

7.2 DESIGN STANDARDS

7.2.1 Streets

A) *Interconnectivity*

- 1) **Conformity with Apex Transportation Plan.** The subdivision's street system shall conform to the Apex Transportation Plan. In areas where no thoroughfares or collector streets are represented thereon, streets shall be designed and located in proper relation to existing and proposed streets, to the topography of the area, and to natural features such as streams, hills, and stands of trees. Residential streets should further be laid out in such manner as to encourage the flow of through-traffic at slow speeds, except upon major and minor thoroughfares. All proposed

street designs shall provide for the appropriate projection of principal streets in surrounding areas to permit reasonable access for surrounding properties, both for current use and future subdivision. No private streets shall be allowed to be built within developments or subdivisions approved on or after October 15, 2002.

2) **Points of Ingress/Egress.**

- a) The points of ingress/egress shall comply with the Apex Transportation Plan.
- b) A minimum of one point of ingress/egress shall be connected to an existing public street. Additional connections shall be required when:
 - (i) Necessary for the connection of existing and future principal streets, including major thoroughfares, minor thoroughfares, collector streets, and main residential streets.
 - (ii) A Traffic Impact Analysis shows that an additional connection or connections are needed.
 - (iii) More than one point of access is required per Sec. 7.5.4.E *Public Access Requirements*.
- c) *Stub streets shall be required as follows:*
 - (i) Stub streets shall be provided to all adjacent land-locked properties.
 - (ii) Stub street connections shall be provided to all existing and planned stub streets on adjacent properties.
 - (iii) Where severe topography or other physical features exist, the Planning Director in conjunction with the Water Resources Director, may determine that a stub street is not required.

3) **Gates on Public Roads.** The use of gates, manned or unmanned, shall be prohibited from all residential districts in order to maintain interconnectivity, except where required by Sec. 7.2.1.K.

4) **Internal Connectivity.** All areas of a subdivision shall be internally connected by at least one (1) street located within the subdivision. Where severe topography or other physical features exist, the Planning Director, in conjunction with the Water Resources Director, may determine that a multi-use path or greenway be used to meet the internal connectivity requirement. If a subdivision is not connected internally, then it shall not be considered one (1) subdivision.

B) **Street Rights-of-Way**

- 1) Minimum street right-of-way widths shall be determined on the basis of the street classification shown on the Town thoroughfare plan and/or street collector plan or, where such plans do not apply, according to the

nature of the street as illustrated on the plat. The subdivider shall refer to the *Town of Apex Standard Specifications and Standard Details* for standard street sections and minimum rights-of-way.

- 2) Subdivisions along existing streets of inadequate right-of-way width shall provide additional right-of-way to meet the minimum widths specified. The entire right-of-way shall be provided where any part of a new subdivision is on both sides of an existing street, and one-half the required right-of-way measured from the centerline of the existing street shall be provided where a new subdivision is located only on one side of an existing street.

C) ***Pavement Widths***

Minimum pavement width shall be measured from back of curb to back of curb. The subdivider shall refer to the *Town of Apex Standard Specifications and Standard Details* for standard street sections.

D) ***Radii of Curvature***

Where a street centerline deflection of more than 10 degrees occurs, a curve shall be introduced. The subdivider shall refer to the *Town of Apex Standard Specifications and Standard Details*.

E) ***Tangents***

A centerline tangent of not less than 100 feet shall be provided between reverse curves on all streets.

F) ***Intersections***

Street intersections shall be laid out in the following manner:

