

## ARTICLE 8 GENERAL DEVELOPMENT STANDARDS

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### 8.1 RESOURCE CONSERVATION

#### 8.1.1 General

- A) **Purpose**  
Protection of the Town's existing natural and cultural resources is intended to preserve the visual and aesthetic qualities of the Town; to encourage site design techniques that preserve the natural and cultural environment and enhance the developed environment; to control erosion, slippage, and sediment run-off into streams and waterways; to increase slope stability; and to protect wildlife habitat and migration corridors.
- B) **Applicability**  
These resource conservation standards shall apply to all new development in the Town, except for development on lots of record that were approved for single-family residential use prior to the effective date of this UDO.
- C) **Structure of this Section**  
This Section 8.1 requires applicants for development in the Town to protect a variety of types of sensitive natural and cultural resources. The Resource Conservation Area (RCA) provisions of Sec. 8.1.2 require delineation of a protected area for every development site, and provide a general framework within which other, more specific types of protection must take place. Subsequent sections (8.1.3 through 8.1.4) provide specific rules for protecting specific types of resources.

#### 8.1.2 Resource Conservation Area

- A) **Establishment of RCA**  
*RCA required.* For every development subject to administrative approval, Site Plan review, Master Subdivision Plan review, and/or planned development plan review, the applicant shall propose, and the Planning Director shall establish, a "resource conservation area" (RCA) according to the criteria set forth below. The plan shall indicate the specific area(s) of a lot, lots, or site to be protected (the RCA), outside of which the developed project (including buildings, accessory structures, driveways, parking, and private utilities) and all development activity shall be contained. The landscaping of non-vegetated RCA is governed by Sec. 8.2.3.C.3 and the *Town of Apex Design and Development Manual*.
- 1) **Off-site RCA.** RCA may be established outside of the limits of the development site provided that all of the following criteria are met by the off-site RCA:
- a) The area shall include one or more of the RCA categories listed below:
    - (i) Undisturbed area within Zone 2 and/or Zone 3 of riparian buffers as defined in Sec. 6.1.11 *Riparian Buffers*.
    - (ii) Undisturbed steep slopes equal to or greater than 3:1 (30%) and other erosion prevention and control measures, including, but not limited to, protection of natural drainage channels.
    - (iii) Preservation of undisturbed forested areas (including trees less than 18" caliper in size), or individual specimen (hardwood) trees 18" caliper and larger.

- (iv) Undisturbed wildlife and plant habitat areas.
- (v) Preservation of other significant site elements such as, but not limited to, historic and cultural sites and structures, scenic views, farm ponds, rock outcroppings, and cemeteries.
- (vi) Undisturbed, non-vegetated land that meets the minimal size standards for RCA and that is planted to achieve a diversified indigenous plant population including a large canopy tree layer and a small understory tree layer by one of the following methods:
  - (a) Within 50 feet of a property line or public right-of-way, the large canopy layer must consist of large-type native deciduous and large-type native evergreen trees and must represent at least 75% of the planted area; the understory tree layer must represent the remaining 25% of the planted area. Planted RCA must be completely mulched with triple-shredded hardwood mulch at least two (2) inches, but no more than three (3) inches thick. Plants must meet or exceed the following minimum container sizes and quantities (each unit represents a planted area of 200 square feet):
    - (1) One (1) large type deciduous tree: 15-gallon and at least 5 feet tall
    - (2) Two (2) large type evergreen trees: 5-gallon and at least 3 feet tall
    - (3) Two (2) small understory trees: 5-gallon and at least 3-feet tall
  - (b) For areas more than 50 feet from a property line or public right-of-way, a reforestation plan prepared by a SAF (Society of American Foresters) Certified Forester shall be approved by the Planning Director or designee. The plan shall provide between 400-700 bare root seedlings per acre that includes a mix of deciduous and evergreen tree species. The number of seedlings per acre shall be based on the existing nearby tree canopy as well as the slope, size, and width of the area to be planted. The seedlings shall be planted during the months of October to December.
- b) The area shall be located within the Town of Apex's corporate limits or extra-territorial jurisdiction.
- c) The area shall meet one of the following criteria:
  - (i) Located directly adjacent to existing RCA, existing public parks, existing conservation easements, or other publicly held land with environmental preservation or wildlife

- habitat preservation as its primary function (such as wetland mitigation);
- (ii) A minimum size of two (2) acres and a minimum width of 30 feet; or
  - (iii) Adjacent to a control of access highway with an average width of at least 30 feet.
- d) The area shall not be located within an existing public or private easement or within a future transportation or utility corridor as identified on the Thoroughfare and Collector Street Plan map, Master Sewer Plan, and Water System Master Plan.
  - e) Off-site RCA shall be provided at a rate equal to the on-site RCA requirement. If the off-site RCA is located adjacent to an existing or planned public park facility and the land is deeded to the Town of Apex, the rate of off-site RCA shall be reduced to 0.75 times the on-site RCA. In no case shall the on-site RCA be reduced more than 50% through the provision of off-site RCA.
  - f) Prior to approval of the Master Subdivision Final Plat or Site Plan Final Plat for the development, the off-site RCA must either be 1) deeded to the Town of Apex or another qualified land management agency, such as but not limited to the Triangle Land Conservancy, or 2) recorded as a conservation easement in favor of the State of North Carolina or another qualified land management agency.

