development shall include a Slope Calculation Analysis when portions of the property contain slopes 20% or greater, as defined by this Ordinance.
2. The information submitted shall clearly indicate the extent and nature of the work proposed, including the area of disturbance, the estimated quantity of cut and fill, and other information as required to review the proposed activity.
3. Applicants may prepare a Slope Calculation Analysis utilizing a methodology differing from those outlined in this Section. Applicants seeking to utilize an alternative methodology shall provide both a written explanation of the proposed alternative methodology and a graphical example of its use.
4. A Slope Calculation Map shall be produced for the review of slope categories as applies to the hillside development standards. The slope map shall contain information necessary to determine compliance with this Section. To determine the location and extent of slope categories, carry out one of the following procedures:

a. Manual Slope Calculation Method:

- 1) Utilize a topographic map at a scale of twenty (20) feet or less to the inch and with contours shown at two (2) foot intervals. All contour lines shall be extended onto adjacent properties to a distance that establishes the overall slope of the land but in no case shall they be extended less than twenty (20) feet onto the adjacent properties.
- 2) The slope category shall commence at the midpoint of the one hundred (100) foot horizontal dimensions used to determine the slope. The one hundred (100) foot slope determination lines shall be located perpendicular to the site or property contour bands. Those properties containing multiple slope planes should provide slope information for all such planes.
- 3) To determine those locations where slopes of twenty percent (20%) thirty percent (30%), and forty percent (40%) begin by the application of one hundred (100) foot slope straight lines that fall within each category. The one hundred (100) foot slope determination lines shall be extended onto adjacent properties to a distance that establishes the overall slope of the land, but in no case shall they be extended less than twenty (20) feet onto the adjacent properties.
- 4) Connect the midpoints of each series of one hundred (100) foot lines of the same slope category to establish the limits of that slope category.
- 5) Measure the areas resulting between each series of straight lines to determine the areas in each slope category.

b. Computer Generated Slope Calculation Method:

- 1) Utilize digital topographic information with contours shown at two (2) foot intervals.
- 2) Utilizing a slope generating software application, slope categories shall be determined utilizing the slope categories identified in this Ordinance.
- 3) Computer generated slope analyses shall be prepared utilizing the following modeling parameters:
 - (a) Maximum five (5) foot slope contour intervals for slopes more than thirty percent (30%).

- (b) The slope analysis shall utilize the above noted slope contour intervals through the modeling basis of grid evaluation to determine slope facets or contours; and,
- (c) The analysis shall utilize a twenty-five (25) foot grid system.

4) All data generated using a computer-generated slope determination shall be presented in both chart and graphic formats. The presentation of all graphic slope information shall be presented in a clear and easily understandable format.

5) The final map shall be plotted at a maximum scale of 1" = 200' and submitted to the Community Development Director or designee finds the analysis acceptable. The final slope determination map shall be approved.

6) The Community Development Director or designee may reject the analysis and require correction(s) to the digitized slope category lines to more accurately reflect the generalized slope conditions of the property or other revisions necessary to ensure compliance with this Section.

H. SLOPE DEVELOPMENT.

1. Maximum Site Disturbance: Maximum site disturbance, as used in this Section, shall include all grading, excavation and fill area for the development of the property but shall not include any public or private street or the building coverage in the calculation.

Slope Category	Maximum Allowable Disturbance Area as per Slope Category Map
0% to 19.9%	As per underlying Zoning.
20% to 29.9%	30%
30% to 39.9%	15%
40% & >	No Disturbance, except as permitted by this Ordinance.

2. Residential Density: The maximum density for residential development within specified slope category areas shall be determined by the following:
 - a. For any portion of land containing slopes below 20% the maximum density is determined by dividing the gross area of the tract of land below the 20%
 - b. For any portion of land containing slopes from 20% up to 29.9% the maximum density is 0.70 of the density determined by dividing the gross area of the tract of land between the 20% and 29.9% slope lines by the minimum lot specified in the underlying zoning district/s.

- c. For any portion of land containing slopes from 30% up to 39.9%, the maximum density is 0.50 of the density determined by dividing the gross area of the tract of land between the 30% and 39.9% slope lines by the minimum lot size specified in the underlying zoning district/s.
- d. For any portion of land containing slopes 40% and greater, the maximum density is determined as 0.25 of the density determined by dividing the gross area of the tract of land at or above the 40% slope line by the minimum lot size specified in the underlying zoning district/s.