- 1) No more than 2 streets shall intersect at a point, unless the subdivider provides sufficient evidence that a proposed intersection with a greater number of streets will be designed to adequately ensure public safety.
- 2) Streets shall intersect as nearly as possible at right angles and no street shall intersect any other street at an angle of less than 60 degrees.
- 3) Proposed public street connections along major thoroughfares shall be at least 800 feet apart from each other and shall align with existing opposite street connections to form intersections, except that small subdivisions that do not require a Traffic Impact Analysis per Sec. 13.19 *Traffic Impact Analysis Required* shall be allowed to include a right-in, right-out public street connection at a minimum of 500 feet apart from another full- or limited-movement public street. All distances for spacing requirements shall be measured from centerline to centerline.
- 4) Street jogs with centerline offsets of less than 100 feet shall be prohibited when the jog lies wholly within the subdivision, except when approved by the Public Works and Transportation Director, and shall be avoided on the exterior boundary of the subdivision, except where external access would otherwise be denied.
- 5) Property lines at street intersections shall be rounded with a minimum radius of curvature of 20 feet. At an angle of intersection less than 75 degrees, a greater radius of up to 60 feet may be required, taking into consideration the functional classification of the streets, parking control, lane width, the number of lanes and similar factors.

G) **Cul-de-sacs**

- 1) In general, cul-de-sacs shall be avoided unless the design of the subdivision and the existing or proposed street system in the surrounding area indicate that a through street is not essential in the location of the proposed cul-de-sac, or where sensitive environmental areas such as streams, floodplains, and wetlands would be substantially disturbed by making road connections.
- 2) Cul-de-sacs shall not be longer than 600 feet. The length of a cul-de-sac shall be measured from the center of the intersection at the beginning of the cul-de-sac running along the centerline to the center point of the turnaround.
- 3) Two or more cul-de-sacs that share a single means of ingress and egress shall not exceed 1,200 feet in length, measured cumulatively as if they were one cul-de-sac.
- 4) The maximum cul-de-sac length designated in Sec. 7.2.1.G.2 and 7.2.1.G.3 shall not apply to non-residential subdivisions and site plans.

H) **Alleys**

- 1) **Commercial or Industrial.** Alleys shall conform to the following typical specifications:
 - a) Twenty-six (26)-foot wide private easement.
 - b) Refer to the *Town of Apex Standard Specifications and Standard Details* for width and pavement structure requirements.
 - c) Proofroll by licensed professional engineer required after laying stone and prior to paving.
 - d) Satisfy the requirements for Streets in Sec. 3.04 "Inspection" of the *Town of Apex Standard Specifications and Standard Details*.
- 2) **Residential.** In addition, alleys may be appropriate in residential zoning districts, and especially in TND-CZ developments, to provide rear access to houses. Where lots front major collectors, thoroughfares, or limited and controlled-access highways without driveway access, then a public alley is required. Visitor parking shall be served by an alternate adjacent street or parking area. Alleys in residential zoning districts shall conform to the following typical specifications:
 - a) Twenty-six (26)-foot wide dedicated right-of-way.
 - b) Refer to the *Town of Apex Standard Specifications and Standard Details* for width and pavement structure requirements.
 - c) Proofroll by licensed professional engineer required after laying stone and prior to paving.
 - d) Satisfy the requirements for Streets in Sec. 3.04 "Inspection" of the *Town of Apex Standard Specifications and Standard Details*.

