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# SITE PLANNING

This chapter describes design standards and procedures to guide the creation of a site plan, preliminary plat or similar type of plan. It references architectural and streetscape guidelines that are necessary for achieving the preferred character for development in specific areas of the city. This chapter also provides specific guidance for preparing site plans and related designs within areas designated by the Environmentally Sensitive Lands ~~Ordinance (ESLO)~~ **(ESL) zoning district.**

2-1 GENERAL CONSIDERATIONS & REQUIREMENTS

2-2 ENVIRONMENTALLY SENSITIVE LANDS **AREA**

**DS&PM 2014 UPDATE NOTES OCTOBER 28, 2014:**

The revisions shown in red bold font (new language) and red bold font strike-through (deleted language) were made after publishing for the September 15, 2014 Open House meeting and public review.

- There was no public input on this document.
- The revisions shown are staff review revisions.

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# ENVIRONMENTALLY SENSITIVE LANDS

This section specifies site design considerations, standards, and criteria for the area covered by the Environmentally Sensitive Lands ~~(ESLO)~~ **Ordinance (ESL) zoning district**. It addresses utility location, grading and drainage issues, roadway improvements and site work guidelines for protecting the unique topography, vegetation and geology within the ~~ESL~~ **Environmentally Sensitive Lands (ESL)** area.

## **DS&PM 2014 UPDATE NOTES OCTOBER 28, 2014:**

**The revisions shown in red bold font (new language) and red bold font strike-through (deleted language) were made after publishing for the September 15, 2014 Open House meeting and public review.**

- **There was no public input on this document.**
- **The revisions shown are staff review revisions. The majority of these revisions provide greater specificity in reference to Environmentally Sensitive Lands:**
  - **The reference to geographic area is “Environmentally Sensitive Lands area” or “ESL area”**
  - **The reference to the Zoning Ordinance is “Environmentally Sensitive Lands (ESL) zoning district” or “ESL District.”**

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# ENVIRONMENTALLY SENSITIVE LANDS

2-2.000

## GENERAL INFORMATION

For more information and related resources see [www.ScottsdaleAZ.gov/codes/eslo](http://www.ScottsdaleAZ.gov/codes/eslo).

### A. History/Background

The **Environmentally Sensitive Lands Ordinance (ESLO) ESL District** is a set of zoning regulations that was adopted by the City Council to guide development throughout the 134 square miles of desert and mountain areas of northern Scottsdale. In addition to being governed by different versions of the **ESL ordinance District**, some projects and subdivisions are governed by the Hillside Ordinance that was established in 1977. These areas are generally located north and east of the Central Arizona Project canal. Refer to Figure 2.2-1.

To verify that a parcel is located within the **ESLO Environmentally Sensitive Lands** area, and to confirm the landform category, refer to the Digital Map Center at [www.eservices.ScottsdaleAZ.gov/dmc](http://www.eservices.ScottsdaleAZ.gov/dmc).

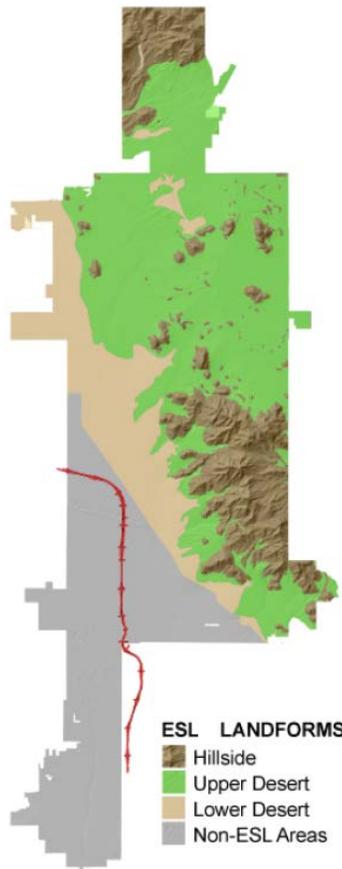


FIGURE 2.2-1  
**ESLO ESL AREA / LANDFORMS MAP**

### B. Purpose

The intent and purpose of **ESLO ESL District** is to identify and protect environmentally sensitive lands in the city and to promote public health and safety by controlling development on these lands. The **ordinance ESL District** requires that a percentage of each property be permanently preserved as Natural Area Open Space (NAOS) and that specific environmental features must be protected, including vegetation, desert washes, mountain ridges and peaks, to assure appropriate development. For specific ordinance text concerning the **ESLO District**, refer to the Zoning Ordinance, Section 6.1010, at [www.ScottsdaleAZ.gov/codes/eslo](http://www.ScottsdaleAZ.gov/codes/eslo).

### C. Goals

The **ESLO ESL District** was established to:

1. Protect the public and property from the special hazards that can be found in this desert setting.
2. Encourage the protection of unique and sensitive natural features in the Upper Sonoran Desert, including but not limited to, mountains and hills, large rock formations, native landscape, archeological and historical sites, and significant desert washes.
3. Minimize the costs to build and maintain the public infrastructure that is needed to sustain the use of the land.
4. Encourage development that blends with the character and nature of this special desert setting. This ordinance is not intended to deny the reasonable use of land, but to guide its use in ways that are sustainable and recognize the unique opportunities that this setting provides.

### D. Community Benefit

**ESLO The ESL District** has a direct impact on the residents of Scottsdale by determining the location and design of residential, commercial, industrial, and institutional development in approximately two-thirds of the city. Application of **ESLO the ESL District**, and its predecessor the Hillside **Ordinance District (HD)**, has resulted in the preservation of over 9,000 acres of Sonoran Desert open space, while protecting residents from potential flooding, erosion, and detrimental visual impacts.

### E. Major Environmental Features and Resources

The regulations and standards of the **ESLO ESL District** are based upon major natural features such as landforms, protected ridges and peaks, and significant desert washes. In order to provide a uniform basis for determining the location of these features, the city has prepared maps of these features that are available at <https://eservices.scottsdaleaz.gov/dmc/default.aspx>.

In addition, there are maps that highlight the priority locations for the placement of NAOS on properties that are based upon significant environmental features of the land, as well as the intent to maintain the continuity of these natural open spaces.

### F. Determination of Appropriate Version of the Ordinance for Application on a Property

The **ESLO ESL District** was originally approved and applied in 1991. Subsequently, there were major updates to this ordinance in 2001, 2003, and 2004. The applicable

version of the **ESLO ESL District** is the one that was in effect at the time that development approvals were established for the property or the initial building permits were issued. In addition, some developments were originally approved under the **Hillside Ordinance HD District** and continue to be governed by the rules and procedures of that **ordinance HD District** (originally approved in 1977 and amended in 1982). The amendments to the **ESLO ESL District** are minor and apply to all properties that are subject to the **ESLO ESL District** regulations. For determination of which ordinance, as well as which version, applies to a given property, contact the One Stop Shop or Current Planning staff in the One Civic Center building at 7447 E. Indian School Road.

### UTILITIES

In general, locate and design utility facilities and corridors to minimize degradation of key natural desert features that are being conserved by the **ESLO ESL District**. This section provides guidelines that support the goals of the ESLO while also allowing for the reasonable and necessary installation of infrastructure that will be serving the land uses that are in the area. Refer to Chapter 6 and 7 of this manual for specific guidelines related to water distribution and wastewater collection lines.

Use the following general principles in the design and construction of utility facilities in **ESLO** areas:

1. Install utility corridors that do not result in slope movement or surface subsidence.
2. Prevent increased erosion along utility corridors.
3. Avoid utility crossings that obstruct or constrict desert washes.
4. Replace vegetation that has been removed, for utility construction or maintenance, with appropriate native desert plants.
5. Avoid placing utility corridors that will require frequent maintenance through significant riparian, vista, or habitat corridors.
6. Place all utility facilities underground or screen them from public view.

### WATER DISTRIBUTION LINES

#### Location

To minimize their impact in **ESLO** areas, locate all public water distribution lines within private and public street rights-of-way. Location of water system lines in other areas will require approval from the Water Resources Department. Water lines that must be located outside of public rights-of-way must be located within either a waterline easement or within a tract, where applicable.

Place water lines within the paved street section rights-of-way and locate water meters adjacent to driveways in order to reduce the impact to sensitive **ESLO area** landforms.

#### Easements

The minimum width of easements within tracts is 20 feet, ~~if lot size is less than 22,000 square feet~~. Place the entire easement on one side of a property line.

2-2.100

2-2.101

Any vertical barrier that crosses an easement must be constructed of wood, wire, or removable type of fencing. Revegetation or landscape improvements that are within the easement must not restrict access to the utility that is located within the easement. **Refer to Chapters 3 and 6 of this manual.**

### Crossings of Storm Water Drainage Ways

Water lines should not cross storm water drainage ways unless the crossing is associated with a roadway or driveway. If a crossing is required, then locate the water line as near to perpendicular to the flow path of the storm water drainage way as possible.

### Water Storage Facilities

Locate water storage facilities, such as water tanks and reservoirs, underground and/or in such a way that it will reduce the impact to the surrounding environment.

Paint any above grade tank surface to match surrounding native stone, rock, or soil color.

Tanks are prohibited on slopes that are greater than 3:1 (horizontal to vertical), unless approved by the Planning Neighborhood and Transportation Administrator and Water Resources Department Executive Director, or their respective designees.

