Town of Waynesville

Standard Specifications
of the Public Services Department

Incorporated into the Land Development Standards by reference

Last Updated:

February 14, 2023

Acknowledgments

This manual was developed by the Development Services Land Use Administrator Olga Grooman with assistance from Steve Marks and others at WithersRavenel: Civil & Environmental Engineering Firm.

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Section 1 – General Provisions

1.1 Intent and Scope

The Standard Specifications of the Public Services Department establish development requirements that protect public health, safety, and welfare. Waynesville strives to promote smart growth through sustainable and multi-modal transportation system, safe and attractive streets, and protection of natural resources. Complete streets create an interconnected transportation network. They safely accommodate cars, bicyclists, pedestrians, transit users, commercial and emergency vehicles, stormwater systems, utilities, and vegetation.

This manual establishes the standards for building and maintenance of the infrastructure related to development, redevelopment, and subdividing land. The specifications in this manual apply to all private and public properties within the Town of Waynesville.

The Standard Specifications of the Public Services Department are incorporated into the Town of Waynesville Land Development Standards (LDS) by reference. The requirements stated herein may be revised or amended from time to time by new standards, supplemental specifications, or special provisions that are unique to a select group of projects. The Waynesville Public Services Director will approve all revisions and updates to this manual.

1.2 Authority

Delegation of Authority: Compliance with *The Standard Specifications of the Public Services Department* and interpretation of its standards shall be carried by the Waynesville Public Services Director, Waynesville Public Services Assistant Director, or by their designee. For the purpose of this manual, the Administrator shall mean any Public Services employee designated in this function.

General Authority: The Town of Waynesville Public Services Department will review, approve, and inspect the design and construction of infrastructure improvements within the public and private rights-of-way, easements, and site developments to ensure compliance with this manual. The Administrator has the authority to approve, accept, or deny the design and construction of any improvement. Any additional requirements and consideration of special circumstances shall be determined by the Administrator.

Conflict of Laws: This manual is not intended to modify or repeal any other ordinance, rule, regulation, or provision of law. The requirements of this manual are in addition to the requirements of any other ordinance, rule, regulation, or provision of law. The manual establishes minimum standards that shall be met or exceeded when designing and constructing all public or private infrastructure improvements. Whenever the requirements of this manual are found to be inconsistent with any other adopted standards, regulations, or codes, the more restrictive standards shall control. Reference to any code, regulation, standard, criterion, or manual of any technical society, organization, or association, or to any law or regulation of any governmental authority, whether such reference be specific or by implication, shall mean the most recently adopted version of the document at the time of a project review.

For general questions about this manual, please contact the Public Services Department:

- Call (828) 456-3706 or email
- *Ricky Foster, Public Services Assistant Director* at rfoster@waynesvillenc.gov
- *Jeff Stines, Public Services Director* at jstines@waynesvillenc.gov

1.3 Terminology

Terms, words, and abbreviations used in this manual are defined in the **Appendix A**.

Section 2 – Infrastructure Standards

2.1 Applicability

The purpose of this Section is to establish criteria for the site development and subdivision of real property within the jurisdiction of the Town of Waynesville.

Subdivision Defined[1]: For the purposes of this Section, a "subdivision" shall mean all divisions of a tract or parcel of land into two (2) or more lots, building sites, or other divisions for the purpose of sale or building development (whether immediate or future) and shall include all divisions of land involving the dedication of new streets or a change in existing streets.

Statutory Exemptions: The following are not included within the definition above nor are they subject to the regulations of this Section, provided however, that any document or plat to be recorded pursuant to any such exclusion shall bear the notation, "Exempt pursuant to the Town of Waynesville Land Development Standards," and the signature of the Development Services Director before being presented for recordation:

1. The combination or recombination of portions of previously subdivided and recorded lots where the total number of lots is not increased and the resultant lots are equal to or exceed the land development standards of the town.
2. The division of land into parcels greater than ten (10) acres in size where no street right-of-way dedication is involved.
3. The public acquisition by purchase of strips of land for the widening or opening of streets.
4. The division of a tract in single ownership whose entire area is no greater than two (2) acres into not more than three (3) lots, where no street right-of-way dedication is involved, and where the resultant lots are equal to or exceed the land development standards of the Town of Waynesville.
5. The conveyance to lineal descendants for the purpose of dividing real estate among said lineal descendants. At such time that any lineal descendants or their successors in interest develop or building upon their respective property, the property must conform in all respects to the regulations of the Town of Waynesville.

Site Plans Defined: A site plan is an architectural and/or engineering drawing of proposed improvements for a specific lot that depicts such elements as building footprints, driveways, parking areas, drainage, utilities, lighting, and landscaping.

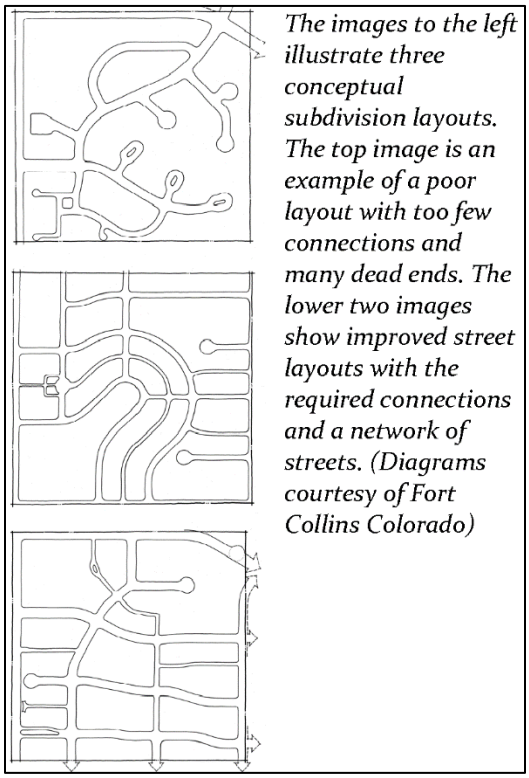
[1] *See LDS Section 6.2 Applicability.*

Required Improvements for all Development: All required improvements set forth in this Section or sections of the Town of Waynesville Land Development Standards shall be installed or constructed by the developer at no cost to the Town except as may otherwise be specifically provided herein or by Town policy or agreement. Required improvements under this Section shall not be installed or constructed until required construction plans have been approved by the Administrator and Development Services Department. The Town may, in order to serve future development, require the developer to install certain oversized improvements and/or to increase such improvements to a size and/or extent beyond that necessary for the needs created by the developer. In such cases, the Town shall enter into an agreement to reimburse the developer for the oversizing and/or extension based upon rates as agreed to by the Town.

2.2 Connectivity

A. Street Network

Streets to be Interconnected: Except where determined not feasible by the Administrator, all streets shall be designed to form a part of an interconnected street pattern. Streets must connect with adjacent street networks to the extent possible. Where existing rights-of-way abut property to be developed, streets shall be built to connect to rights-of-way as feasible. Street designs will be assessed, in terms of meeting this interconnectivity standard, on their ability to: permit multiple routes between origin/destination points; diffuse traffic; and shorten walking distances.



The images to the left illustrate three conceptual subdivision layouts. The top image is an example of a poor layout with too few connections and many dead ends. The lower two images show improved street layouts with the required connections and a network of streets. (Diagrams courtesy of Fort Collins Colorado)

Block Lengths: Low speed, low volume streets shall be designed with short block lengths. The Administrator may approve block length designs based on topography, the existence of environmentally sensitive lands, the need to preserve cultural resources, and similar considerations.

Reserve Strips Prohibited: Reserve strips and non-access easements adjoining street rights-of-way for the purpose of preventing access to or from adjacent property (except those required by

the Board of Aldermen to prevent access to thoroughfares), and half-streets shall not be permitted.

Connections to Greenways and Parks: When lots abut greenways, parks, and open space areas, accessways must be provided at a minimum of every six hundred (600) feet. Where a cul-de-sac street is permitted within a development, accessways to greenways, parks and open space areas must be provided where such streets back up to these areas.

Connection of Cul-de-sacs: Where two (2) cul-de-sac streets end within three hundred (300) feet of each other, accessways shall be provided between the cul-de-sacs where feasible.

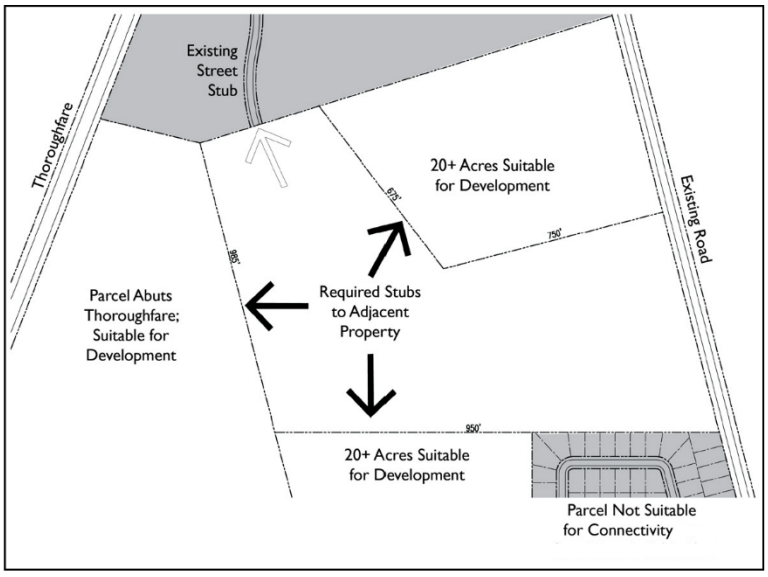
Desirable Minimum Pedestrian/Bicycle Accessway Width: Five (5) feet

Surface Treatment of Accessways: The surface of accessways shall be constructed of a smooth, compactable material that is accessible for wheelchairs and strollers. Acceptable materials include asphalt, concrete, and crushed stone.

Public Transit Connections: Projects with 100 or more residential units or 100,000 square feet of non-residential space that are adjacent to present or planned transit routes shall provide adequate and well-located space for a shelter and bus drop-off area.

B. Street Stubs

Stubs: Connection to street stubs is required. New developments shall connect to any existing street stubs from adjacent properties.



Street Stub Prioritization: New development shall stub to all adjacent properties where practical. The location of new required street stubs shall be prioritized as follows:

a. Adjacent parcels 20 acres or greater

b. Adjacent parcels that abut or are traversed by existing or proposed thoroughfares or collector streets.

c. Where any adopted transportation or land use plan recommends a street connection.

Exemptions: Street stubs shall not be required where the conditions listed below would prevent connections:

- Topographical conditions (where pre-development slopes are 18 percent or greater)
- Environmental conditions (e.g., jurisdictional wetlands)
- Property shape
- Property accessibility (e.g., existing platted subdivision with no stubs)
- Land use relationships (e.g., incompatible land use)

Stub Street Details: Stub streets and streets intended for extension during future phases shall be constructed to extend to the property line or as close to the line as practical. It shall be the responsibility of the second development to construct the connection to an existing stub street. Stub (or dead head) streets shall not exceed 150 feet in length without a paved turnaround (permanent or temporary).

2.3 Town Street Classifications and Design

A. General

Streets are the most important part of Waynesville's transportation system. Ideal street design must accommodate all modes of transportation (motor vehicle, bicycle, pedestrian, and transit), although there are certain street classes, such as alleys, that have specialized purposes. Residential streets should provide connectivity while discouraging high-speed cut-through traffic. The standards in this section are required for new public and private streets constructed within the the Town of Waynesville.

Streets may be accepted into the Town street system for maintenance with approval of the Town Board of Aldermen. Roads that cannot be accepted into the Town roadway system are:

a) Roadways in elevations above 2900 and/or
b) Roadways with grades above 22% with a maintained distance over 500 feet and/or
c) Roadways in areas prone to rockslides and/or
d) Roadways where the Town is unable to provide emergency services due to geometrics of the roadway and/or
e) Roadway stopping sight distance is inconsistent with design speed.

Measurement of Pavement Area Details: Pavement widths (travel ways, bike lane and parking areas) measured from the face of curb to the face of curb or to the edge of pavement (for roadways with open drainage).

Turn Lanes: Right turns, where required, may be taken from the parking lane.

Dimension Ranges: Where ranges are given, the project designer should consult with the Administrator as to the appropriate detail.

- **Design Speed and Posted Speed Limit:** Design speed is a selected speed used to determine the various geometric design features off a roadway. The posted speed limit is established either by law or by traffic control devices. Speed limit is usually less than the design speed.

- **Street design includes multiple elements:** the roadway or vehicle travel surface, which may include an improved shoulder or bicycle lane; curb and gutter, swale or other stormwater conveyance, planted strips and landscaping as required, sidewalks, greenways or other pedestrian facilities such as crosswalks as required.

- **Blocks** are a unit of land, inclusive of private land, alleys, parking areas and sidewalks or other features that are circumscribed by a combination of streets, waterways, or linear greenspace that break up the linear development pattern along a roadway. New streets shall be organized with blocks that are a maximum of 500 feet in length unless within a conservation subdivision or hillside development, or Low Density Residential Districts (CC-RL, EN-RL, FC-RL, or HT-RL).

B. Right-of-Way

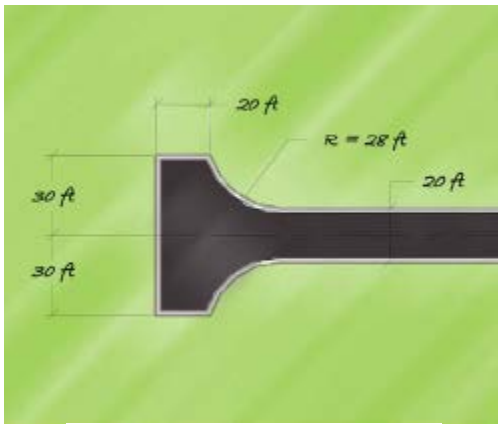
Rights-of-Way: The right-of-way width should be the minimum required to accommodate the street, median, planning strips, sidewalks, utilities, and maintenance consideration. The right-of-way width required for new streets may include the following elements:

- The paved roadway section including travel lanes, turning and acceleration or deceleration lanes, transit lanes, bicycle lanes, and parking lanes
- Curb and gutter or drainage swales
- Roadside and median landscaping areas
- Sidewalks and multi-use paths
- Any necessary utility corridors

C. Cul-de-Sac

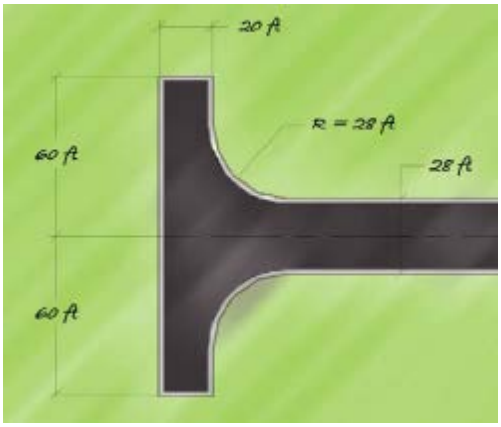
Cul-de-sac streets are strongly discouraged on local and residential streets because they disrupt connectivity of streets for safety and access. The Administrator or Fire Code Official may approve cul-de-sacs where there is no other possible street or driveway access to a property from a public right-of-way. Where a cul-de-sac is approved, a pedestrian/bicycle connection to adjacent development will be required, if feasible. The length of a cul-de-sac will be measured from the last point of alternative connected access. Where approved, cul-de-sacs shall have a minimum pavement diameter (curb face to curb face) and a minimum right-of-way diameter as follows:

- **Short Cul-De-Sac.** When the total length of the cul-de-sac is 500 feet or less (measured from centerline of the intersecting street), the minimum pavement diameter is 70 feet, and the minimum right-of-way diameter is 90 feet. The small hammerhead design may be used as an alternative. Image of the "Small Hammerhead Design" is to the left.



Small Hammerhead Design

- **Long Cul-De-Sac.** When the total length of the cul-de-sac is between 501 and 1,000 feet (measured from centerline of the intersecting street), the minimum pavement diameter is 90 feet, and the minimum right-of-way diameter is 110 feet. The large hammerhead design may be used as an alternative. Cul-de-sacs longer than 1,000 feet must be approved by the Administrator and Fire Code Official. Image of the "Large Hammerhead Design" is to the left.



Large Hammerhead Design

D. Boulevard

Definition: Boulevards provide multi-lane access to commercial and mixed-use developments. Boulevards also serve to carry regional traffic throughout the town. *(Russ Avenue is an example of a Boulevard.)*

- Right-of-way width: 100-124 feet (Curb and Gutter),
- Lane Widths: 10-12 feet
- Median Width: 10 – 20 feet
- Traffic Lanes: 4 or 5 lanes
- Parking Lanes: None, Generally Off-street Parking
- Curb Type: Vertical curb and gutter or LID or Open Drainage (Additional right-of-way may be required for natural drainage sections)
- Curb Radius: 15 -25 feet at street intersection
- Grades: As approved by Administrator.
- Design Speed: 50 mph
- Stopping Sight Distance: minimum 425 feet
- Pedestrian Facilities – Intersection bulbouts (required) and Mid-block crosswalks
- Walkway Type: 6 ft. sidewalk both sides (Residential Districts) 8 ft. all other districts
- Bicycle Facilities: 5 ft. Bike Lane or 6 ft. w/on-street parking
- Planter Type: Continuous planting strip - 6 ft. (curb) or 8 ft. Open Drainage
- Landscape Type: 1 per 40 ft. of street frontage

E. Avenue

Definition: Avenues serve as arterial, collector, or local route connectors between neighborhoods and area centers. Used in residential and commercial areas, often terminating at prominent buildings, downtown centers, or plazas. Avenues may also circulate around squares or neighborhood parks. (Dellwood Road and Howell Mill Road are examples of Avenues).

- Right-of-way width: 80-104 feet (Curb and Gutter),
- Lane Widths: 10-12 feet
- Median Width: 12 – 18 feet. (Optional)
- Traffic Lanes: 2-3 lanes

- Parking Lanes: parking on both sides
- Curb Type: Vertical curb and gutter or LID or Open Drainage (Additional right-of-way may be required for natural drainage sections)
- Curb Radius: 15 -25 feet. at street intersection
- Grades: As approved by Administrator
- Design Speed: 45 mph
- Stopping Sight Distance: minimum 360 feet
- Pedestrian Facilities – Intersection bulbouts (required) and Mid-block crosswalks
- Walkway Type: 6 ft. sidewalk both sides (Residential Districts) 8 ft. all other districts
- Bicycle Facilities: 5 ft. Bike Lane or 6 ft. w/on-street parking
- Planter Type: Continuous planting strip - 6 ft. (curb) or 8 ft. Open Drainage
- Landscape Type: 1 per 40 ft. of street frontage

F. Business District Street

Definition: Business District Streets can be arterial, collectors, or local streets that serve as a primary thoroughfare for traffic circulation in a limited area. They provide access to downtown, commercial, or outlying business districts and generally have a high percentage of truck traffic. A destination street that serves as a center of civic, social, and commercial activity. (Downtown, Frog Level, and Hazelwood are examples of locations for Business District Streets).

- Right-of-way width: 60-80 feet (Curb and Gutter),
- Lane Widths: 10-12 feet
- Traffic Lanes: 2 - 3 lanes
- Parking Lanes: Both sides or (one side only as appropriate)
- Curb Type: Vertical curb and gutter
- Curb Radius: 15 -25 ft. at street intersection
- Grades: As approved by Administrator
- Design Speed: 35 mph
- Stopping Sight Distance: minimum 250 feet
- Pedestrian Facilities – Intersection bulbouts (required) and crosswalks at all intersections and Mid-block as appropriate.
- Walkway Type: 12 ft. sidewalk both sides (16 ft. required for outdoor seating areas) (dimensions are measured from back of curb to the outside edge of sidewalk)
- Bicycle Facilities: Normal Lane with integrated bicycle traffic or Wide Lane of 3-5 foot improved or striped shoulder.

- Planter Type: Tree wells or 6 ft. continuous planting strip (included in walkway type dimension)
- Landscape Type: 1 per 40 ft. of street frontage

G. Residential Street

Definition: Local Residential streets serve as the primary transportation network in the community. Generally, they contain more than 50% residential dwellings based on road frontage.

- Right-of-way width: Minimum 40 feet. (Curb and Gutter), 50 ft. (Open Drainage)
- Pavement Widths: Minimum 20 feet. (27 ft. with parking)
- Traffic Lanes: generally, two lanes (one in each direction)
- Parking Lanes: parking on one side
- Curb Type: Vertical Curb and Gutter or LID (Low Impact Development)
- Curb Radius: 15 feet. at street intersection
- Grades: Maximum Grade of 18% for a maximum length of 2,500 feet
- Design Speed: 40 mph
- Stopping Sight Distance: minimum 305 feet
- Walkway Type: 5 ft. sidewalk both sides (one side with environmental constraints)
- Bicycle Facilities: Normal Lane with integrated bicycle traffic or Wide Lane of 3-5 foot improved or striped shoulder.
- Planter Type: Continuous planting strip 5 ft. (Curb) or 8 ft (Swale)
- Landscape Type: 1 per 40 ft. of street frontage
- Subdivision Type: All Major Subdivisions

H. Lane

Definition: Lanes are small, traveled ways intended to provide direct access to the front of a limited number of residential structures. Lanes are limited in the number of lots served. Generally, they are very short; often less than four hundred (400) feet. Items including, but not limited to, traffic carrying capacity, topography, connectivity, and emergency vehicle access, shall be a consideration when permitting a lane in lieu of a street.

- Right-of-way width: Minimum 36 feet. (Curb and Gutter), 46 feet. (Open Drainage)
- Pavement Widths: Minimum 20 feet.
- Traffic Lanes: two lanes (one lane in each direction) or one lane as a one-way street or loop, as approved by fire code official.
- Parking Lanes: Parking on one side
- Curb Type: Vertical Curb and Gutter, Open Drainage or LID (Low Impact Development) (Additional right-of-way may be required for natural drainage sections)
- Curb Radius: 15 feet. at street intersection
- Grades: Maximum Grade of 18% for a maximum length of 2,500 feet
- Design Speed: 35 mph
- Stopping Sight Distance: Minimum 250 feet
- Walkway Type: 5 ft. sidewalk one side (4 feet. with environmental constraints)
- Bicycle Facilities: Normal Lane with integrated bicycle traffic or Wide Lane of 3-5 foot improved or striped shoulder. Type N or W
- Planter Type: Continuous planting strip 5 ft. (Curb) or 8 ft (Open Drainage).
- Landscape Type: 1 per 40 ft. of street frontage
- Length: Maximum 800 ft. unless approved by the Administrator

I. Alley

Definition: Alleys are intended to provide indirect, limited access to the rear of properties but not to accommodate through traffic. Utilities, either above ground or underground, may be located in alleyways to provide service connections to rear elevations.

