

SECTION 09000 Greenway Construction Standards

09001 Greenway Trails

Trail standards were developed to clearly establish minimum trail requirements and to establish criteria for matching trail types to corridors based on anticipated use. Trails shall be constructed to the following specifications.

Primary Greenway Trail – 10’ Paved Trail (See Detail # 1)

Uses: Mixed bicycle and pedestrian traffic. These trails are considered the primary corridors of the greenway system.

- 10’ wide paved trail, with 2’ wide grassed shoulders on both sides of the trail
- 1% Minimum and 2% Maximum cross slope
- 2 inch minimum Asphalt surface course, Type SF 9.5A per NCDOT Standards
- 6” minimum Aggregate Base Course as specified in Section 520 in the NCDOT “Standard Specifications for Roads and Structures”
- Geotextile Fabric below ABC
- Side Slopes shall be maximum 3:1
- Maximum Longitudinal slope of 5%. Longitudinal Slopes of up to 8% are acceptable for short distances where the terrain makes 5% impractical
- Meet AASHTO Standard
- Meeting ADA standards is preferred
- Trees shall be limbed up a vertical distance of 10 feet from the forest floor, within 5 feet from the outside edge of the trail. Remove dangerous tree limbs hanging over trail. Dead trees within the project limits that present a danger to pedestrians utilizing the trail shall be removed during construction.
- The edge of the trail shall be a minimum distance of 5 feet from trees raised manholes and other raised utilities.

Secondary Greenway Trail – 8’ Paved Trail (See Detail # 2)

Uses: Minor/short connections to the main trail; primarily pedestrian use, bicycle use is limited to access to the main trail.

- 8’ wide paved trail, with 2’ wide grassed shoulders on both sides of the trail

- 2% Maximum cross slope
- Asphalt surface course, Type SF 9.5A per NCDOT Standards
- 6" Aggregate Base Course as specified in Section 520 in the NCDOT "Standard Specifications for Roads and Structures"
- Geotextile Fabric below ABC
- Side Slopes shall be less than 3:1
- Maximum slope of 8%
- Trees shall be limbed up a vertical distance of 10 feet from the forest floor, within 5 feet from the outside edge of the trail. Remove dangerous tree limbs hanging over trail. Dead trees that present a danger to pedestrians utilizing the trail shall be removed during construction.
- The edge of the trail shall be a minimum distance of 4 feet from raised manholes and other raised utilities.

Connector Greenway Trail – 6' Paved Trail (See Detail # 3)

Uses: Minor/short connections to the secondary and main trails; primarily pedestrian use, bicycle use is limited to access to the main trail. These trails are typically located on areas of steep terrain and between residential lots.

- 6' wide paved trail, with 2' wide grassed shoulders on both sides of the trail
- 2% Maximum cross slope
- Asphalt surface course, Type SF 9.5A per NCDOT Standards
- 6" Aggregate Base Course as specified in Section 520 in the NCDOT "Standard Specifications for Roads and Structures"
- Geotextile Fabric below ABC
- Side Slopes shall be less than 3:1
- Maximum slope of 10%
- Trees shall be limbed up a vertical distance of 10 feet from the forest floor, within 5 feet from the outside edge of the trail. Remove dangerous tree limbs hanging over trail. Dead trees that present a danger to pedestrians utilizing the trail shall be removed during construction.
- The edge of the trail shall be a minimum distance of 4 feet from raised manholes and other raised utilities.

09002 Greenway Proof-rolling of Subgrades for 8 and 10 foot Trails

- The Town of Cary Engineering Inspector shall proof-roll the greenway trail. Trail proof-rolling shall be performed on the exposed sub-grade soils along the full length of the proposed paved

09000-2

greenway trail after clearing, grubbing, and topsoil removal are complete.