## WASTEWATER COLLECTION LINES

2-2.102

### A. Location

To minimize their impact in **ESLO ESL** areas, locate all public sewer collection lines, including public sewer force mains, within private and public street rights-of-way. Wastewater lines that must be located outside of public rights-of-way must be located within either a sewer line easement or within a tract, **if the lot size is less than 22,000 square feet.**

Sewer lines are allowed to cross the centerline, and be located within the paved street section, but should not cross the curb line. Locate manholes in order to keep manhole covers out of the tire paths on the roadway.

### B. Easements

The minimum width of easements is twenty (20) feet. Place the entire easement on one side of a property line.

Any vertical barrier that crosses an easement must be constructed of wood, wire, or removable type fencing. Revegetation or landscape improvements that are within the easement must not restrict access to the utility that is located within the easement.

### C. Drainage Ways

Do not locate wastewater lines within any storm water drainage way that may be inundated by a 100-year storm flow, unless specifically approved by Planning Neighborhood and Transportation Administrator and Water Resources Department Executive Director, or their respective designees. Exceptions will be based upon specific design analyses that demonstrate that there will be no mixing of wastewater and

stormwater flows, and that no other viable solution is available. If a wastewater line must be located alongside a storm water drainage way, then do not clear existing natural riparian vegetation during construction of the wastewater line.

Do not cross storm water drainage ways with wastewater lines unless there is no other reasonable alternative alignment. Where possible, place such crossings in association with the location of roadways or driveways, and/or perpendicular to the flow path of the storm water drainage way.

### **PUBLIC LIFT STATIONS**

**2-2.103**

In **ESLO ESL** areas, wastewater pumping stations and pressurized collection systems may be used with Water Resources Department approval.

Protect wastewater pumping stations from inundation by stormwater runoff. Locate such stations so that adequate access is available. Contact the Water Resources Department prior to design of wastewater systems in **ESLO ESL** areas.

### **INDIVIDUAL SEWAGE EJECTOR SYSTEMS**

**2-2.104**

If sewer service cannot be provided by gravity flow, then install an individual sewage ejector pump to transport wastewater from a residence. The private ejector pump shall meet all State and County Health Department, and Local Building Code requirements.

The property owner shall maintain the private ejector pump. Each ejector pump shall serve only one lot and may not extend past the property line, unless otherwise approved by the Water Resources Department. Septic system facilities, including leach fields, shall not be located within designated NAOS easements. **Refer to Chapter 7 of this manual.**

### **ON-SITE WASTEWATER TREATMENT**

**2-2.105**

In **ESLO ESL** areas where connection to a public sanitary sewer collector is not available, an individual sewage disposal system may be approved. On-site wastewater disposal systems are subject to authorization by the Water Resources Department prior to approval from the Maricopa County Department of Environmental Services.

Locate such facilities per Maricopa County requirements. Any areas that have been cleared for such facilities must be revegetated to a native desert landscape.

### **MISCELLANEOUS UTILITIES**

**2-2.106**

#### **A. Location**

Locate utility lines within private streets and public rights-of-way in order to minimize the impact on **ESLO ESL** areas. The paved street section is reserved for water and sewer lines, enabling other utilities to be placed within the balance of the rights-of-way. Utility locations in the **ESLO ESL** areas will be restricted due to grading limitations.

If circumstances dictate that utility lines will need to be placed outside of a public/private rights-of-way, then establish a Public Utility Easement or tract ~~if the lot size is less than 22,000 square feet.~~

Construction of underground utilities may adversely impact adjacent lands. Therefore, revegetation of all disturbed areas will be required after installation, or any subsequent maintenance activities.

Avoid locating utility lines in storm water drainage ways and channels. If such locations are necessary, then the construction plans shall specify how to protect the facility from storm water runoff flows.

### B. Design of Utility Cabinets

Any utility cabinets that are located within **ESLO ESL** areas shall be painted Frazee **Paint** 'Western Reserve' (**9716N**), or shall be constructed of self-weathering steel. Any land surrounding a utility cabinet that has been disturbed by the installation of the cabinets and related utilities, shall be restored to a natural desert condition with native plant materials.

Utility cabinets shall be screened in one of the following ways:

1. Placed in vaults below the ground level;
2. Enclosed within a self-weathering steel enclosure fence that incorporates a three dimensional design;
3. Enclosed within a wall that incorporates native stonework, rammed earth, or exposed aggregate and colored concrete;
4. Berms landscaped with native desert plants and shaped to blend into the natural terrain; or
5. Dense landscaping with desert trees and large shrubs.

### C. Easements

Do not place Public Utility Easements along the edge of rights-of-way unless they are required by the specific design for installing utilities in that location. Keep the installation of utilities within the rights-of-way.

Utility easements along any side or rear lot line must be entirely within a lot (that is not split with part on 1 lot and the remaining portion on an adjacent lot) and must be at least twelve (12) feet wide. Utility easements along the front of lots and tracts must be at least eight (8) feet wide.

## STORM WATER DRAINAGE PLANNING

The analysis of hydrologic and hydraulic hazards within this region must consider impacts to all downstream areas. Failure to consider these impacts may result in hazardous diversions of storm water flow, increases in peak discharge flow rates, and disruption of the transport equilibrium. Any of these phenomena could increase the flooding and erosion potential to downstream properties and create a liability. Therefore:

**2-2.200**

1. Design drainage facilities to maintain the natural runoff and channel characteristics.
2. Do not adversely impact storm water drainage patterns, including the location and configuration of watershed boundaries.
3. Maintain the stability of existing storm water drainage channels and desert washes, particularly the channel banks, as much as is possible.
4. Do not increase the natural volume of existing channel flows.
5. Maintain the natural sedimentation characteristics of an existing drainage way.
6. Do not restrict or obstruct the natural habitat condition or desert fauna movement with improvements to existing channels.
7. Maintain the natural vegetation density and diversity of existing channels.
8. Preserve the view-shed characteristics of large desert washes and vista corridors.
9. Design detention basins so that they blend into the natural contours and undulations of the site and the local natural terrain.
10. Locate detention basins within a subdivision in separate tracts, not on individual lots. Exceptions may be made by the Zoning Administrator, or designee, if the following conditions are met:
  - a. The basins will be maintained by a property owners association, or its equivalent;
  - b. Appropriately sized drainage and maintenance access easements are provided; and
  - c. The basin is accessible from a street.

**Refer to Chapter 4 of this manual.**

### IMPROVEMENTS TO NATURAL WASHES

Design any improvements to natural desert washes so that they complement the natural function and appearance of the site. It is preferable to leave the washes in an undisturbed state and use sufficient building setbacks to preclude the need for artificial bank protection.

Avoid any disruption of the natural geometry and bed-profile of desert washes in the **ESLO ESL areas** to the greatest extent feasible. This includes any unnatural diversion of water into or from these washes. Such diversion could upset the system equilibrium and induce accelerated bank erosion and long-term degradation of the channel bed.

#### A. Incised Natural Desert Washes

Virtually all desert washes in the Hillside landform, and many of the washes in the Upper Desert landform, are deeply incised. As such, they generally have capacity that is equal to or exceeding that necessary to contain the anticipated storm flows.

The steep slopes in the Hillside landform and the relatively steep slopes in the Upper Desert landform promote very high velocity flows. This creates a potential for bank erosion and bed scour.

Due to bedrock outcrops and relatively large diameter sediment particles that are found in these desert washes, bed scour may be arrested by channel armoring, particularly in association with road crossings. This phenomenon will be evaluated on a case-by-case basis.

**2-2.201**

Avoid the use of structures that might form an artificial grade control. Consider clear span bridges for crossings where multiple barrel culverts may impede the flow due to the amount of sediment transport or debris that is likely to occur during a major storm event.

Include the entire top-of-bank to top-of-bank dimension that exists naturally, in addition to the area normally required to contain the 100-year storm, within drainage easements along incised washes.

### B. Over-bank Flow and Braided Washes

In portions of the Upper Desert landform and across most of the Lower Desert landform, washes do not have natural channels with adequate capacity to contain major storm water flows. In major storms, flows will fill the visible channel, inundate adjacent lands, then divert into other braided channel courses and/or become sheet flow that is not confined to any particular drainage way. Modifying or restructuring the natural drainage way may be needed to protect structures and public infrastructure. To maintain control of flood flows along such drainage ways, provide reinforced channel banks by using reinforced embankments, flood walls, raised pads for buildings, or other such methods.

Reconstructing or relocating a natural channel may be considered only when it has been demonstrated that there is no other reasonable approach available. Relocated desert wash channels shall be designed and constructed in a manner that restores the wash to a natural condition, with revegetation of native desert plants that are typical to local washes, and with contours that blend into the natural topography. Placing channels into underground drain pipes shall not be utilized unless there is no other possible solution for managing the storm water flows. Any modification of a desert wash that has a 100-year storm flow of 50 cubic feet per second (cfs), or greater, will require a modification approved by the Zoning Administrator as described in the **ESLO ESL District**, see [www.ScottsdaleAZ.gov/codes/eslo](http://www.ScottsdaleAZ.gov/codes/eslo).