3. Hillside Residential Density Bonus: For properties where the maximum density for residential development is limited as established in this Section for development in slope category areas at or above 20%, the net difference with a potential density bonus increase in the allowable number of dwelling units may be transferred to other portions of the same or contiguous development property where such areas are shown as below the 20% slope category level. For transfer of residential density to zoning districts other than PAD Zone, development shall otherwise meet all standards of this Ordinance and shall not exceed more than 125% of the density otherwise allowed in the Zoning District. Transfer of residential density for projects with PAD Zoning shall be subject to the standard review and criteria for Planned Area Development as determined through the Master Development Plan.

4. All such development qualified for transfer of residential density shall be subject to standards as specified in this Ordinance and the following:

- a. In addition to other residential use types allowable in the underlying zoning district, transferred density rights may be developed as detached single-family residential units or as attached residential units with townhouse or clustered type design.
- b. Proposed clustered unit development located within a 20% or greater slope category shall be subject to the processing of a Planned Area Development (PAD) application and approval at the sole discretion of the City Council.
- c. Aspects for consideration of a density transfer design may include but are not limited to:
 - 1) Locations and distribution of any attached or clustered housing.
 - 2) The condition of buffering or separation between proposed housing and the abutting properties.
 - 3) The overall variety of housing types, sizes, lot sizes

- 4) The amount and quality of natural open space or usable landscaped areas that are contained within the proposed transfer area.
- d. For all areas of the lot or parcel with less than a 20 percent slope, 100 percent site disturbance may occur where densities are being transferred from higher slope areas.

5. The following criteria shall be applied for review of proposed clustered development:

- a. Minimize the disturbance to the terrain, avoiding cuts or fills unless they are necessary.
- b. Preserves and incorporates natural features and vegetation, preserves significant large trees or landscape specimens, preserves rock formations.
- c. Mitigates visual impacts by keeping structures below ridgelines, stepping structures with the slope, and minimizing the height of structures.
- d. Building and structure design is compatible with hillside characteristics using natural materials and colors, and variation with roof and wall components.

I. HILLSIDE DESIGN CRITERIA

1. Mass Grading Standards. Leveling of large development sites through mass grading shall be discouraged even for areas with less than 20% slope. Careful design of site grading to allow stepping of areas within larger development sites is preferred to preserve natural slopes, vegetation and similar features.
2. Construction Envelope. All lots 20,000 square feet or more in net area shall establish a construction envelope equal to the combined area of the maximum disturbed area and maximum lot coverage as described in this Section.
3. Spill Slopes. Spill slopes greater in depth than five (5) feet shall be prohibited for development sites, driveways and streets. All such surplus material shall be removed from the site or disposed of on-site as permitted by this Ordinance.
4. Removal or disposal of excess material. All excavated material shall be removed from lots and roadways or contained behind retaining walls or landscaped so that the slopes of any fill material will not be visible.

5. Cuts and Fills. Stabilization is required for all cut and fill slopes of five (5) feet or greater in elevation. To reduce visual impacts of cut fill slopes they should be rounded or tapered where they meet natural grade so that they blend with the natural slope.
 - a. Building pad: The maximum height of any cut or fill used to establish a building site shall not exceed twelve (12) feet. For cuts greater in height stepping shall be required with at least four (4) foot steps to allow landscaping.
 - b. Street: The maximum height of any cut or fill used to establish a road shall not exceed 12 feet. For cuts greater in height, stepping shall be required with at least four (4) foot steps to allow landscaping. All building sites, driveways and roadway cut, and fill slopes shall be re-vegetated with native plant material.
 - c. Driveway: Any driveway cut greater than eight (8) feet in depth shall not have a length greater than one hundred (100) feet; and the maximum height of any cut or fill used to establish a driveway shall not exceed twelve (12) feet.
 - d. Grade of backslope, cuts and fills: The grade for resulting slopes shall be a maximum 2:1, or greater if determined necessary by engineering analysis to ensure a sustainable slope. A combination of retaining walls and slopes may also be considered.
 - e. Partial bench construction: Where a grading plan proposed a combination of cuts and fills to create a level area for a building, road, driveway or development site due to constraints of property, a detailed treatment plan shall be required for the cut and fill sections to ensure adequate compaction of the fill material and a minimum 2:1 backslope grade so as to maintain a stable slope. Any fill material shall be carefully blended with the prevailing natural grade of the hillside and landscaping shall be provided as necessary to minimize the visual effects of any spill slope.
 - f. Setbacks: Both the top of cut slope and toe of slope shall be setback at least 10 feet from any property line or greater if required by building codes. Exceptions may be considered where the existing topography or drainage patterns are such that strict adherence to this standard would result in a less desirable condition for abutting properties. In such cases, a recorded slope or drainage easement shall be provided for the applicable portions of the abutting property.