- I) **Reserved**
- J) **Street Names**
Street names shall be coordinated with the Town Planning Department and Wake County. New street names shall not duplicate or be similar to existing street names, irrespective of the suffix appended (e.g., street, circle, boulevard, etc.). Existing street names, however, shall be projected where appropriate.
- K) **Stub Street**
An existing stub street(s) shall be extended and connected to the subdivision. In the event that the existing street(s) anticipated to be affected by the connection provides access exclusively to a controlled-access highway (including but not limited to US 64), Town Council may require a locking gate of a type subject to approval of the fire code official capable of preventing public vehicular access, provided that the proposed subdivision does not require the connection of the stub street to satisfy UDO Section 7.5.4.E *Public Access Requirements*. The gate shall be owned and maintained by the Town of Apex. The regulation of, use of, and access through a gate constructed in accordance with this section, and the removal thereof, shall be governed by Chapter 20 of the Apex Town Code of Ordinances or other appropriate police power ordinances or actions.
- L) **Traffic Calming**
- 1) No development proposal shall be permitted to provide for the installation of traffic calming measures in an adjacent or nearby existing neighborhood unless the street(s) meet the criteria in Sec. 7.2.1.L.3 of this Ordinance.
 - 2) All new residential developments shall provide for the installation for traffic calming measure(s) on each residential street within the development where the length of the public street exceeds 1,000 feet. The location and type of traffic calming measure(s) shall be determined by the Planning Department and Public Works and Transportation Department. Traffic calming measure(s) include but are not limited to traffic circles, roundabouts, curb extensions, chicanes, splitter islands, and designated on-street parking. Speed humps are only allowed as traffic calming measures in existing neighborhoods that meet the criteria in Sec. 7.2.1.L.3 of this Ordinance.
 - 3) This section replaces the Town of Apex Traffic Calming Device Policy and Guidelines. The Town may install and maintain traffic calming devices on Town-maintained streets directly serving residential driveways where speeding vehicles are the primary concern. The following procedures are meant to ensure that traffic calming devices are installed and used as intended for the appropriate and consistent treatment on Town-maintained streets and receive the support of the affected neighborhood. Traffic calming devices are limited to vertical and/or horizontal changes in the vehicular travelway that may or may not involve adjustments to existing curb. Stop and yield signs are defined as traffic control devices and are not appropriate for use as traffic calming devices. Stop and yield signs are however subject to engineering evaluation by the Town's Transportation Engineer according to the Manual on Uniform Traffic Control Devices. Traffic calming requests are subject to the following qualifying criteria:

- a) Streets on which traffic calming devices are requested must be residential and exhibit all of the following characteristics:
 - (i) Posted speed is 25 miles per hour;
 - (ii) Roadway is not a Collector Street or Thoroughfare;
 - (iii) The average speed exceeds 30 miles per hour during any one-hour period in which the number of vehicles meets or exceeds 100. The data collected to determine average speed may be based on an average of 100 vehicles per hour or more over multiple days; and
 - (iv) Installation of traffic calming devices along the street is not anticipated to create unacceptable delays in emergency response times for residences served by the street in the judgment of the Town's Police Chief and Fire Chief.

- b) The request must be initiated, accepted, and supported by the property owners within the affected residential neighborhood:
 - (i) The requesting party must submit a request to the Transportation Engineer. Requests for traffic calming devices at a particular location are limited to one request within a 24 month period. Upon consultation with the Town's Police Department, the Transportation Engineer may request a study be conducted or inform the requesting party that the location is not a candidate for traffic calming measures based on the Town's criteria. If requested, the Town's Police Department will conduct a traffic speed and volume survey and provide the results to the Transportation Engineer who will determine whether all criteria in Sec. 7.2.1.L.3 are satisfied.

 - (ii) If all the required criteria in Sec. 7.2.1.L.3 are met, the Transportation Engineer will notify the requesting party and homeowners' association (if one exists), develop a sketch plan reflecting the types and locations of the proposed traffic calming devices, and prepare a petition boundary area. The petition boundary area shall include, at a minimum, all lots adjacent to the street within the subdivision where traffic calming devices are proposed along with all cul-de-sac streets and loop streets dependent on that street for connectivity. Once the homeowners' association is provided the sketch plan and petition boundary area, the association shall have 30 calendar days to either vote against the plan in order to end the process or vote to proceed, either with the association voting to administer a petition to the Transportation Engineer or the association delegating that authority to the original requesting party. In either event, the association shall notify the Transportation Engineer of the vote. If the homeowners' association takes no action or fails to notify the Transportation Engineer of the outcome of the vote within 30 calendar

days of being provided the sketch plan and petition boundary area then the requesting party may proceed with the petition. The requesting party and homeowners' association may provide Town staff with input concerning the desired types and locations of the proposed traffic calming devices, but the final decision as to all elements of the sketch plan (including but not limited to the types and locations of the proposed traffic calming devices) shall be solely within the engineering judgment of Town staff.