- Right-of-way width: 20-24 feet.
- Pavement Widths: Minimum 14 feet.
- Parking Lanes: None
- Curb Type: inverted Crown
- Curb Radius: Taper at street intersection
- Grades: As approved by Administrator
- Design Speed: 30 mph
- Stopping Sight Distance: 200 feet
- Walkway Type: Path optional
- Landscape Type: None
- Building Setback from Alley Centerline: 15 ft.
- Maximum Length: Approved by Administrator

J. Conservation or Hillside Street

Definition: Streets designed to accommodate environmental constraints and to encourage minimal grading and adaption to the natural character of the land. This street standard can be applied when environmental issues, environmental protection and/ or conservation are a consideration. This standard can only be used with the pre-approval of the administrator.

- Right-of-way width: Minimum 36 ft. (Vertical Curb), 46 ft. (Open Drainage)
- Pavement Widths: Minimum 20 ft. (14 ft. in one-way sections with pull-out every 150 ft. or as allowed by Town Fire Officials)
- Traffic Lanes: 1 or 2 lanes
- Parking Lanes: None (off-road parking only)
- Curb Type: Vertical Curb, Open Drainage or LID (Low Impact Development) with Curb and gutter at intersections. (Additional right-of-way may be required for natural drainage sections)
- Curb Radius: 15 ft. at street intersection
- Grades: As approved by Administrator.
- Design Speed: 40 mph
- Stopping Sight Distance: Minimum 305 feet
- Walkway Type: 5 ft. (4 ft. with environmental constraints) sidewalk on one side.

- Bicycle Facilities: Optional Type N or W
- Planter Type: Continuous planting strip of 5 ft (Rolled Curb) or Open Drainage.
- Landscape Type: 1 per 40 ft. of street frontage

2.4 Street Engineering Standards

A. General

The following standards are intended to provide general clarity for most conditions in Waynesville. Deviations to these standards may be granted by the Administrator subject to generally accepted safety and engineering practices.

Stopping Sight Distance (SSD) is the forward view that a driver has at all times while driving the indicated maximum speed limit for each classification of Town Street. The SSD is greatly dependent on the approach grade. The values presented are for an assumed approach grade within a range of -3% to +3%. For approach grades outside this range, the design engineer shall be required to certify that SSD is met at all times along the street. ***Guidance obtained with***

reference to NCDOT Subdivision Manual, AASHTO (American Association of State Highway and Transportation Official), (Highway Capacity Manual, and NACTO (National Association of City Transportation Officials).

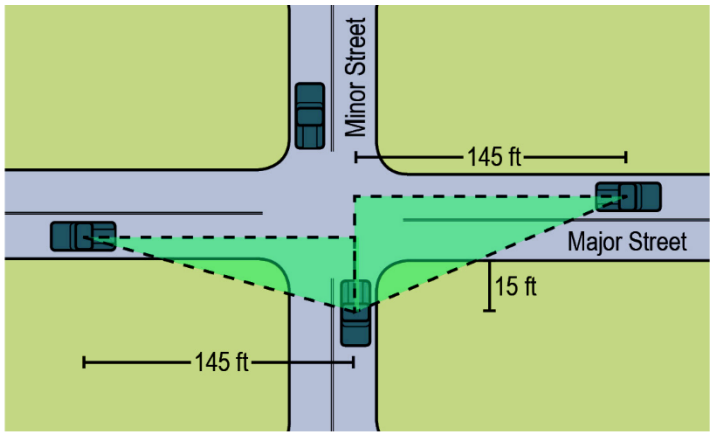
Minimum stopping sight distance should conform to the design speed of the roadway:

Street Classification	Design Speed	Stopping Sign Distance
Boulevard	50 mph	425 feet
Avenue	45 mph	360 feet
Residential or Conservation Street	40 mph	305 feet
Business District Street or Lane	35 mph	250 feet
Alley	30 mph	200 feet

The required sight distances set forth in this section should be provided by both vertical and horizontal alignment. Where grades vary from level conditions, stopping sight distances must be increased for downhill grades, but may be decreased for uphill grades***. In cases where the speed limit is greater, refer to the latest published copy of AASHTO's "A Policy on Geometric Design of Highways and Streets."***

B. Sight Triangles

The minimum sight triangle for stop conditions at a street intersection shall be one hundred forty-five (145) feet along the major road and fifteen (15) feet on the minor road approach from the edge of the traveled way. The 145 feet is measured in the center of the near lane looking left, and to the center of the far lane looking right. The intersection sight triangle shall be permanent right-of-way.



In order to ensure adequate sight visibility at intersections, sight visibility triangles shall be provided and maintained at all intersections with public streets, private streets, and driveway access points. On streets maintained by the NCDOT, additional sight visibility triangle requirements may be applied by that authority.

Sight visibility triangles include the following provisions:

- For intersections formed by two public streets with a traffic sign or other traffic control device, the minor approach is defined as the street that must stop or yield.
- For intersections formed by a public street and a private street or driveway, the public street is defined as the major approach and the private street or driveway is defined as the minor approach.
- For a private street or driveway, the short side of the sight visibility triangle shall be measured along the edge of the private street or driveway.
- There are times when the rights-of-way are large enough to adversely affect the intent of a sight triangle making it difficult for a driver to enter the major street. The Administrator or his/her designee will review these situations on a case-by-case basis and make any appropriate adjustments as needed.

Within the sight visibility triangles identified above, and except as provided below, no structure, sign, plant, shrub, tree, berm, fence, wall, or other object of any kind or parking or storage of automobiles shall be installed, constructed, set out, or maintained so as to obstruct cross-visibility at a level between three (3) and 10 feet above the level of the center of the street intersection. These restrictions shall not apply to:

- Existing natural grades which, by reason of natural topography, rise three feet above the level of the center of the intersection.
- Trees having limbs and foliage trimmed in such manner that no limbs or foliage extend into the area between three and ten feet above the level of the intersection.
- Fire hydrants, public utility poles, street markers, governmental signs, and traffic control devices.
- Any structure, sign, plant, shrub, tree, berm, wall, or fence located in the Central Business District.

When street trees are planted in order to meet the requirements of the Land Development Standards and they interfere with the sight triangle standards, please contact the Development Services Director at 828-456-8647. Any other special situations will be determined by the Public Services Director or his/her designee.

C. Intersections

Intersection Angles: The most desirable intersections are those with angles of 75 to 90 degrees. Intersections with angles of 60 to 75 degrees are acceptable under extreme conditions as determined by the Administrator.

Intersection Offset Standards: If intersections are offset, they should be in accordance with the following:

- The offset should be to the left at major streets.
- At least one hundred and twenty (120) feet offset between centerlines is desirable.

T-Intersection Preferred for Low Density Residential Streets: For low density residential neighborhood, the use of two T-intersections with proper offset is preferable to using a standard four-way intersection as a means to calm traffic and highlight important views. The opposite side of the terminated street should have a strong visual presence to frame the view (e.g., civic space, civic building, vertical landscaping treatment, prominent architectural feature).

D. Grades

Vertical Curves: K values for vertical curve design should be consistent with design speed and stopping sight distance.

Maximum Grade for Residential Streets and Lanes: Maximum Grade of 18% for a maximum length of 2,500 feet. Each 2,500-foot maximum grade section must be separated by a 500-foot section of 7% maximum grade. The maximum grade can be increased by 3% for distances less than 500 feet as long as there is a 500-foot "normal maximum grade" section between each "increased maximum grade" section.

Maximum Grade for All Other Streets: As approved by Administrator. Must meet AASHTO guidelines.

Minimum Street Grades: No grades less than 0.5% should be used to facilitate water drainage (e.g., vertical slope, cross-slope, inverted crown).

E. Materials

Concrete: Concrete shall be plant or transit-mixed concrete conforming to ASTM C33 for aggregates and ASTM C94 for ready-mixed concrete. Any concrete poured that has a slump over four (4) inches as per ASTM C143, or has a batched time of more than 90 minutes, will be considered unacceptable. The Administrator or Engineer may allow a minimum plant mix of 4,000 psi with a slump over four (4) inches provided that it is a certified pump mix. Concrete shall not be deposited on frozen sub-grade. Concrete shall not be poured when the air temperature is 40 degrees Fahrenheit or below, and the predicted low temperature for the succeeding 24 hour period is less than 32 degrees Fahrenheit. Also, concrete shall not be poured when the air temperature is over 95 degrees Fahrenheit.

All concrete when placed in the forms shall have a temperature of between 50 and 90 degrees Fahrenheit and shall be maintained at a temperature of not less than 50 degrees Fahrenheit for at least 72 hours for normal concrete and 24 hours for high early strength concrete, or for as much time as is necessary to secure the proper rate of curing and designed compressive strength. Concrete shall be air entrained with 5-7% air. Retarders and accelerators shall be used only within the manufactures specification and clearly documented on the loading tickets.

Placed concrete should not be allowed to free fall more than 48 inches. Forms should be pre-wetted prior to the placement of concrete.

Placement of pervious concrete shall be approved by the Administrator or Engineer prior to installation. A pervious pavement design will require a maintenance plan if utilized as part of the stormwater management plan.

Fill Material: Fill material shall be free from construction material, debris, frozen material, organic matter, unstable material, or contaminated soils. For the top two (2) feet below finished sub-grade, no fill material shall be used weighing less than 100 pounds per cubic foot. The top two (2) feet of backfill material shall be free from stones greater than two (2) inches.

Cul-de-Sac Pavement Materials: Due to extensive wear created by turning movements of service vehicles on cul-de-sac sections, stronger pavement design is required.

Pedestrian Facilities: 4 inch compacted stone base under a sidewalk is required (per Jeff's request).

Sidewalks and Curbing: All sidewalks and curbing shall be constructed of 4,000 psi. Materials not meeting ADA requirements are not allowed. The minimum concrete thickness of a sidewalk shall be four (4) inches. At locations where a driveway crosses a sidewalk, a six (6) inch concrete thickness is required. A 1/2 inch expansion joint filled with joint filler and sealer shall be placed between all rigid objects and placed no farther than 50 feet apart for sidewalks extending the full depth of the concrete with the top of the filler 1/2 inch below the finished surface. Joint filler shall be a material conforming to the most current NCDOT Standard Specifications for Road Structures manual. Tool joints shall be spaced to match the width of the sidewalk but be no less than five (5) feet apart. Tool joints shall be 3/4 inch deep and must not be sealed. The sidewalk surface shall have a broom finish in a transverse direction to pedestrian traffic.

Bridges: Bridges must provide for bicycle facilities in the same way as the adjacent streets. Bridge

surfaces shall not be of a material or design that presents a danger to bicyclists. Railings on bridges will be at least 54 inches high. See "NCDOT Bicycle Facilities Planning and Design Guidelines" for details.

F. Centerline Radius

When determining the centerline radius for a new roadway, refer to the latest published copy of AASHTO's "A Policy on Geometric Design of Highways and Streets".

G. Curb and Gutter Construction

Curb and gutter are required for all new privately maintained and publicly maintained streets that are constructed within the Town limits.

Curb Radius (Minimum): 15 feet

Larger Radius May Be Required: Where deemed necessary for safety by the Administrator, some intersections on avenues, main streets and boulevards may require a curb radius of up to twenty-five (25) feet. With these larger curb radii, sidewalks may be set back six (6) to ten (10) feet from curbs and on-street parking may be restricted thirty (30) feet back from the intersection on each street.

Minimum Gutter Dimension: Unless otherwise approved by the Administrator or as stipulated below, gutters must be a minimum of eighteen (18) inches in width.

Minimum Gutter Dimension (Lanes and Street Medians): 1 foot.

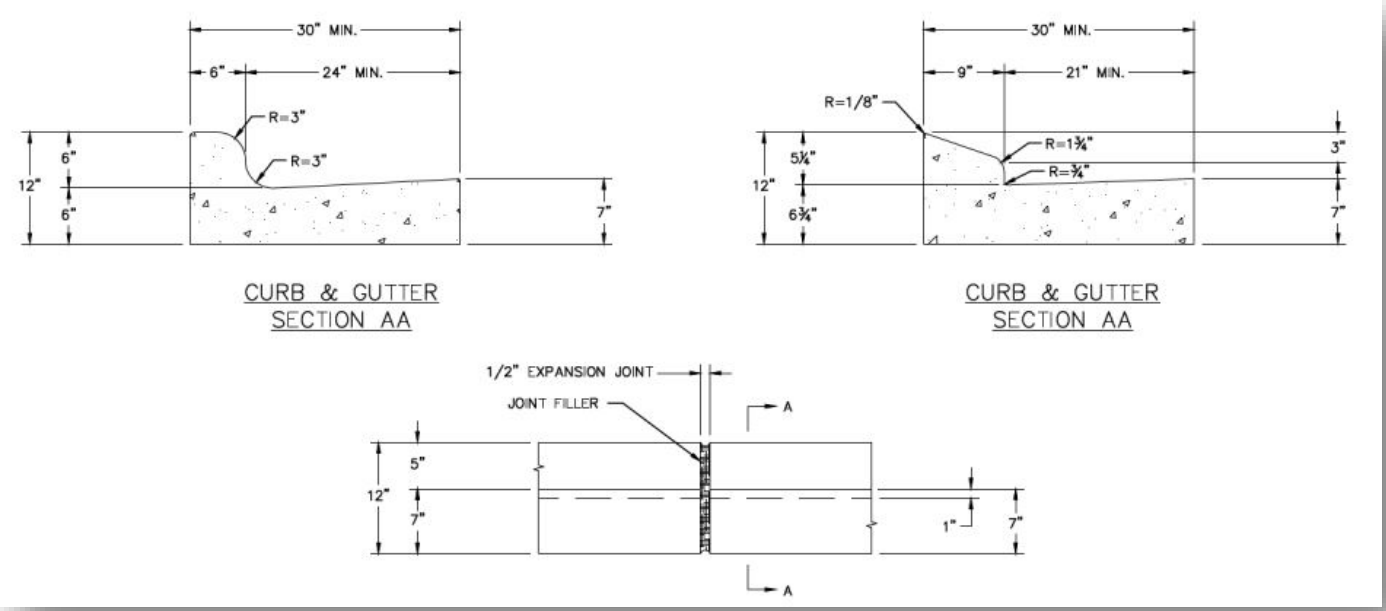
Ramps Required: Wheelchair ramps shall be provided at all curb and gutter intersections and at other major points of pedestrian flow in accordance with ADA Accessibility Standards.

Alternative Compliance: Curbs – when the permeable pavement is in use or when the direct stormwater runoff has less impact than the concentrated runoff of standard drainage systems. Low Impact Development (LID) stormwater controls may be used with approval by the administrator:

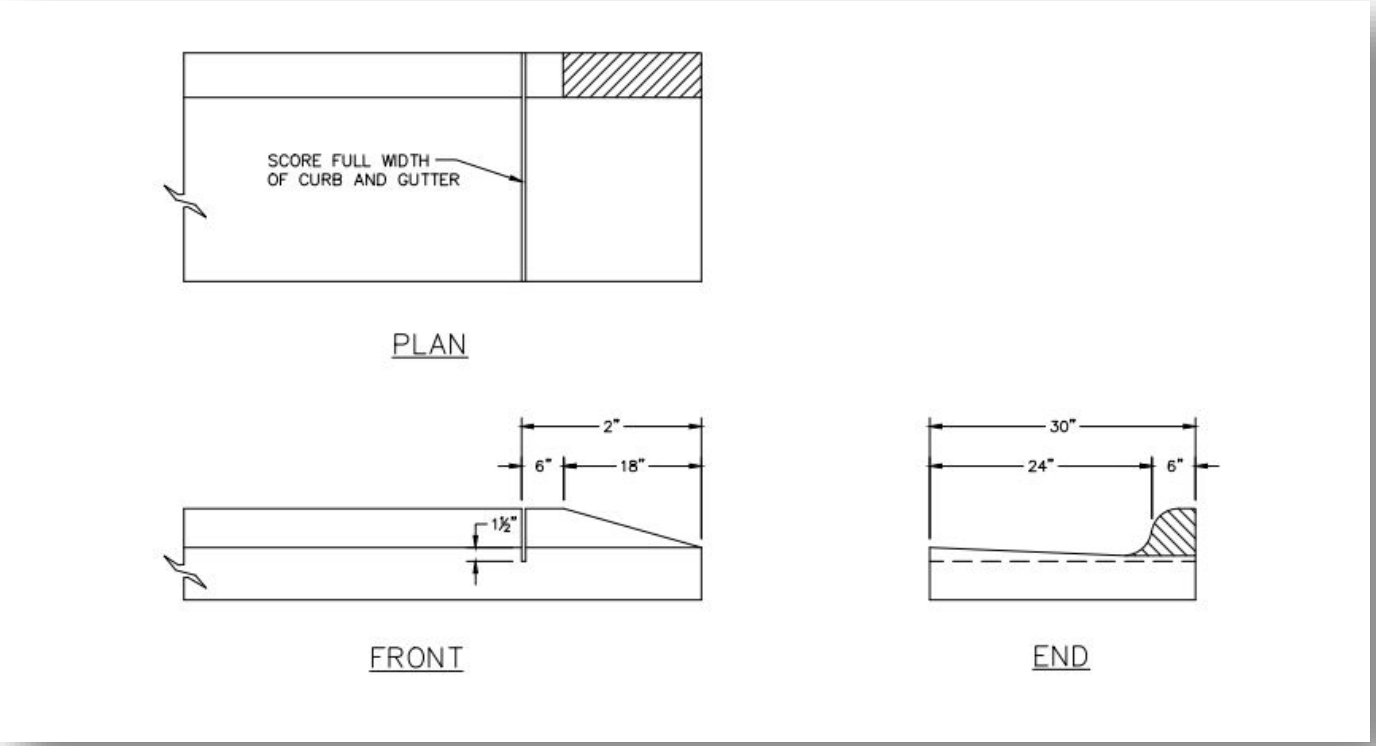
1. Alternative Compliance: Alternative provisions for curbs meeting the intent of this section may be used where unreasonable or impractical situations would result from the application of these requirements or where an alternative drainage plan is preferred for stormwater management. Such situations may result from significant street trees, impending road widening, topography, utility easements, lot configuration or other unusual site conditions.

2. In districts such as Hillside Protection areas and Conservation Subdivisions, Low Impact Development (LID) or preservation of existing vegetation may be used with approval by the administrator. All alternative stormwater features shall be constructed in accordance with the standards in the latest edition of the North Carolina Environmental Quality's (NCDEQ) Stormwater Design Manual. The Administrator may approve an alternate plan that proposes different stormwater amenities provided that the intent of this section is fulfilled.

Standard Concrete Curb and Gutter (Example):



Standard Method of Ending Curb and Gutter (Example):



H. Pavement Standards

The standards of this section apply to curbs, gutters, driveways, and sidewalks, unless otherwise specified by the Administrator.

Alleys: Pavement is not required for alleys. However, when alleys are proposed to be paved, the pavement shall meet the specifications below. Where alleys are to be unpaved, an appropriate concrete apron shall be installed to restrain all alley surfacing material from entering the street.

Pavement Depth and Material: Minimum design is eight (8) inches stone base and two (2) inches pavement surface.

Strength. Portland cement concrete for curb and gutter, driveways, and sidewalks shall have a minimum 28 day compressive strength of 4,000 psi, a non-vibrated slump between 2.5 and 4 inches, a minimum cement content of 564 pounds per cubic yard, an air entrainment of 5-7 %, and a maximum water-cement ratio of 0.532. The Engineer or Administrator may allow a plant mix with a minimum 4,000 psi with a slump over four (4) inches, provided that it is a certified

pump mix. Retarders and accelerators shall be used only within the manufactures specification and must be clearly documented on the loading tickets.

Curing. Concrete curing agents shall be free from any impurities which may be detrimental to the concrete and meet the NCDOT Standard Specifications for Roads and Structures.

Aggregate. Aggregate for Portland cement concrete shall meet the requirements for fine and course aggregate found in the NCDOT Standard Specifications for Roads and Structures.

Water. Water for mixing or curing the concrete shall be free from injurious amounts of oil, salt, acid, or other products injurious to the finished product.

Joints. A 1/2 inch expansion joint filled with joint filler and sealer shall be placed between all rigid objects and placed no farther than 50 feet apart for sidewalks, curb, and curb and gutter, extending the full depth of the concrete with the top of the filler 1/2 inch below the finished surface.

Tool Joints. Tool joints in sidewalks shall be spaced to match the width of the sidewalk but be no less than five (5) feet apart. Tool joints in curb and gutter shall be spaced every 10 feet. Tool joints shall be 3/4 inch deep and must not be sealed.

I. Shoulders

- Construct the top 6 inches of shoulders with soils capable of supporting vegetation.

- Construct the shoulders in proper sequence with the type of base and pavement being constructed. Perform the work so as to provide proper drainage at all times. Shape and roll the shoulder material during placement to provide for bonding of layers and compaction to the satisfaction of the Administrator or Engineer.

- Before placing any earth material on existing graded shoulders, remove all existing vegetation and scarify the existing shoulders to ensure a proper bond.

- Perform the final shaping of the shoulders, adjacent slopes, and ditches in accordance with the typical section shown on the plans.

- Provide adequate equipment to perform the work. Do not damage base, surface, pavement, or drainage features during the construction of the shoulders. Should damage

occur because of the contractor's operations, repair the damaged portions, or remove and replace them as directed.

J. Concrete Curb Ramps

Concrete curb ramps must be installed according to the current ADA standards. The concrete curb ramp requirements in North Carolina follow the Americans with Disabilities Act (ADA) Accessibility Guidelines. For more information, see:

1. NC State Building Code, Chapter 11- Accessibility
2. Accessible and Usable Buildings and Facilities ICC A117.1-2009 (International Code Council, American National Standard Institute)

In accordance with General Statute 136-44.14, all street curbs in North Carolina being constructed or reconstructed for maintenance procedures, traffic operations, repairs, correction of utilities or altered for any reason after September 1, 1973, shall provide concrete curb ramps for the physically handicapped at all intersections where curb and gutter is provided and at other major points of pedestrian flow.