- Proof-rolling shall be performed using a loaded tandem-axle dump truck or equipment of similar size and weight. The Staff Professional shall address problems concerning rutting, deflection or “pumping” of the sub-grade soils. In evaluating the need for remedial measures, the Staff Professional shall determine if the sub-grade soils are suitably firm to allow compaction of the planned ABC layer with the planned geotextile fabric placement, keeping in mind that the planned use of the trail will include only limited vehicular traffic.
- The aggregate base course surface shall also be proof-rolled prior to asphalt or concrete pavement placement. A minimum of 100% compaction is required.

09003 Curvature

- The minimum radius of curvature for primary greenway trails shall be 50 feet. This will provide safe bicycle travel at a speed of up to 15 mph, which is the current speed limit on Cary Greenways. When there is ample room the design radius should be increased.

09004 Trail Drainage

- Because of safety concerns and erosion, site drainage should be collected on the uphill side of the trail and piped under the trail.
- A diversion ditch shall be cut on the uphill side of the trail to direct water to the creek or to storm drainage culverts to allow drainage to flow under the trail. The edge of the ditch shall be a minimum of 2 feet from the edge of the asphalt trail.
- Drainage culverts shall be reinforced concrete pipes, according to Town standards, with concrete flared end sections on both sides of the pipe. Culverts shall be equal to that furnished by NC Products or Adams Concrete.
- Culverts shall have a minimum of 12“compacted fill over the pipe.
- A class B rip-rap dissipator with filter fabric below shall be installed at the pipe out-flow.
- Yard Inlets and Catch Basins shall be in accordance with the Town of Cary Standard Details.
- When culverts are located within the TOC 100’ buffer area, properly sized RCP Culverts will be permitted to address natural swale and drainage draws. RCP culverts can also be utilized to pass discharges of less than 1 cfs. If a RCP is used and does not meet these requirements then a level spreader will be required at the

point of discharge. In certain circumstances such as non-tree covered areas a grassed swale on the uphill side of the trail will be reviewed as a possible solution.

a.) When dealing with drainage situations within the TOC 100' buffer that do not meet the requirements stated above then a series of 8" HDPE pipes shall be sited by the design engineer to achieve defuse flow within the buffer.

09005 Safety Railings

- Safety railings a minimum of 42" high are required along trails with a side grade steeper than 2:1, bridges and retaining walls. In high hazard situations a 54 inch height shall be used.
- Either metal or wooden safety railings are acceptable. For the standard metal safety railing. (See Detail # 4) For the standard wooden safety railing. (See Detail # 5)
- Split rail fencing is required along trails with a side slope that is between 2:1 and 4:1. Split rail fencing is also required above rip-rap dissapator pads adjacent to the trail. (See Detail # 6)

09006 Greenway Trail Heads

Driveway Aprons and Handicap Ramps

- All greenway trails that intersect with a public or private road shall provide access for bicycles and town maintenance vehicles.
- Primary and Secondary Trails shall provide a 10' wide concrete driveway apron. (See Detail # 7)
- Connector trails shall provide a standard Town of Cary handicap ramp. (See TOC Engineering Detail: Standard Wheel Chair Ramp 03000.14)

Entrance Gates and Bollards

- Greenway trailheads shall be secured with entry gates and bollards, to prevent unauthorized vehicles from accessing the trail.
- Primary Trails shall be secured with a galvanized steel metal gate with pedestrian and bicycle access point. (See Detail #9)
- Secondary and Connector trails shall be secured with a removable and fixed metal bollard system. (See Detail # 10)

Benches and Gates

- All trailheads shall have one bench and one trash receptacle which will be located by the park planner. See descriptions below on benches and trash receptacles.

Signage

- All trailheads shall utilize the appropriate signs as illustrated within the Town of Cary, Comprehensive Sign Plan completed by Lose & Associate, Inc. in 2007.