B) **Criteria for Establishing RCA**

In establishing the RCA, the Planning Director shall take into account the criteria listed below:

- 1) *Categories of RCA:*
  - a) Undisturbed floodplains, floodways, flood fringes, and flood hazards.
  - b) Undisturbed riparian streams, wetland protection, and riparian buffering.
  - c) Undisturbed steep slopes equal to or greater than 3:1 (30%) and other erosion prevention and control measures, including, but not limited to, protection of natural drainage channels.
  - d) Preservation of undisturbed forested areas (including trees less than 18" caliper in size), or individual significant trees 18" caliper and larger.
  - e) Undisturbed significant wildlife and plant habitat areas.
  - f) Preservation of other significant site elements such as, but not limited to, historic and cultural sites and structures, scenic views, farm ponds, rock outcroppings, and cemeteries.
  - g) Private recreation area, including but not limited to, privately-owned play lawns, open space, pools, tennis courts, tot lots, ball fields, and village greens shall be allowed to be counted as partial

credit toward the RCA requirement. In order to qualify as RCA, the private recreation area must be located on a lot .3 acre or larger in size. The credit for the private recreation area shall be 50% of the acreage provided in the private recreation area. (For example, 1 acre of private recreation area counts as .5 acre of RCA).

- h) Solar panels and all associated equipment when installed on the dam of a SCM.
- i) When an insufficient amount of RCA in categories 8.1.2.B.1.a-h is available for designation as RCA, then undisturbed, non-vegetated land that meets the minimal size standards for RCA and that is planted to achieve a diversified indigenous plant population by including a large canopy tree layer, a small understory tree layer, and a shrub layer shall be allowed.

The large canopy layer must consist of large-type native deciduous or large-type native evergreen trees and must represent at least 75% of the planted area; the understory tree and shrub layer must represent the remaining 25% of the planted area. Planted RCA must be completely mulched with triple-shredded hardwood mulch at least two (2) inches, but no more than three (3) inches thick. Plants must meet or exceed the following minimum container sizes and quantities (each unit represents a planted area of 200 square feet):

- (i) One (1) large type deciduous tree: 15-gallon and at least 5 feet tall
- (ii) Two (2) large type evergreen trees: 5-gallon and at least 3 feet tall
- (iii) Two (2) small understory trees: 5-gallon and at least 3-feet tall
- (iv) Six (6) native type shrubs: 3-gallon

2) *Site and Tree Survey Required.*

In order to determine which categories of RCA shall be established on a site, the applicant shall provide a site and tree survey to the Planning Director as part of the submission of an application for development approval. The site and tree survey shall map the following items:

- a) Provide boundaries of the site in metes and bounds.
- b) Provide field verified topography of the area located within the limits of disturbance (including stormwater retention areas within RCA) at a minimum of 2' contours is required at the site plan stage and subdivision construction plan stage of plan review or 2013 topography generated from the 2013 LiDAR Project over Wake County, NC, and acquired on February 21-24, 2013, as updated from time to time. Topographic coverage may be obtained from the Town of Apex, the Town of Cary, or Wake County, depending on the site location.
- c) Call out location of slopes equal to or greater than 3:1 (30%) and rock outcroppings.

- d) Provide tree survey locating all specimen (hardwood) trees 18" caliper and larger within RCA and buffers on site. For North Carolina Certified Sites, the tree survey shall only be required within buffers. Fifty (50) feet outside of the perimeter of the site, document location of all trees 18" caliper and larger by providing an aerial photograph, registered forester's or certified arborist's report, tree survey, or other appropriate means.
- e) Document that all proposed RCA areas meet the Criteria for Establishing RCA (per Sec. 8.1.2.B.1) by means of a tree survey or other appropriate means, including but not limited to a registered forester's or certified arborist's report referenced to-scale digital photos, a registered forester's or certified arborist's report referenced to aerial photographs. Aerial photographs are not an acceptable stand-alone means of documentation for trees in RCA.
- f) Document that buffers meet the required "A", "B", "C", "D" or "E" type standards by means of a tree survey or other appropriate means, including but not limited to a registered forester's or certified arborist's report referenced to-scale digital photos, a registered forester's or certified arborist's report referenced to aerial photographs. Aerial photographs are not an acceptable stand-alone means of documentation for trees in buffers.
- g) Show location of wetlands as determined by a licensed soil scientist, the Army Corps of Engineers (ACOG), or the NC Department of Environmental Quality (DEQ).
- h) Show location of all creeks, streams, ponds, and dams.
- i) Note whether the site is in the Primary or Secondary Watershed Protection Overlay District and show required riparian buffers on both sides of perennial and intermittent streams.
- j) Show location of the 100 year floodplain and 100 year floodway based upon the FIRM maps, the FEMA detailed study, and field measurements (if applicable). If not applicable, certify that there is no FEMA floodplain on the subject property by giving FIRM map # and date. Provide non-FEMA flood study information on floodplains, floodways, flood fringes, and flood hazards at the construction plan stage of plan review.
- k) Provide location of existing fencing, roads, and structures.
- l) Provide locations of significant site elements such as, but not limited to, historic and cultural sites and structures, scenic views, farm ponds, rock outcroppings, and cemeteries.
- m) Indicate clearly on the plans the location of all existing utilities (water, sewer, natural gas, electric, telephone, cable, fiber optic, etc.) above and/or below ground as well as existing utility easements.
- n) Identify location of any underground storage tanks, hazardous waste and debris, abandoned wells, septic tanks or similar structures.