K. Removal of Existing Pavement

Break up, remove and satisfactorily dispose of the cement, concrete, or asphalt components of an existing roadway pavement structure, including paved shoulders, within the limits shown in the plans or as directed. This work includes the removal of any temporary roadway pavement structure placed during construction to serve as a detour.

Break up and remove the pavement for its entire depth. Where concrete or asphalt pavement is to be removed, provide a neat edge along the pavement being retained by sawing the pavement approximately 2 inches deep before breaking the adjacent pavement away. Properly dispose of all materials resulting from the pavement removal as provided herein.

L. Drainage Systems in Streets

- Provide construction layout of drainage systems.

- The Administrator shall review all drainage prior to acceptance of any facility to the Town system. Drainage in easement areas is not considered a portion of the street facility.

Permanent drainage easements may be established; however, the Town does not accept maintenance responsibility for easement outside of the street right-of-way.

- All storm drainage shall be adequate so that the road and rights of way may be maintained without excessive cost, and not cause flooding on private property from storm runoff of the design frequency.

- Pipes, drains, flumes, or other concentrated stormwater devices shall not discharge across a sidewalk, but shall be piped or flumed under the sidewalk.

- Consider the locations and elevations of all existing and proposed utilities, proposed utility construction and existing and proposed drainage systems, in the layout of the drainage system.

- Provide a layout drawing of the drainage system, including calculations of flow line elevations for all drainage structures; pipe invert elevations, both inlet and outlet of the drainage structure; grade of each pipe within the drainage system; elevation of any existing facility connection, such as stream or pipe; headwall location, locations and elevations of any existing or proposed utilities, and any additional information requested by Administrator.

- Stormwater shall not be allowed to flow across streets at intersections.

- All public storm drains shall be installed in dedicated street right of way or dedicated storm drain easements.

- All storm drainage structures, such as manholes, inlets, junction boxes, catch basins, end walls, and headwalls shall be constructed of solid brick, solid block, or precast concrete meeting NCDOT standards. All hoods, frames, and grates shall be domestically produced cast iron or steel and approved by NCDOT. No inaccessible storm drainage structures shall be allowed.

- Subsurface drainage shall be adequate to maintain a stable subgrade.

- All drainage grates must be safe for bicyclists, with slots running perpendicular or diagonal to the direction of travel.

- See section 7 of this Manual for stormwater drainage facilities system requirements.

Design Frequency: The minimum design frequency is ten (10) years. However, the design frequency for cross drainage on thoroughfare routes (major and minor)shall be fifty (50) years.

All storm drainage shall be adequate so that the street may be maintained at minimal cost and not cause flooding at the design frequency.

Pipe Sizes: Minimum cross pipe diameter shall be eighteen (18) inches. The minimum driveway culvert size shall be fifteen (15) inches.

Subsurface Drainage: Subsurface drainage shall be provided, if necessary, to maintain a stable subgrade.

Retention/Detention Basins: Retention/detention basins shall be located outside of the right-of-way.

Bridges: Bridges to be built by private interests for future acceptance shall be designed for a minimum live load of HS-20 and designed for hydraulic requirements in accordance with flood hazard areas. Materials of construction shall be pre-stressed concrete, reinforced concrete to the maximum extent feasible.

Open Drainage: Open drainage shall include rock dams every thirty (30) feet in the ditch line on slopes. The ditch line should be planted to help clean drain flows.
Bicycle Safe Storm Drainage Grates: Storm drainage grates pose a hazard for bicyclists when the openings are parallel to the bicyclists' direction of travel. Bicycle tires can get caught between the bars of these grates and cause bicyclists to crash. Unsafe storm drainage grates should be replaced.

M. Parking Spaces on Streets

All on-street parking spaces must meet local fire code, the latest editions of the Architectural Graphic Standards, and the Manual on Uniform Traffic Control Devices (MUTCD) guidelines, and are subject to approval by the administrator**.**

Parallel Parking Spaces on Existing Streets: All mid-block parallel parking spaces shall be seven (7) feet in width by twenty-two (22) to twenty-six (26) feet in length and end of block spaces may be seven (7) feet by twenty (20) feet as determined by the Administrator subject to the constraint of the existing conditions. The dimension is measured from the face of the curb and may include the gutter.

N. Islands and Medians

Administrator Approval: Medians are highly recommended on new streets wider than two travel lanes. Medians may be permitted on all streets subject to review and approval by the Administrator or his/her designee.

a) The Administrator will review landscaped medians for appropriate vegetation types and to determine any necessary maintenance agreements.
b) The Administrator will review all requests for islands or short medians at subdivision entrances.

Median Width Design Standards

Function	Minimum Width (feet)
Separation of Opposing Traffic	4 feet
Pedestrian Refuge or Traffic Control Device Location	6 feet
Medians Separating Left Turn Lanes	14 feet

Maintenance: Maintenance shall be by the developer or property owner's association. The island or median section will be removed if not properly maintained.

2.5 Driveway Permit

Driveway. A private vehicular access connecting a dwelling, carport, garage, parking area or other buildings with a street. A driveway is not a road, street, boulevard highway or parkway.

Driveway Approach. The improved area between the roadway of a public street and private property intended to provide access for motor vehicles to a well-defined area on private property.

Driveway, Joint. A joint-use driveway serving two (2) abutting properties.

Driveway, Shared. A shared driveway with the similar characteristics as a street that serves 3 or fewer dwelling structures (single family or duplex structures), often used to reach landlocked parcels or for access management purposes.

Driveway, Width. The horizontal distance between the sides of a driveway measured at the right-of-way or the back of the sidewalk (whichever is farthest from the traveled way) and measured

parallel with the centerline of the traveled way. Medians shall not be included in the calculations for the width of driveways.

Purpose and Applicability: The standards contained in this section are designed to ensure that access to development in the Town of Waynesville does not impair the function of adjacent roadways or public safety. All proposed vehicular access points connecting to a public or private street shall conform to the provisions of this section as well as to the driveway construction standards of the Town, or as determined by the Public Services Director.

Permit Requirement: Before any proposed vehicular access point connecting to a public or private street may be constructed, a driveway permit must be obtained from the Administrator, unless deemed exempt by the Public Services Director.

The North Carolina Department of Transportation (NCDOT) is required to review all connections to state system streets. Driveway permits on state system streets should be submitted to NCDOT for the initial review. Upon NCDOT approval, the driveway permit will be forwarded to the Town of Waynesville for its approval. Where a conflict arises with respect to these standards, the more restrictive access standards shall apply. Any driveway access to a state-maintained roadway shall comply with NCDOT's *"Policy on Street and Driveway Access to North Carolina Highways."*

All driveway permit applications must be approved by the Public Services Director or his/her designee. Public Services will coordinate with Development services to ensure compliance with the Town Ordinance and all applicable laws. The Development Services Department will serve as the "gatekeeper" for all driveway applications and will advise applicants on appropriate personnel to contact. All driveways will have two inspections: pre-pour and post-pour.

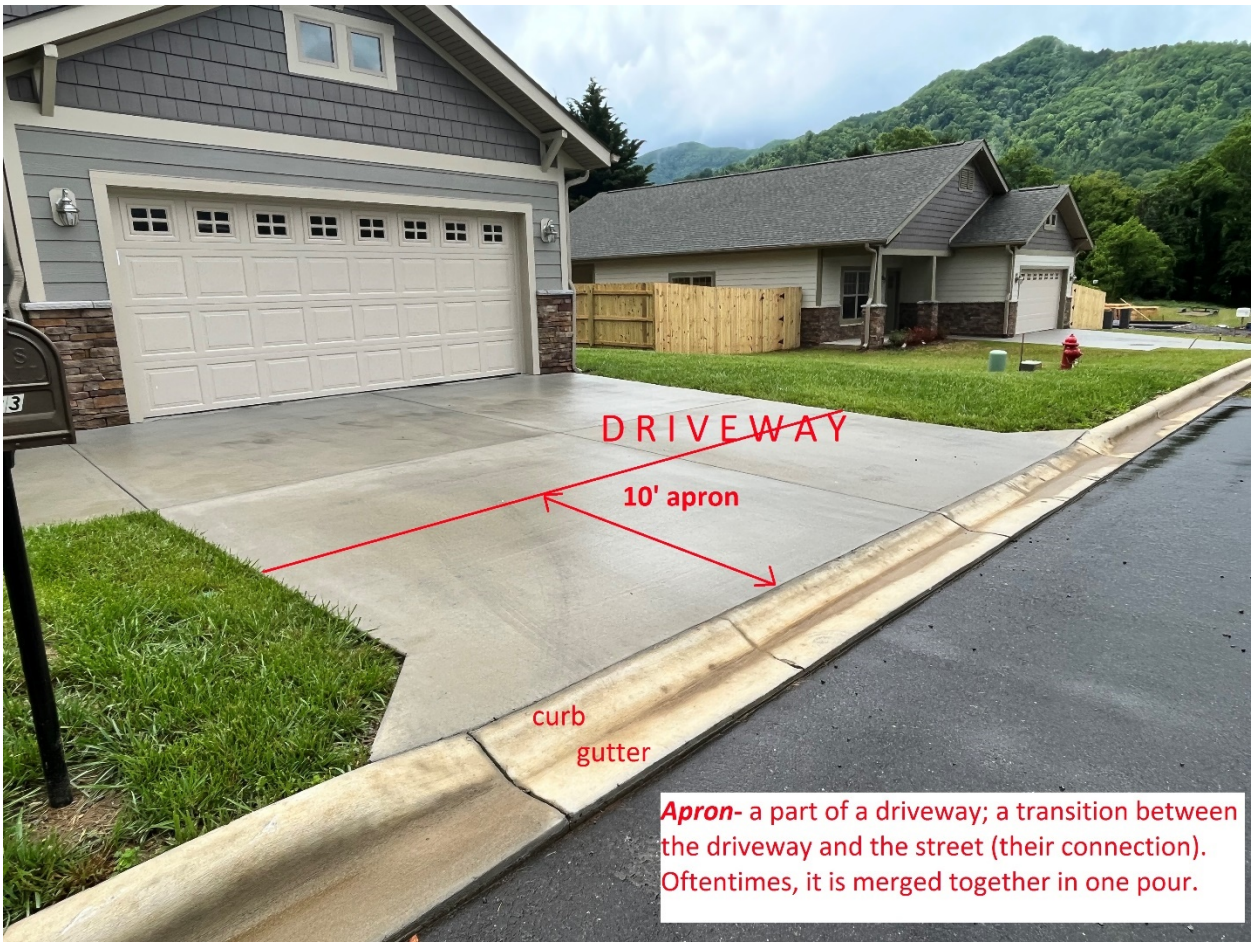
The driveway permit form is available in the Appendix B of this manual or Town of Waynesville Website (*Departments- Development Services- Permits and Application Forms*): https://www.waynesvillenc.gov/departments/development-services/permits-and-application-forms

Existing Driveway Approaches: Existing driveway approaches shall not be relocated, altered, or reconstructed without a permit approving the relocation, alteration or reconstruction and such driveway approaches shall be subject to the provisions of this section.

When the use or layout of any property is changed, making any portion or all of the driveway approach unnecessary, the owner of the property, shall, at his expense, replace all necessary curbs, gutters, and sidewalks, or correct all nonconforming features.

Driveway Width: The width, in feet, of a driveway approach shall be within the minimum and maximum limits as specified below. Required driveway width pertains to the measurement at the sidewalk. At other points in the driveway the width may vary.

Driveway Design: Driveways shall be spaced from other drives and from intersecting streets as set forth for the land development district in which the property is located. Access separation between driveways shall be measured from inside edge to inside edge of driveways. Access separation between a driveway and intersecting street shall be measured from the nearest edge of the driveway to the intersection right-of-way lines. Refer to the table on page 30 of this Manual:



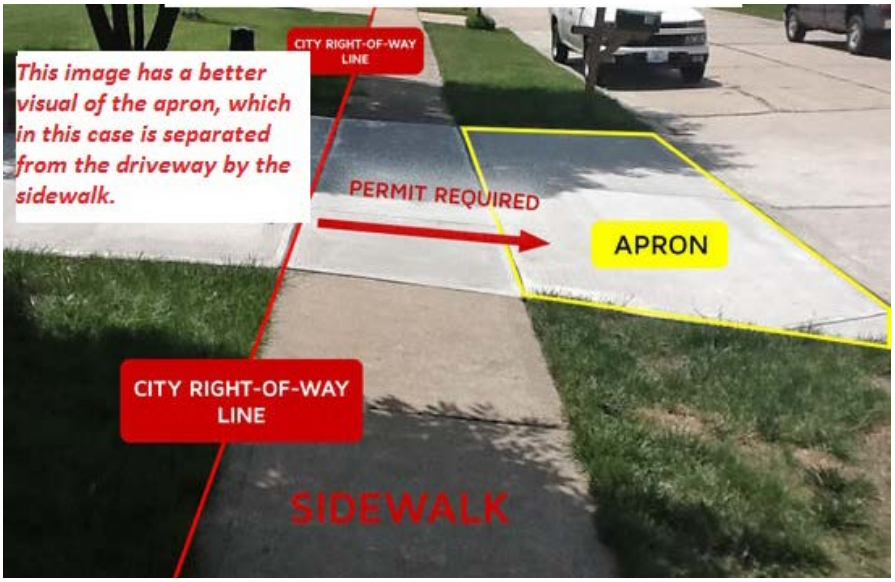


Image above: Driveway in Waynesville, NC

Image to the left: Driveway in O'Fallon, MO

Residential Driveways:

1. Driveways serving single family and duplex residences should have a minimum width of 10 feet and shall not exceed a maximum width of 18 feet.

2. The minimum distance between the front wall or garage door of a residential dwelling to the back of sidewalk along the driveway length shall be at least 25 feet to permit vehicular parking without blocking the sidewalk.

3. Joint Use or Shared Driveways are encouraged. Driveways serving adjacent residential properties shall have easement agreements between owners, and shall not serve more than three single-family or duplex structures. Rights of Way serving more than 3 structures should comply with LDS Chapter 6 Infrastructure Standards.

4. A shared driveway that serves 3 or fewer dwelling unit structures shall be managed to provide emergency access and fire protection and shall conform to the following:

- Right-of-way width: Minimum 18 feet.
- Surface Widths: Minimum 10 feet for driveways less than 150' in length; and a minimum of 14 feet in width If driveway length exceeds 150 ft, or as approved by the Fire Code Official.
- May be paved, gravel, or natural compacted surface.

- Parking for units served by the shared driveway must be provided outside of the shared driveway right-of-way so that access to structures is not blocked.
- Shared driveways do not require curbs, pedestrian connections, or landscaping, but must be designed for stormwater management and safety as approved through the driveway permit.
- Length: Maximum 150 ft. unless a hydrant and turn-around are provided.
- Only 3 dwelling unit structures (single family or duplex) may be served off of a single shared driveway accessing a public street. Shared driveways may be converted to alleys, lanes, or other roadway types and uses with approval of the Administrator and Fire Code Official.

Non-Residential and Multi-Family Driveways:

1. Driveway Widths:

    a) One-way drives shall have a minimum width of 12 feet and shall not exceed a maximum width of 18 feet.
    b) Two-way drives shall have a minimum width of 18 feet and shall not exceed a maximum width of 24 feet.
    c) Commercial driveways shall have a radius of 20 to 50 feet, or per engineering judgment based on the adjacent roadway.
    d) All driveways shall have an internal stem length of 25 feet or greater unless otherwise approved by the administrator.
    e) Two-way drives serving a major site plan containing a multi-family development shall have a minimum paved width of 20’ and shall include a sidewalk or other pedestrian connection.
    f) Driveways entering industrial property may be up to 36 feet in width with the approval of the Administrator.

2. **Joint Use Driveway:** Wherever feasible, the Administrator shall require the establishment of a joint use driveway serving two (2) abutting non-residential properties. When a property is developed before an abutting property is developed, the site shall be designed to ensure that its driveway and circulation may be modified to create a joint use driveway and interconnected parking with the abutting properties at a later date., or to connect to a shared driveway for the purpose of access management.

Driveway Spacing:

1. Access separation between driveways shall be measured from inside edge to inside edge of driveways. Access separation between a driveway and intersecting street shall be measured from the nearest edge of the driveway to the intersection right-of-way lines.

2. Residential Driveways shall be spaced from other drives and from intersecting streets as set forth for the land development district in which the property is located.

3. Non-Residential and multi-family driveways shall be spaced from other driveways and from intersecting streets in accordance with the chart below, or per AASHTO's "A Policy on Geometric Design of Highways and Streets," at the determination of the Administrator. All driveways shall be located as far from signalized intersections as feasible.

4. The use of alleys to access the rear of properties is strongly encouraged. A minimum separation of ten (10) feet between adjacent property lines and the alley intersection is required. A forty (40) feet separation is required between alleys and the intersection of streets.

5. As determined by the Administrator, engineering judgment shall override the required dimensions set forth in district standards if warranted by:

    - pre-existing environmental conditions (such as a rock outcrop, steep slope, stream or protected area),
    - Recommendations of a Traffic Impact Analysis,
    - Low traffic volumes on adjacent streets,
    - Cumulative impact of adjacent land uses, and
    - Safety of vehicles and pedestrian users.

5. Driveway Minimum Spacing Chart:

District Category	Applicable Districts	Driveway Spacing (Min)
Residential—Low Density (RL)	CC-RL, EN-RL, FC-RL, HT-RL	40 ft. (75 ft. between driveways and streets)
Residential—Medium Density (RM)	CP-RM, D-RM, HM-RM, SW-RM	No minimum.
Neighborhood Residential (UR)	AC-NR, LL-NR, MS-NR, N-NR, PS-NR, PC-NR, RC-NR, SS-NR, WS-NR	No minimum.
Urban Residential (UR)	EW-UR, H-UR, HM-UR	No minimum.
Neighborhood Center (NC)	PS-NC, RC-NC, NM-BD	100 ft. (100 ft. between driveways and streets) or as determined by AASHTO Standards or NCDOT permit.
Business District (BD)	CBD, SM-BD, H-BD	50 ft. (100 ft. between driveways and streets) or as determined by AASHTO Standards or NCDOT permit.
Regional Center (RC)	RA-RC, DJ-RC, NC-RC	150 ft. (250 ft. between driveways and streets) or as determined by AASHTO Standards or NCDOT permit.
Commercial Industrial (CI)	CI	50 ft. (150 ft. between driveways and streets) or as determined by AASHTO Standards or NCDOT permit.

Additional Standards:

- All driveway approaches shall be a concrete apron section ("ramp" type), except that street type driveway entrances may be required by the Administrator for large parking lots and along high volume roadways.

- Driveway approaches must cross the sidewalk area at the sidewalk grade established by the Administrator and to accommodate ADA compliance in accordance with the driveway permit.

- All aprons shall be installed to the right-of-way line or at least ten (10) feet from the edge of the traveled way and be built to the specifications of the Administrator. Apron section

materials other than concrete must be determined appropriate and approved by the Administrator.

- Driveway access to state highways shall not be permitted for parking or loading areas that require backing maneuvers in a public street right-of-way. Driveway access to town-maintained streets for nonresidential and multi-family developments shall not be permitted for parking or loading areas that require backing maneuvers in a public street right-of-way.

- When it is feasible, road access for corner lots shall be provided to the street or road with the lowest traffic volume.

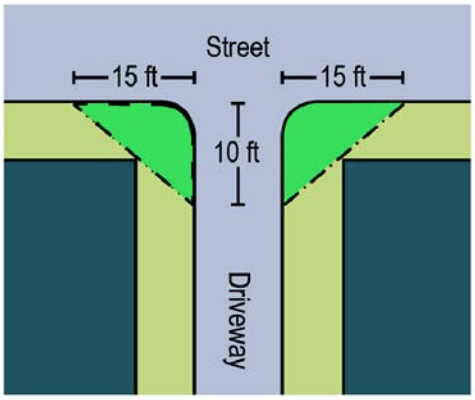
- Driveways shall not interfere with municipal facilities such as street lights, traffic signal poles, signs, fire hydrants, crosswalks, drainage structures or other necessary street structures.

- In situations where the driveway separation requirements prevent any access from a property and at least one adjacent street, and where existing shared driveways do not provide adequate access for the development of the property, as determined by the Administrator, a single driveway connection is permitted, subject to all other applicable design standards, in a location approved by the Administrator.

Sight Visibility Triangle: At all driveway approaches, a sight area shall be maintained. Within the sight area no fence, wall, sign or other structure, no slope or embankment, no parked vehicle, no hedge, no foliage or other planting and no other object or structure shall be placed, erected or maintained which will obstruct visibility within the sight area.

Sight areas are triangular areas formed by a ten-foot side measured along the edge of the driveway approach and a fifteen-foot side measured along the edge of the traveled way, as indicated on the image below:

Sight Visibility Triangle



2.6 Pedestrian Facilities

Sidewalk, pedestrian pathways and other required or proposed pedestrian amenities shall be reflected in all site plans and subdivision plans.

These standards are set forth to:

1. Provide a safe and walkable pedestrian environment while considering local environmental constraints, low impact development standards, and public safety
2. Promote access for those who are mobility impaired or wheelchair dependent.
3. Improve connectivity and convenience among residential, recreational, and commercial areas.

A. Sidewalks

General Standards/Location: Sidewalks are required in accordance with the Town Street Classifications (See Section 2.3 of this Manual) as part of major site plans and major subdivisions, and wherever designated in the adopted pedestrian plan. Alternative facilities may be considered in the Residential Low Density Districts and in areas where Hillside Protection standards apply (See Section 12.6 of the LDS) in accordance with Alternative Compliance provisions below. A payment in lieu may be considered.

Design Standards:

1. Where existing sidewalk abuts an area where new sidewalk is to be developed, the new sidewalk shall be the same width as the existing sidewalk or meet the standards of the Town Street Classifications, whichever standard width is greater.
2. Within commercial areas and places with high pedestrian volumes, sidewalks should be designed to meet the anticipated pedestrian/traffic volume as well as accommodate outdoor seating areas.
3. Sidewalks shall be constructed of concrete or other approved materials (such as pavers) and built in accordance with the specifications of the Town's Public Services Department.
4. Where a sidewalk abuts a curb because of right-of-way, topographic or existing building limitation, the minimum width shall increase by 1 foot. Where a sidewalk abuts a wall the minimum width shall increase by 1 foot.