### C. Residential Development

1. Design residential street systems in order to avoid diverting or blocking historical drainage patterns.
2. Contour and align streets so that water is directed into the historical drainage course on the site.
3. During the construction phase of residential development, minimize erosion that may occur on disturbed ground surfaces, such as utility alignments, street cuts, etc.
4. Disperse on-site storm water flows from improved portions of residential properties in order to minimize off-site erosion, or direct flows into a defined drainage course in order to minimize erosion and maintain flow characteristics of the drainage way.

### D. Utility Installations

1. Complete the installation of underground utilities so that there is little or no alteration of historical drainage patterns that exist within the development site.
2. Utility crossings of drainage ways should be limited to the minimum extent feasible.

3. Wherever possible, place utility crossings in conjunction with road crossings and diagonal to the flow path of the drainage way.
4. Place utility crossings in natural or man-made channels, below the maximum expected scour depth of such channels, in addition to the usual depth of cover.
5. Do not place utility corridors alongside drainage ways within the area that could be inundated in a 100-year storm flow, or through the native riparian vegetation that is adjacent to the drainage way.

### E. Culverts and Grade Crossings

1. With the design of culvert capacities, determine the potential for clogging due to sediment and debris in the storm water flow.
2. At culvert entrances construct headwalls and wingwalls. In addition, an erosion resistant apron may be necessary when analysis indicates the need. Consult the Federal Highway Administration's manuals regarding the design of such facilities.  
**Also refer to Chapter 5 of this manual.**
3. Consider the possibility of storm water flow over the roadway in the design of a culvert at a roadway crossing and provide erosion resistant bank protection on both the upstream and downstream side-slopes of the crossing, as needed.
4. Where "wet" crossings of washes are approved by Planning Neighborhood and Transportation Administrator and Community Facilities Executive Director, or their respective designees, a concrete road surface may be necessary for that portion of the street that may be inundated during a 25-year storm flow. Concrete cut-off walls shall be designed and constructed on both the upstream and downstream sides of the roadway. All "wet" crossings shall be **sign**-posted in order to assure public safety.

### F. Protection of 50 cfs Desert Washes

The goal of the **ESLO ESL District** is to leave significant desert washes in place and in a natural condition when it is practical to do so. Site plan designs should accommodate natural desert washes in their native locations and condition to the greatest extent feasible. Significant desert washes as defined in the **ESLO ESL District** are those having a 100-year storm water flow of 50 cfs or more.

Special note: The city has prepared maps of desert wash channels that have a capacity of 50 cfs or more, but it should be noted that no storm water flow calculations were made during the preparation of these maps. The purpose of these maps is to highlight drainage corridors that should be studied and evaluated in order to determine if they qualify as significant desert washes and to assure continuity of drainage flows across various properties.

**ESLO The ESL District** provisions in the Zoning Ordinance include a procedure for a Wash Modification in order to consider the need for, and the resulting environmental character of, any proposed changes in the location, configuration, or condition of a significant wash.

## ROADWAY

2-2.300

This section focuses on minimum design guidelines for roadway improvements within the ESLO areas.

Alternative design solutions shall be considered if appropriate technical analysis and documentation can demonstrate compatibility with the environmental management objectives for **ESLO-ESL** areas.

Roadways can impact **ESLO-ESL** areas not only during construction, but also over the life of their use. Determine ways to mitigate such impacts as obstructing natural drainage channels, introducing road surface pollutants and disrupting habitat conditions during the planning stages of the project proposal. This section provides guidance for ways to effectively mitigate some of these impacts.

Some of the goals to meet in the design and construction of roads in the **ESLO-ESL** area are:

1. No slope movement or surface subsidence from construction shall occur outside of the approved construction limits for the road project.
2. Do not obstruct the capacity and function of drainage channels.
3. Avoid creating artificial sub-basins with road construction and layouts unless specifically approved as a part of a subdivision plat.
4. Maintain water quality by avoiding introducing surface run-off pollutants from road surfaces.
5. Maintain connections between significant riparian habitats or vista corridors with the roadway layout.
6. Replace native vegetation removed for roadway construction to the greatest extent possible.

### GENERAL DESIGN FACTORS

In **ESLO-ESL** areas, the location of a roadway (horizontally, vertically and in cross-section) should be compatible with the surrounding environment. The following factors should be considered in addition to design specifications for **ESLO-ESL** area roadways listed in the Transportation Chapter, ROW Section of this manual.

#### A. Location

Locate the roadway to minimize impacts to the natural environment, refer to Subdivision Street Planning Figure 2.2-2 below.

#### B. Alignment and Profile

Follow the topography of the area with the roadway design to minimize excavation and embankment scars. Curvilinear horizontal alignments and gently rolling profiles consistent with the natural topography minimize unnecessary disturbance to the existing environment.

#### C. Natural Features

Avoid significant natural features, such as stands of vegetation and rock outcroppings, when suitable alternative alignments are available.

**2-2.301**

D. Structures

Consider impacts on vegetation, topography, wildlife movements and the viewshed in the design and location of roadway structures.

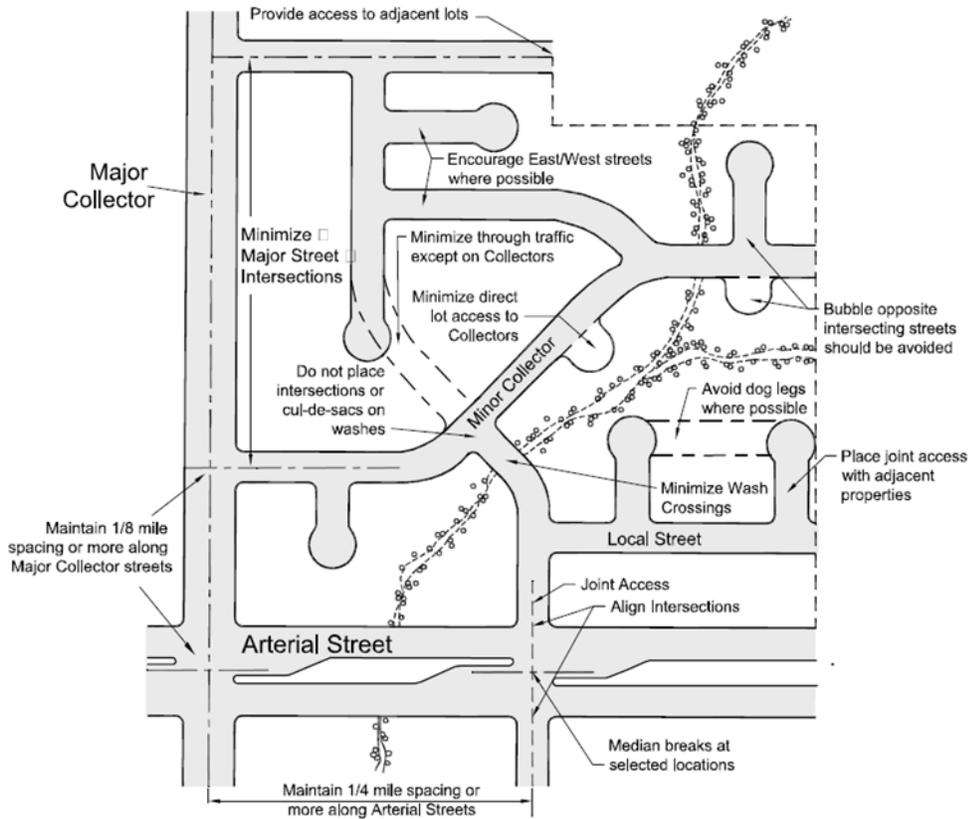


FIGURE 2.2-2 SUBDIVISION STREET PLANNING

**SPECIAL CONSIDERATIONS FOR ROAD CROSS-SECTIONS**

2-2.302

A. Street Rights-of-Way

Additional rights-of-way may be required for cut or fill slopes, bike paths, horse trails, traffic control devices, fire hydrants or other public facilities located adjacent to streets. Where cut or fill slopes extend beyond the rights-of-way, a permanent easement may be provided in lieu of increasing the width of the rights-of-way.

B. Shoulders

All roads within **ESLO-ESL** areas should have improved shoulders. Construct shoulders with clean native topsoil that is free from roots, debris, heavy clay and large stones or rocks. Compact all shoulders to a minimum of 90 percent of maximum density.

C. Cross Slopes

In **ESLO-ESL** areas it may be necessary to use roadway cross slopes to control drainage. The slope of shoulders should match the pavement cross slope.

D. Utility Locations

In general, place utilities within the improved area of the pavements and adjacent shoulders. If it is necessary to place utilities **outside the bounds** in a Public Utility

Easement (PUE) of the road improvements, minimize the amount of grading, loss of native desert vegetation and impacts to the natural drainage character.

**2-2.303**

**ROAD GRADING**

This section establishes criteria for cut and fill slopes, slope stabilization, erosion controls and restoration of scarred areas due to roadway grading. All roadway improvement plans and street design must be completed under the supervision of a registered Civil Engineer.