09007 Trail Amenities

Benches

- Benches shall be sited on a 7' x 4'-7" concrete slab which abuts the asphalt greenway trail. (See Detail # 12)
- Benches shall be 6' long, and constructed of recycled plastic, redwood color. (See Detail #11) Benches shall be a DuMor Product #88 Series PL or Equivalent
Carolina Recreational Products, Inc.
PO Box 29242
Greensboro, NC 27429
(336) 288-9083 (800) 542-2887

Trash Receptacles

- Trash receptacle support post shall be set in a 12"x24" concrete footer. (See Detail # 13)
- Trash receptacles shall have a 32" metal liner.
- Trash receptacles shall be constructed of recycled plastic, redwood color. Trash receptacles shall be a DuMor Product #88 Series #40-32 PL or Equivalent
Carolina Recreational Products, Inc.
PO Box 29242
Greensboro, NC 27429
(336) 288-9083 (800) 542-2887
- Trash receptacles have a dome cover DuMor Product #88 Series #47-30 PL or Equivalent

09008 Signage

Greenway signs are broken down into three different categories.

- **Identification**
- **Informational**
- **Regulatory**

During the site plan review process the park planner will work with the applicant to ensure that the appropriate signs are properly sited along the greenway trail.

09009 Street Crossings

The most important aspect of all road crossings is pedestrian safety. When greenway trails have to cross a road it is preferred that the crossing occurs at a signalized intersection, with a crosswalk. This may require that the trail be extended a longer distance than would typically be required to connect with the intersection crossing.

There are certain circumstances where a pedestrian mid-block crossing cannot be avoided. These situations require additional planning to ensure pedestrian safety. The optimal solution for these locations is a grade separated crossing that utilizes a bridge or pedestrian underpass. Grade separated crossing should be carefully considered during the planning of all new roads that will bisect a primary greenway corridor.

Listed below are mid block trail crossing types that should be utilized based on the speed limit for that road. Final greenway mid block crossing designs shall be approved by the Engineering and PRCR Departments. For trail type crossing details refer to PRCR Master Plan.

Trail Crossing Type 1:

2-Lane Road; 25 mph Speed

- Warning and stop signs at trail approaches to road
- 10' wide crosswalk, with ladder bar pattern, across road and curb ramps at each end
- Warning signs along road at approaches to trail crossing
- Stamped concrete for the first 50 feet of both sides of the greenway trail. (See Detail # 14)

Trail Crossing Type 2:

2-Lane Road, 35 mph Speed

- Warning and stop signs at trail approaches to road
- 10' wide crosswalk, imprinted asphalt with ladder bar pattern, across road and curb ramps at each end
- Warning signs along road at approaches to trail crossing
- Distinctive markers at approach to trail –boulders, plantings, etc.
- Stamped concrete for the first 50 feet of both sides of the greenway trail. (See Detail # 14)

Trail Crossing Type 3:

3-Lane Road, 35 mph or Less

- Warning and stop signs at trail approaches to road
- 10' wide crosswalk, imprinted asphalt with ladder bar pattern, across road and curb ramps at each end
- Warning signs along road at approaches to trail crossing
- Distinctive markers at approach to trail –boulders, plantings, etc.
- Stamped concrete for the first 50 feet of both sides of the greenway trail. (See Detail # 14)
- Rumble strips on road at approaches
- Lighted overhead signage identifying pedestrian crossing
- Planted median in place of center lane; +/- 200 ft. long (each side of trail crossing)
- Trail crossing – striped or imprinted asphalt; flush through median
- Angle crosswalk in median to orient pedestrian toward on-coming traffic

Trail Crossing Type 4:

4-Lane Road, 45 mph or Less

- Warning and stop signs at trail approaches to road
- 10' wide crosswalk, imprinted asphalt with ladder bar pattern, across road and curb ramps at each end
- Warning signs along road at approaches to trail crossing
- Distinctive markers at approach to trail –boulders, plantings, etc
- Stamped concrete for the first 50 feet of both sides of the greenway trail. (See Detail # 14)
- Rumble strips or pavement markings
- Provide pedestrian activated traffic signals

Trail Crossing Type 5:

5-Lane Road, 45 mph or Less

- Warning and stop signs at trail approaches to road
- 10' wide crosswalk, imprinted asphalt with ladder bar pattern, across road and curb ramps at each end
- Warning signs along road at approaches to trail crossing
- Distinctive markers at approach to trail –boulders, plantings, etc.
- Stamped concrete for the first 50 feet of both sides of the greenway trail. (See Detail # 14)
- Rumble strips or pavement markings
- Provide pedestrian activated traffic signals
- Planted median in place of center lane; +/- 200 ft. long (each side of trail crossing)
- Trail crossing – striped or imprinted asphalt; flush through median

- Angle crosswalk in median to orient pedestrian toward on-coming traffic

Trail Crossing Type 6:

2-Lane Road, Over 35 mph

- Warning and stop signs at trail approaches to road
- 10' wide crosswalk, imprinted asphalt with ladder bar pattern, across road and curb ramps at each end
- Warning signs along road at approaches to trail crossing
- Distinctive markers at approach to trail –boulders, plantings, etc.
- Stamped concrete for the first 50 feet of both sides of the greenway trail. (See Detail # 14)
- Rumble strips or pavement markings
- Provide pedestrian activated traffic signals

Trail Crossing Type 7:

3-Lane Road, Over 35 mph

- Warning and stop signs at trail approaches to road
- 10' wide crosswalk, imprinted asphalt with ladder bar pattern, across road and curb ramps at each end
- Warning signs along road at approaches to trail crossing
- Distinctive markers at approach to trail –boulders, plantings, etc.
- Stamped concrete for the first 50 feet of both sides of the greenway trail. (See Detail # 14)
- Rumble strips or pavement markings
- Provide pedestrian activated traffic signals
- Planted median in place of center lane; +/- 200 ft. long
- Trail crossing – striped or imprinted asphalt; flush through median
- Angle crosswalk in median to orient pedestrian toward on-coming traffic

09010 Retaining Walls

- The design of all retaining walls taller than 30” shall be sealed by a licensed North Carolina Professional Engineer.
- All retaining walls shall be installed at the lines, grades and depths as shown on the approved plans.
- The base block size shall be the commercial block similar to the standard size by “Keystone”. Compact, mini-block or garden size blocking is not acceptable. Block retaining walls shall have a cap unit on the top of the wall. The block color shall be light brown.
- The selected retaining wall system shall be joined, pinned and/or secured in accordance to the manufacturer’s recommendations.

- Retaining walls which are 30" or taller, located adjacent to the trail shall have a 42' tall metal safety rail on top of the wall.
- Check with local building permit authorities for permitting requirements.

09011 Greenway Boardwalks: (See Details # 15A, 15B & 15C)

- Timber boardwalk shall be designed in accordance with AASHTO Standard Specifications for Highway Bridges (17 Edition-2002). Design Live Load is for a small vehicle of 5,000 pounds, 2,500 pounds per axial with a minimum 96" wheel base.
- Minimum pile penetration for piers shall be 10' feet or to a depth recommended by a North Carolina Professional Engineer.
- All bolts, nuts, washer's and hardware shall be hot dipped galvanized after fabrication, in accordance with ASTM A153.
- Small members shall have pre-drilled holes to prevent splitting during construction. All members shall be screwed together.
- Treated timber and lumber shall be used and shall be in accordance with 2002 NCDOT Standard Specifications, Section 1082 and shall be Southern Yellow Pine, Grade 2 or better.
- Site soil properties are assumed to support Foundation loads. Contractor shall provide geotechnical report to park planner, indicating that the soil properties can support the foundation loads, prior to construction.
- Joist hangers shall be capable of supporting a minimum working load of 3,150 pounds and be galvanized.
- The bottom support beams shall be a minimum of 3' above normal water level, and be above the 100' year storm elevation.
- Boardwalk structures shall located a minimum of 15' from the center of all existing sewer lines.
- The ends of the boardwalk shall have a 10'x10' concrete approach slab 6" thick. (See Detail # 16)
- Requires Town of Cary building Permit.