Alternative Compliance: Alternative provisions for pedestrian movement meeting the intent of this section may be used where unreasonable or impractical situations would result from application of these requirements. Such situations may result from significant street trees, impending road widening, topography, utility easements, lot configuration or other unusual site conditions. Alternative pedestrian facilities may also be used as part of Low Impact Development (LID), development design, hillside, or within conservation and cottage development with approval by the Administrator.

1. In districts where trails are permitted in lieu of sidewalks (Residential Low Density, Conservation Subdivisions, & Hillside Protection areas), they shall be constructed in accordance with the standards in Trails. Trails are generally allowed in very low density development, and are only required on one side of the road.
2. The Administrator may approve an alternate plan that proposes different pedestrian amenities provided that the intent of this section is fulfilled.

Payments in Lieu: In lieu of alternative compliance in C above, the Administrator may approve a payment in lieu (in accordance with an adopted annual fee schedule) where any one or a combination of factors render compliance impractical:

1. Steep slopes;
2. Absence of existing sidewalks along the corridor and in the general neighborhood;
3. Where sidewalks are not shown on an adopted Comprehensive Pedestrian Plan.

B. Trails

Trails, if provided, shall comply with the following standards:

Width: 6—14 ft.

Right-of-way/Easement Width: 18—20 ft.

Connections: Trail stubs at property lines should be placed in areas that are easily accessible for future connectivity through adjacent parcels.

Materials: Compact gravel, concrete, or asphalt or other material approved by the Administrator.

C. Pedestrian Crosswalks

Mid-block crossings, bulb-outs, raised crosswalks and similar crossing techniques should be commonly used to accommodate pedestrians when appropriate for traffic conditions and site specific situations as directed by the Administrator. All designs shall be consistent with the Town's adopted Pedestrian Plan.

2.7 Bicycle Facilities

A. Bike Lanes

A bicycle lane is a portion of the roadway that has been designated by pavement markings and signs for the preferential or exclusive use of bicyclists

Requirements for Installation:

1. Bike lanes or separate off-street multi-use paths shall be installed on developer-built or modified roadways where designated for such by the Town of Waynesville Transportation Plan or similarly adopted plan; and/or as specified in this section below where the adopted plan does not provide sufficient guidance.
2. Where a proposed development does not include new or widening of existing collector or thoroughfare streets, the developer shall reserve right-of-way sufficient to accommodate the appropriate bikeway facility.

Design Standards: Bike lanes and bike paths shall be designed according to the North Carolina Bicycle Facilities Planning and Design Guidelines published by NCDOT and shall include all appropriate signage and pavement markings. Variations from the NCDOT standards may be allowed subject to approval from the Administrator based on the standards below.

Applicability of Bicycle Facilities: Bicycle facilities shall be included in the cross-sections of the Town Street Classifications (Section 2.3 of this manual) based on the matrix below. Motor vehicle volumes shall be based on projected motor vehicle volumes in a 20-year time horizon. Speeds shall be based on the design speed of the proposed roadway.

See matrix below:

		Projected Motor Vehicle Volumes (Average Daily Traffic)					
		< 2,500 ADT	2,500—5,000 ADT	5,000—10,000 ADT	10,000—20,000 ADT	20,000—40,000 ADT	> 40,000 ADT
Roadway Design Speed							
	< 25 mph	N	N	W	BL	BL	BL
	25 mph	N	W	BL	BL	BL	BL
	30 mph	N	W	BL	BL	BL	S
	35 mph	W	W	BL	BL	BL	S
	40 mph	W	BL	BL	BL	BL	S
	45 mph	W	BL	BL	BL	S	S
	> 45 mph	S	S	S	S	S	S

Type N Normal Lane, 9—12 feet wide. Cyclists would operate in mixed traffic near the middle of the lane.

Type W Wide Lane, 13—15 feet wide. Cyclists would generally operate in the right most portion of the lane. MUTCD-approved shared lane markings shall be used.

Type BL Bike Lane, 4—6 feet wide (striped/marked) or narrow shoulder. In general, bike lanes should be at least 5 feet wide at higher traffic volumes (over 20,000 ADT) and higher speeds (40 mph and higher) and 6 feet wide next to on-street parking.

Type S Separated Lane. Anything wider than 6-foot bike lane, including wide bike lanes/shoulders or parallel multi-use paths.

B. Bike Racks/Parking

Bicycle Parking: Bicycle parking is required to encourage the use of bicycles for personal transportation and to provide for bicycle access to employment, retail, and other destinations in Waynesville. Where bicycle racks are used, "Inverted U" type racks or other racks that support the bicycle at two points on the bicycle frame are required.

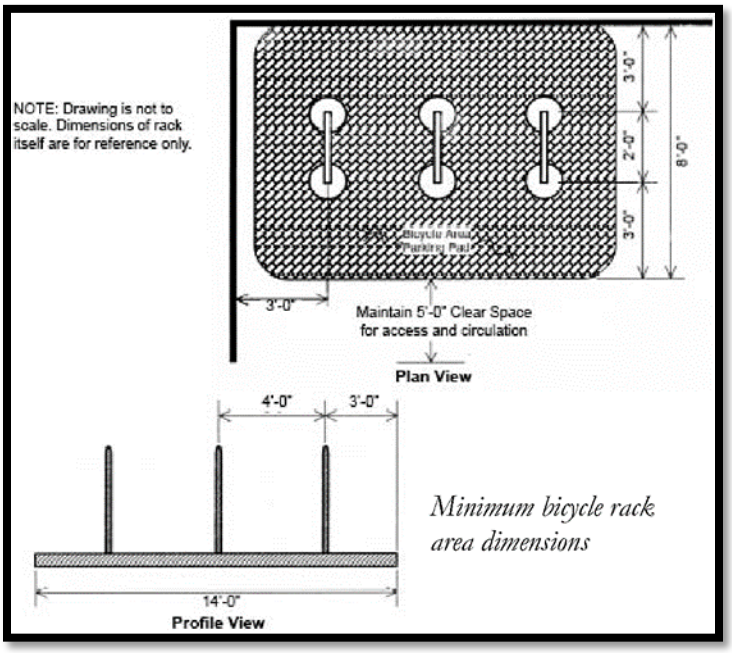
Inverted "U" Rack

Bike racks shall:

- Prevent the wheel of the bicycle from tipping over.
- Allow head-in or back-in parking.
- Resist rust or surface changes that may damage bicycles.
- Resist being cut or detached using common hand tools, such as bolt cutters, pipe cutters, wrenches, etc.
- Be anchored so it cannot be stolen with bikes attached.

Examples of Acceptable Bicycle Rack Designs:

Bicycle Rack Location and Dimensions[2]:



- Bicycle racks installed on sidewalks should provide for a clear, unobstructed width of at least 5 feet for pedestrians and should be installed parallel to and at least 3 feet from the face of curb.

- Bicycle racks shall be placed a minimum of 4 feet from existing street furniture (i.e. mailboxes, light poles, benches) and be no closer than 12 feet from the edge of fire hydrants.

- Racks should be placed along a major building approach line and clearly visible from the approach and no more than 100 feet from building entrances. Rack placement shall allow for visual monitoring by people within the building and/or people entering the building.

- If required bicycle parking is not visible from the street or main building entrance, a sign shall be posted at the main entrance indicating the location of the parking.

Shared Bicycle Parking: Any property owner required to have bicycle parking may elect to establish shared bicycle parking with any other property owner within the same block to meet the combined requirements.

[2] *Dimensions may vary by manufacturer and model and are subject to approval by the Development Services Department.*

Section 3 – Pipe Culverts

3.1 Pipe Installation

- Excavate, undercut, provide material, condition foundation, lay pipe, joint and couple pipe sections; furnish and place all backfill material as necessary to install the various types of pipe culverts and fittings required to complete the project.

- Unload and handle pipe with reasonable care. Do not roll or drag metal pipe or plates over gravel or rock during handling. Take necessary precautions to ensure the method used in lifting or placing the pipe does not induce stress fatigue in the pipe. Use a lifting device that uniformly distributes the weight of the pipe along its axis or circumference. Repair minor damage to pipe when permitted. Remove pipe from the project that is severely damaged or is rejected as being unfit for use. Undamaged portions of a joint or section may be used where partial lengths are required.

- Do not waste excavation. Use suitable excavated material as backfill or in the formation of embankments, subgrades, and shoulder. Furnish disposal areas for the unsuitable material.

- Prepare the pipe foundation in accordance with the applicable method as shown in the contract documents, true to line and grade and uniformly firm.

- Where traffic is to be maintained, install pipe in sections so half the roadway width is available to traffic.

- Install pipe in accordance with the details in the plans/construction documents.

3.2 Drainage Pipe

- Furnish and install drainage pipe at locations and size called for in the construction documents/plans.
- All stormwater pipes shall be installed to provide a true line and grade between structures.
- No inaccessible storm drainage structures are allowed.
- Pipe shall not project into a drainage structure but shall be finished flush with the inside of the structure.
- All drainage structures shall be of sufficient length to accommodate appropriate roadway side slopes.
- All drainage ditches shall be of such a width and depth and with such a slope as to carry the anticipated discharges. Paved ditches or Rip Rap shall be required where necessary.

3.3 Pipe Culverts

- The minimum driveway culvert size shall be fifteen (15) inches (LDS 6.7.9).
- All pipe culverts and storm sewers shall be free of all debris and silt buildup and shall be structurally and hydraulically sound, and functioning in a normal manner.
- **Steep Slope Areas (LDS 12.6):** Perennial streams shall not be placed in culverts except to the minimum extent possible for necessary road crossings.

3.4 Pipe Removal

- Remove and dispose of all existing roadway drainage pipe, including flared end sections, where the removal of the existing pipes is required by the plans or as directed.
- The contractor has the option of leaving pipes in place and filling with flowable fill, as determined by the Administrator.

3.5 Pipe Cleanout

- Clean out silt accumulations and other debris from existing drainage pipes at locations shown in the plans and as directed.

- Use a pipe clean out method that does not damage the existing pipe.

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Section 4 – Utilities

4.1 General Standards

- The purpose of this section is to establish minimum utility design standards within the Town of Waynesville, its extraterritorial planning jurisdiction, and other areas to which the Town of Waynesville provides public utilities.

- It is unlawful for any person to begin the installation of any utilities without first obtaining a certificate of land development standards compliance from the Administrator. Additional permits may be necessary pursuant to the regulations of the State of North Carolina.

- **All Utilities to be Underground:** All major developments must place all utilities underground in accordance with the standards set forth in this section.

- Utilities, either above ground or underground, may be located in alleyways to provide service connections to rear elevations.

- Where utilities are installed outside of the rights-of-way, utilities, either above ground or underground, may be located in alleyways. If utilities are not to be placed in the alleyways or streets rights-of-way, developers are required to provide an additional five (5) feet minimum utility easement behind the sidewalk.

- Where utilities are provided within the rights-of-way of lanes, streets, main streets and avenues, underground utilities may cross under or run longitudinally under the pavement, provided future utility stub-outs are installed prior to paving. For boulevards and state highways, underground utilities may cross under but may not run longitudinally under the pavement, except in cases of unusual circumstances as approved by the Administrator.

- **Horizontal Location:** Where there are curbed sections, poles and other above ground utilities shall be located behind sidewalks or as far back as practical from the edge of the traveled way with six (6) feet as a design safety guide. Where the section is not curbed (drainage stands, etc.), pole lines shall be located inside the right-of-way under an encroachment agreement. These lines shall be located as close as is practicable to the right-of-way line.

- **Lighting:** Lighting shall be provided along new traveled ways in conformance with the standards set in section 4.4.A of this Manual.

- Construction plans for utilities must be submitted meeting all of the standards required on the applicable development application.

- Pipeline materials shall be approved by the Administrator.

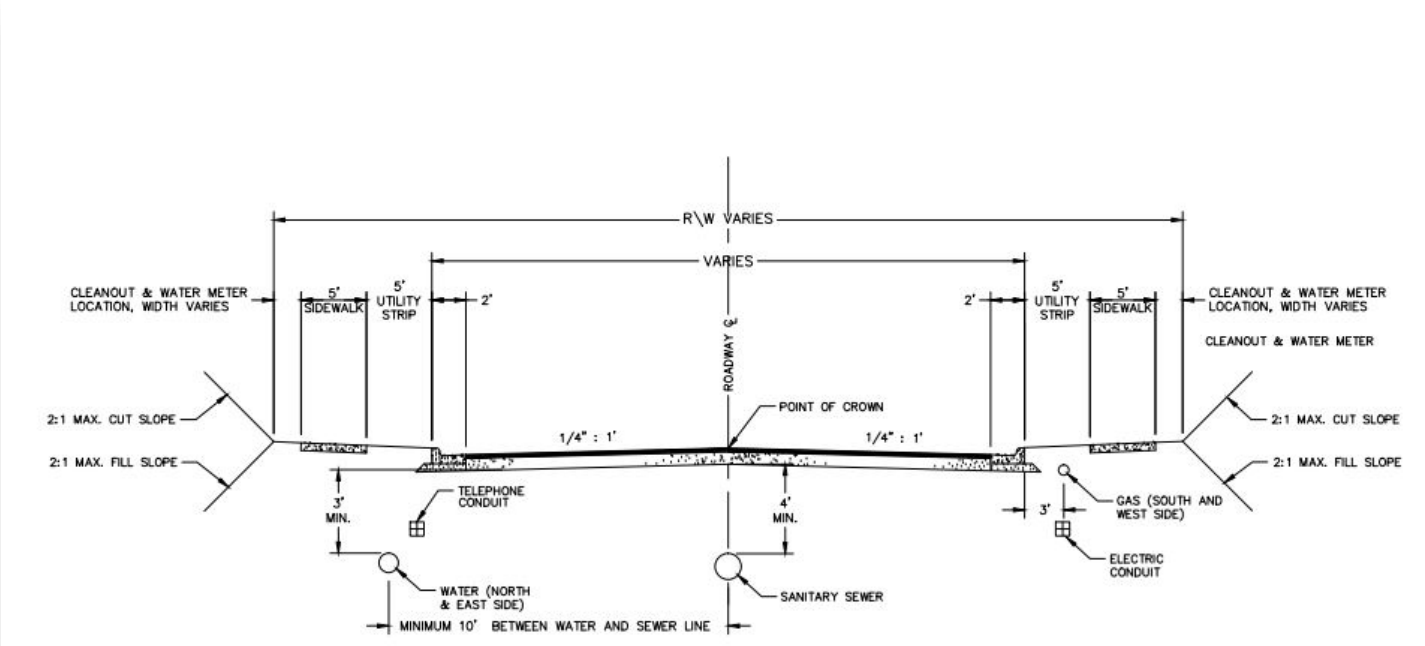
- All nonferrous pipeline shall be installed with a locator wire (exception - sewer lines).

- All structures shall be water-rated.

Mixed Use/Commercial Buildings (LDS 5.10.4):

A. **Rooftop Equipment:** All rooftop equipment shall be screened from view to the extent practical given the varied topography of Waynesville. If, due to the topography of the site, a physical screen would not suffice, alternative methods to minimize the negative aesthetics of the otherwise utilitarian equipment (e.g., painting the equipment to match the building) may be approved by the Administrator.
B. **Wall Mounted Equipment:** No wall-mounted building utility service equipment (e.g., electrical house panel boxes) shall be placed on the public street right-of-way side of the building.

Standard Cross Section with Utility Locations (Example):



4.2 Water Systems

- All development applications must be accompanied by satisfactory evidence as to the proposed method and system of water supply.

- In no case shall water lines be extended beyond the Urban Services Boundary line established in the Town of Waynesville Land Development Plan unless approved by the Board of Aldermen.

- The installation of all water systems (except for individual wells) shall be required prior to final plat approval or the issuance of a certificate of occupancy unless otherwise permitted in this section.

Public Water Systems:

1. Where connection is proposed to the public water system, the proposed system shall be installed according to Town specifications and standards and designed by a registered engineer. Plans shall be reviewed and approved by the Administrator and any appropriate

state agency. A letter of approval from the Administrator and appropriate state agency must accompany the development application.

2. Connection to the public water system shall be required as set forth below depending on the number of dwelling units proposed in a development and the distance the development is located from existing public water supply systems.

    a) One unit - connection required if development is within two hundred (200) feet of a public system.
    b) Two units - connection required if development is within four hundred (400) feet of a public system.
    c) Three units - connection required if development is within six hundred (600) feet of a public system.
    d) Four units - connection required if development is within eight hundred (800) feet of a public system.
    e) Five units or more - connection required if development is within one thousand (1,000) feet of a public system.

3. Where a water line six (6) inches or greater in diameter is required in a public water system, fire hydrants shall be installed on the line. The hydrants shall be spaced so that coverage to all building sites along the line may be provided with not more than five hundred (500) feet of hose and shall be located to facilitate access, hose laying, and drainage.

Private Systems: Where private individual systems are proposed for a development, a written statement or letter of approval from the Haywood County Health Department shall be submitted with the development application indicating that each lot has adequate land area and soil conditions suitable to accommodate the proposed methods of water supply.

Contact the Administrator for water tap fees or go to Town of Waynesville website- Development Services – Fee Schedule on the right under the Department Menu:
https://www.waynesvillenc.gov/departments/development-services

4.3 Sanitary Sewer Systems

- All development applications must be accompanied by satisfactory evidence as to the proposed method and system of sanitary sewer.

- In no case shall sanitary sewer lines be extended beyond the Urban Services Boundary line established in the Town of Waynesville Land Development Plan, unless approved by the Board of Aldermen.

- The installation of all sanitary sewer systems (except for individual septic systems) shall be required prior to final plan approval or the issuance of a certificate of occupancy unless otherwise permitted by the Waynesville Code of Ordinances.

Public Sewer Systems:

1. Where connection is proposed to the public sewer system and dedicated to the Town of Waynesville, the proposed system shall be installed according to the specifications of the Town's Public Services Department and designed by a registered engineer. Plans shall be reviewed and approved by the Public Works Department for the Town of Waynesville and any applicable state agency. A letter of approval from the Public Works Department and appropriate state agency must accompany the development application.

2. Connection to the public sewer system shall not be required for developments on slopes exceeding 30% average.

3. Installation of sewer lines requiring the Town of Waynesville to pump sewage is not permitted.

4. Connection to the public sewer system shall be required as set forth below depending on the number of dwelling units proposed in a development and the distance the development is located from existing public sewer system.

    a) One unit - connection required if development is within two hundred (200) feet of a public system.
    b) Two units - connection required if development is within four hundred (400) feet of a public system.
    c) Three units - connection required if development is within six hundred (600) feet of a public system.

d) Four units - connection required if development is within eight hundred (800) feet of a public system.
e) Five units or more - connection required if development is within one thousand (1,000) feet of a public system.

Private Systems:

- Private sanitary systems are not permitted.

- Private treatment systems resulting in discharges to surface waters are not permitted.

- Individual on-site systems are permitted.

- Where individual systems are proposed for a development, a written statement or letter of approval from the Haywood County Health Department shall be submitted with the development application. Such approval must indicate that each lot in the development has adequate land area and soil conditions suitable to accommodate the proposed methods of water supply and sewage disposal.

- When individual, on-lot systems are approved, each lot so served shall be of a size and shape to accommodate the necessary length of a leach field at a safe distance from and at a lower elevation than the proposed building(s). Such lot size and shape shall conform to the requirements of the zoning district in which they are located.

Requests for connections to, extension of sewer lines outside town limits[3]:

a) All requests for connection to or extensions of sewer lines from the present sewer system of the town outside the corporate limits of the town shall be writing and shall be addressed to the Board of Aldermen.

b) A written petition for voluntary annexation which meets the requirements of G.S. Ch. 160A, Art. 4A for the particular piece of property in question shall accompany all written requests for connections to or extensions of sewer lines outside the corporate limits of the town. The petition shall be addressed to the board of aldermen and shall comply in all respects with the then-existing annexation laws of the state.

[3] *Waynesville Code of Ordinances, Article IV- Sewer Service, Division 11- Miscellaneous Provisions, Section 58-277.*

c) The board of aldermen shall have 180 days from the date of submission of the voluntary petition for annexation to the board of aldermen within which to commence the annexation process.

d) The board of aldermen may accept or reject a written request for extension of sewer lines outside the corporate limits of the town without regard to whether or not it accepts the property in question for annexation; however, if the board of aldermen rejects the written request for connection to or extension of the town sewer lines outside the corporate limits of the town, the board of aldermen shall also automatically reject the petition for annexation.

Contact the Administrator for sewer tap fees or go to Town of Waynesville website- Development Services – Fee Schedule on the right under the Department Menu:
https://www.waynesvillenc.gov/departments/development-services

4.4 Electricity

A. Lighting

The standards set forth in this section are designed to achieve several purposes. It is the intent of this section to:

- Minimize light pollution, glare and light trespass.
- Conserve energy and resources while maintaining night-time safety and utility.
- Curtail the degradation of the night-time visual environment.
- Enhance and preserve mountain and valley vistas.

This section shall apply to all new development in the Town of Waynesville unless otherwise specified. The standards contained in this section shall apply to all new lighting unless specifically exempted herein or as specified.

Control of Glare—Luminaire Design Factors:

A. Any luminaire with a lamp or lamps rated at a total of more than 1,000 lumens shall be full-cutoff type fixtures.

B. Any luminaire with a lamp or lamps rated at a total of more than 1,000 lumens shall be mounted at a height equal to or less than thirty-two (32) feet above finished grade.

C. Exceptions:

1. Non-cutoff decorative post-mounted fixtures equipped with a solid top and mounted 18 feet or less above ground and other non-cutoff dusk to dawn utility type fixtures mounted 25 feet or less may be used. The maximum initial lumens generated by each fixture shall not exceed 9500 initial lamp lumens.

2. All metal halide, mercury vapor, fluorescent, and other white-colored light source lamps used in non-cutoff fixtures (excluding flood lights) shall be coated with an internal white frosting inside the outer lamp envelope.

3. All metal halide fixtures equipped with a medium base socket must utilize either an internal refractive lens or a wide-body refractive globe so that light rays emitted by the light fixture are projected below the horizontal plane passing through the lowest point on the fixture from which light is emitted.