- (iii) The requesting party or homeowners' association for the affected residential neighborhood must provide the Town with a completed petition as noted in Sec. 7.2.1.L.3.b.ii with at least 70% agreement from homeowners within the petition boundary area no later than six (6) months following the date of the traffic survey. Each signature line shall include the printed and signed name of at least one (1) of the deed holders for the residential property, the address, and date signed.
- (iv) The requesting party or homeowners' association must pay the Town 20% of the estimated cost of installing the requested traffic calming devices as reflected in the sketch plan prior to the request being scheduled for consideration by the Town Council. If the Town Council does not approve the plan then the 20% cost share shall be refunded.
- (v) The Town Council will consider a petition to remove traffic calming devices on Town-maintained streets upon receipt of a petition signed by at least 70% of the owners of lots within the petition boundary area as noted in Sec. 7.2.1.L.3.b.ii. In the absence of a previously defined petition boundary area the Transportation Engineer shall prepare a new petition boundary area. The homeowners' association may proceed with a petition to remove traffic calming devices at any time or delegate that authority to a requesting party. In the absence of a homeowners' association or if no action is taken by the homeowners' association within 30 calendar days of receiving a request the requesting party may proceed with a petition. If a removal petition is submitted at any time within five (5) years from the date of installation thereof, the requesting party or homeowners' association must pay the Town (in advance of removal) 100% of the estimated cost of removing such device(s); provided, however, that nothing shall limit or otherwise impair the Town's discretion to remove, at the Town's initiative, any traffic calming device on Town-maintained streets.

After all of the criteria have been satisfied, the Town Council will make the final decision whether to approve the proposed installation/removal project. The Town Council reserves the right to deny any request for installation/removal of traffic calming devices on Town-maintained streets, in its sole discretion. After the project has been approved by the

Town Council and submitted to the Town's Public Works and Transportation Director, the street will be rated for priority, and then scheduled for installation/removal of the traffic calming devices in accordance with the approved sketch plan.

7.2.2 Blocks

- A) **Generally**
Blocks shall be laid out with consideration given to the type of land use proposed within the block.
- B) **Length**
Residential and commercial subdivision blocks shall not exceed 1,200 feet in length, nor shall they be less than 200 feet in length.
- C) **Width**
Residential blocks shall have sufficient width to provide for 2 tiers of lots of appropriate depth except where otherwise required to separate residential development from through traffic.
- D) **Crosswalks**
A pedestrian crosswalk not less than 10 feet in width may be required near the center and entirely across any residential block 900 feet or more in length where deemed essential to provide adequate access to schools, shopping centers, churches, transportation facilities or recreational facilities. Crosswalks shall be constructed of permanent materials such as those generally used for sidewalks, including concrete, brick, asphalt and similar wear-resistant and weather-resistant surfacings.

7.2.3 Lots

- A) **Standards**
Where public water and/or sewer systems are utilized in the subdivision, lots shall conform to the dimensional and density requirements established in Section 5.1 *Table of Intensity and Dimensional Standards*. Where public water and/or sewer are not utilized, lots shall comply with the specifications and standards of the Wake County Environmental Services Department. If percolation tests performed by the Wake County Environmental Services Department indicate the necessity of larger lot sizes because of soil or geologic conditions or for the protection of surface water impoundments used for recreational or domestic water supply purposes, such larger lots may be required in connection with the use of water supply or sewage disposal methods other than connection to existing public systems.
- B) **Setbacks and Yards**
Minimum building setback lines shall conform to the requirements of Article 5, Measurements; lots shall be so designed as to provide yard spaces as required in connection with building sites by the terms of this Ordinance. Developers are, however, encouraged to place structures in varying locations behind the required setback line as a means of affording visual variety in the neighborhood.
- C) **Compliance with Development Standards**
The subdivider shall refer to the General Development Standards of Article 8 and shall apply them in the layout of subdivisions in order to avoid creating lots or

patterns of lots that will make compliance with such development standards difficult or infeasible.