C) **Size of the RCA**

The size of the RCA for each development site shall be calculated by the applicant and staff based on the following:

- 1) *Planned Developments*  
The RCA for all planned developments shall be determined by the Town Council per Sec. 2.3.4.F.1.c and per Sec. 8.1.2.C.4, 5, 6, 7, or 10 as applicable, based on the criteria set forth in subsection B. above.
- 2) *Small Town Character Overlay District*  
All development meeting the criteria of Sec. 6.3 *Small Town Character Overlay District* shall be exempt from Sec. 8.1 *Resource Conservation*.
- 3) *Low Density Single-Family Residential Developments (maximum of two dwelling units per gross acre)*  
Low density single-family residential developments with a maximum of two (2) dwelling units per gross acre shall be exempt from Sec. 8.1 *Resource Conservation*.
- 4) *Development located north and east of NC 540 and outside Apex Peakway*  
All developments which do not meet the criteria of subsections 8.1.2.C.2, 3, or 10 and which are located north and east of NC 540 and outside existing and future Apex Peakway shall provide buffers and RCA equal to or greater than 20% of the gross site acreage.
- 5) *Development located south and west of NC 540*  
All developments which do not meet the criteria of subsections 8.1.2.C.3 or 10 and which are located south and west of NC 540 shall provide buffers and RCA equal to or greater than 30% of the gross site acreage for single-family and townhome uses and 25% of the gross site acreage for multi-family, mixed-use, and non-residential uses.
- 6) *Development located inside Apex Peakway*  
All developments which do not meet the criteria of subsections 8.1.2.C.2, 3, or 10 and which are located inside existing and future Apex Peakway shall provide buffers and RCA equal to or greater than 10% of the gross site acreage.
- 7) *Resource Conservation Area Exchanged for Reduced Width Buffers*  
Resource Conservation Areas (RCA) may be established in lieu of portions of otherwise required perimeter, streetfront, thoroughfare, and fully- and limited-controlled access highway buffers, provided that all of the following criteria are met:
  - a) RCA established in lieu of buffers shall be undisturbed forested areas or individual significant trees 18" caliper and larger, meeting the category described in Sec. 8.1.2.B.1.d *Categories of RCA*.
  - b) RCA established in lieu of buffers shall be located directly adjacent to existing or proposed RCA, or shall be a minimum of ½ acre in size.
  - c) RCA established in lieu of buffers shall have a minimum width of 30 feet; the minimum width can be measured in combination with other RCA and buffers.
  - d) The exchange rate for RCA established in lieu of buffers shall be at a 1 to 1 (1:1) ratio.

- e) The reduced width buffers must still meet the screening (opacity) requirement for the type of buffer required.
  - f) No required perimeter or streetfront buffer can be reduced to less than one half of the required buffer width or less than 10 feet (whichever is greater).
  - g) A required thoroughfare buffer may be reduced to no less than 15 feet when an encroachment is due to public street improvements.
  - h) Required fully- and limited-controlled access highway buffers can only be reduced per Sec. 8.2.6.B.5.f *Buffers Along Fully- and Limited-Controlled Access Highways*.
- 8) ***Maximum Built-Upon Area***  
The overall site (including RCA), shall not exceed the applicable maximum built-upon area limitations set forth in Sec. 5.1 *Table of Intensity and Dimensional Standards* and Sec. 6.1 *Watershed Protection Overlay Districts*.
- 9) Notwithstanding any other provisions in the UDO, if a public utility line or easement counts toward buffer requirements, then the Public utility line or easement shall be allowed to be counted in RCA calculations (see Secs. 8.2.2.C.2.a and 8.2.6.C.4).
- 10) ***North Carolina Certified Sites***  
Any development designated as a North Carolina Certified Site by the North Carolina Department of Commerce shall provide RCA equal to or greater than the area located within required perimeter and street buffers, riparian buffers, and preserved wetlands, but shall not be less than 15%. On properties where the combined acreage of required perimeter and street buffers, riparian buffers, and preserved wetlands exceeds 35% of the gross acreage of the site, RCA may be reduced to no less than 35% to permit grading in portions of riparian buffers where state regulations and UDO Sec. 6.1 *Watershed Protection Overlay Districts* allow and to reduce buffer widths where permitted by UDO Sec. 8.1.2.C.7 *Resource Conservation Area Exchanged for Reduced Width Buffers*.
- D) ***Ownership of RCA in Subdivisions***  
No portion of the RCA in a planned development or residential or non-residential subdivision shall be part of an individual building lot. The RCA shall be designated so that the RCA is not removed, modified or damaged. The RCA shall be a separate lot or lots and be owned in common by the building lot owners or owned by a separate entity or entities (e.g. property owner's association, development corporation, building lot owner or owners, etc.) In no case shall the RCA for one (1) subdivision be owned by more than three (3) entities.
- E) ***Designation of RCA on Plans and Plats***
- 1) ***Master Subdivision Plan and Plats***. The approved RCA shall be shown on the Master Subdivision Plan as a separate lot (or lots) from the individual residential or non-residential building lots. The RCA (with metes and bounds description) shall be shown on the Final Plat, to be preserved in perpetuity.
  - 2) ***Site Plans and Plats***. The approved RCA shall be shown on the Site Plan for each development site. The RCA (with metes and bounds description) shall be shown on the Final Plat, to be preserved in perpetuity.