Lighting Use Regulations for Specific Areas:

A. Other than floodlights, flood lamps, and spotlights all outdoor lighting fixtures of more than 2,000 lumens shall be full-cutoff type fixtures. Any fixture that is not full-cut off shall be a directional fixture (such as flood lights) and may be used provided they shall be aimed and fully shielded.

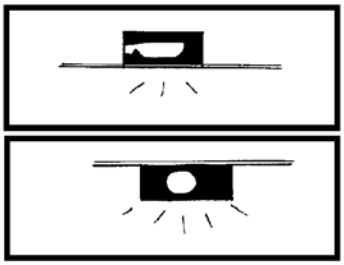
B. The mounting height of all outdoor lighting, except outdoor sports field lighting and outdoor performance area lighting, shall not exceed thirty-two (32) feet above finished grade.

1. Outdoor Display Areas:

a. The mounting height of outdoor display area fixtures shall not exceed thirty-two (32) feet above finished grade.

b. All light fixtures shall meet the IESNA definition of full cutoff fixtures. Forward throw fixtures (type IV light distribution, as defined by the IESNA) are required within twenty-five (25) feet of any public street right-of-way. Alternatively, directional fixtures (such as flood lights) may be used provided they shall be aimed and fully shielded.

2. Lighting for Vehicular Canopies: Lighting under vehicular canopies shall be designed so as not to create glare off-site. Acceptable methods include one or more of the following:



a. Recessed fixture incorporating a lens cover that is either recessed or flush with the bottom surface of the vehicular canopy.

b. Surface mounted fixture incorporating a flat lens that provides a cutoff or shielded light distribution.

c. Other method approved by the Development Services.

C. Lighting Standards by District:

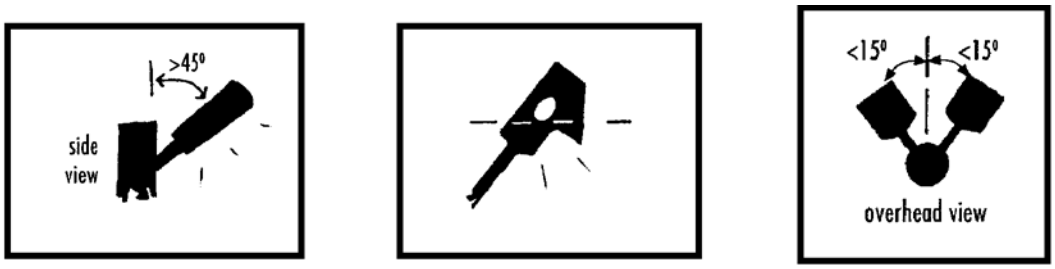
1. District Lighting Standards in Footcandles (FC).

	RL	**RM, NR, UR**	**NC, BD**	**RC, CI**
Trespass	0.1	0.3	0.8	1.5
Display/Canopy	8	12	20	20
Parking Areas	4	4	6	6

2. The values of the preceding Subsection for Trespass and Display/Canopy area lighting shall represent the maximum point of illuminance.

3. The values of the preceding section for Parking Area shall represent the average point of horizontal illuminance, provided that in all districts the maximum uniformity ratio shall be 4:1 minimum to average.

Security Lighting:



A. All flood or spot lamps emitting 1,000 or more lumens shall be aimed at least sixty (60) degrees down from horizontal or shielded such that the main beam from the light source is not visible from adjacent properties or the public street right-of-way.

B. Landscape and decorative lighting using incandescent lighting of 40 watts or less is permitted, provided that the light is installed and aimed to prevent lighting build up and light trespass and shielded to prevent view from the public right-of-way.

C. Area "dusk to dawn" open-bottom lights are permitted. These lights must be full cutoff.

Outdoor Recreational Lighting:

A. Lights shall be shielded and positioned so as not to shine onto adjacent properties.

B. All fixtures used for event lighting shall be fully shielded or be designed or provided with Manufacturer's Glare Control Package, so as to minimize up-light, spill-light, and glare.

C. Fixtures for outdoor recreational facilities must not exceed eighty feet (80') in mounting height (this includes bases and/or other mounting structures) above finished grade.

D. Fixtures shall be fitted with a manufacturer's glare control package.

E. Fixtures shall be designed and aimed so that their beams fall within the primary playing area and the immediate surroundings, so that off-site direct illumination is significantly restricted (spillover levels at the property line must not exceed 1.5 footcandles).

Street Lighting:

Street lighting shall be placed on all streets by the developer to allow for the safe use of streets by both cars and pedestrians. All street lighting shall be placed in accordance with the following minimum design standards:

A. Minimum average streetlight spacing:

	RL, RM	NR, UR	NC, BD RC	CI
Minimum Average Street Light Spacing (on-center)	n/a	300 ft.	150 ft. (pedestrian-scaled)	300 ft.

B. Lighting shall be placed at street intersections and is preferred at street curves.

C. Pedestrian-scaled lighting (no taller than 18 feet) shall be prioritized over automobile lighting. Lighting shall be placed in a manner to limit the casting of shadows on sidewalks.

D. All lighting shall utilize a cutoff fixture. Where buildings are close to the street (less than 15 feet from the right-of-way), full cutoff fixtures are required to limit glare and light spillage on upper levels.

E. Alleys are excluded from the spacing and lighting requirements of this Section.

Building Façade Lighting:

Floodlights, spotlights, or any other similar lighting shall not be used to illuminate buildings or other site features unless approved as an integral architectural element on the development plan. On-site lighting may be used to accent architectural elements but not used to illuminate entire portions of building(s) or sign(s). Where accent lighting is used, the maximum illumination on any vertical surface or angular roof surface shall not exceed 5.0 average maintained footcandles. Building facade and accent lighting will not be approved unless the light fixtures are carefully selected, located, aimed, and shielded so that light is directed only onto the building facade and spillover light is minimized.

Specific Provisions:

Gas/Fueling Stations: All lighting must be shielded to direct light and glare only onto the lot or parcel where the gas/fueling station is located and shall be in accordance with the Lighting Use Regulations for Specific Areas section of this Manual.

Entertainment/Recreation Uses (LDS 2.5.3): Lighting shall be provided in accordance with the Outdoor Recreational Lighting section of this Manual. Additionally, all exterior lighting shall be shielded such that light is not directed toward adjacent residential property. Lights and loudspeaker systems shall not be operated before 8:00 a.m. or after 10:00 pm (LDS 3.6.2).

Mini-Warehouses: : Lighting must be deflected, shaded and focused away from any adjoining residentially zoned property.

Monopole Wireless Communication Towers: Towers shall not be artificially lit unless required by the FAA or other applicable authority. If lighting is required, the Board of Adjustment may review the available lighting alternatives and approve the design that will cause the least disturbance to surrounding views.

Security lighting for equipment shelters or cabinets and other on-ground accessory equipment is also permitted, as long as it is appropriately down-shielded to keep light within the boundaries of the site.

Other: Exterior lighting for accessory uses and/or structures shall meet the requirements by which principal structures are governed as set forth in this section. Lighting of parking lots shall be in accordance with this section.

Exemptions:

A. Luminaires used for public-roadway illumination may be installed at a maximum height of thirty-seven (37) feet and may be positioned at that height up to the edge of any bordering property.

B. All temporary emergency lighting needed by the Police or Fire Departments or other emergency services, as well as all vehicular luminaires, shall be exempt from the requirements of this ordinance.

C. All hazard warning luminaires required by Federal regulatory agencies are exempt from the requirements of this article, except that all luminaires used must be red and must be shown to be as close as possible to the federally required minimum lumen output requirement for the specific task.

D. Individual residential lighting that is not part of a site plan or subdivision plan for street or other common or public area outdoor lighting.

E. Lighting associated with landscape/holiday/festive/temporary uses.

F. Lighting of public art that has been permitted or otherwise approved by the Town.

G. Other Municipal or State lighting installed for the benefit of public health, safety, and welfare.

H. All fixtures installed or temporarily used by public agencies, their agents, or contractors for the purpose of illuminating public streets.

I. Lighting of US Flags provided the flag standard does not exceed the maximum permitted building height for that district.

Prohibitions:

A. Laser Source Light - The use of laser source light or any similar high intensity light for outdoor advertising or entertainment is prohibited.

B. Searchlights - The operation of searchlights for advertising purposes is prohibited.

C. Flashing Lights - Lights that flash, move, revolve, rotate, scintillate, blink, flicker, vary in intensity or color, or use intermittent electrical pulsation are prohibited.

D. Awning and Canopy Lighting - Awnings and canopies used for building accents over doors, windows, and etc. shall not be internally lit (i.e. from underneath or behind) so as to visually turn a translucent material into an internally illuminated material. Lighting may be installed under canopies that lights the sidewalk, or downlights onto the architectural features of a building.

Light Measurement Technique:

Light level measurements shall be made at the property line of the property upon which the light to be measured is being generated. If measurement on private property is not possible or practical, light level measurements may be made at the boundary of the public street right-of-way that adjoins the property of the complainant or at any other location on the property of the complainant. Measurements shall be made at finished grade (ground level), with the light-registering portion of the meter held parallel to the ground pointing up. The meter shall have cosine and color correction and have an accuracy tolerance of no greater than plus or minus five (5) percent. Measurements shall be taken with a light meter that has been calibrated within the year. Light levels are specified, calculated and measured in footcandles (FC).

Compliance:

While not required to be provided with the submission of the site plan, projects may be required to provide the following information upon request by the Development Services Department:

- Point-by-point footcandle arrays in a printout format indicating the location and aiming of illuminating devices. The printout shall indicate compliance with the maximum maintained footcandles required by this section.

- Description of the illuminating devices, fixtures, lamps, supports, reflectors, poles, raised foundations and other devices (including but not limited to manufacturers or electric utility catalog specification sheets and/or drawings, and photometric report indicating fixture classification [cutoff fixture, wall pack, flood light, etc.]).

B. Electric, Telephone, and Cable

- Electricity and telephone service shall be provided to all developments.

- Cable service shall be required where reasonably accessible.

- Telephone, electric, cable and street lighting wires shall be constructed underground in accordance with the requirements set forth for the applicable land development district. When such utilities are required to be placed underground, the Administrator may exempt developments from such a requirement where it is determined that topographic, bedrock or underground water conditions would result in excessive costs to the developer to provide underground utilities.

- Overhead utility lines, where permitted, shall be located at the rear of all lots unless the Administrator, upon the recommendation of the utility company, provides reasons that justify the location of easements at another location. The width of the easement to be provided shall be determined by the Administrator.

- Whenever a sanitary sewer line and electric and/or telephone line are each placed underground in the same utility easement, the total easement width shall not be less than twenty (20) feet.

- Joint use poles are required.

- Pole lines where permitted inside the right-of-way shall be at or as close to the right-of-way line as is possible.

- Electric and communications facilities shall conform to the current National Electric Safety Code.

- Vertical clearances shall be no less than eighteen (18) feet. For boulevards and highways the minimum clearance shall be twenty-two (22) feet.

- The minimum depth of cover shall be three (3) feet for primary and three (3) feet crossing under grade. Two (2) foot minimum cover is required for all other installations.

4.5 Utility Manholes

Utility manhole[4]- an underground structure cylindrical in shape and tapered off at the top to provide for an access manhole cover and ring.

Utility vault- an underground structure rectangular in shape and composed essentially of a floor slab, vertical walls, top slab, manhole covers, and manhole rings or frames.

Utility manholes and vaults are sized to allow personnel to enter a confined space for the purpose of inspecting, installing, operating, or maintaining equipment, wiring, cable, pipes, and related a.

- All storm drainage structures such as manholes, inlets, junction boxes, catch basins, end walls, and headwalls shall be constructed of solid brick, solid block, or precast concrete meeting NCDOT standards (See *NCDOT Utilities Accommodation Manual*).

- Any structure with a depth greater than 4 feet shall have steps installed. All hoods, frames, and grates shall be domestically produced cast iron or steel and approved by the Administrator.

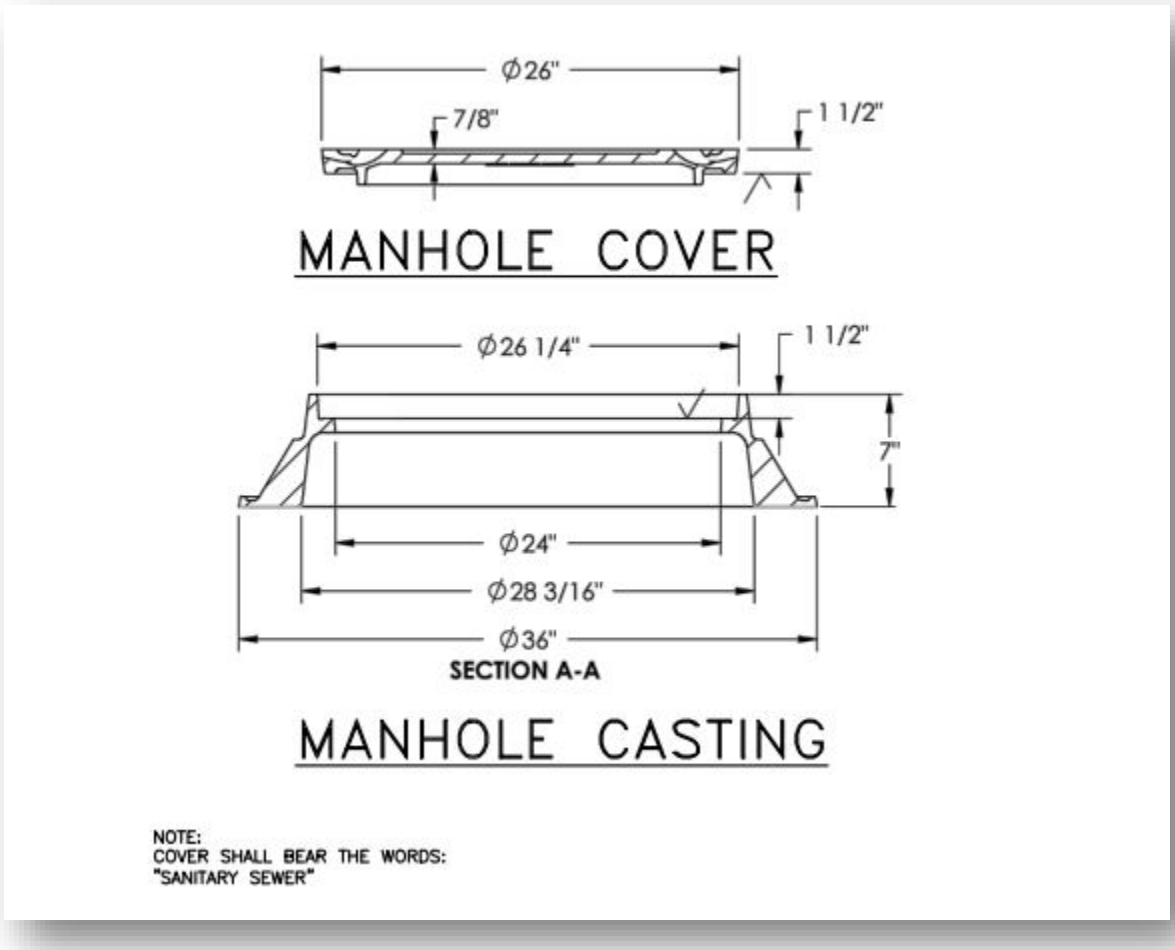
[4] *NCDOT Utilities Accommodation Manual, March 2021:* https://connect.ncdot.gov/municipalities/Utilities/UtilitiesDocuments/20210301%20NCDOT%20UAM%20Ver%201-1.pdf

- Installation of these structures within the pavement should be avoided. If location within pavement is required, installation in wheel paths and at roadway intersections should be avoided.

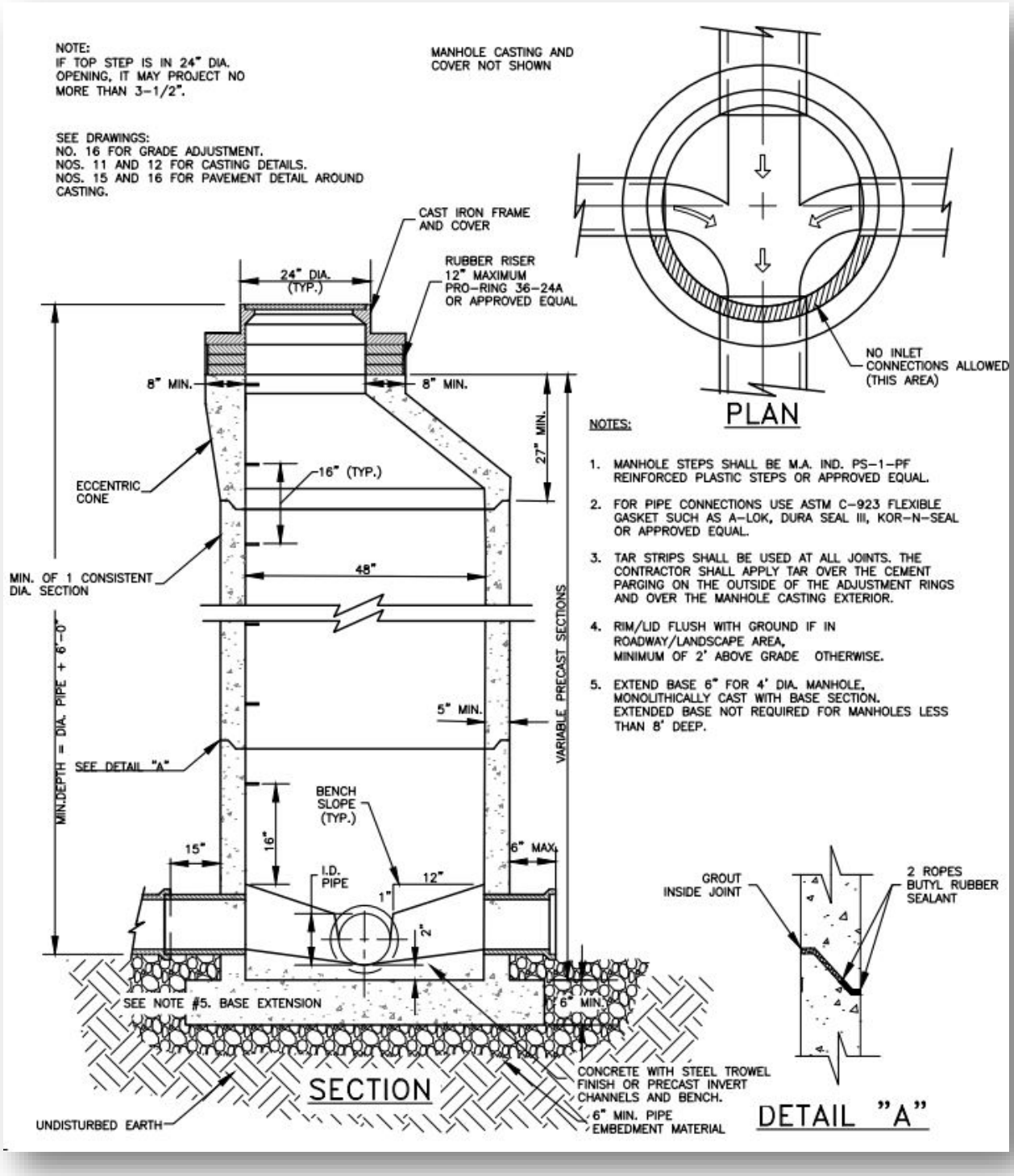
- All utility structures (i.e. vaults, manholes, and boxes) shall be load rated for the appropriate dead load plus an HL-93 live load. Such structures shall be designed and certified by a licensed professional engineer.

- Manhole covers must be flush with the roadway surface. Depressed features are a hazard for bicyclists and pedestrians when they are within the crosswalk and/or bicycle lanes.