- D) **Access**
Every lot shall abut a public street.
- E) **Double Frontage**
With the exception of corner lots, double frontage lots shall not be created except where the land could not be otherwise developed. The final plat for subdivision shall note on such lots that access shall be limited to 1 and such access shall not be from a thoroughfare.
- F) **Orientation**
Side lot lines shall be perpendicular or radial to street right-of-way lines except where a variation will provide a better street and lot layout.
- G) **Corner Lots**
For single-family residential uses, corner lots shall have additional width sufficient to provide setbacks based upon the yard standards of Article 5: *Measurements*, from both front and side streets and the front lot line shall be specified on the Master Subdivision Final Plat. Except as provided in Sec. 8.3.4.E.3, the final plat shall note on such lots that access shall be limited to one (1) and such access shall not be from a thoroughfare or major collector street.
- H) **Flag Lots**
- 1) The Town discourages and restricts creation of flag lots in subdivisions. A flag lot shall be permitted if necessary to allow a property owner reasonable use and benefit of a parcel of land or to alleviate situations that would otherwise cause extreme hardship for the owner. Flag lots are prohibited except:
 - a) Where necessary to eliminate access onto arterial streets or thoroughfares;
 - b) To reasonably utilize irregularly shaped land;
 - c) To reasonably utilize land with severe topography;
 - d) To reasonably utilize land with limited sites suitable for septic tank nitrification fields; and/or
 - e) To provide for the protection of significant natural or cultural resources.
 - 2) No flag lot will be allowed if it increases the number of access points onto a major thoroughfare. Subdivisions approved after the effective date of this Ordinance shall not be resubdivided to create flag lots.
 - 3) Use of a single driveway, granted through an easement, to serve adjoining flag lots or to serve a flag lot and an adjoining conventional lot is permitted and encouraged to reduce access points on public streets.
 - 4) The minimum lot width at the public street is twenty (20) feet.

- I) **Driveways**
Driveways serving residential properties shall meet the standards found in Sec. 8.3.4.E.

7.2.4 Easements

- A) **Utility Easements**
The subdivider shall dedicate easements to the Town or an appropriate utility company for utility installation where needed. Easements shall be sized in accordance with the *Town of Apex Standard Specifications and Standard Details*. Easements shall be at least 20 feet wide and normally centered along rear or side lot lines. Wider easements may be required if the topography along the proposed right-of-way is such that maintenance equipment cannot reasonably operate within the minimum 20-foot wide easement.
- B) **Drainage Easements**
Where a subdivision is traversed by a watercourse, drainage way, channel or stream, there shall be provided a storm water easement or drainage right-of-way conforming substantially with the lines of such watercourses and of such further width or construction, or both, as will be adequate for the purpose, but in no instance less than 20 feet. Lakes, ponds, watercourses, and the land immediately adjacent thereto shall be considered for maintenance by the Town only if sufficient land is dedicated as a public recreation area or park or if such area constitutes a necessary part of the drainage control system. The Town reserves the right to reject any intended dedications. Easements shall be sized in accordance with the *Town of Apex Standard Specifications and Standard Details*.

7.2.5 Single-Family Residential Grading

- A) **General Grading Standards**
 - 1) As required by the North Carolina Building Code Appendix J *Grading*, no grading shall be performed without first having obtained a permit from the Building Official.
 - 2) Grade changes in existing public utility easements and public rights-of-way consisting of a cut of greater than one (1) foot in elevation or fill greater than two (2) feet in elevation must be approved by the Town of Apex Water Resources Director.
 - 3) After rough grading of a subdivision is completed, the grade of any single-family residential lot shall not be raised or lowered more than six (6) feet at any point, except the grade may be raised or lowered up to 12 feet to accommodate foundation walls incorporated into the principal structure for walk-out basements.
- B) **Single-Family Residential Subdivision Mass Grading**
Mass grading of single-family residential subdivisions shall be allowed provided all provisions of Sec. 7.2.5.B are met.
 - 1) Grading activities shall be staged; prior to proceeding to another stage the developer shall stabilize the present stage with adequate ground cover sufficient to restrain erosion and have all infrastructure installed.