F) **Development Activity Inside of the RCA**

- 1) No development, including grading or vegetation removal or alteration, shall occur as part of the development project or associated construction activity inside the RCA except as provided in subsections 3 and 4 below.
- 2) No private utility easements shall be allowed within RCA. Existing and proposed private easements must be excluded from the RCA calculation.
- 3) Disturbance or construction activity may occur inside the RCA when construction is done in such a way as to protect significant resources with approval of the Planning Director for the following limited purposes:
  - a) Emergency public safety activities when such activities and installations cannot reasonably be restricted to areas outside the RCA or other nearby developed areas. Measures shall be required to mitigate the impact of the disturbed area;
  - b) The portion of stormwater wetlands and wet detention basins that include the constructed and planted wetland, basin area, vegetated, littoral shelf, and the surrounding interior embankments up to the top of dam elevation;
  - c) Construction of a trail, pedestrian walkway, or passive recreational amenity (e.g. picnic tables, benches, gazebo, etc.) that will provide public access for educational or recreational purposes when such trails, walkways, or amenities cannot reasonably be restricted to areas outside the RCA or nearby developed areas and where construction is done in such a way as to protect significant resources;
  - d) The enhancement of the habitat values and/or other natural resource values of an identified natural area; or
  - e) The removal of noxious species, such as kudzu or poison ivy for general maintenance of the area; see the *Town of Apex Design and Development Manual* for details.
- 4) Construction of solar panels on the dams of a SCM.

G) **Standards for Protection During Construction**

The owner of the property, the developer, and contractors shall be responsible for protecting all existing natural resources, including trees, vegetation, streams, wetlands, ponds, wildlife habitats, historic/cultural sites and structures, that are designated as RCA or as areas to be preserved. Natural areas shall be protected and maintained in a healthy, viable condition. The following minimum standards shall apply throughout the site and/or subdivision approval process:

- 1) *Protective Fencing*
  - a) The RCA shall be designated in the field prior to commencement of excavation, grading, or construction with construction barrier fencing or other methods approved by staff. Protective fencing shall also be placed around all other designated save areas identified by the Planning Director. Fence placement shall be based on the following minimum standards:
    - (i) *Trees and Vegetation:* Fencing shall enclose all stands of trees or vegetation within a buffer or other save area that



meet the base buffer standard (trees with calipers of 2 ½ inches or greater). Where significant trees exist (18-inch caliper or greater), the fencing shall protect the critical root zone of such trees and shall be located no less than one (1) foot from the trunk of the tree for each one inch of tree caliper (diameter at breast height). Both applicant and staff shall consider the existing site conditions in determining the exact location of any tree protection fencing. For the protection of trees and clusters of trees to be preserved outside the RCA, tree protection specifications as required in Sec. 8.1.2.G.2.c below shall be followed.