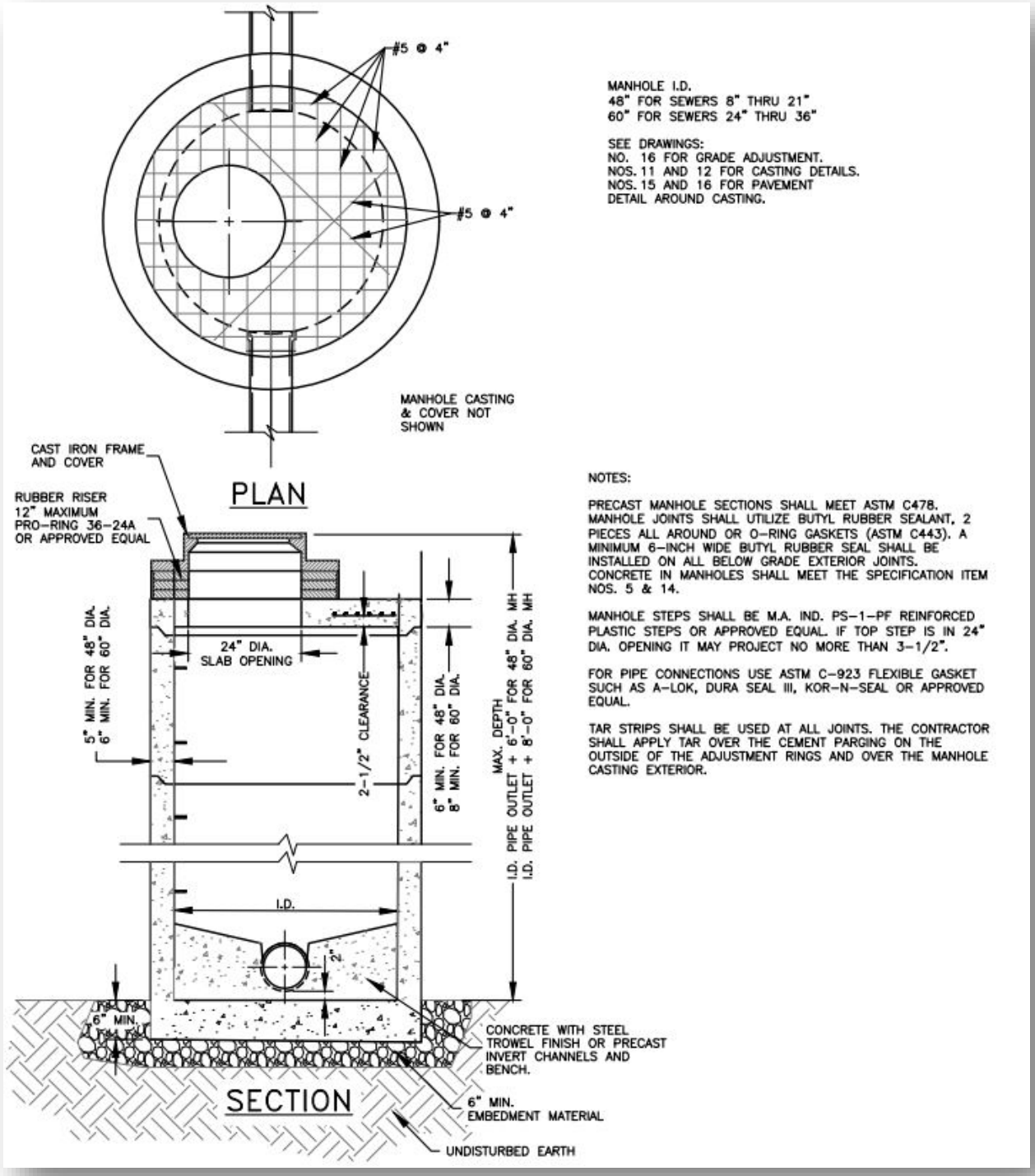
Standard Manhole Casting and Cover (Example):



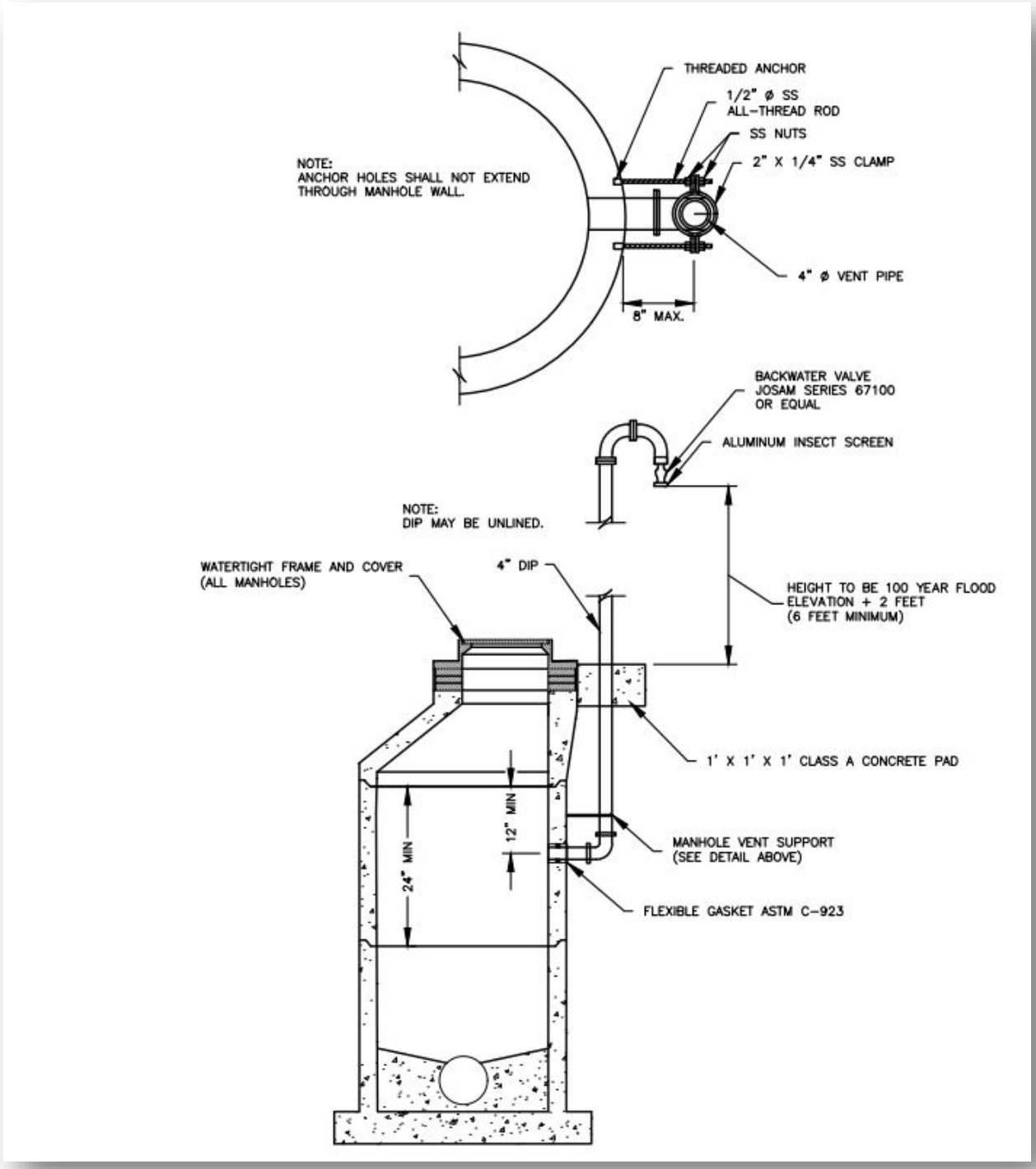
Precast Manhole (Example):



Shallow Manhole (Example):



Vented Manhole (Example):



4.6 Easements

A utility easement means any area to which the Town has unlimited access for servicing utility lines.

- Any plantings installed within a utility easement may be damaged or destroyed during the course of servicing. The Town is not liable for damage to any improvements or plantings within a utility easement. The Town will, however, re-seed any bare or disturbed soil for erosion control purposes as necessary.

- Nothing shall be planted or installed within an underground or overhead utility easement or a drainage easement without the consent of the Administrator and the easement holder at the time of site plan approval (LDS 8.3.2).

- Buffer yards (when required) shall not be located on any portion of any existing or proposed street right-of-way. Buffers shall be permitted to intersect utility easements or run parallel with them. However, they shall not be permitted to run linear with and superimposed on them. (LDS 8.41.E)

- Utility easements shall be determined by the developer or utility provider, as necessary.

- Adequate rights-of-way or utility easements shall be dedicated to the Town to allow the electric utility company to install street lights.

- All public storm drains shall be installed in dedicated street rights-of-way or dedicated storm drain easements.

- Where a water course, drainage way, channel, or stream runs through a subdivision, there shall be provided a stormwater easement or drainage right-of-way conforming substantially with the lines of such water course to adequately provide drainage.

- All proposed utility easements shall be properly labeled on the plans, discussed with the Administrator, and recorded (LDS 15.4).

Section 5 – Public Safety Standards

5.1 General

The standards in this section are established to ensure that new development and redevelopment within the Town of Waynesville meets the public safety requirements of the Town, State, and applicable federal regulations.

Maintenance of Traffic:

- The contractor is required to maintain traffic within the limits of the project, including all existing roadways that cross or intersect the project. The Contractor shall conduct his work in a safe manner that will create a minimum amount of inconvenience to traffic.

- The contractor is responsible for maintaining in a safe, passable and convenient condition, such part or parts of existing roads as are being used by him to maintain traffic within the limits of the project from the time the contractor begins work on the project until acceptance of the project.

- Whenever it is necessary to use traffic control devices, the work of furnishing, erecting, operating, maintaining, covering, relocating and removing traffic control devices shall be in accordance with the NC DOT standards.[5] Provide temporary traffic control devices listed on the NCDOT Approved Product list.

Address Identification:

New and existing buildings shall be provided with an approved address identification. The address identification shall be legible and placed in a position that is visible from the street or road fronting the property. Address identification characters shall contrast with their background. Address numbers shall be Arabic numbers or alphabetical letters. Numbers shall not be spelled out. Each character shall be not less than 6 inches (153 mm) high with a minimum stroke width of 3/4 inch (20 mm). Where required by the Fire Code Official, address identification shall be provided in additional approved locations to facilitate emergency response. Where

[5] *NCDOT Standard Specifications for Roads and Structures, 2018:* file:///P:/Planning/Design%20Specifications%20Manual/2018%20Standard%20Specifications%20Manual%20with%20ASTM.pdf

access is by means of a private road and the building cannot be viewed from the public way, a monument, pole, or other sign or means shall be used to identify the structure. Address identification shall be maintained.

5.2 Fire Apparatus Access Roads

- A Fire Code Official or Senior Code Enforcement Official will require that a development provides adequate emergency vehicle access, based on the type of the development, occupancy load, surrounding traffic conditions, and topography of the area.

- Emergency access roads shall be installed in accordance with all applicable requirements of the NC Fire Prevention Code and all other applicable regulations.

- Emergency access roads are required for all commercial developments, including schools.

- Fire apparatus access roads shall extend to within 150 feet of all portions of the facility and all portions of the exterior walls of the first story of the building.

- A Fire Code Official is authorized to require more than one fire apparatus access road based on the potential for impairment of a single road by vehicle congestion, condition of terrain, climatic conditions, or other factors that could limit access.

- Adequate emergency access shall be a minimum 20-foot wide unobstructed access road with an unobstructed vertical clearance of 13.5 feet and meets all applicable standards as set forth in Section 502 of the NC Fire Prevention Code.

- In general, emergency vehicle/fire apparatus access roads shall not exceed 15 percent in grade. Alternative grades may be approved by a Fire Code Official, with the maximum grade not to exceed 18 percent.

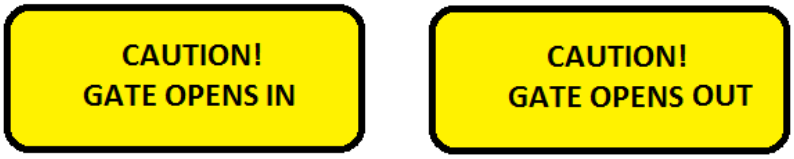
- Dead-end fire apparatus roads shall provide an adequate turnaround, as approved by the Fire Code Official.

Fire Apparatus Roads with Gates:

The installation of security gates across a fire apparatus access road shall be approved by the Fire Code Official. Gates securing the fire apparatus access roads shall comply with all of the following criteria:

1. The minimum clear gate width shall be 20 feet.

2. Gates shall be of the horizontal swinging or sliding type. Vertically operating gates are not permitted. The access road shall be painted with yellow striping to show the depth of the gate swing. Swinging gates shall have a posted sign to indicate whether the gate opens in or out:



3. Gate components shall be maintained in an operative condition at all times and replaced or repaired when defective. Inoperative gates shall remain in the full open position until repaired or operating power is restored.

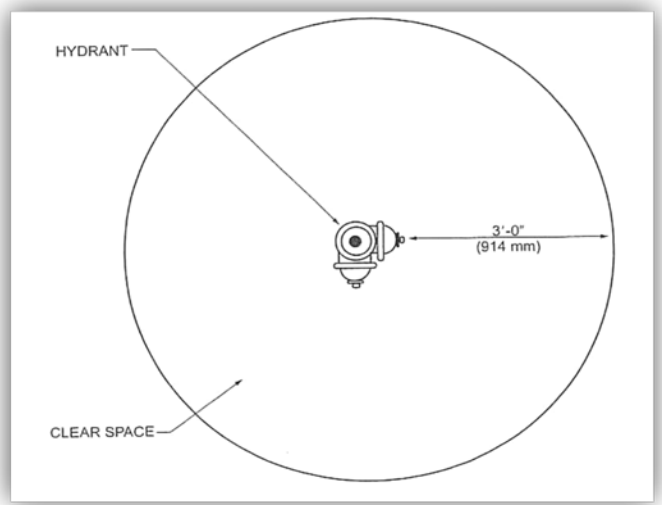
4. All gates limiting access will be required to provide emergency access controls for Fire Department entry.

5. Manual opening gates shall not be locked with a padlock or chain and padlock unless they are capable of being opened by means of forcible entry tools or by use of a KNOX padlock. Manual gates are not approved for use on required fire department access roads.

6. Locking device specifications shall be submitted to the Fire Code Official and are subject to approval prior to installation.

5.3 Fire Hydrants

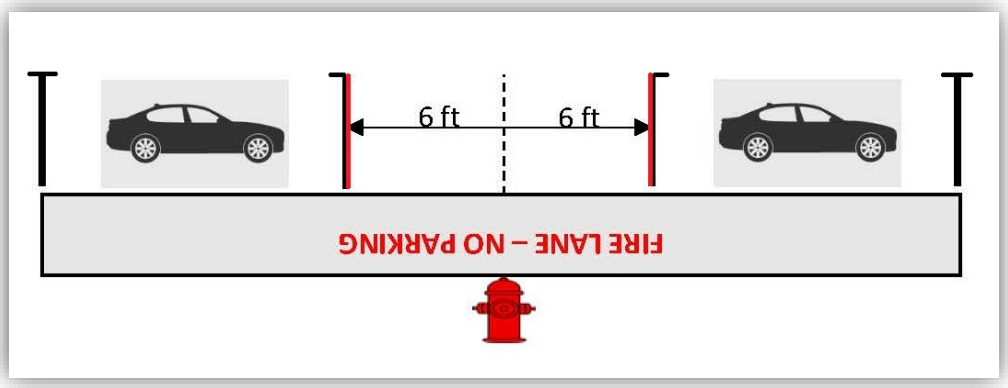
Clear Space Around Fire Hydrants: A 3-foot clear space shall be maintained around the circumference of fire hydrants, except as otherwise required or approved. Care must be taken so that fences, utility poles, barricades, and other obstructions do no prevent access to and operation of fire hydrants. A clear space of 3 feet must be provided around hydrants to allow easy hose connections to the hydrant and the efficient use of hydrant wrenches and other tools needed by the apparatus engineer. See examples below:



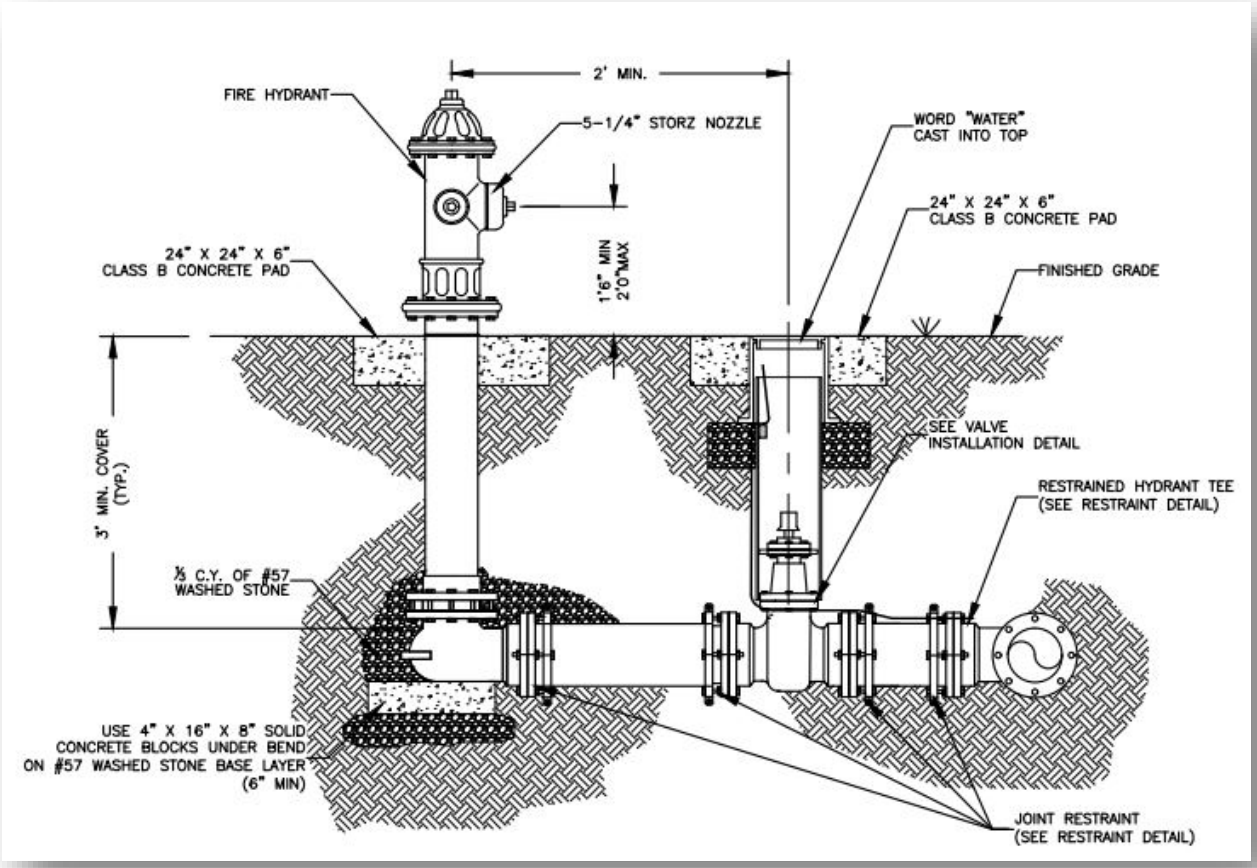
Hydrant Clearance
218 IFC Code and Commentary

Physical Protection: Where fire hydrants are subject to impact by a motor vehicle, guard posts or other approved means shall be installed. The guards include but not limited to: steel posts filled with concrete or 4-inch curb around the hydrant.

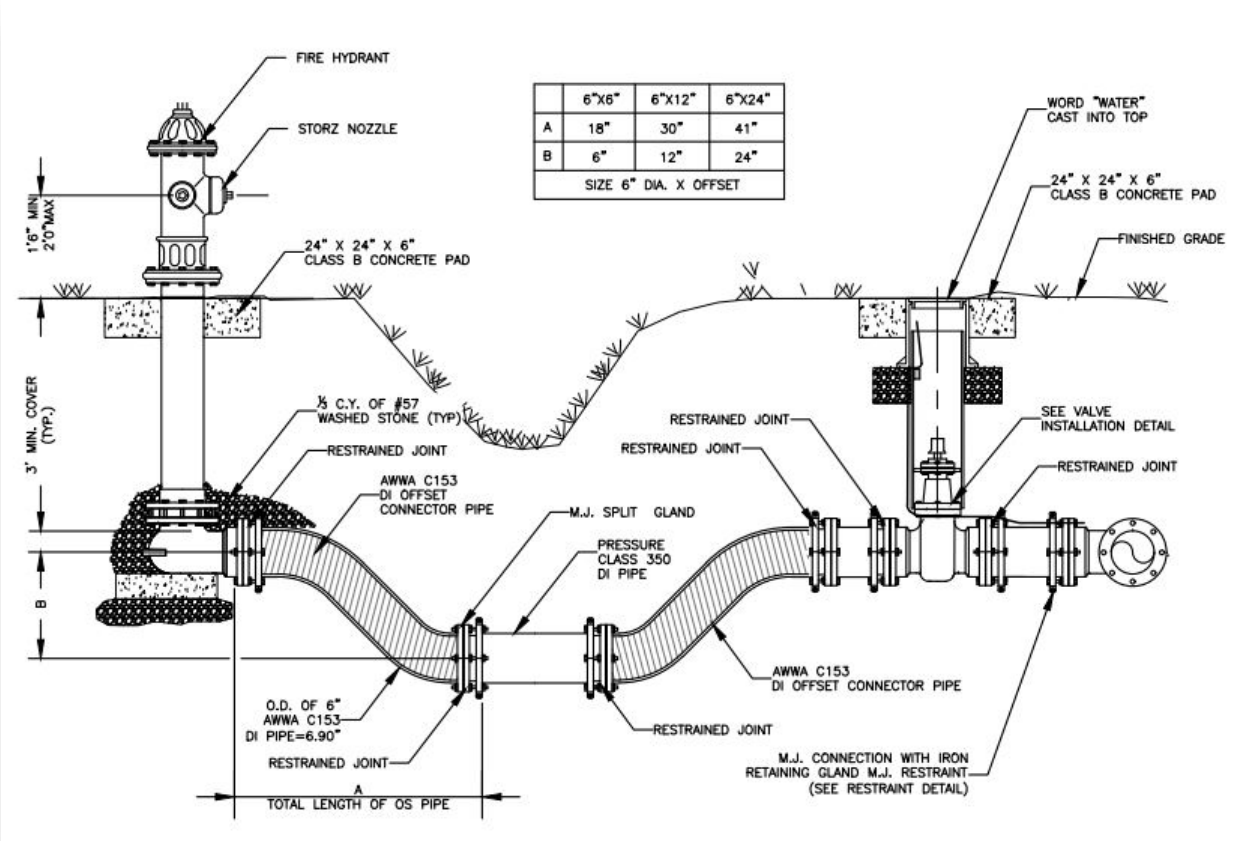
Fire Hydrants Adjacent to Parallel Parking: When a fire hydrant is located adjacent to a street with a parallel parking, there should be no parking space markings located within 6 feet either side in and should be marked with red "Fire Lane – No Parking" text and striping. Alternative compliance may be granted by the Administrator or Fire Marshall. See Image below for reference:



Fire Hydrant, Standard Installation (Example):



Fire Hydrant, Ditch Installation (Example):



Quick-connect fire hydrants are strongly preferred (example below):

Quick-Connect / Full Pressure Rating

Mueller Centurion hydrants (traditional or Modern styles), can be ordered with an integral, Mueller designed and manufactured Storz connection on the pumper nozzle. The connection is also available separately to retrofit hydrants in the field. Making our own Storz connection means your Centurion hydrants remain '100% Mueller' for assurance of reliability.

The Mueller Storz connection allows the fire department to connect its pumper hose to the hydrant with a quick, quarter-turn action. The action is fast and smooth so fire fighters can get to their tasks quickly without the thread alignment, cross threading, or leakage problems sometimes associated with threaded connections.

The Mueller Storz option is available for 4" and 5" pumper nozzles on any Centurion 200™, 250™, or Modern hydrant. Mueller hydrants retain their UL Approval, FM Listing, AWWA Compliance and published pressure rating when ordered with the Storz option. Hydrants are also compliant with NFPA 1963. To order, specify Storz size, and locking or non-locking caps.

Section 6 – Soil Erosion and Sedimentation Control

6.1 Temporary Measures

A. General

The State authorizes municipalities to approve and regulate best management practices related to erosion and sedimentation control. The Town of Waynesville controls erosion and and sedimentation through its local ordinances and applicable State and federal regulations in order to prevent the pollution to watercourses and damage to public and private property by sedimentation. Erosion control also safeguards the natural resources of the Town by regulating stormwater runoff.