09012 Greenway Bridges

- The Town of Cary utilizes two types of greenway bridges. Greenway bridges can either be constructed with a pre-engineered laminated beam construction or with structural steel with wooden decking and hand rails as indicated in the detail.

Typically, the pre-engineered laminated beam bridges have been utilized at locations that have adequate access for a crane to set the bridge on the concrete abutments. Both styles of bridge shall be designed to meet or surpass the design requirements listed below.

Bridge Design

- Greenway bridge plans and abutment details shall be signed and sealed by a registered North Carolina Professional Engineer.
- The bridge shall be designed for an evenly distributed load of 85 pounds per square foot as required by AASHTO Standard Specifications for Highway Bridges 16th Edition or a concentrated load of 20,000 pounds at mid-span.
- Bridges on primary trails shall be 12' clear between railings.
- Bridges on secondary trails shall be 10' clear between railings.
- Bridges shall have 42" wooden railings.
- Structural Lumber: Solid timber decking, posts and handrails shall be No. 1 Southern Pine. All lumber shall be pressure treated.
- All connectors shall be hot-dipped galvanized. This includes bolts, washers, screws and fabricated connections. All decking and railings shall be connected with bolts or screws.
- Manufacturer shall submit working drawings to the Town for review prior to manufacturing of the bridge. Working drawings shall be signed, sealed and dated by a North Carolina Professional Engineer.
- Construction Inspector may require additional certifications.

Bridge Clearance

- There shall be a minimum clearance of 4-feet from the lowest portion of the bridge to the water level.
- Bridge abutments cannot be located within the floodway and shall be located a minimum of 5' from the top of the stream bank.
- Bridges and abutments shall be located a minimum of 15' from the center of all existing sewer lines.
- At a minimum the elevation of the bridge shall be set high enough to pass the 25 year storm and receive necessary FEMA approvals. When feasible the 100 year storm should be accommodated.
- Illustrate how high water levels will pass without damaging bridge. Provide a section of the proposed bridge with the construction documents.

Bridge Footings and Wing Walls

- Bridge footings and wing walls shall be constructed with reinforced concrete as designed and sealed by the North Carolina Professional Engineer. A representative of the geotechnical engineer's staff shall approve the footing excavation bottoms prior

to constructing bridge footings and placement of rebar and concrete.

Concrete Bridge Approach

- Greenway bridges shall have a 15' approach slab on both sides as indicated in bridge approach plan and section details.
(See Details # 17 & #18)

Metal Safety Rails

- Bridge approaches shall incorporate metal safety rails.
(See Detail # 4)

Pedestrian Bridges: Pre Engineered Laminated Beam Bridge

(See Detail #19)

- These specifications are for a fully engineered clear span bridge of laminated lumber and solid sawn lumber construction and shall be regarded as minimum standards for design and construction as manufactured by a qualified bridge manufacturer. The manufacturer shall have a minimum of five years experience in design and fabrication of pre-engineered pedestrian bridges. (See Detail # 19)
- The bridge shall be designed for an evenly distributed load of 85 pounds per square foot as required by AASHTO Standard Specifications for Highway Bridges 16th Edition and a concentrated load of 20,000 pounds at mid-span. The design of the laminated lumber bridge components shall be in accordance with the "American Institute of Timber Construction", "AITC 117-2001", or latest edition.
- The total bridge dead load applied to the End Bent shall not exceed 37,000 pounds.
- All bridges shall be designed for a minimum wind load of 30 pounds (approximately 120 mph). The wind is calculated on the entire vertical surface of the bridge as is fully enclosed. All bridges shall be designed for seismic loads of the intensity required by local codes.
- Bridge camber at center of the bridge span shall be a maximum of 2-½% of the total bridge span. This should produce a localized

deck slope of 1:12 or 8.8%. Bridge shall be cambered to offset full dead load deflections.