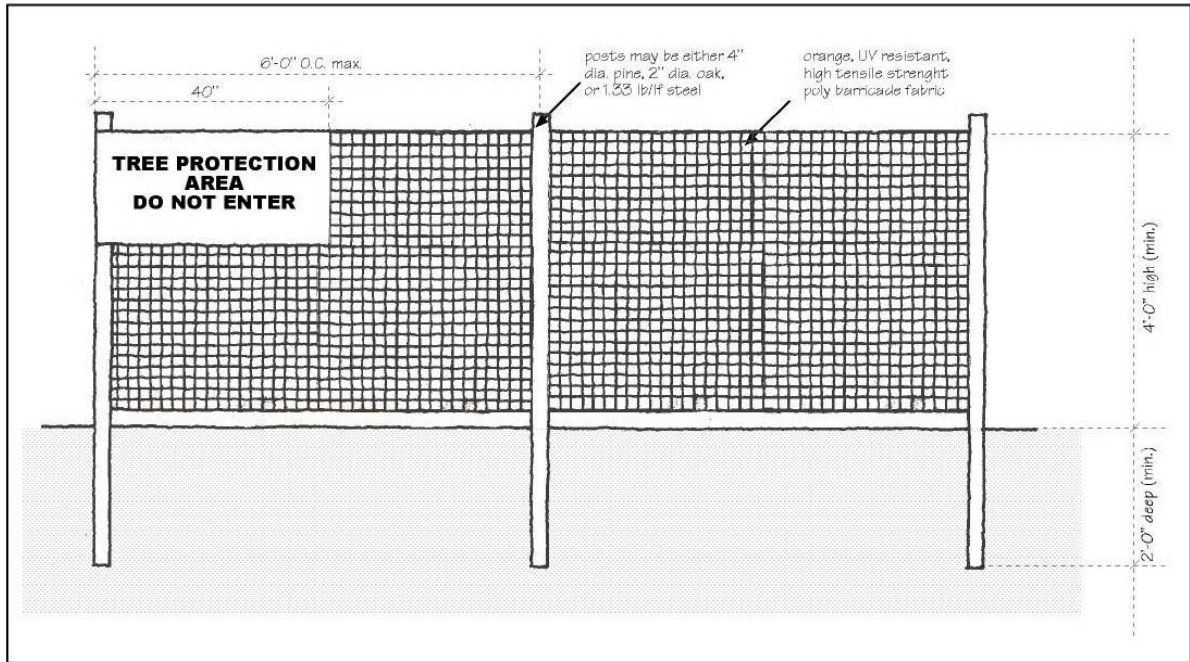
- (ii) *Floodplains*: Fencing shall be placed along the line representing the 100-year floodplain.
- (iii) *Streams*: Fencing shall be placed at the outside edge of the required riparian buffer in accordance with Sec. 6.1 *Watershed Protection Overlay Districts*.
- (iv) *Other Resources*: Fencing shall be placed at least 10 feet from the edges of other saved or protected features identified by the Planning Director. Such features may include, but are not limited to, wetlands, ponds, rock outcroppings, steep slopes and historic structures.

- b) No construction, grading, equipment or material storage, or any other activity shall be allowed within the fenced protection area, and the fencing shall remain in place until all land alteration, construction, and development activities are completed.

2) *Other Requirements*

- a) The owner shall keep all saved areas within the RCA free of refuse, debris, equipment, and supplies throughout the entire site development process.
- b) The owner shall be responsible for replacing trees and/or vegetation if they are destroyed or substantially damaged and for paying any civil penalties associated with the encroachment into any protected area according to the standards set forth in Sec. 8.2.3.
- c) The proposed methods for protection shall be reviewed and approved as part of the Site Plan and/or Master Subdivision Plan approval process and must be clearly indicated on plans. If construction is proposed within any saved area, a registered architect, engineer, or landscape architect, certified arborist, or horticulturalist, must submit detailed plans indicating how the sensitive area will be protected, and shall supervise all construction activity within such areas. Protection measures must adhere to generally accepted good design standards and practices.
- d) Out parcels that are graded shall be seeded, mowed, and maintained until development occurs on the parcel.

- H) *Setback from Resource Conservation Area*  
All buildings shall be set back 10 feet and all vehicular use areas shall be set back five (5) feet from any area designated as RCA.



TREE PROTECTION FENCE

Warning signs to be made of durable waterproof material all letters to be at least 3" high, clearly legible

Signs to be placed 200' on center, max.

Signs to be placed at each end of linear tree protection area and 200' on center thereafter

For tree protection areas less than 200' in perimeter, provide no less than one sign per protection area and/or side

Attach signs securely to fence posts and fabric

Fabric must be attached to approved posts only - do not attach to trees

Maintain tree protection fence throughout duration of project - fencing must remain upright and slack free

Additional signs and/or protection measures may be required by Planning Department based upon actual field conditions

Failing to maintain tree protection measures may result in fines and/or permit revocation

Figure 8.1.2(G)(1): Tree Protection Fencing

### 8.1.3 Tree and Vegetation Conservation

#### A) Purpose

- 1) For all development sites, the Town requires both the conservation of existing trees and vegetation, and also the installation of new landscaping. This Section sets forth requirements for the conservation of existing trees and vegetation, and new landscaping requirements are set forth in Sec. 8.2 *Landscaping, Buffering, and Screening*.
- 2) The Town encourages and supports saving all types of existing vegetation. This includes small caliper, mixed hardwood stands of trees to large significant vegetation. The intent of this section is to save not only large, significant vegetation, but also existing, small vegetation that over time will mature into stable, healthy stands of large trees.