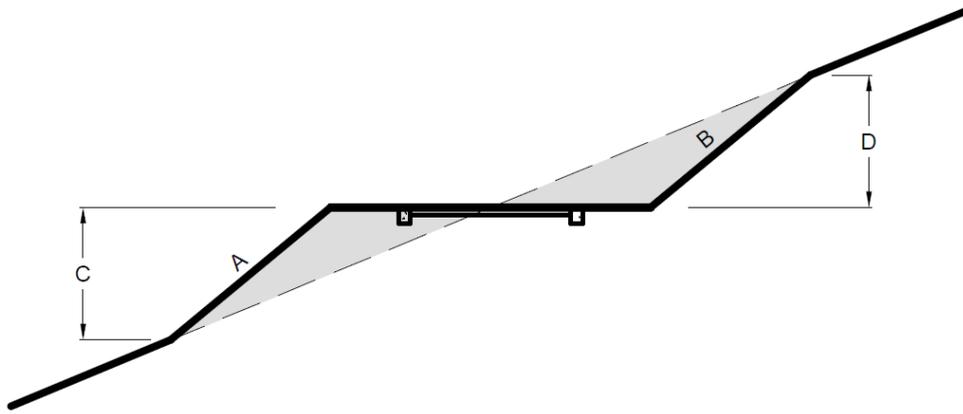
**A. Side Slopes**

1. Consider stability, maintenance and appearance of cut and fill slopes during construction. Use geotechnical reports for safe slope gradients.
2. The maximum slope gradient for fill slopes within the rights-of-way is 4:1 (horizontal to vertical) and for cut slopes is 3:1 (horizontal to vertical), unless otherwise approved by the Planning and Development Services and Transportation Directors or their designees.
3. In areas where the engineer anticipates unstable soils or potential erosion, flatter slopes or specific mitigation techniques may be accepted. Design measures to mitigate unstable slope conditions and potential erosion problems must be identified in the geotechnical report.
4. Steeper slopes are allowable provided that geotechnical conditions are properly analyzed and a stable embankment is detailed on the construction plans. **Fill Guardrails are required along fill slopes steeper than 4:1 (horizontal to vertical) require the use of guardrails.**
5. The maximum height of cuts and fills for roadway improvements is 8 feet in the Upper and Lower Desert Landforms and 12 feet in the Hillside Landform, as measured vertically from the pavement surface to the natural grade at the toe or top of the constructed slope, see Figure 2.2-3, Hillside Landform Road Cuts.
6. When retaining walls are used, the exposed height should be the height of the retaining wall plus the vertical height of the retaining slope. In addition, these maximum heights will limit length as shown below.

Slope Height	Maximum Length
0-4 feet	None
6 feet	375 feet
8 feet	300 feet
10 feet	225 feet
12 feet	150 feet

7. Cut and fill slopes should maintain an average height of 6 feet in the Upper and Lower Desert Landform and 8 feet in the Hillside Landform areas for any continuous slope. Determine the average slope height by using individual slope heights measured at 50-foot intervals.

8. Where there is a combination of cut and fill slopes at any station along the roadway, do not exceed a combined slope height of 12 feet in Upper and Lower Desert areas and 16 feet in Hillside areas.



- |                                     |  |
|-------------------------------------|--|
| A: 4:1 SLOPE (3:1 WITH GUARD RAILS) | C: 12' MAX. / 8' AVERAGE FOR EACH 50' LENGTH |
| B: 2:1 SLOPE                        | D: 12' MAX. / 8' AVERAGE FOR EACH 50' LENGTH |
| C+D: 16' MAX.                       |  |

FIGURE 2.2-3 HILLSIDE LANDFORM ROAD CUTS (Drawing NTS)

9. Heights exceeding the above criteria may be allowed by the Development Review Board or Zoning Administrator provided the applicant demonstrates that objectives of **ESL** the Environmentally Sensitive Lands (ESL) zoning district are met.
10. Round all slopes to blend into the existing terrain to produce a contoured transition from the slope face to the natural ground.
11. Planning and Development Services staff may require mitigation techniques for cuts and fills greater than 8 feet be presented to the Development Review Board for approval. Slopes and fills must be engineered in accordance with the recommendations of the geotechnical report.

**B. Retaining Walls**

Retaining walls may be used to reduce the horizontal and vertical distances required to construct cut and fill slopes.

1. All retaining walls, regardless of height, shall comply with the city building code and also conform to the following requirements. The heights and types of retaining walls may be subject to Development Review Board approval as determined by the Planning and Development Services Director or designee, based upon the visibility and magnitude of the proposed structure.
2. Acceptable types of retaining walls include stone gravity, structural masonry and reinforced concrete. Do not use other types, such as metal cribbing walls and rock gabion walls, unless approved by the city.
3. Consider terraced walls in place of a single wall for instances requiring retaining walls in excess of 6 feet. The minimum dimension of the landscaped level located between the lower and upper terrace walls shall be at least equal to the visible

height of the lower wall, but not less than 4 feet. Refer to Figure 2.2-8 Retaining Wall Dimensions.

4. In general, match the finish material and color of retaining walls with the surrounding natural stone, rock or soil color.
5. Plans for retaining walls greater in height than 3 feet must be signed and sealed by a registered Civil Engineer or Structural Engineer in the State of Arizona.

### C. Drainage Controls

1. Design all drainage facilities to carry surface waters to their historical outfall.
2. Do not pond water above cut or fill slopes.
3. Construct and maintain erosion controls (temporary or permanent) to prevent erosion of all slopes and graded areas.
4. Provide surface drainage interceptors at the top of cut and fill slopes where surface runoff will create erosion problems.
5. Subsurface drainage facilities may be required for stability and protection of affected areas due to ground water seepage.

### D. Slope Restoration

Restoration and stabilization of all exposed slopes created by grading shall be completed within 90 calendar days after rough grading of the roadway. Restoration shall consist of revegetation with native species of a type and mix consistent with local natural conditions and/or artificial weathering of rock faces. A revegetation plan including plant species, locations, sizes and methods of transplanting must be submitted for review and approval.

## STREET INTERSECTIONS

Do not place street intersections within the alignment and floodplain of major or minor washes, on or within boulder clusters or other such sensitive environmental features.

**2-2.304**

## STREET LIGHTING

Do not provide street lighting within the Hillside landform; refer to Chapter 2.1 of this manual.

### A. In the Upper Desert Landform

Where the average residential density is less than 1.5 dwellings per acre or the surrounding land use is some form of open space, provide street lighting only at intersections with major and minor collector streets. Where the residential density is higher or there are non-residential uses, provide street lighting at all intersections. Finish street lighting equipment to match the surrounding environment.

### B. In the Lower Desert Landform

Where the average residential density is less than 1.5 dwellings per acre or the surrounding land use is some form of open space, provide street lighting only at intersections with collector or larger streets. In all other areas use street lighting based upon the latest **IES International Illumination Society (IES)** recommended standards

**2-2.305**

that are based upon the land use and context of the street, refer to Chapter 2.1 of this manual.

### SIDEWALKS

2-2.306

#### A. In the Hillside Landform

Sidewalks are not required within the Hillside Landform.

#### B. In the Upper Desert Landform

1. Sidewalks are not be required where the residential density is less than 1.5 dwellings per acre or the adjacent land use is an open space area of at least 40 acres, except along arterial or larger streets.
2. Sidewalks are required in all other areas.
3. Sidewalks on one side only of a street may be permitted by the Planning and Development Services Director or designee if the street is accessed only on one side, the street is a cul-de-sac less than 400 feet in length, or the local land slopes generally average 10 percent or more.

#### C. In the Lower Desert Landform

In areas where the average residential density is less than 1.5 dwellings per acre sidewalks are required along major collector or larger streets. Sidewalks are required in all other locations.

#### D. Other Considerations

Shoulders may be used as pedestrian ways provided safety is not compromised. In these cases, wider shoulders may be used in place of a concrete sidewalk.

### BIKEWAYS

2-2.307

Scottsdale policy requires bikeways on all arterial and major collector roads, refer to the Transportation Chapter of this manual. However, this requirement is waived in the Hillside landform.

### DRIVEWAYS

2-2.308

#### A. Residential Developments

In general, limit driveways in ~~ESLO~~ **ESL** areas to 1 per residence. However, additional and circular driveways will be permitted provided they do not adversely disrupt the surrounding natural desert environment.

1. The minimum driveway width for driveways less than 200 feet long is:
  - a. 16 feet in the Upper and Lower Desert Landforms and
  - b. 12 feet for driveways in the Hillside Landform.
2. The maximum linear grade of a driveway shall be 18 percent and the average grade for the length of the driveway shall be 12 percent.
3. To minimize crossings of drainage ways, shorten the length of cul-de-sacs in steeper terrain and protect boulder clusters or formations, a single driveway may serve more than one residence but not more than four residences provided that:

## ENVIRONMENTALLY SENSITIVE LANDS

- a. The maximum length is 400 feet, unless specifically approved by the Planning and Development Services Director or designee,
  - b. The minimum width is 24 feet in the Upper and Lower Desert Landform and
  - c. The minimum width is 18 feet in the Hillside Landform.
4. Driveways greater in length than 150 feet or with grades steeper than 12 percent in Hillside areas are subject to prior approval by the Planning and Development Services Director or designee, as well as from the city's Fire Department. Design such driveways based upon the following criteria and Private Driveway Design for Emergency Access. Also refer to the Fire Code at [www.ScottsdaleAZ.gov/codes](http://www.ScottsdaleAZ.gov/codes):
- a. Where the driveway gradient is 0 to 12 percent:
    - The driveway surface shall be all-weather,
    - The minimum driveway width shall be 16 feet if it is longer than 200 feet and
    - A turn-around is required if the driveway length exceeds 200 feet.
  - b. Where the driveway gradient is from 12.1 to 15 percent:
    - The driveway shall have a hard surface,
    - A turn-around is required if the driveway length exceeds 200 feet,
    - The minimum width shall be 16 feet if the driveway is longer than 200 feet (a 12 feet wide hard surface with 2 foot wide compacted shoulders on each side may be used) and,
  - c. Where the driveway gradient is from 15.1 to 18 percent:
    - The driveway shall have a hard surface,
    - A turn-around is required if the length of the driveway exceeds 200 feet,
    - The minimum width shall be 16 feet if the driveway is longer than 200 feet (a 12 feet wide hard surface with 2 foot wide compacted shoulders on each side may be used) and,