- g. Alternative cut and fill limitations and methods to mitigate the visual impact of cut and spill slopes such as terracing, use of retaining walls and re-vegetation of disturbed areas may be submitted based on a finding that the proposed alternative limitations and methods meet the intent of this of this Section to reduce the visual impact of cut and spill slopes and are otherwise in compliance with this with this Ordinance. All such alternative proposals shall be subject to Design Review Approval.
- 6. Retaining walls: The intent of retaining wall standards is to reduce the visual impact of retaining methods used on hillside developments. Specific criteria for design include the following:
 - a. Fill slopes greater than two (2) feet in depth may be contained by a retaining wall as provided by this Ordinance. Retaining walls may be used to retain fill where slopes cannot be stabilized by the application of boulders, vegetation or the underlying native rock.
 - b. Residential retaining walls shall not exceed six (6) feet in height; non-residential retaining walls shall not exceed eight (8) feet in height. Where additional height is required, a series of stepped retaining walls may be used where such walls are offset at least four (4) feet horizontally. The area between stepped retaining walls shall be improved with landscaping, as per Section 407. Landscaping Requirements.
 - c. Decorative view fences, not exceeding six (6) feet in height above the highest part of adjacent natural grade may be added to a retaining wall. View fences may include wrought iron, wood picket or a combination or wrought iron and masonry columns but shall not include chain link for such applications.
 - d. The location and layout of retaining walls shall be designed to compliment the shape or the natural terrain to the greatest extent possible through the use of stepped or offset sections both in elevation and plan view. Retaining walls shall be designed to preserve attractive areas existing desert vegetation where possible.
 - e. If retaining walls are constructed of block or finished with stucco, they should be colored to blend with surrounding landscape or to be compatible with the development theme of the project. Rock facing on masonry walls is encouraged and the use of rock walls comprised of native materials where structurally appropriate is also encouraged.
- 7. Driveways: The design of driveways located within development projects shall meet the following standards:

- a. Driveway in hillside development areas (20% or greater slopes) shall be limited to one per residence. A driveway may be used to serve more than one residence where in compliance with applicable codes.
- b. Driveways with 10% grade or greater shall be paved with asphalt, concrete, pavers or a comparable hardened surface to stabilize slopes and minimize erosion and sedimentation.
- c. Driveways with 10% grade or greater shall have a 20-foot minimum landing area at intersection with maximum 6% grade to allow safe transition to street.
- d. Driveways with 15% or greater grade shall be constructed of concrete with appropriate surface treatment to provide adequate friction for vehicles.
- e. Where a driveway crosses a wash or drainageway, it shall not impede or adversely alter drainage. Wash crossings shall be stabilized to minimize maintenance. Where necessary to accommodate regular run-off or flooding, appropriately sized and designed culverts or bridging shall be required. For low-flow or local drainage swales, concrete aprons on each side of the driveway may be approved to accommodate the cross flow.
- f. Drainage culverts: Where driveways cross drainage ditches and channels beside the roadway, culvert pipes shall be sized to meet all applicable engineering requirements but in no case shall be less than 12" in size for pipes up to 16 feet in length and minimum 24" for pipes greater than 16 feet in length. A uniform size of culvert pipe shall be established for similar drainage crossings to lots accessed across the same channel along the same roadway.
- g. The applicant shall provide engineered plans, prepared by a registered civil engineer licensed in the State of Arizona, for all driveways that have grades more than ten (10) percent to ensure compliance with the design criteria.

8. Street Design: Both public and private streets proposed for new development shall conform to the following standards for Hillside Development.

- a. Street grade shall be designed to take advantage of the natural topography of the landscape through such techniques as following the natural contours across hillsides.
- b. All cut and fill slopes associated with new streets shall be within the roadway right-of-way or roadway easement. Slope maintenance easements for roadway cuts and fills shall be required where such disturbance extends onto private property.

- c. Street grades shall typically not exceed 6% except where there are exceptional circumstances of the natural topography that would otherwise limit locating the new street in a conforming manner than individual sections up to 10% grade may be considered for a maximum length of five-hundred (500) feet. Exceptions for new streets may be approved by the City Engineer if there are no reasonable alternatives and the proposed street follows all other applicable codes and Ordinances and is approved by fire, police and public safety agencies for emergency access.