

SECTION 4 - CURB & GUTTER, DRIVEWAYS, SIDEWALKS, AND GREENWAYS

4.01 Materials

a. Concrete:

Concrete for curb and gutter, driveways, or sidewalks shall be Portland cement concrete having a 28-day strength of 3000 psi when tested in accordance with ASTM C39. Detailed specifications for concrete shall conform to the specifications contained in Section 2.08 hereof.

b. Bituminous Concrete (Asphalt):

Asphalt for public greenways shall meet the requirements as set forth in Section 610 of NCDOT Specifications for Type S 9.5A.

c. Joint Fillers:

Joint fillers shall be a non-extruding joint material conforming to ASTM D1751.

4.02 Dimensions

The minimum thickness of a sidewalk shall be 4 inches, except at driveway crossings where the sidewalk shall be 6" thick. Sidewalks shall have a uniform slope perpendicular to the curb of $\frac{1}{4}$ inch per foot toward the curb. The utility strip between the sidewalk and the back of curb shall be less $\frac{1}{2}$ inch per foot toward the roadway. Where street trees are required a subgrade of soil aggregate mixture will be required by the Town.

Curb and gutter shall be standard 30" combination curb and gutter. Rolled or valley type gutter shall not be used. Standard median curb (18-inch) may be used on entrance islands and medians.

4.03 Construction Methods

a. Subgrade:

The subgrade shall be excavated to the required depth to allow placement a minimum of 5" of aggregate base course beneath the curb and shaped to the proper cross-section. Where tree roots are encountered, they shall be removed to a depth of 1 foot for the full width of the excavation. The subgrade shall be stable and thoroughly compacted as specified in paragraph 2.05 and tested in accordance with paragraph 3.04.

For sidewalks a 6" subbase mixture of ABC shall be provided.

b. Forms:

Forms shall be set and maintained true to the required lines, grades, and cross-sectional dimensions as shown in the approved Construction Drawings. Forms shall be constructed with material of such strength and with such rigidity to prevent deflection between supports. Straight forms shall be within a tolerance of $\frac{1}{2}$ inch in 10 feet from a true line horizontally or vertically. Forms shall be thoroughly cleaned of all dirt, mortar and foreign material before being used. All inside form surfaces shall be thoroughly coated with commercial quality form oil before placing concrete.

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Curbing forms or "stringline" guides shall be carefully placed to assure that the curbing will be constructed to accurate grades and without creating any depressions or "bird baths. Curved sections shall be placed such that the radii are smooth and continuous and without abrupt bends.

c. Expansion, Contraction and Control Joints:

Contraction and control joints shall be cut to a depth equal to at least 1/3 of the total concrete thickness. Contraction or control joint spacing shall be 10 feet maximum for curbing and driveway aprons. Expansion joints for curbing shall be no more than 50 feet on centers, with the joint material extending the full depth of the concrete with the top of the filler 1/2 inch below the finished surface. Expansion and contraction joints shall be spaced such that no final curb section shall be less than 5 feet long (including repair sections). Expansion joints for sidewalks shall be spaced no greater than 50 feet apart. Sidewalks shall be finished to grade and cross-section with a float, troweled smooth and finished with a broom. Contraction joints shall be no less than 1/8 inch in width, to a depth equal to at least 1/3 of the total slab thickness and cut at intervals equal to the width of sidewalk.

d. Driveway Aprons:

Where driveway aprons are to be installed in an existing curb, the entire curb and gutter section shall be removed. Saw cutting and removing the curbing, leaving the existing gutter in place, shall not be allowed. Contraction, control and expansion joints shall be located as previously specified and shown on the details. The flow line of the gutter shall be maintained across driveway aprons.

4.04 Pedestrian Crossings

Pedestrian crossings, curb cuts and ramps shall be provided at all intersections in accordance with NC GS 136-44.14. Construction, pavement marking, etc. shall conform to Detail 4.06.

4.05 Inspection

No concrete shall be placed until the forms and subgrades have been inspected and authorized by the Town Representative. Offset or reference points shall be maintained in place to assure proper placement of the forms by the Town Representative. Where machine extruded curbing is used, the "stringline" shall be inspected by the Town Representative. A minimum of 24 hours' notice shall be given for inspections.

For all residential lots that require sidewalk along the road frontage, sidewalk shall be formed and ready for inspection at the time of the driveway inspection. Sidewalk may be installed prior to, but under no circumstances later than the time of the driveway installation.

The Town will require the removal and replacement of sidewalks and driveways that have been broken, cracked, excessively chipped, or misaligned. Such areas designated by the Town Representative shall be repaired at no cost to the Town. Repairs shall be made prior to the issuance of Certificates of Occupancy for the development or final acceptance of the public infrastructure.

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4.06 Greenways

a. General:

All construction shall conform to the requirements and dimensions on the approved construction plans, Town Standard Details, the Unified Development Ordinance, the latest edition of AASHTO Guide for the Development of Bicycle Facilities, Section 405 of 2009 ANSI A117.1., and the Shared Use Path Accessibility Guidelines as published by the United States Access Board, or as stated in these Specifications, whichever, in the opinion of the Town Representative, is applicable.

b. Proof-rolling of Subgrades:

The Town Representative shall oversee the proof-roll of public greenway trails. Proof rolling shall occur at the following stages: prior to placing fill in low areas; after the preparation of subgrade prior to placing ABC; and after the placement of ABC prior to paving.

c. Amenities:

All greenways shall have amenities in accordance with Unified Development Ordinance Section 7 and 11 and standard detail 4.09. Placement shall be approved with Construction Drawings.

d. Signage:

Signage shall be provided in accordance with Unified Development Ordinance Sections 7 and 11 and standard detail 4.09. A proof of the proposed signage shall be submitted to the Town Representative for approval prior to ordering materials

e. Boardwalks & Bridges:

Greenway boardwalk systems shall be constructed of precast concrete and in accordance with standard detail 4.09. Other designs and materials may be allowed with prior review and approval from the Town of Knightdale.

f. Permits:

Greenway structures (i.e. retaining walls, boardwalks, bridges) are required to be certified by a North Carolina Professional Engineer and shall include all necessary plan documents with the final Construction Drawing set for approval. As required by NC Building Code, approved Construction Plans must be submitted with the building permit application for all greenway structures and a building permit must be obtained before construction commences.