Grading activities 1000+ square feet require a Land Disturbing Permit[6] that can be obtained in the Development Services office. Grading activities 1+ acres require a State-issued permit by the NC DEQ. A copy of this permit must be turned in to the Development Services.

This manual focuses on providing a brief overview of temporary and permanent erosion control measures. Examples of temporary erosion control measures include but are not limited to: silt fences, sediment basins, sediment traps, check dams, construction entrances, stone erosion controls, etc. Permanent measures may include mulch, ground cover, stream buffers, etc. For more information on the Town's land disturbing regulations, refer to section *12.4- Sedimentation and Erosion Control* of the LDS.

The installation of all erosion and sediment control measures shall be in compliance with the most current version of the *NC DEQ Erosion and Sediment Control Planning and Design Manual: https://deq.nc.gov/about/divisions/energy-mineral-and-land-resources/erosion-and-sediment-control/erosion-and-sediment-control-planning-and-design-manual*

[6] *See Appendix C*

B. Silt Fences

A silt/sediment fence is a permeable barrier erected on small, disturbed areas to capture sediment from sheet flow. It is made of filter fabric buried at the bottom, stretched, and supported by steel posts. The sediment fence reduces the velocity of flow, allows deposition, and retains sediment. Silt fences are not designed to withstand high flows.

Silt fences may be designed to store all the runoff from the design storm, or located to allow bypass flow when the temporary sediment pool reaches a predetermined level. Silt fences may also divert small volumes of flow to protected outlets.

Prior to the beginning of construction, silt fence must be installed down slope of all disturbed areas and any other necessary locations as directed. The location of the silt fence must be indicated on the grading plan submitted for the Land Disturbing Permit. **Follow the NC DEQ Design Manual[7] for specifications and installation.**

In general:

- Install in areas receiving sheet runoff, not concentrated flow
- Do not install silt fence across streams or ditches where flows are concentrated
- Use steel posts
- Install woven wire fence tightly along the perimeter of a silt fence for additional support
- Bury the fabric in the ground to avoid sediment seepage

Common problems:

- Too much sediment accumulation
- Approach too steep
- Fence not adequately supported
- The bottom of the fence is not buried deep enough
- Overtopping at corners and low points

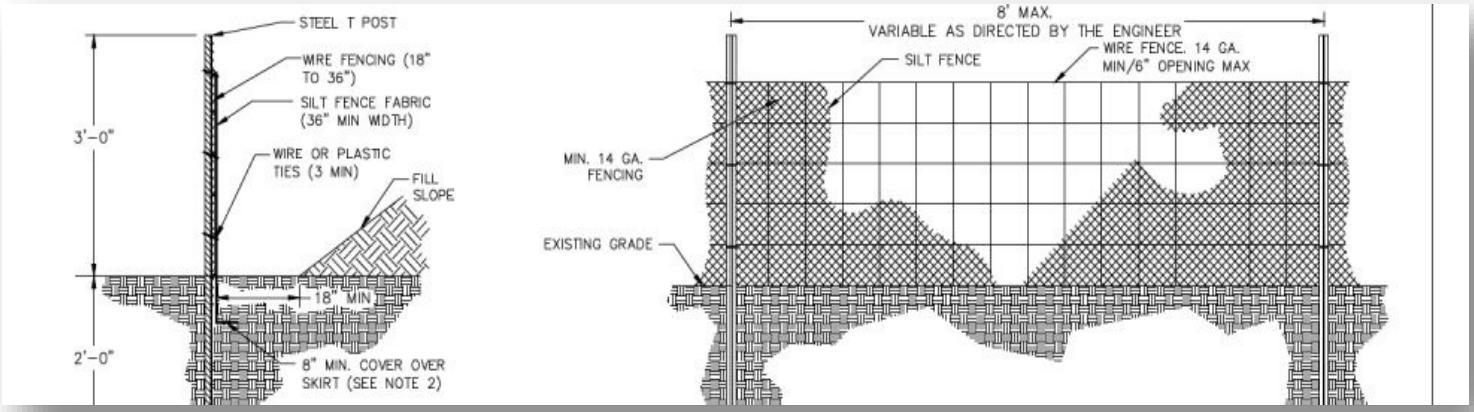
Although silt fences represent one of the most common erosion control methods, trenching of a silt fence may not be beneficial for the survival of sensitive tree species.

[7] NC DEQ Erosion and Sediment Control Planning Design Manual: https://deq.nc.gov/about/divisions/energy-mineral-and-land-resources/erosion-and-sediment-control/erosion-and-sediment-control-planning-and-design-manual

EXAMPLES OF GOOD AND POORLY INSTALLED SILT FENCES
WAYNESVILLE, NC

Silt fences are especially useful where there is limited space to work, such as near property lines, among trees, or near sidewalks and streets.

Example of a Standard Temporary Silt Fence (Side View- Left; Front View- Right):



C. Construction Entrance

A gravel/stone construction entrance shall be installed at all points of access to construction sites to prevent dirt and sediment from leaving the site with construction traffic. This is especially important where vehicles exit construction areas directly onto public roads or other off-site paved areas. The contractor shall be responsible for maintaining the cleanliness of existing sidewalks and streets impacted by construction activities.

<u>In general:</u>

- Make the gravel pad the full width of the entrance area, sufficiently long for vehicles to drop their mud and sediment and stable enough for construction traffic.
- Avoid entrances on steep grades or at curves in public roads.
- In some cases, it may be necessary to wash vehicle tires in this area. Sometimes contractors install washing stations at the construction entrance and spray all the equipment that comes out of site.
- Stabilize the graveled area well at these points and provide drainage to a sediment trap.

Common problems:

- Pad too thin
- Pad too short
- Too much dirt accumulated over the stones

Proper installation of a construction entrance/exit is extremely extremely important as it provides an immediate buffer for on-site deposition of mud and sediment.

D. Sediment Basins

Sediment basins provide a convenient concentration point for sediment-filled flows from the disturbed areas. They capture sediment from the disturbed area of the site and should be installed before clearing and grading activities begin. Sediment basins are especially needed in large construction sites. Ease of basin cleanout and spoil disposal under all weather conditions should be considered in site selection.

Sediment Basin at Former BI-LO Site in Waynesville, NC

Porous baffles are often installed inside temporary sediment basins to reduce the velocity and turbulence of the water flowing through the measure, and they facilitate the settling of sediment from the water before discharge. Baffles improve the rate of sediment retention by distributing the flow and reducing turbulence. This process can improve sedimentation retention and allow the capture of soil particles 50 percent smaller than those that can be captured without baffles.[8]

[8] NC DEQ Erosion and Sediment Control Planning Design Manual: https://deq.nc.gov/media/14649/download

A large sediment basin failure can have disastrous results; low points in dams can cause major gullies to form on a fill slope. It is essential to inspect all practices to determine that they are working properly and to ensure that problems are corrected as soon as they develop. Assign an individual responsibility for routine checks of erosion and sedimentation control practices.

In general:

- Sediment basins are usually constructed by building a low earthen dam across a drainageway to form a temporary sediment storage pool.
- A properly designed spillway outlet with adequate freeboard is essential.
- The embankment should be well compacted and vegetated. Temporary seeding preserves the integrity of the basin.
- Sediment basins may also be formed by excavation, but these are usually more costly.
- Sediment should enter the basin as far from the outlet as possible.
- Baffles should be installed in the sedimentation pool to maximize trapping efficiency.
- Divert sediment-free water away from sediment basins and release it through stable outlets. This reduces construction costs, and improves basin efficiency.
- A storm drain flow from the protected inlets may be diverted to a sediment basin for additional sediment control.

Common problems:

- Inadequate size
- Basin is not cleaned/no plan for maintenance
- No access for maintenance
- Low point in embankment
- Erosion
- Settling of embankment due to poor compaction

Image by NC DEQ

Do not locate sediment basins in live streams!

Unless the basin is designed to be converted to a stormwater pond, it shall have a lifespan of 3 years or less.

E. Temporary Sediment Traps

Sediment traps are small ponding basins that are often installed in outlets for diversions, channels, slope drains, and other points where sediment-filled water is concentrated. Trapping sediment at selected points in a construction area reduces potential for sediment damage, simplifies structural design, provides for convenient removal of sediment, and limits damage if a structure fails. Like sediment basins, temporary sediment traps need to be constructed before land disturbing activities, whenever possible.

In general:

- Restrict the drainage area to small acreage (generally = 5 acres or less).
- Dewatering of sediment traps shall be accomplished by a stone spillway.
- Include baffles in the sedimentation pool to maximize trapping efficiency. Traps must be readily accessible for periodic sediment removal and other necessary maintenance.

Image by NC DEQ

Temporary sediment trap provides a settling pool for a small drainage area. The outlet spillway section is constructed of stone and provides drainage for the pool.

Common problems:

- Inadequate spillway size
- Inadequate storge size
- No plan/access for maintenance
- Low point in embankment

Do not locate sediment traps in live streams!

F. Check Dams and Wattles

Check dams are small dams made of stone. **Wattles** are tube-shaped straw or coir (coconut fiber) fabric dams constructed across a drainage way. Both measures reduce erosion and velocity in small open channels. They can also be used in roadside ditches and as temporary diversions on site.

Check dams and wattles are placed on the bottom of the small channels that will be filled permanently or stabilized later during construction.

In general:

- The center section must be lower than the edges
- Extend stone beyond ditch banks to avoid washing
- Space the dams
- Upstream dam shall have the same elevation as the downstream dam
- Ensure that the overflow areas of the channel are resistant to erosion
- Restrict drainage area to ½ acre
- Inspect the dams weekly and after significant rain events

Common problems:

- Not removed in a timely manner
- Ponding water kills vegetation
- Erosion along abutments

Images by NC DEQ

Do not use check dams and wattles in live streams!

G. Stone Erosion Control

Riprap, gravel, and other land covers (such as straw) can provide immediate surface protection to disturbed soil areas. Riprap is especially useful where concentrated runoff over steep slopes occurs. It can be used to line slopes and channels to prevent erosion and sedimentation.

Image by NC DEQ

Well-graded riprap forms a dense, flexible, seal-healing cover that will adapt well to uneven surfaces. Care must be exercised in the design so that stones are of good quality, sized correctly, and placed to proper thickness.

<u>In general:</u>

- Riprap should be installed on a proper filter material, such as gravel, fabric bed, straw matting, or sand.
- Lining thickness = 1.5 x max. stone diameter.

Common problems:

- Foundation not properly excavated
- Side slopes are too steep
- Riprap poorly graded or placed

Image by NC DEQ

Image by NC DEQ

Enchantment Park, Waynesville, NC

H. Inlet Protection

Protection against sediment entering a storm drain drop inlet can be provided by excavating an area in the approach to the drain. Temporary excavated drop inlet protection creates an effective settling pool to remove sediment at a stormwater inlet.

Image by NC DEQ

In general:

- Limit drainage area to 1 acre.
- Size, shape, and depth of excavation are designed for optimal sediment trapping.
- Frequent maintenance and sediment removal are required.

Types:

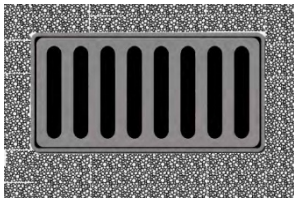
- Excavated
- Hardware cloth and gravel

- Block and gravel
- Sod
- Rock doughnut
- Rock pipe

Common problems:

- Excessive ponding
- Sediment pool area overwhelmed and sediment enters storm drain
- Steel posts not used (for hardware cloth and gravel type)
- Land slope at storm drain too steep

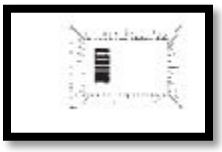
EXAMPLES OF THE INLET PROTECTION PRACTICES



Hardware Cloth and Gravel Inlet Protection

Rock Doughnut Inlet Protection

Rock Pipe Inlet Protection



Temporary Excavation Inlet Protection

I. Temporary Seeding and Mulching

Temporary seeding and mulching serve as a protective cover, and it is a must in all graded slopes and fills. Annual plants that are adapted to site conditions and that sprout and grow rapidly should be used for temporary plantings. Proper seedbed preparation and the use of quality seed are also important.

Temporary seeding is used on graded/exposed land areas that will not be brought to final grade for several weeks or months. When done properly, it provides quick and effective erosion control.

Image by NC DEQ

In general:

- Seeding and mulching shall be applied immediately following the completion of any phase of grading
- Native plants should be used (grass is a common groundcover)
- Fertilizer shall be applied
- Temporary seeding should provide protective cover for less than one year
- Areas must be re-seeded annually or planted with perennial vegetation
- Mulching shall consist of small grain straw

Common problems:

- Non-native plant species selected
- Seedbed not properly prepared
- Mulched areas not tacked and not holding straw in place

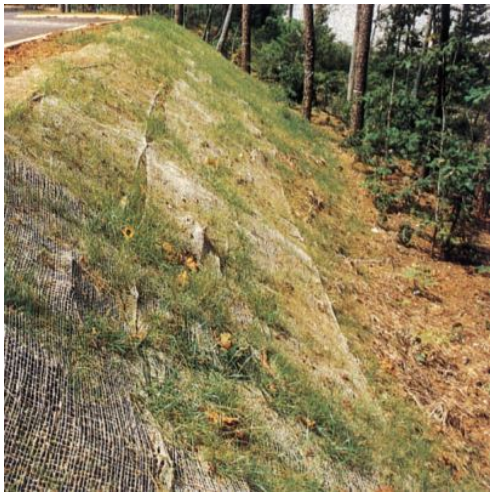
6.2 Permanent Measures

A. Permanent Ground Cover

Permanent ground cover is the establishment of perennial vegetation cover for periods longer than 12 months.

Permanent seeding produces long-term vegetative cover. It controls erosion by physically protecting a bare soil surface from raindrop impact, flowing water, and wind. Plant roots bind soil particles together, increase water absorption speed, and reduce the velocity and volume of overland runoff.

Permanent vegetation should be the preferred method of surface stabilization wherever site conditions permit. The advantages of seeding over other means of establishing plants include the relatively small initial cost, wide variety of grasses available, lower labor input, and ease of application.



Images by NC DEQ

In general:

- Give special attention to selecting the most suitable plant material for the site and intended purpose.
- Good seedbed preparation, adequate liming and fertilization, and timely planting and maintenance are also important.
- Areas to be stabilized with permanent vegetation must be seeded or planted within 15 working days or 90 calendar days after final grade is reached unless temporary stabilization is applied.
- Test and analyze the type(s) and quality of the existing soils on a site, their pH ranges, and their nutrient levels. Taking soil samples from the different areas of the project site and having them tested at a state or independent lab will provide a baseline for determining the pH modifiers and additional nutrients required for the selected plant varieties.

Common problems:

- Potential erosion during the establishment period
- Dying of the plant species due to soil conditions
- Limitations on seeding dates
- Weed competition
- Need for additional care, such as watering, during germination and early growth

For specific recommendations on permanent seeding in the mountain region, including plant species, soil types, and planting schedules, see the latest version of the *NC DEQ Erosion and Sediment Control Planning and Design Manual:*

https://deq.nc.gov/about/divisions/energy-mineral-and-land-resources/erosion-and-sediment-control/erosion-and-sediment-control-planning-and-design-manual

B. Mulch

Mulch is a temporary ground cover intended to provide temporary erosion prevention and promote growth of vegetation. Mulch may only be used as a permanent ground cover in the beds of installed landscaping with an accompanying landscaping plan. Trees, shrubs, vines, and ground covers, in combination with a suitable mulch, beautify and provide long-term protection to sloping areas.

Mulch is essential for retaining seeds, preserving soil amendments, retaining moisture, and promoting filtration. It fosters seed germination and seedling growth by reducing evaporation, preventing soil crusting, and insulating the soil against rapid temperature changes. Mulch helps the revegetation of most disturbed sites, especially on difficult sites, such as southern exposures, channels, and excessively dry soils. The steeper the slope and the poorer the soil, the more valuable it becomes.

Mulch may also protect surfaces that cannot be seeded. It prevents erosion in the same manner as vegetation, by protecting the surface from raindrop impact and by reducing the velocity of overland flow.

Raingarden at Enchantment Park, Waynesville, NC

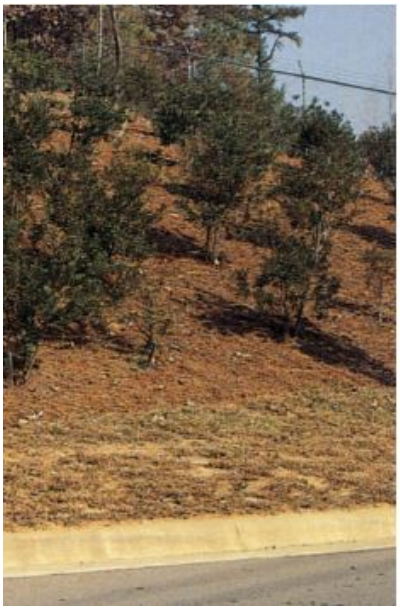


Image by NC DEQ

When used as a permanent groundcover, mulch requires continued maintenance and additions as it can easily float away or be blown away by winds. A thick layer of wood mulch can be adequate. Grain straw (wheat, oats, barley, rye) is also one of the the most widely used and one of the best mulches.

C. Stream Buffers

General:

A buffer zone is a natural area of vegetation that is adjacent to a natural stream, lake, wetland, marsh, or any other type of watercourse. Waynesville Land Development Standards require stream buffers.

Image by NC DEQ

- Buffers protect the water courses. They are most effective at filtering surface runoff and groundwater. They also filter dust from surrounding land-disturbing activities, cycle nutrients from vegetative roots, control the temperature of the watercourse through shading, and provide leaves and woody debris used for food and shelter by aquatic organisms.

- The protective buffer zones should be used for perennial streams, intermittent streams, lakes, ponds, estuaries, and modified natural streams

- No land disturbing activity during periods of construction or improvement to land shall be permitted in proximity to a lake or natural watercourse unless a buffer zone is provided along the margin of the watercourse of sufficient width to confine visible siltation within the

twenty-five (25%) percent of the buffer zone nearest the land-disturbing activity or 25 feet wide, whichever is greater.

- Unless otherwise provided, the width of a buffer zone is measured from the edge of the water to the nearest edge of the disturbed area, with the twenty-five (25) percent of the strip nearer the land-disturbing activity containing natural or artificial means of confining visible siltation.

- During the development of a site, the person conducting the land-disturbing activity shall install and maintain all temporary and permanent erosion and sedimentation control measures as required by the approved plan or any provision of the North Carolina Sedimentation Pollution Control Act, the regulations in this Manual, or other local ordinances.

- No storage is permitted within stream buffers.

- Buffer zones are a crucial natural area of vegetation between a body of water and a construction site used to filter out sediment and other pollutants that could contaminate the water resource.

- For more information, see Chapter 12- Environmental Conservation Standards of the LDS: https://www.waynesvillenc.gov/departments/development-services/land-use-zoning-ordinances

Steep Slope Area Development:

For the purposes of this section, a Steep Slope Area is defined as any lot, parcel, tract or portion thereof, that has a natural elevation of 2,900 feet above mean sea level or higher, with a natural average slope of 25% or greater (as defined in Section 12.6- Hillside Protection of the LDS).

The riparian stream buffers shall be left intact, which means that removal of trees, or other vegetation, or disturbance of soils within this buffer is prohibited, except for necessary road crossings. The buffers shall be a minimum of 30' from the edge of the stream or 25 feet from the top of bank, whichever is greater.

For projects requiring Environmental Survey:

- See section 15.4 of the LDS.
- Mandatory for major site plans and preliminary plats of major subdivisions.
- Stream buffers must be indicated on the preliminary plans.

Projects that are subject to the Town of Waynesville Stormwater Ordinance Requirements[9]:

a) Cumulatively disturb one (1) acre or more.
b) Projects of less than one acre and that are a part of a larger common plan of development or sale, even though multiple, separate, or distinct activities take place at different times on different schedules.
c) Projects of less than one acre and that have a proposed increased impervious surface on completion of greater than 24,000 square feet.

For projects as listed under a), b), and c) above, the following applies:

All Low Density projects and High Density projects must have the built-upon area at a minimum of thirty (30) feet landward of all perennial and intermittent surface waters. This distance shall be measured horizontally from the edge of water. A perennial or intermittent surface water shall be deemed present if the feature is approximately shown on either the most recent version of the soil survey map prepared by the Natural Resources Conservation Service of the United States Department of Agriculture (USDA) or the most recent version of the 1:24,000 scale (7.5 minute) quadrangle topographic maps prepared by the United States Geologic Survey (USGS). An exception to this requirement may be allowed when site-specific determination is made using NC Division of Water Quality approved methodology.

The projects that are exempt from the Town of Waynesville Stormwater Ordinance:

- Single-family and two-family developments on individual lots.
- All development in the Central Business District (CBD) zone.
- Development and redevelopment that cumulatively disturbs less than (1) one acre and is not part of a larger common plan of development or sale, unless such activities are part of a larger common plan of development or sale, even though multiple, separate, or distinct activities take place at different times on different schedules.
- Activities that are exempt from permit requirements of Section 404 of the Federal Clean Water Act as specified in 40 CFR 232 (primarily ongoing farming and forestry activities) are exempt from the provisions of this section.
- Redevelopment that results in no net increase in built-upon area and provides equal or greater stormwater control than the previous development is exempt from the provisions of this ordinance.

[9] *See Section 12.5- Stormwater Ordinance for applicability, exceptions, and additional requirements: https://www.waynesvillenc.gov/departments/development-services/land-use-zoning-ordinances*

Trout Waters[10]:

- Waters that have been classified as trout waters by the state environmental management commission shall have an undisturbed buffer zone twenty-five (25) feet wide or of sufficient width to confine visible siltation within the twenty-five (25) percent of the buffer zone nearest the land-disturbing activity, whichever is greater. Provided, however, the Town may approve plans which include land-disturbing activity along trout waters when the duration of the disturbance would be temporary and the extent of the disturbance would be minimal. This subsection shall not apply to land-disturbing activity in connection with the construction of facilities to be located on, over, or under a lake or natural watercourse.

- The twenty-five (25) foot minimum width for an undisturbed buffer zoned adjacent to designated trout waters shall be measured horizontally form the top of the bank.