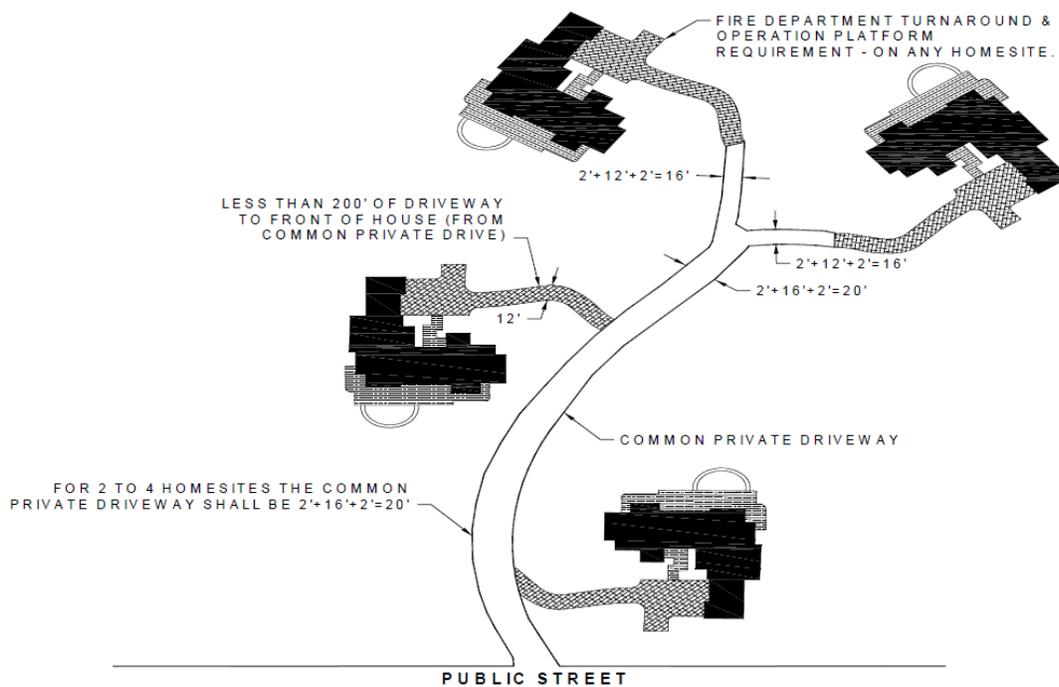
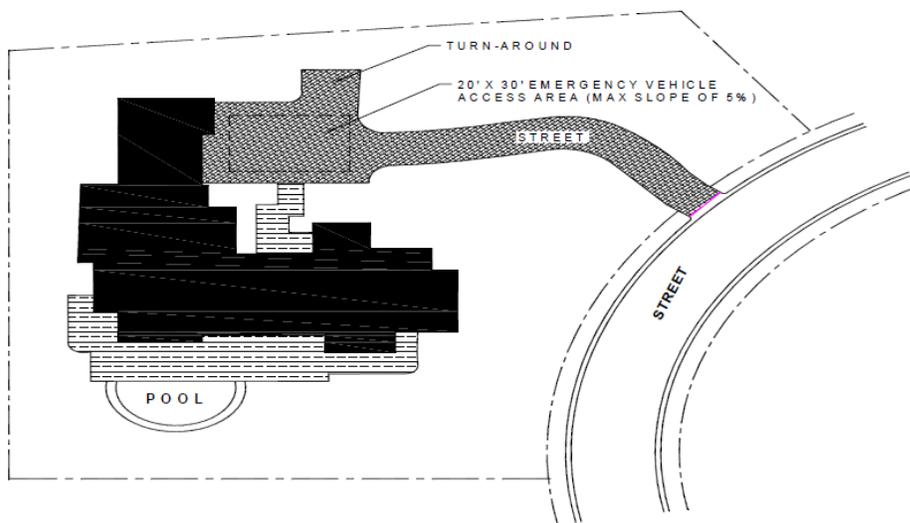


FIGURE 2.2-4 PRIVATE DRIVEWAY DESIGN FOR EMERGENCY ACCESS

5. Design driveways and parking areas for adequate vehicle maneuvering and turn around for a Single Unit Truck (SU) as defined by AASHTO.
6. Provide a fire Operational Platform adjacent to the main building whenever the driveway exceeds 12 percent in grade or is longer than 200 feet. The minimum dimensions for this platform are 20 by 30 feet and the maximum cross slope is 5 percent, refer to Operational Platform for Fire Access.
7. Where required, the turn-around shall be either a circular drive with a minimum radius of 40 feet 6 inches or a T-type hammer head with 16 feet by 76 feet dimensions, refer to Figure 2.1-2.
8. A turn-out is required along extended driveways at 300 feet intervals. The turn-out shall be at least 20 feet wide for a distance of at least 45 feet, refer to Fire Turn-out for Extended Driveways.



## OPERATIONAL PLATFORM

A 20' X 30' EMERGENCY VEHICLE ACCESS (MAX 5% SLOPE) AREA SHALL BE PROVIDED ON ALL LOTS IN WHICH THE ADJACENT STREET OR DRIVEWAY GRADES ARE GREATER THAN A 12% SLOPE

FIGURE 2.2-5 OPERATIONAL PLATFORM FOR FIRE ACCESS

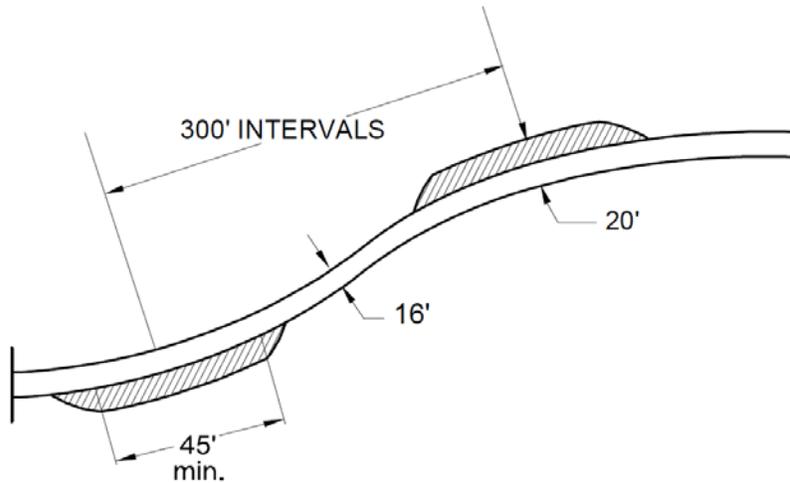


FIGURE 2.2-6 FIRE TURN-OUT FOR EXTENDED DRIVEWAYS

B. Locations

Locate driveways in the Hillside Landform a minimum of 100 feet away from the rights-of-way line of an intersecting street and a minimum of 25 feet from a side property line. In special cases the Planning & Development Services Director or designee may make exceptions to this standard. Refer to Figure 2.2-7 Driveways on Hillside Landform.

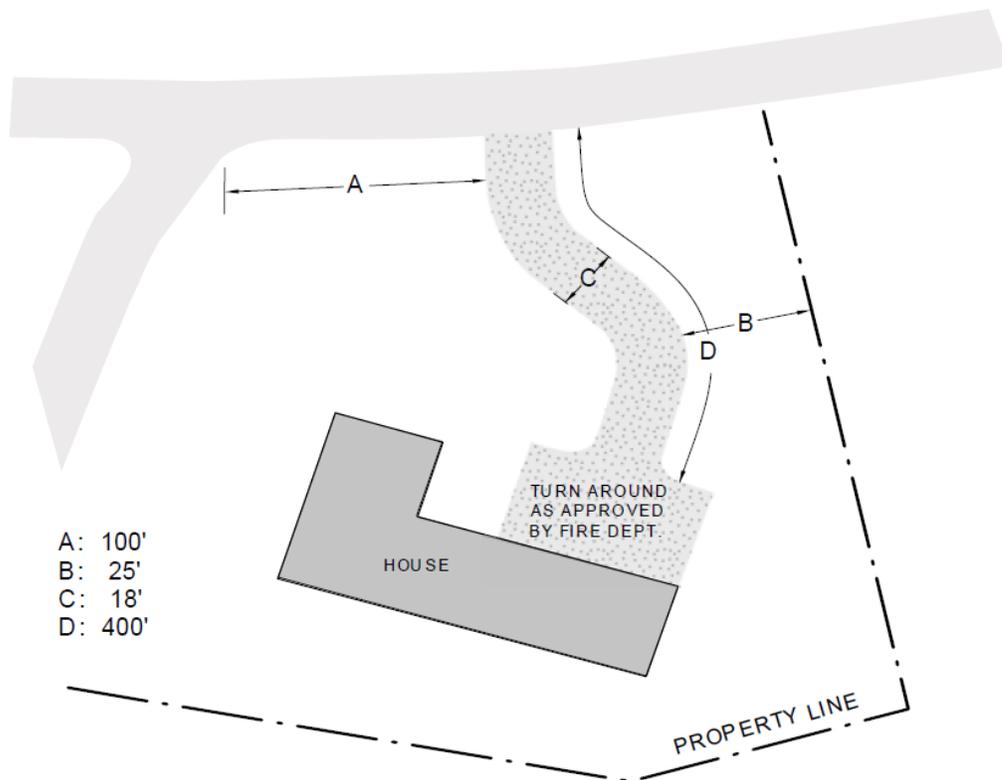


FIGURE 2.2-7 DRIVEWAYS ON HILLSIDE LANDFORM

### C. Surfacing

Pave driveway aprons with asphalt, Portland Cement concrete or concrete pavers. Other types of stabilized surfaces, such as cemented native granite or approved equal, may be allowed where it can be demonstrated that there would be no erosion off of the surface and the construction will allow for the loading of emergency vehicles. Where sidewalks are used, design and build the driveway apron according to MAG standards.