B) ***Exemptions for Specific Activities***

The following activities shall be exempt from this section:

- 1) The removal, by hand, of dead or naturally fallen trees or vegetation, or the removal, by an approved method, of trees or vegetation that are found by the Town to be a threat to the public health, safety, or welfare;
- 2) The selective and limited removal of trees or vegetation necessary to obtain clear visibility at driveways, intersections, or within sight triangles;
- 3) The selective and limited removal of trees less than 2-inch caliper for the purpose of performing authorized field survey work;
- 4) The removal of trees or vegetation on land zoned or lawfully used for:
  - a) Agricultural, forestry, and horticultural uses as classified by Wake County, including normal forestry activities conducted pursuant to a forestry management plan prepared or approved by a forester registered pursuant to Chapter 89B of the General Statutes.

However, if a Tree Removal and Non-Structural Development Permit is not issued, per NCGS 160A-458.5(c)(1), no approval of a site or subdivision plan or issuance of a building permit shall occur for a period of 3 or 5 years from the date the tree removal activities are completed, based on the following:

- (i) Three years after the completion of a timber harvest if the harvest results in the removal of all or substantially all of the trees that were protected under Town regulations governing development from the tract of land for which the permit or approval is sought.
  - (ii) Five years after the completion of a timber harvest if the harvest results in the removal of all or substantially all of the trees that were protected under Town regulations governing development from the tract of land for which the permit or approval is sought and the harvest was a willful violation of the Town regulations.
- b) The removal of trees or vegetation for the purpose of sale by established commercial garden centers, greenhouses, or nurseries. Such land shall be classified by Wake County as horticultural use in order to meet this exemption.

C) ***Tree/Vegetation Removal***

- 1) *Inside the RCA*  
No trees or vegetation shall be removed inside the approved RCA, except as specifically exempted in this section or article. Significant trees or vegetation removed from inside the RCA, including those removed for installation of utility lines, but not including those removed pursuant to exempted activities, shall be replaced as set forth in Section 8.2.3 *Maintenance Responsibility and Replacement of Damaged Vegetation.*
- 2) *Outside the RCA*

- a) To the maximum extent feasible, significant trees or vegetation outside the RCA shall be preserved.
- b) Any existing trees or vegetation outside the RCA that are in appropriate locations, in sufficient quantities, and of acceptable quality to be utilized to fulfill landscaping or buffering requirements of this Ordinance, including the “base buffer” as defined in Article 12, shall be preserved to the maximum extent feasible. All existing vegetation which meets the landscape buffer requirements of this article, or which is located in a preservation area (plant communities, groves and selected individual trees) designated on the approved site plan, subdivision plan, or PD plan shall be preserved on the site. Existing vegetation that is to remain on the site, as well as off-site vegetation to be protected, shall be clearly delineated and identified on all site plans, subdivision plans, and PD plans.
- c) *Tree/Vegetation Removal for Views Prohibited*  
No trees or vegetation shall be removed for the sole purpose of providing open views to or from structures on a site, except for the selected and limited removal of trees or vegetation necessary to obtain clear visibility at driveways, intersections, or within sight triangles.
- d) *Site and Tree Survey Required.*  
The applicant shall provide a site and tree survey to the Planning Director as part of the submission of an application for development approval. The site and tree survey shall follow the requirements of Sec. 8.1.2.B.2.

D) ***Tree Protection During Construction and Grading Activities***

In addition to the general requirements for protection of natural resources during construction and grading activities set forth in Sec. 8.1.2.F, the following specific standards shall apply to protect all trees and vegetation on a development site throughout the site development and construction process:

- 1) If it is necessary to fill over the critical root zone, compacted soils shall be avoided by sandwiching fabric, rocks, and more fabric under the area to be filled.
- 2) Fill placed directly on the roots shall not exceed a maximum of six inches in depth.
- 3) If fill creates a tree well or depression around a tree or shrubs, such area shall be drained so that the vegetation is not drowned by the pooling of rainfall or irrigation.
- 4) If a tree’s roots must be cut, the branches shall be trimmed by an amount equal to the percent of roots that were lost. Roots shall be pruned cleanly prior to digging and not ripped off by heavy equipment. Cutting more than 30% of the roots endangers the health of the tree, and over 40% affects the tree’s stability.
- 5) Utility trenches near trees should be avoided. If a line must be near a tree, tunneling, auguring, or other mitigation measures shall be used.