- 2) In no case shall mass grading exceed 20 acres per stage, including grading necessary for on-site infrastructure.
- 3) Mass graded acreage in single-family residential subdivisions must retain at least 80% of the pre-development drainage areas within their natural basins.
- 4) A land disturbing and sedimentation & soil erosion control plan shall be submitted for Master Subdivision Plan approval that shows:
 - a) How stormwater will be handled within the subdivision to meet Sec. 6.1 *Watershed Protection Overlay District* requirements;
 - b) Existing and proposed grades of site based on topography verified by a professional land surveyor 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) Required sedimentation and erosion control measures;
 - d) The limits of disturbance;
 - e) Offsite drainage;
 - f) Stockpile areas and maximum heights;
 - g) Debris piles and maximum heights; and
 - h) Clearly identified borrow and/or waste areas on-site and/or off-site if located in Town of Apex's corporate limits or ETJ.
- 5) Grading activities shall be done in accordance with all applicable federal, state, and local laws, rules, and regulations, including those pertaining to air and water pollution.
- 6) When an owner of any parcel shall raise, lower, or alter the level of existing grade of a site by a fill or excavation, the owner shall bear the expense to protect all adjoining property, with the exception of off-site easement areas, from encroachment by such fill or from danger of collapse due to such excavation either by erection of engineered retaining wall(s) or by sloping the sides of such fill or excavation entirely within the confines of the development including off-site easement areas in a manner approved by the Town of Apex. (See Secs. 8.1.4 *Development Restrictions on Steep Slopes* and 8.1.6 *Retaining Structures*.)
- 7) Each lot 8,000 square feet in size or greater shall be supplemented with a minimum of four (4) shrubs and two trees, to be provided in the front, side, or rear yard.
- 8) An additional five percent (5%) Resource Conservation Area (RCA) shall be set aside. This requirement is added to the standard RCA percentage requirement found in Sec. 8.1.2.C *Size of the RCA*.

C) **Single-Family Residential Subdivision Staged Grading**

Staged grading shall be allowed provided that the following standards are met:

- 1) Grading activities shall be staged; prior to proceeding to another stage the developer shall stabilize the present stage with adequate ground cover sufficient to restrain erosion and have all infrastructure installed.
- 2) In no case shall staged grading exceed 20 acres per stage, including grading necessary for on-site infrastructure.
- 3) Stage graded acreage in single-family residential subdivisions must retain at least 80% of the pre-development drainage areas within their natural basins.
- 4) A land disturbing and sedimentation & soil erosion control plan shall be submitted for Master Subdivision Plan approval that shows:
 - a) How stormwater will be handled within the subdivision to meet Sec. 6.1 *Watershed Protection Overlay District* requirements;
 - b) Existing and proposed grades of site based on Town of Apex LIDAR topography in the corporate limits and ETJ and Wake County LIDAR topography in Wake County's jurisdiction or topography verified by a professional land surveyor;
 - c) Required sedimentation and erosion control measures;
 - d) The limits of disturbance;
 - e) Offsite drainage;
 - f) Stockpile areas and maximum heights;
 - g) Debris piles and maximum heights; and
 - h) Clearly identified borrow and/or waste areas on-site and/or off-site if located in Town of Apex's corporate limits or ETJ.
- 5) Grading activities shall be done in accordance with all applicable federal, state, and local laws, rules, and regulations, including those pertaining to air and water pollution.
- 6) When an owner of any parcel shall raise, lower, or alter the level of existing grade of a site by a fill or excavation, the owner shall bear the expense to protect all adjoining property from encroachment by such fill beyond off-site easement areas or from danger of collapse due to such excavation either by erection of engineered retaining wall(s) or by sloping the sides of such fill or excavation entirely within the confines of the development including off-site easement areas in a manner approved by the Town of Apex. (See Secs. 8.1.4 *Development Restrictions on Steep Slopes* and 8.1.6 *Retaining Structures*.)

D) **Exemptions**

- 1) The following shall be exempt from the provisions of Sec. 7.2.5 *Single-Family Residential Grading*:
 - a) Grading in emergency situations involving immediate danger to life or property or substantial fire hazards.
 - b) Agricultural activities on bona fide farms.
 - c) Routine maintenance activities, including tree removal required to control vegetation on public roads and public utility rights-of-way.
 - d) Traditional Neighborhood Developments (TNDs).
 - e) Attached and detached townhomes, multi-family/apartments, condominiums, and non-residential developments.