## SITE WORK

The intent of these guidelines is to promote creative design and innovative methods for site development within the **ESLO-ESL** area. Modified grading guidelines may be allowed where it can be demonstrated that they achieve the goals and purposes of **ESLO the ESL District**. Grading includes initial clearing, grubbing, excavating and placement of fill associated with any form of development.

This section establishes guidelines for grading which are intended to:

- Regulate the development of potentially hazardous terrain;
- Preserve the general visual character of graded sites; and
- Preserve native vegetation and wildlife habitat.

Consider the following key elements during the design and implementation of all grading activities.

1. Conserve the natural environmental features and functions of the site.
2. Design and construct grading to be compatible with the surrounding natural desert land.
3. Use construction techniques that result in no slope movement or subsidence and the stabilization of hillsides, slopes or other areas subject to erosion or mass movement.
4. Preserve the natural capacity of drainage courses and protect natural drainage ways, including the native vegetation associated with them.
5. Control dust pollution and surface water runoff and related erosion during construction operations.
6. Maintain the stability of underlying geological conditions wherever development is proposed, unless specific mitigation measures are proposed to assure safe development of the land.
7. Do not alter drainage basin boundaries.
8. Do not create any obstructions within any drainage channels.
9. Do not increase the movement of sediment in volume or velocity as a result of any modifications to natural channels.
10. Do not obstruct scenic, riparian or vista corridors. Preserve or restore them to a natural desert condition.
11. Minimize topsoil and vegetation removal.
12. Design and finish graded cuts and fills that are visible from adjacent properties in a manner that matches the surrounding native soils and rocks.
13. Leave significant natural boulders and rock formations intact and minimize any damage.

2-2.400

### APPLICABLE PROJECTS

2-2.401

A grading permit is required of all development projects, private or public, for **ESLO-ESL** areas, except as exempted herein. Categories for general grading that require a grading permit include but are not limited to the following:

1. Residential development for a single lot of any size.
2. Residential or mixed-use development that requires a subdivision plat or development plan.
3. All other nonresidential types of development.
4. The clearing, brushing or grubbing of any area where grading for any purpose is to be done.
5. Temporary off-site stockpiling of fill material.
6. Driveways and parking areas where the graded area will be greater than 500 square feet.
7. Recreational facilities such as golf courses, parks and ball fields.
8. Educational institutions and schools (public or private).
9. Public service facilities such as fire stations, police stations and libraries.
10. Public infrastructure facilities such as water storage tanks, flood control structures and wastewater treatment facilities.

### EXEMPTIONS

2-2.402

The following activities are not required to have a grading permit:

1. Resurfacing or maintenance of an existing paved surface.
2. If authorized by a building or zoning construction permit, excavation below finished grade when the excavation is for the construction of a basement, foundation, wall or swimming pool.
3. Exploratory excavation performed under the direction of a registered soil engineer or geologist, provided all excavation is properly backfilled.
4. Archaeological exploration of an archaeological site recognized by the State.
5. Removal of native vegetation when being performed under an existing de-vegetation permit.
6. Underground utility installations under a graded or paved roadway surface.
7. Grading for maintenance purposes of an existing private road, access or driveway, provided that it existed prior to the adoption of **ESLO the ESL District** or that it was established in conformance with this section.
8. Land uses which are exempt under statutory regulations.

### GEOTECHNICAL INVESTIGATIONS

2-2.403

Most grading activities in **ESLO-ESL** areas require some level of geotechnical investigation and analysis, the level of which shall be left to the discretion of the city and the engineer based upon the known conditions on the site. Such studies are required where there are known or likely occurrences of unstable slopes, exposed or shallow bedrock, on-site materials that may bear radon elements, soils with high shrink/swell potential or the presence of caliche hardpan. Exceptions to this requirement may include the construction

at single-family residences where the improvements are not occupied structures or are not attached to any rock materials.

### MAXIMUM GRADING AREA

2-2.404

1. Grading is allowed to occur only within an approved construction envelope.
2. The maximum grading area for any parcel is based on NAOS requirements. Grading is not permitted within designated undisturbed NAOS areas. When utility trenches cannot be reasonably provided without crossing designated natural or open space areas, such trenching activities may be allowed provided all disturbed areas are revegetated to a natural condition.
3. The actual graded area for any parcel must be less than or equal to the developable area of a parcel as specified in **ESLO the ESL District**. If a conflict arises, the terms and conditions of the **ESLO ESL District** shall govern.
4. Site grading that impacts special features is prohibited; these areas are identified on **ESLO-ESL District** Special Features Map or the High Priority NAOS Locations map, refer to [www.ScottsdaleAZ.gov/codes/eslo](http://www.ScottsdaleAZ.gov/codes/eslo). Site work should be planned to avoid cutting off significant riparian and habitat corridors. Buffer areas should be provided around developed sites. The design of final grading must consider view shed impacts.
5. Grading is prohibited where geologic hazards are identified, unless a specific exemption to this guideline has been approved by the Planning and Development Services Director or designee, as the result of the recommendation of the geotechnical investigation. Such areas may include but are not limited to boulder rolling, rockfalls, slope collapse, and talus slopes.

The Planning & Development Services Director or designee may approve modifications to these grading limits for special conditions such as unique soil or geologic conditions.

### GRADING DESIGN GUIDELINES

2-2.405

#### A. Cut and Fill Slopes

##### 1. Maximum Slope Gradient

- a. Use geotechnical reports to provide recommendations for safe slope gradients for exposed cuts or fill materials. Unstable slope conditions and potential erosion problems must also be identified within the geotechnical report as well as adequate design measures to mitigate these conditions.
- b. Typically, safe slope gradients in **ESLO-ESL** areas range between 4:1 and 2:1 (horizontal to vertical). For exposed cut slopes the structural nature and strike and dip of the native soil or rock material being cut into governs the appropriate slope gradient. For exposed fill slopes the appropriate slope is based on the natural angle of repose based upon the structure of the fill material.
- c. Where applicable, incorporate revegetation techniques within the slope design. In general, the steepest slope for revegetation or landscaping is 3:1 (horizontal to vertical).
- d. Conform slopes adjacent to roadways to the requirements in Section 2.300 of this manual.

##### 2. Heights

- a. In general, do not exceed 8 feet for the height of cuts and fills in **ESLO-ESL** areas, as measured vertically from the finished grade to the natural grade.
  - b. Exceptions to this guideline are subject to the approval by a Planning and Development Services General Manager's designee where a cut surface will be entirely hidden by a building.
  - c. The Planning and Development Services Director's designee may allow cut and fill heights greater than 8 feet where it can be demonstrated that **ESLO the-ESL District** objectives are met.
  - d. The Planning and Development Services Director's designee may require cuts and fills greater than 8 feet to be subject to Development Review Board approval.
  - e. Any cut or fill on a property subject to the **ESLO-ESL District** regulations with a vertical dimension greater than 8 feet shall require a specific staff review. For properties subject to the Hillside **Ordinance District**, a specific staff review shall be required where there is an exposed fill greater than 4 feet in vertical dimension or cuts greater than 8 feet in vertical dimension.
3. Slope Shaping
    - a. Round all man-made slopes at the edges to blend into the existing terrain adjacent to the new slope to produce a contoured transition from the slope face to the natural ground.
    - b. Incorporate undulating slopes in all man-made slopes greater than 500 square feet in area to reflect the natural undulations occurring in the adjacent desert.
4. Slope Revegetation
    - a. Restore all exposed slopes created by grading to a natural condition and stabilize them to minimize erosion and slope collapse or wasting.
    - b. Restoration shall include revegetation with native species as found on similar natural slopes in the area.
    - c. Treat cuts into rock or caliche with artificial weathering techniques.
    - d. Irrigate all revegetated areas for at least 3 years or until the vegetation has become established.
    - e. Do not use imported decomposed-granite soil-cover/mulch in revegetated areas or in any place within NAOS areas.
  5. Setbacks

Building walls and other structures shall be set back from the top/toe of slopes far enough to assure stability and prevent damage from erosion. The engineer/architect shall specify the setback on the plans. Larger setbacks may be enforced in order to meet the intent of **ESLO-ESL District**.
  6. Drainage Considerations
    - a. Construct and maintain erosion controls (temporary or permanent) to prevent erosion of all slopes and graded areas.
    - b. Design building sites to carry surface waters away from buildings at a minimum grade of 2 percent for a minimum distance of 10 feet from any buildings.
    - c. Provide surface drainage interceptors at the top of all cut and fill slopes where surface runoff will create erosion problems.
    - d. Do not pond water above cut or fill slopes.
    - e. Subsurface drainage facilities may be required for stability and protection of affected areas due to ground water.
  7. Building Height

Establish all building pads and finish floor elevations so that the maximum allowable building height does not exceed the building height outline limit as specified in **ESLO ESL District**.