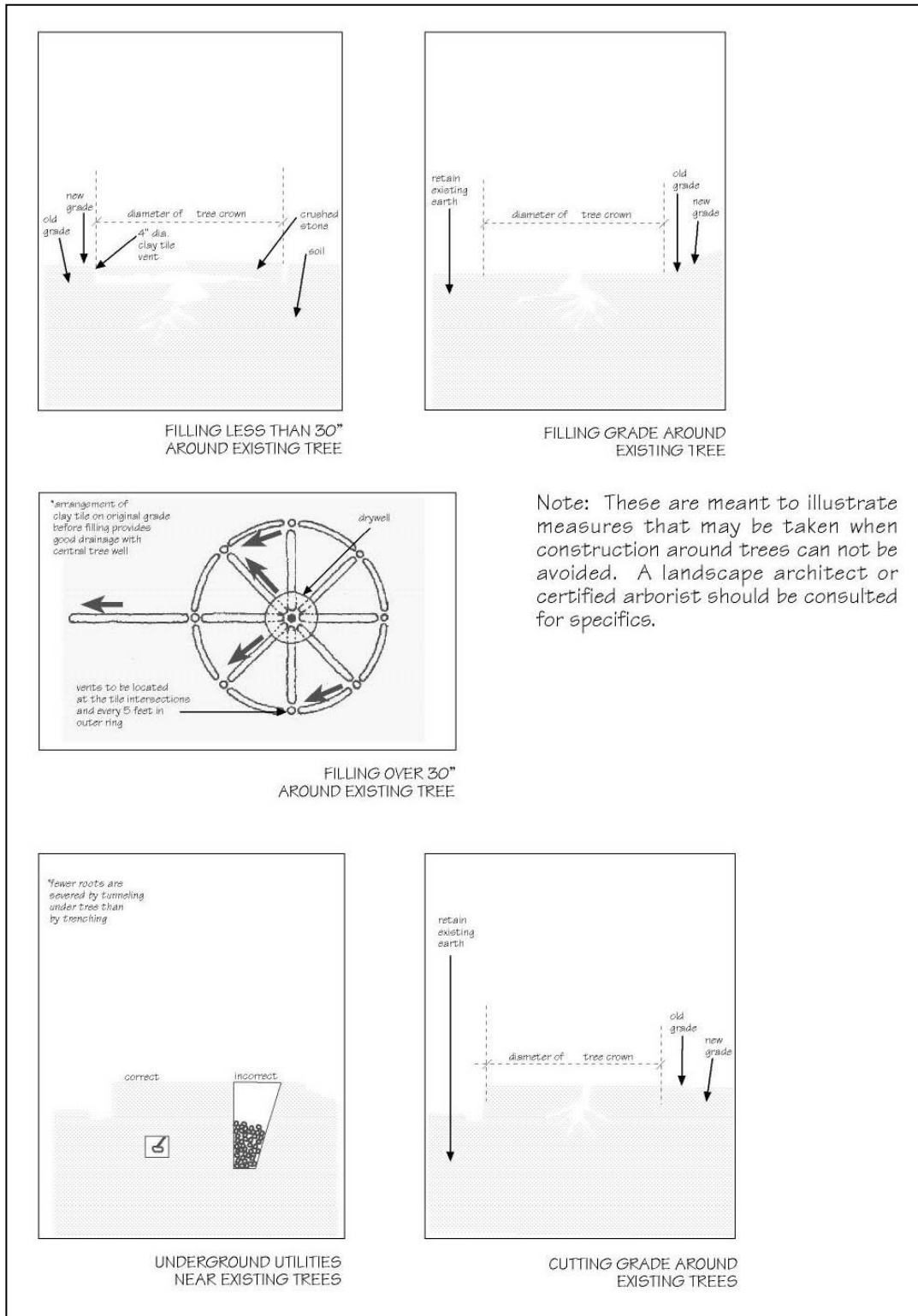


Figure 8.1.3(D): Filling and Cutting Around Trees

#### 8.1.4 Development Restrictions on Steep Slopes

A) **Staff Review Criteria**

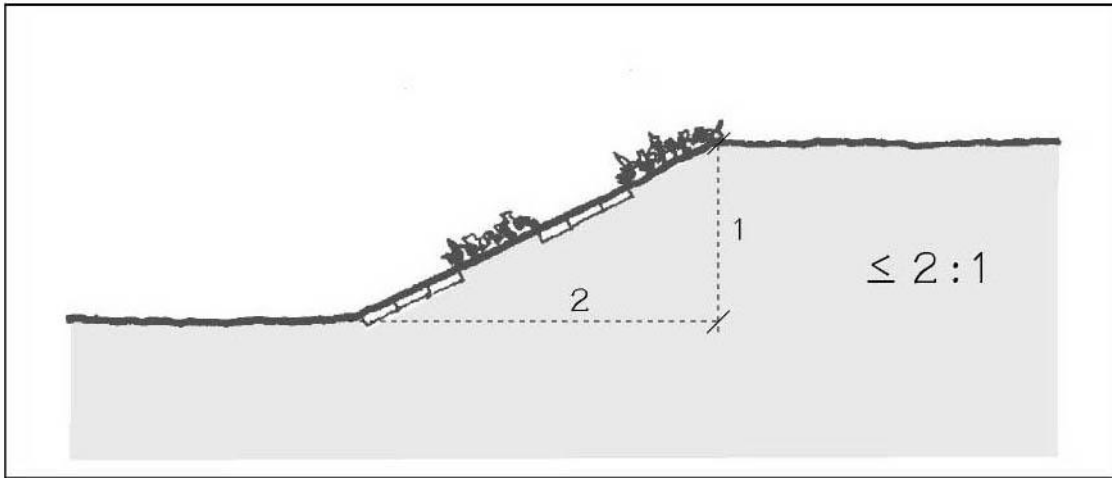
Staff shall review all Site Plans and/or Subdivision Plans and evaluate them according to the following standards:

- 1) Site disturbance shall be minimized to the maximum extent practicable;
- 2) Cuts for utilities and access driveways shall be shared to the maximum extent feasible;
- 3) To the maximum extent feasible, new construction shall not take place on any portion of a parcel that shows slope instability, flooding, or other natural or man-made hazards;
- 4) The applicant shall demonstrate that the slope's ground surface and subsurface are not unstable, that the proposed development will not cause instability or increase the potential for slope failure, and that the development of the slope will not increase the degree of hazard both on-site and on adjacent properties.
- 5) Slopes greater than a ratio of two to one (2:1) shall not be permitted.

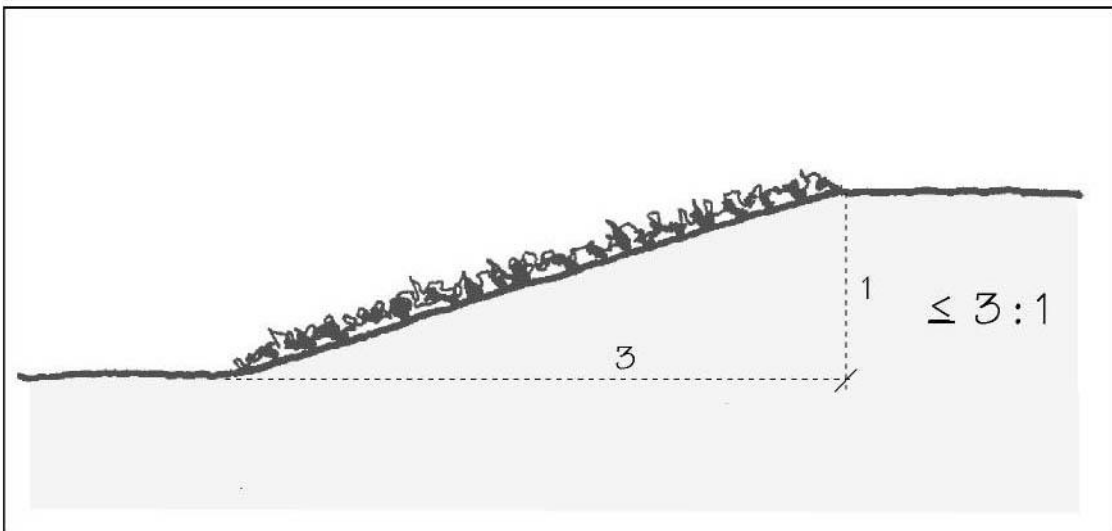
B) **Stabilization Measures**

On all sites containing steep slopes on which development is allowed pursuant to this subsection, the following stabilization measures shall be required:

- 1) All slopes equal to 2:1 shall be stabilized with a suitable combination of plantings and permanent slope retention devices. Slopes equal to or greater than 3:1 shall not be stabilized with turf grasses, but shall be stabilized with other permanent ground cover referenced in the *Town of Apex Design and Development Manual*.



Stabilize 50 per cent or slopes greater than 2:1 with permanent slope retention devices or a suitable combination of plantings (ground cover, shrubs, etc.) and retention devices.



Stabilize slope greater than 3:1 with permanent ground covers rather than turf grasses

**8.1.5 Reserved**

**8.1.6 Retaining Structures**

Retaining structures are permitted as elements of site design and shall meet the following requirements:

- A) Retaining structures providing a cumulative vertical relief greater than five (5) feet in height within a horizontal distance of 50 feet or less must be designed, inspected, and certified by a licensed professional engineer. Additionally, retaining structures meeting this provision must be constructed under a building permit from the Building Inspections and Permitting Department.

- B) All grading and support structures associated with the retaining structure shall not encroach into any required buffer or protected area (such as, but not limited to, RCA and critical root zones of buffer trees), and shall be contained entirely on site.
- C) Retaining structures on land developed for single-family and duplex residences shall not exceed six (6) feet in height and shall not exceed two (2), six (6) feet tall terraced sections.
- D) Terraced sections must be spaced a minimum of three (3) feet horizontally to allow for planting of small shrubs and groundcovers between the terraces.
- E) Wood lag retaining structures shall be prohibited for all uses.
- F) Retaining structure materials must meet one of the following standards:
  - 1) *Permitted Materials*
    - i) Single-family residential lots shall use either wood or masonry materials.
    - ii) For all locations other than single-family lots, masonry materials shall be used.
  - 2) *Permitted Colors*
    - i) Segmental masonry retaining structure materials must be an integrally tinted medium or dark brown or rust color.
    - ii) Gravity and cast in place structures must be integrally tinted or stained a medium or dark brown or rust color or be covered with a masonry veneer that is a medium or dark brown or rust color.