- Bridge span shall mean the distance from center to center of the bearings. The bridge being designed shall have bearing elevations that are equal.
- Manufacturer shall submit working drawings to the Engineer for review prior to manufacturing of the bridge. Working drawings shall be signed, sealed and dated by a North Carolina Professional Engineer.
- Manufacturer shall provide for one deck plank at each end of the bridge to span the one-inch gap as described below to prevent debris from falling through the gap. This deck plank shall match the decking of the bridge and shall be installed at the site after the backwall is installed (see plan detail).

Materials

- A. All structural members shall have minimum thickness of material of at least 2" nominal.
- B. Structural bridge components shall be fabricated from laminating lumber. Laminating lumber shall be Southern Pine Kiln Dried and graded to meet the requirements of standard specifications for structural glued laminated timber, AITC 117. Lumber combination shall be used for identification. Laminated components shall be per AITC architectural appearance grade.
- C. Miscellaneous solid sawn lumber for decking shall be Southern Pine graded in accordance with SPIB.
- D. Preservative treatment for glulam components shall consist of pressure treated laminated lumber (treated prior to gluing) with pentachlorophenol type C in accordance with AITC 109 and AWPA C28. Exterior stringers and all other glulam components shall be .6 pcf retention. Solid sawn decking shall be pressure treated in accordance with C2 for above ground use.
- E. Laminated lumber handrail posts shall be fastened to the exterior beam with galvanized steel carriage bolts. Handrails must meet current requirements as stated in the ADA Accessibility Guidelines (ADAAG).

- F. Adhesives shall be wet-use (waterproof) complying with ANSI/AITC A190.1 – latest edition.
- G. Each bearing and template shall be fabricated to accommodate one (1) ¾ inch diameter anchor bolt. Anchor bolts shall be aligned longitudinally with the bridge. All steel for bearing connection plates and shall be ASTM A36. Minimum yield (Fy) shall be greater than 36,000 psi. The manufacturer shall furnish all connecting steel and hardware. Decking shall be held down using stainless steel deck screws. Material shall be hot dipped galvanized. Pre-engineered bridge manufacturer is not responsible for the template, setting plates or anchor bolts.
- H. At the End Bents, the bridge shall be fabricated to produce a six (6) inch longitudinal distance from centerline of anchor bolts to end of beam. A one (1) inch open joint shall exist between the end of the bridge and the end bent backwall.

Fabrication

Workmanship, fabrication, and shop connections shall be in accordance with the latest version of American Institute of Timber Construction and all related Interim Specifications. Bridges may be assembled at the site or at the manufacturer.

Railings and Accessories

- A. The railings shall be fabricated from laminated lumber. The railings shall have a smooth inside surface with no protrusions or depressions. Finished railing height shall be 42". All members, railings, corners, and ends of lumber shall be sanded smooth and edges eased.
- B. Maximum spacing of railings shall be such that a 31/2" sphere shall not pass between the members.

Finishes

All glulam materials to receive one factory applied coat of clear penetrating sealer.

Delivery and Erection

- A. Bridges or bridge components will be delivered by truck to a location nearest to the site accessible by roads.

- B. The contractor shall provide for the installation of anchor bolts to be installed. The information required to develop the template shall include the size, configuration, and spacing of the bolts as they shall be installed in the footing.

Quality

- A. The bridge manufacturer shall maintain records assuring that all timber, bolts, and materials used are in accordance with the material specified and certified by a North Carolina Professional Engineer. (A copy of the records shall be provided with the bridge to the owner.)
- B. The bridge shall be identified and marked with a permanent nameplate showing the manufacturer's name, location, date of manufacture and load carrying capacity. Structural materials shall be traceable to the bridge.

09013 Underpasses and Tunnels

- Greenway tunnels shall be 12' x 12' reinforced pored in place concrete structures as specified by NCDOT.
- Tunnels shall exhibit a 1% minimum slope.
- Headwalls with wing-walls are required at both ends of the tunnel.
- Special consideration shall be placed on the drainage design at the entrance to the tunnel. Where necessary trench drains should be incorporated at the tunnel entrance to intercept water from pooling within the tunnel. (See Detail # 20)

09014 Typical Greenway Construction Plan Notes

1. Trail shall be constructed per plans and according to all other pertinent details and specifications.
2. Contractor shall confine construction activity within limits of construction.
3. Contractor shall retain a PLS to stake centerline of the trail as shown on the Layout Plan. The trail is to be staked at 50' intervals in the field.
4. Staked centerline of the trail is to be approved by Town of Cary,
5. Erect tree protection fence along limit of construction for inspection by Town of Cary site inspector.
6. Install required erosion control measure prior to construction.