### B. Terraces and Retaining Walls

The use of retaining walls is an effective means to minimize grading, reduce the height of cut or fill slopes and stabilize slopes. The heights and types of retaining walls may be subject to Development Review Board approval, as determined by a Project Coordination Manager. All retaining walls, regardless of height, shall comply with the city Building Code and also conform to the following requirements.

#### 1. Terraces

- a. Terracing may be employed where deemed necessary by the engineer or where desired in order to reduce the amount of area to be graded.
- b. In order to minimize the impacts of the grading on a project, terracing may be required by Planning and Development Services staff.
- c. In general, the minimum width of terraces shall be at least 4 feet wide or equal to the height of the lower retaining wall if it is taller than 4 feet, in order to allow for the future maintenance of the retaining wall and allow for landscaping materials that will screen the visibility of the walls.

#### 2. Types of Walls

- a. Acceptable types of retaining walls are stone or concrete gravity, structural masonry and reinforced concrete.
- b. Other types such as metal cribbing walls or rock gabion walls are not permitted unless approved by Planning and Development Services Director or designee or the Development Review Board.
- c. The finish material and color of retaining walls should match the surrounding natural desert stone, rock or soil color.

#### 3. Alignments of Walls

Use undulating or angular alignments for all terrace walls greater than 50 feet in length.

#### 4. Heights

- a. Do not exceed 6 feet for the exposed height of any single retaining wall in ESL areas, as measured vertically from the inside ground level to the outside ground level as shown in Figure 2.2-8 Retaining Wall Dimensions.
- b. Use terracing where the vertical height to be contained by the retaining wall exceeds 6 feet of fill material or 8 feet of cut, as shown in Figure 2.2-8 Retaining Wall Dimensions.
- c. Meet structural stability for overturning, slope sliding and drainage considerations for all walls, regardless of height.
- d. The maximum face height of a wall that combines a retaining wall and a solid wall shall be 10 feet. The maximum height of the wall above the retaining wall structure as measured from the retained ground level shall meet the normal zoning wall height standard.
- e. The maximum face height of a combination of retaining wall and view fence shall be 12 feet. The maximum height of the wall/view fence above the retaining wall shall meet the usual zoning wall height standard.

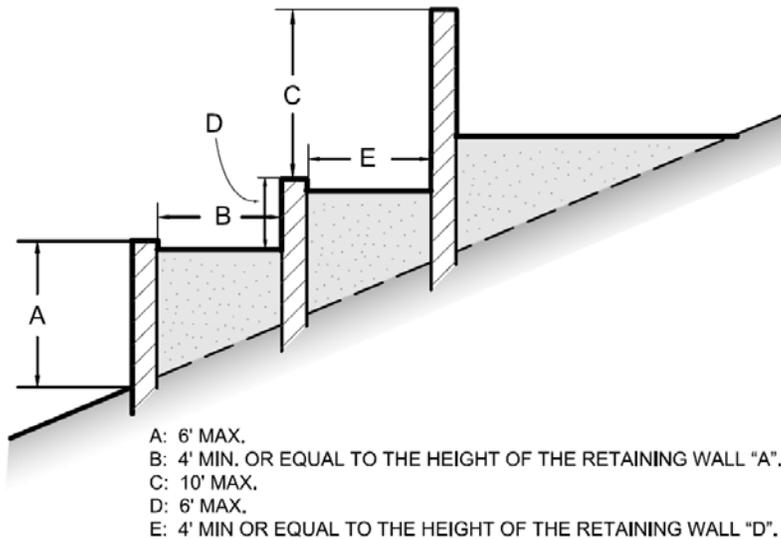


FIGURE 2.2-8 RETAINING WALL DIMENSIONS

C. Site Restoration

1. Required Restoration

Revegetate all disturbed areas. All revegetation shall be done with native species in a comparable density and pattern to that which exists upon the undisturbed adjacent areas unless otherwise approved by staff.

2. Slope Protection

On slopes where erosion may be a problem or the slope materials and/or gradient will not readily support soil binding plants, hold the plant material in place by anchored straw mulch, erosion control fabric or an equivalent material.

3. Plant Materials for Slope Restoration

Where the slope restoration includes the use of revegetation of native desert plants, use those plants that occupy similar natural desert slopes in steepness and orientation in the area.

4. Timing of Slope Restoration

Complete all site restoration for any type of development within 90 days of the completion of work or prior to the issuance of a certificate of occupancy, whichever occurs first.

D. Construction of Fills or Embankments

1. Fill Materials

Comply with the design engineer's recommendations for fill material and preparation of areas that are to receive fill. At a minimum, fill material should not contain any organic material, building materials, plastics, metals, hazardous wastes or refuse debris. Do not bury or place rocks, pieces of concrete or asphalt pavement or other irreducible material with a maximum dimension greater than 8 inches in any fill unless their placement has been specified and inspected by the engineer. Place and compact all fills in accordance with the engineer's specifications.

2. Expansive Soils

The design engineer must insure that there will be no adverse impacts created by expansive soils. Should the engineer's investigation reveal the presence of expansive

soils, the grading plans and specifications shall address how these soils will be managed.

3. Excess Material

Haul excess material to an appropriate off-site disposal area that has been approved by the Planning and Development Services Department. The disposal area must be outside of any Hillside landform area. An off-site hauling permit may be required from the city.

4. Dust Control

Apply approved dust control methods during all grading and until revegetation or site restoration is complete. Prior to the start of grading activities, a dust control permit must be obtained from the Maricopa County Health Department.

### SITE DESIGN GUIDELINES

Consider the following key elements in site design for any proposed development for the protection of the unique visual quality and the native desert environment in the ~~ESLO~~ **ESL** area:

1. Preserve view corridors along significant public transportation routes.
2. Minimize scarring of the natural topography.
3. Preserve existing vegetation as much as is feasible.
4. Preserve drainage ways as view and wildlife corridors, thus providing open space connections throughout proposed development areas.
5. Protect significant visual features such as peaks, ridge lines, rock outcrops, boulder fields and significant stands of vegetation wherever feasible.

### GENERAL DESIGN GUIDELINES

The following guidelines apply to all areas that are visible from public viewpoints or nearby development, which shall be designed and sited to blend into the landscape.

A. Site Development - Buildings, Structures, Walls and Fences

1. Blend all exterior finish surfaces with the color and texture of the surrounding stone, rock or soil color.
2. Do not use reflective building materials. Recessed window and entry openings and deeper roof overhangs are encouraged.
3. Preserve the ridge line silhouette of significant topographic features by locating all improvements below the ridge line and using a finished height that does not protrude into the silhouette as viewed from nearby public roads.
4. Match and blend buildings and surrounding improvements with the form of the landscape. Use stepped floor elevations to avoid massive building forms and wall surfaces that contrast with the surrounding terrain.
5. Use exterior lighting fixtures that are recessed or shielded so that the light source is not visible from a public viewpoint or other development in the immediate area. Direct building mounted lighting downward.
6. Screen all exterior mechanical equipment with material complementary to both the structure and the surrounding environment.

B. Walls and Fences

2-2.500

2-2.501

1. Perimeter Walls
  - a. In general, perimeter walls are not a preferred approach to providing privacy and minimizing the impacts of nearby roads. Consider using walls around individual building envelopes, mounding that blends into the terrain and other such treatments. If perimeter walls are used, set them back 25 feet from a perimeter street right-of-way or a property line.
  - b. Use undulating, notched or similar non-linear alignments for perimeter walls. They should move around significant natural desert vegetation leaving substantial room for these plants to survive (3 feet out from the canopy of desert trees and at least half the height of saguaros).
  - c. Use designs and materials for perimeter walls that reflect the form, materials, texture and colors of the natural desert setting.
  - d. NAOS does not include the area within 5 feet on either side of a perimeter wall, although this area may be considered as revegetated NAOS.
  - e. Maintain continuity of Natural Area Open Space; do not separate adjacent NAOS areas with perimeter walls.
  - f. Do not cross minor or major watercourses with perimeter walls.
  - g. Install openings in perimeter walls at least 3 feet in width and height, at intervals no greater than 200 feet to allow wildlife movement.
2. Individual On-Site Walls
  - a. Where on-site walls are placed adjacent to NAOS areas at least 50 percent of the wall surface shall be a view fence.
  - b. Do not cross or enclose minor or major watercourses with on-site walls.
3. Fences
  - a. Fences may cross drainage ways as long as they do not impede storm flows, collect debris in storm flows or block the passage of wildlife.
4. Walls Along Vista Corridors
  - a. Walls located immediately adjacent to a Vista Corridor easement are limited to a height of 3 feet. Set back taller walls parallel to Vista Corridor easements an additional 4 feet for each foot of wall height above 3 feet.
  - b. Where channel capacity is sufficient to contain the 100-year storm flow, place walls along the edge of Vista Corridor easements a minimum of 2 feet back of the grade break at the top of the natural channel of the wash.
5. Sound-buffer Walls Along Roads

Sound walls are not allowed where there is a Scenic Corridor Easement along a roadway and are generally discouraged in other locations. Naturally contoured and landscaped berms may be permitted subject to the specific approval of the Development Review Board. Exceptions to this may be considered along roads with 4 or more lanes where the adjacent subdivision has no Scenic Corridor Easement. The design of any wall in such a case shall be subject to specific approval by the Development Review Board. The wall design shall incorporate rustic and dark materials, provide openings and breaks for washes and adjacent NAOS areas, and shall include variations in vertical and horizontal alignment.

### C. Ancillary Improvements

#### 1. Corral Areas

Do not place corral areas over or across minor or major watercourses, boulder clusters or rock formations. Also, do not place them on areas with slopes in excess of 15 percent.

#### 2. Tennis Courts

Do not build tennis courts on terrain with slopes in excess of 15 percent. On slopes of 3 percent or more cut tennis courts into the slope rather than placing them upon fill material. The screen fencing should be a dark color, preferably black or dark brown.

#### 3. Parking Areas

On slopes of 5 percent or more divide parking areas into sections generally with no more than 50 spaces. Use landscaped islands to transition the grade breaks across parking areas. Parking area run-off should be directed into detention basins, as applicable. The maximum height of light poles in parking areas is 16 feet.

### D. Other Site Design Considerations

#### 1. Refer to the Zoning Ordinance and the Outdoor Lighting section in this manual for light standards within ~~ESLO~~-ESL areas.

#### 2. Firebreaks

Maintain a Defensible Space firebreak within 30 feet of any occupied structure. A firebreak shall consist of a maintained area where the typical herbaceous and grass plant materials that grow annually are kept clear. This does not include the removal of any native perennial plant materials, except those that might overhang structures. In lieu of the removal of certain plants, fire-rated walls and/or exterior fire sprinklers may be considered. Cantilevered, bridged or similar types of structures may be allowed subject to the approval of the city's Fire Department. Native trees may be trimmed within this Defensible Space. In addition, gutters and eaves should be kept clear of debris; flammable materials should not be stored or stacked; and a hose connection should be provided near where building walls are adjacent to NAOS areas. Consult the city's Invasive Plants brochure, [www.ScottsdaleAZ.gov/codes/nativeplant](http://www.ScottsdaleAZ.gov/codes/nativeplant) and wildland fire prevention information, [www.ScottsdaleAZ.gov/codes/fireord.asp](http://www.ScottsdaleAZ.gov/codes/fireord.asp) for assistance in identifying and eradicating these plants.

#### 3. NAOS Setbacks

NAOS easement may be located adjacent to site walls, driveways, parking area or similar construction as long as the first 5 feet of NAOS out from the improvement is revegetated, as provided in the Zoning Ordinance. The NAOS easement shall be placed at least 5 feet away from a roofed structure, with the next 5 feet out from the structure being revegetated area, refer to below.

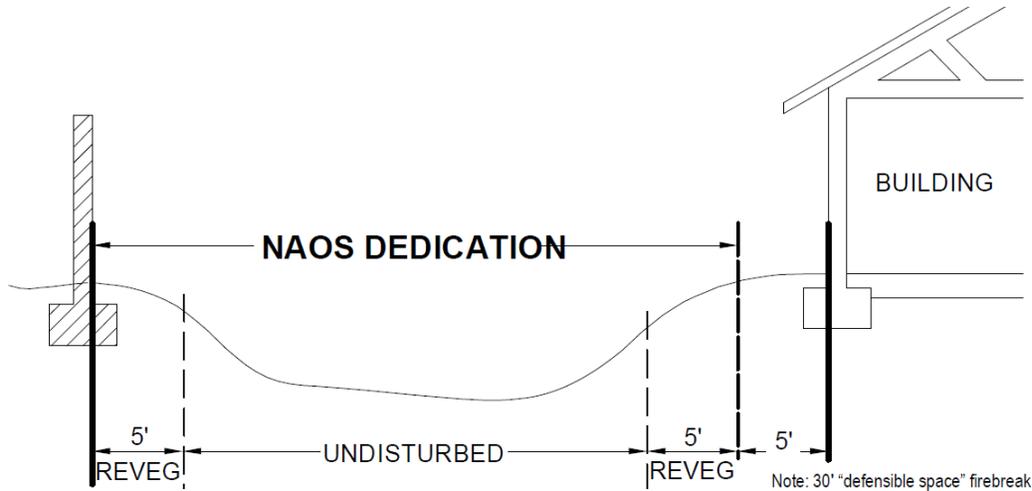


FIGURE 2.2-9 NAOS LOCATION GUIDE

4. Landscaping

- a. The palette of plants that can be used for areas that are not enclosed or trees that exceed a mature height of 20 feet are listed on the city’s Indigenous Plants for Environmentally Sensitive Lands publication. The use of any other plant materials in such situations shall be subject to the specific approval of the Zoning Administrator or designee, refer to [www.ScottsdaleAZ.gov/codes/nativeplant](http://www.ScottsdaleAZ.gov/codes/nativeplant).
- b. Use hydro-applications in revegetated areas only as a supplement to the use of container or relocated plant specimens. The mix in terms of plant types and ratios shall be based upon the native mix and density that occurs on the site.
- c. Design and install swimming pool filtration systems in such a manner that no flows shall enter any NAOS areas or drainage ways.
- d. Landscape lighting is not allowed within NAOS areas.

5. NAOS Enhancements

- a. In-fill Areas (refer to the Zoning Ordinance)
  - i. The type or cause of the man-made or natural disturbance needs to be identified before any enhancement can be considered. The most common disturbance would be an historic brush fire.
  - ii. On-site vegetation surveys need to be conducted and compared with surveys of undisturbed natural areas in the vicinity in order to establish the appropriate types of plant materials and planting densities to be used.
  - iii. The perimeter of the disturbed area to be enhanced shall be identified on the revegetation plans as well as staked on-site during installation of the plant materials.
- b. Native Plant Replacement
  - i. If a native plant dies that qualifies for protection under the Native Plant Ordinances (refer to the Zoning Ordinance and Chapter 46, Article V of the City Code) and is located within 50 feet of an improved area, it may be replaced by a plant of the same species.
  - ii. The minimum replacement size is a 15-gallon container size and the maximum size is a 24-inch box container size.
- c. Edge Area Enhancements

- i. Additional native plant specimens may be added to NAOS areas within 50 feet of improved areas as long as the plant material is native to the site.
    - ii. The addition of the specimen shall not result in a plant density that is significantly denser than what is typical within the vicinity of the site.
    - iii. Decomposed granite and other non-native materials may not be added to the NAOS area.
  - d. General Limitations and Requirements
    - i. No motorized vehicles are allowed to enter into the NAOS area in conjunction with the installation of any NAOS Enhancements.
    - ii. Plant material installed with any NAOS Enhancement shall be watered for a period not less than 18 months and not greater than 36 months in order to establish the plant survival. The watering technique shall not include any permanent irrigation facilities. All temporary irrigation materials are to be removed once the establishment irrigation period has ended.
6. NAOS Maintenance
  - a. It is the intent and definition of Natural Area Open Space that it be natural or naturalized Sonoran Desert land that is kept in a self-sustaining, undisturbed and natural condition (refer to the Zoning Ordinance).
  - b. These areas are required to be maintained as natural areas by designation and practice (refer to the Zoning Ordinance). The basic intent is that these areas should not be subjected to any form of regular maintenance.
  - c. Certain maintenance practices within NAOS areas are considered acceptable within specific limitations:
    - i. Removal of trash and debris – non-native material that is blown onto, washed onto or dumped in an NAOS area should be removed in order to allow the NAOS area to remain in a stable natural condition.
    - ii. Limited clearing and trimming of flash fire fuels as prescribed in printed materials prepared by the Fire Department is allowed in order to maintain a safe environment for habitable structures (refer to D.2 above).
    - iii. Limited clearing of debris and trimming of live plant materials that may obstruct the flow path in a wash (subject to confirmation by Drainage Inspection staff).
    - iv. Removal of non-native and invasive plant materials. The preferred technique for removal is to dig out the entire plant or to use a “Weed Wrench”, particularly on younger specimens. For removing larger Desert Broom and Mexican Palo Verde specimens, the use of Dow AgroSciences The Milestone VM (10% solution), or approved equivalent, directly on the stump after the trunk and branches have been removed is an acceptable technique.
  - d. Land repair using boulders or any form of stone shall only use rock materials that are native to the site.
  - e. Certain practices are not acceptable in the maintenance of NAOS areas:
    - i. No motorized vehicles may enter NAOS areas. All materials being removed should be removed on foot or with the aid of a wheelbarrow, as long as a singular path is not used for the wheelbarrow trips. Compacted soil thwarts future native plant growth and encourages undesired invasive plants.
    - ii. Raking or other methods of dressing the soil are not to be used. Disturbed soils encourage and facilitate undesired invasive plants.

- iii. The use of pre-emergent herbicides, pesticides and other such chemical applications particularly by spray methods, are not allowed except the specific DOW AgroSciences product or approved equivalent as described above,. Such applications may damage nearby native plant materials and may wash downstream and damage native vegetation on other properties.