7. Contractor to call for utility locations prior to construction.
8. All trails, regardless of width shall maintain a 2' wide grassed shoulder with a 2% cross slope. Trails that do not incorporate a 2' wide grassed shoulder capable of being maintained with a standard lawn mower will not be accepted by the town.
9. Proposed pavement shall meet existing pavement flush.
10. Trail to exhibit 2% cross slope towards creek or low area.
11. Side slope shall be 3:1 maximum and 2% minimum slope except where otherwise noted.
12. All disturbed areas shall be seeded per specification.
13. Grade side slopes and adjacent ground to drain. Ensure that there is no standing water on the uphill side of the trail. Install diversion ditch as needed to direct water to culverts.
14. Additional culverts will be added as needed during construction to prevent erosion and slick spots on greenway trail.
15. Drainage culverts shall be concrete and have a flared end section on both ends. A class B rip-rap dissipater with filter fabric shall be installed at the pipe out-flow.
16. Trees shall be limbed up a vertical distance of 10 feet from the forest floor, within 5 feet from the outside edge of the trail. Remove dangerous tree limbs hanging over trail as directed by the park planner. Dead trees that present a danger to pedestrians utilizing the trail shall be removed during construction.
17. The Town of Cary Engineering Inspector shall proof roll greenway trail prior to placement of fabric and 6" of crushed stone. The trail shall also be proof rolled prior to paving. A minimum of 97% compaction is required.
18. All trails that intersect with a curbed road shall have a Town of Cary, driveway apron or HC Ramp.
19. All trails that intersect with roads or parking lots shall be secured with standard gates or bollards as specified by the PRCR Department.
20. The first 50 feet of all trails that intersect with a road which will utilize a mid block crossing shall incorporate 50' of stamped concrete starting at the edge of the driveway apron.
21. The edges of paved trails shall be a minimum of 4' to the edge of raised manholes.
22. No greenway trails or easements shall be co-located within any BMP's or stormwater control devices.
23. Split rail fencing shall be located adjacent to the trail in areas that exceed a 4 to 1 slope.
24. No shrub or tree plantings are allowed within the greenway easement.
25. The developer's contractor shall ensure that all access points leading to the trail are posted with signs that read Trail Closed For Construction.

26. The Town of Cary Greenway shall be constructed and approved as part of the infrastructure acceptance by the TOC Engineering Department.

Multi-Purpose Trails

1. Multi-purpose trails are 8'-10' wide asphalt or concrete paths that are located adjacent to roads. Their primary purpose is to enhance pedestrian opportunities along roadways and to provide pedestrian connectivity to the town's greenway system.
Multi-purpose trails are often located in densely developed areas where constructing an off-road greenway trail is impractical. These trails will typically replace sidewalks that would be required.
2. The width and the construction material utilized will be determined during the development process.
3. Typically the multi-purpose trail shall be located within the public Right of Way. If it is determined during site plan review that the multi-use trail is more suitably located outside of the public right-of way it shall be located within a 14' standard easement.
4. The edge of the multi-purpose trail shall be a minimum distance of 5 feet from the back of curb.
5. No planting or raised utilities will be allowed within the easement area.
6. Multi-Purpose Trails shall be constructed to Town of Cary standards.
7. When the multi-purpose trail is to be constructed with asphalt the contractor shall utilize the standard paved trail details. (See Details # 1 & # 2) When the multi-purpose trail is to be constructed with concrete. (See TOC Engineering: Detail 03000.08)

END OF SECTION 09000