- When a temporary and minimal disturbance is permitted as an exception, land-disturbing activities in the buffer zone adjacent to designated trout waters shall be limited to a maximum of ten (10) percent of the total length of the buffer zone within the tract to be disturbed such that there is not more than one hundred (100) linear feet of disturbance in each one thousand (1,000) linear feet of buffer zone. Larger areas may be disturbed with written approval of the Administrator.

- No land-disturbing activity shall be undertaken within a buffer zone adjacent to designated trout waters that will cause adverse temperature fluctuations in these waters, as set forth in 15 NCAC 2B. 0211 "Fresh Surface Water Classification and Standards (available at the North Carolina Division of Environmental Management).

- See NC DEQ Surface Water Classifications Map:
  https://experience.arcgis.com/experience/7073e9122ab74588b8c48ded34c3df55/

[10] *See section 12.4 Sedimentation and Erosion Control of the LDS for exceptions and additional details:* https://www.waynesvillenc.gov/departments/development-services/land-use-zoning-ordinances

D. Other

Other permanent erosion and sedimentation control measures may include: permanent diversions, sodding, tree and shrub plantings, and grass-lined channels.

Permanent Diversions subdivide a development site and control the direction and velocity of runoff throughout the life of the development. They should be located during initial site planning and sloped and stabilized then. Permanent diversions may be used as temporary diversions until the site is stabilized and then completed as a permanent measure. They control the direction and velocity of runoff above steep slopes, across long slopes, below steep grades, and around buildings to other areas subject to damage from runoff.

Permanent Diversion. Image by NC DEQ

Sodding is an effective erosion control measure where immediate cover is required. Vegetation effectively protects channels, spillways, and inlets. Sodding stays year-round, it is resistant to weeds and has a very small chance of failure. However, irrigation during the initial weeks is required.

Grass-Lined Channels resemble natural systems. Generally, they are constructed in stable, low areas, sometimes on the edge of the road or site. They should not be constructed on steep slopes, and rip rap may be needed to stabilize the banks and protect them from erosion.

Trees and Shrubs provide superior, low maintenance, long-term erosion protection. In addition, they add to the aesthetics of the area. Properly selected species may adapt to steep slopes and rocky soils and will require low maintenance. The main disadvantage is that trees and shrubs will not provide an immediate erosion control as the roots take time to develop. Therefore, additional control measures may be needed in the meanwhile.

Section 7 – Stormwater

7.1 General

The Environmental Protection Agency (EPA) defines stormwater as a rainwater or melted snow that runs off streets, lawns, and other sites. When stormwater is absorbed into soil, it is filtered and ultimately replenishes aquifers or flows into streams and rivers.

To ensure that development in the Town does not result in increased stormwater runoff, which adversely impacts adjacent property, no development to which the Stormwater Ordinance applies, shall be commenced without the issuance of a Stormwater Permit, which is a part of the building permit, unless specified otherwise by the Administrator.

The Town of Waynesville Stormwater Ordinance is in **Section 12.5** of the Land Development Standards. The stormwater permitting process is described in **Section 15.7.3** of the Land Development Standards. The requirements for development within Special Flood Hazard Areas (SFHA) are described in **Section 12.3** of the Land Development Standards. The purpose of these ordinances is to protect, maintain, and enhance the public health, safety, environment, and general welfare by establishing minimum requirements and procedures to control the adverse effects of increased post-development stormwater runoff and nonpoint and point source pollution associated with new development and redevelopment, as well as illicit discharges into the Town of Waynesville's municipal stormwater systems. The ordinances can be accessed through the Town's website:
https://www.waynesvillenc.gov/departments/development-services/land-use-zoning-ordinances

The Town has a Stormwater Management page with the latest information on local, state, and federal regulations. In addition, the page contains relevant application documents, inspection forms, annual reports, stormwater-related plans, maps, and educational resources:
https://www.waynesvillenc.gov/departments/development-services/stormwater-management

In addition, all developments, including subdivision projects must comply with the North Carolina Sedimentation Pollution Control Act and all attendant regulations:

https://deq.nc.gov/about/divisions/energy-mineral-and-land-resources/erosion-and-sediment-control/erosion-and-sediment-control-laws-and-rules

The development and redevelopment projects that fall under the requirements of the Waynesville Stormwater Ordinance and that are subject to the requirements of this section are listed in chapter 6.1.C of this Manual.

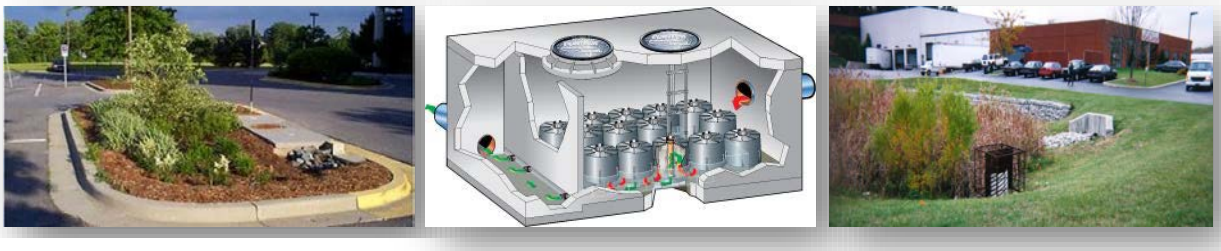
7.2 General Design Standards

- Whenever the requirements of this Manual are found to be inconsistent with any other adopted standards, codes, or regulations, the more restrictive standards shall control.

- All developments and redevelopment that fall under the Town of Waynesville Stormwater Ordinance are required to submit a **Stormwater Management System Concept Plan**. This plan shall be prepared by a licensed professional engineer or landscape architect. Stormwater Management System Concept Plan requirements are outlined in Section 15.4.4 of the Land Development Standards.

- **A Stormwater Control Measure (SCM**), also referred to as Best Management Practice (BMP), is a permanent structural device that is designed, constructed, and maintained to remove pollutants from stormwater runoff by promoting settling or filtration; or to mimic the natural hydrologic cycle by promoting infiltration, evapotranspiration, post-filtration discharge, reuse of stormwater or a combination thereof. The approved designs for the Stormwater Control Measures within Waynesville are based on the latest version of the NC DEQ Stormwater Design Manual. The latest version can be accessed here: https://deq.nc.gov/about/divisions/energy-mineral-and-land-resources/stormwater/stormwater-program/stormwater-design-manual

  Examples of SCMs include but not limited to dry detention basins, stormwater wetlands, bioretention cells, permeable pavement, underground detention systems, sand filter, grassed swale, filter strips, etc.



From left to right: Bioretention Cell, Storm Filter, Dry Detention Basin. Images by NC DEQ

https://www.waynesvillenc.gov/sites/default/files/inline-files/SCM%20Definitions_0.pdf

- The use of natural vegetation and creative landscaping in establishing stormwater control measures is required if applicable. A developer must incorporate the use of natural topography and land cover such as wetlands, ponds, natural swales as they exist prior to development to the degree that they can accommodate the additional flow of water.

- Developers are required to use the aforementioned natural measures as well as other BMPs (pervious pavement, discontinuous imperviousness, etc.) in developing property in the town's jurisdiction for the purpose of cleansing and diffusing surface water flow.

- No utilities or habitable structures may be located within any impoundment area of any stormwater management facility. Structures may not be located over a storm drainage line.

- All stormwater management facilities will be considered permanent.

- Projects impacting a FEMA Special Flood Hazard Area (SFHA) shall meet regulations outlined in Section 12.3 of the of the Land Development Standards.

- A Uniform Watershed Analysis is required for all developments. Analysis requirements are outlined in Section 12.5.7.F of the Land Development Standards.

7.3 Water Quality Standards

- All Low Density Project sites must employ LID practices to analyze the infiltration capacity and natural drainages of the site and develop a system of controls which mimic the existing natural hydrology and which cumulatively capture and treat the runoff from the 1-year 1- hour storm event. Wherever LID practices are not achievable, or have not been demonstrated, the stormwater management measures shall be designed to control the stormwater runoff according to the requirements of this section.

- All High Density projects, for both LID and conventional design approaches, shall include stormwater management measures designed to control the stormwater runoff according to the requirements of this section.

High Density Project is any project that exceeds the low density threshold for dwelling units per acre (two dwelling units per acre) or built-upon area (24%).

Low Density Project is a project that has no more than two dwelling units per acre or twenty-four percent built-upon area (BUA) for all residential and non-residential development.

7.4 Water Quantity Standards

- The calculated difference in the peak runoff rate from the post development peak flow rates, less the pre-development shall determine the size of detention structures.

- The storage shall be sufficient to store all excess surface runoff up to the 10-year 24-hour storm event.

- The post development peak flow rates discharged from any development that this section applies, shall not exceed the pre-development peak discharge rates for the 2-year, 24-hour storm event and the 25-year, 24-hour storm event.

- The temporary storage capacity shall be restored within 72 hours.

- The emergency overflow outlet must be designed to safely pass the 50-year, 24-hour storm event peak discharge.

- Requirements of the Dam Safety Act shall be met when applicable.

- No one stormwater management facility shall receive runoff from a developed or redeveloped area greater than three (3) acres. However, the total drainage area from BMPs used in series (i.e., integrated) can exceed this three-acre maximum.

- The impoundment of stormwater runoff may be incorporated in the design of stormwater conveyance structures, engineered stormwater BMPs, and ponds. These structures may be located on or off site.

- In all instances engineered stormwater management facilities and devices shall be designed to complement a development and the surrounding community. If ponds are used, such areas shall be landscaped as amenities or hidden from view.

7.5 Stormwater Conveyance System Standards

- Stormwater collection systems (drainage parallel to road, including ditches, swales, and pipes) shall be designed to pass the peak flows from the 2-year, 24-hour storm event. The minimum allowable pipe size is 15-inches.

- Cross drainage systems that do not convey intermittent or perennial streams shall be designed to pass the peak flow rates from the 10-year, 24-hour storm event.

- Cross drainage systems conveying intermittent or perennial streams, shall be designed pass peak flow rates for the 50-year, 24-hour storm event. These structures shall consist of bottomless single span structures.

7.6 Stormwater Control Measures

1. All structural stormwater control measures shall control and treat the runoff from the 1-year 1-hour storm event as determined by NOAA data for the Town of Waynesville.

2. All structural stormwater treatment management measures shall be designed to have an eighty-five (85) percent average annual removal for total suspended solids (TSS).

Dry Detention Basin off Calhoun Rd, Waynesville, NC

3. Areas designated as open space that are not or will not be disturbed, developed, or redeveloped do not require stormwater runoff treatment.

4. Where any stormwater management treatment measure utilizes a temporary water quality storage pool as a part of its designed treatment system:

   a. The drawdown time shall be a minimum of 48-hours and a maximum of 120- hours.
   b. The minimum draw down orifice size shall be 2-inches or equivalent.
   c. The post development peak flow rates discharged shall not exceed the pre development 1-year 24 hour peak discharge rates.

5. No one BMP shall receive runoff from an area greater than three (3) acres. However, the total drainage area from BMPs used in series (i.e., integrated) can exceed this 3- acre maximum.

6. Water quality BMPs may encroach into a required buffer as long as the encroachment does not disturb the majority of existing vegetation. Minor understory may be disturbed in order to accommodate water quality structures. Trees and shrubs shall be placed to maximize screening where the encroachment takes place.

7. General engineering for all projects shall be in accordance with 15A NCAC 2H.1008(c).

8. All stormwater control measures and stormwater treatment practices required under this ordinance shall be evaluated by the Stormwater Administrator according to the policies, criteria, and information, including technical specifications, standards, and the specific design criteria for each stormwater practice, in the Design Manual. The Stormwater Administrator shall determine whether proposed SCMs/BMPs will be adequate to meet the requirements.

9. All SCMs installed pursuant to the Town of Waynesville Stormwater Ordinance are subjects to annual inspections/reporting by the Stormwater Administrator. Recordation of Operations and Maintenance Agreement with the final plat/deed before is mandatory before the final certificate of occupancy. Contact the Development Services Department for more information on annual SCM inspections.

7.7 Hydrology

Many hydrologic calculation methods are available. Hydrologic calculations for Stormwater Control Measures (SCMs) should follow the latest version of the NC DEQ Stormwater Design Manual. All other stormwater hydrologic calculations should follow the recommended methods and circumstances listed in Table 7.1 below. Additional guidance for each calculation method and applicable uses can be found in the latest version of the NCDOT Guidelines for Drainage Studies.

Table 7.1 Recommended Hydrologic Methods*

Description	Size Limitations
Rational Method	0 – 100 acres
NRCS Method (TR-55)	0 – 2,000 acres
NRCS Method	Varies
FEMA FIS	SFHA Compliance

*See latest version of the NC DEQ Stormwater Design Manual for SCM design

- Methodologies not listed in the above table may be approved by the Town for use.
- The Town will review the hydrologic calculations to verify that the selected methodology is appropriate for project design.
- Minimum Time of Concertation (Tc) to be used is 5 min.

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Appendix A – Terminology

For the purpose of this manual, these terms shall have the following meanings:

APRON: The broadened paved area of a driveway where it adjoins the traveled way.

BEST MANAGEMENT PRACTICES (BMPs): Methods, measures, practices, schedules of activities, maintenance procedures, and other management practices to prevent or reduce the pollution of waters. With regard to construction, these may include structural devices such as infiltration devices, ponds, filters, constructed wetlands, or nonstructural practices such as maintenance practices, street sweeping, public education and outreach programs that are designed to prevent pollutants from entering water or to direct or reduce the flow of water.

BICYCLE LANE is a portion of the roadway that has been designated by pavement markings and signs for the preferential or exclusive use of bicyclists

CALENDAR DAY: A day shown on the calendar beginning and ending at midnight.

COMPLETION DATE: That date established as set forth in the contract, agreement, permit, or as revised by an Administrator, by which the required work shall be satisfactorily completed.

CONSTRUCTION EASEMENT: A right owned by the Public Services Department or any other entity in a parcel of land owned by a third party containing construction that exceeds the right of way.

CUL-DE-SAC: A street permanently terminated by a turnaround.

CULVERT: Any structure not classified as a bridge that provides an opening under the roadway.

DEVELOPER: Any person, firm, corporation, or duly authorized agent who develops land.

DEVELOPMENT: Any man-made change to improved or unimproved real estate, including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, or storage of equipment or materials. For stormwater calculation development shall be considered any land disturbing activity that increases the amount of built upon area or otherwise decreases the infiltration of precipitation into the soil.

DRAINAGE EASEMENT: A right owned by the Public Services Department or any other entity, in a parcel of land owned by a third party to construct and maintain ditches, channels, or structures for directing the course and flow of water outside the right of way.

DRIVEWAY: A private vehicular access connecting a dwelling, carport, garage, parking area or other buildings with a street. A driveway is not a road, street, boulevard highway or parkway.

DRIVEWAY APPROACH: The improved area between the roadway of a public street and private property intended to provide access for motor vehicles to a well-defined area on private property.

DRIVEWAY, JOINT: A joint-use driveway serving two (2) abutting properties.

DRIVEWAY, SHARED: A shared driveway with the similar characteristics as a street that serves 3 or fewer dwelling structures (single family or duplex structures), often used to reach landlocked parcels or for access management purposes.

DRIVEWAY, WIDTH: The horizontal distance between the sides of a driveway measured at the right-of-way or the back of the sidewalk (whichever is farthest from the traveled way) and measured parallel with the centerline of the traveled way. Medians shall not be included in the calculations for the width of driveways.

EASEMENT: a grant by the property owner for the use by the public, a corporation, or person of a strip of land for specified reasons.

ENGINEER: A North Carolina licensed engineer.

FILL: Any material, such as (by way of illustration) earth, clay, sand, concrete, rubble, wood chips, bark, or waste of any kind, that is placed, stored, or dumped upon the surface of the ground resulting in an increase in the natural surface elevation.

FIRE APPARATUS ACCESS ROAD: A road that provides fire apparatus access from a fire station to a facility, building, or portion thereof. This is a general term inclusive of all other terms such as fire lane, public street, private street, parking lot lane and access roadway. When two access roads are required, they shall be placed a distance apart equal to not less than one half of the length of the maximum overall diagonal dimension of the property or area to be served, measured in a straight line between accesses, unless determined otherwise by a Fire Code Official.

FIRE LANE: An approved road or other passageway developed to allow the passage of fire apparatus. A fire lane is not necessarily intended for vehicular traffic other than fire apparatus.

FIRE CHIEF: The chief official of the Fire Department serving the Town of Waynesville or their duly authorized representative/designee.

FIRE CODE OFFICIAL: The Fire Marshal or other designated authority charged with the administration and enforcement of the fire code by the Fire Chief.

HIGH DENSITY PROJECT (STORMWATER): A project that exceeds the low density threshold for dwelling units per acre (two dwelling units per acre) or built-upon area (24%).

IMPERVIOUS SURFACE: Any hard-surfaced, man-made area that does not readily absorb or retain water, including but not limited to building roofs, parking and driveway areas, graveled areas, block pavers (unless allowing vegetative growth though the pavers), roads, sidewalks, and paved recreation areas. Impervious surface includes all structures measured at their greatest extent and so as to include areas overhung by eaves, balconies, and other projecting features of the structure. Wooden slatted decks and the water area of a swimming pool are considered pervious.

INDIVIDUAL SEWER SYSTEM: Any septic tank, ground absorption system, privy, or other facility serving a single source or connection and approved by the Haywood County Health Department or other department with appropriate jurisdiction.

INDIVIDUAL WATER SYSTEM: Any well, spring, stream or other source used to supply a single connection.

INSPECTOR: An authorized representative of the Public Services Department assigned by the Administrator to make a detailed inspection of any or all portions of the work and materials.

INVERT: The lowest point in the internal cross-section of a pipe or other culvert.

LOW DENSITY PROJECT (STORMWATER): A project that has no more than two dwelling units per acre or twenty-four percent built-upon area (BUA) for all residential and non-residential development.

MATERIALS: Any substances that may be incorporated into the construction of the project.

PARKING SPACE: An area for parking a vehicle exclusive of access drives, maneuvering space, and paved areas intended for the display of merchandise (e.g., cars, boats).

PERVIOUS: A surface that allows inflow of rainwater into the underlying construction or soil**.**

PROJECT: The work specified under the contract or permit.

PROJECT SPECIAL PROVISIONS: Special provisions peculiar to the project and not otherwise thoroughly or appropriately set forth in the standard specifications or plans.

PUBLIC SERVICES DEPARTMENT OR PUBLIC WORKS DEPARTMENT: A department of the Town of Waynesville that provides municipal services to the Town's residents. The services include but not limited to trash pickup, yard waste collection, seasonal leaf collection, snow removal, street sweeping, maintenance of Town roads, sidewalks, water, sewer, stormwater infrastructure, electric maintenance, and verification and inspection of infrastructure against adopted standards.

PUBLIC SEWER SYSTEM: Any sewer system owned and operated by a local government, or other sewage treatment facility serving two (2) or more connections, or any wastewater treatment system having a discharge to surface waters when approved by the North Carolina Division of Environmental Management, or a ground absorption system serving two (2) or more connections when approved by the county sanitarian.

PUBLIC WATER SYSTEM: A system for the provision to the public of piped water for human consumption if the system serves more than fifteen (15) or more service connections or which regularly serves twenty-five (25) or more year-round residents.

PUBLIC WAY: A street, alley, sidewalk, or other parcel of land open to the outside air leading to a street that has been dedicated or otherwise permanently appropriated to the public use.

RIGHT-OF-WAY: A strip of land whose legal title has been offered for public access and is occupied or intended to be occupied by a street and is also available, with the consent of the appropriate governmental agency, for installation and maintenance of traffic control devices, regulatory and information signs, water lines, sanitary sewer lines, storm sewer lines, gas lines, power lines, and communication lines.

ROAD: Synonymous with Street and Highway.

ROADSIDE: A general term denoting the area within the limits of the right of way adjoining the outer edge of the road.

SHOULDER: The portion of the road adjacent to the traveled way for accommodation of stopped vehicles, for emergency use and for lateral support of base and surface courses.

SIDEWALK: That portion of the road primarily constructed for pedestrian traffic.

SIGN: Any display of letters, words, numbers, symbols, emblems, pictures or any combination thereof made visible for the purpose of attracting attention or of making something known, whether such display be made on, attached to, or constructed as part of a building, structure, vehicle or object.

SIGN, DIRECTIONAL: A sign or guide whose sole purpose is to direct pedestrian or vehicular traffic on the premises on which it is displayed. Examples include: "entrance," "exit," "driveway", "one-way traffic," etc.

SILT/SEDIMENT FENCE: A permeable barrier erected on small disturbed areas to capture sediment from sheet flow. It is made of filter fabric buried at the bottom, stretched and supported by steel posts.

STORMWATER: A rainwater or melted snow that runs off streets, lawns, and other sites (as defined by the EPA). When stormwater is absorbed into soil, it is filtered and ultimately replenishes aquifers or flows into streams and rivers.

STORMWATER CONTROL MEASURE (SCM): A permanent structural device that is designed, constructed, and maintained to remove pollutants from stormwater runoff by promoting settling or filtration; or to mimic the natural hydrologic cycle by promoting infiltration, evapotranspiration, post-filtration discharge, reuse of stormwater or a combination thereof. May be also called Best Management Practices (BMPs).

STREET: A dedicated and accepted public right-of-way for vehicular traffic which affords the principal means of access to abutting properties.

TRAVELED WAY: That portion of a public right-of-way that is improved for use by self-propelled vehicles or bicycles, including paved or gravel areas and any other area intended for vehicle movement.

UTILITY EASEMENT: A right owned by the Public Services Department or any other entity, in a parcel of land owned by a third party to construct and maintain utility outside the right of way.

UTILITY LINES AND RELATED APPURTENANCES: All lines and supporting apparatus or equipment related to the distribution, transmission or disposal of water, storm and sanitary sewage, natural gas, power, and telephone and telecommunication cable. "Related appurtenances" shall include such things as: sewage pump stations, telephone poles, hydrants, transformers, switching boxes, and other similar structures.

UTILITY MANHOLE: An underground structure cylindrical in shape and tapered off at the top to provide for an access manhole cover and ring.

UTILITY VAULT: An underground structure rectangular in shape and composed essentially of a floor slab, vertical walls, top slab, manhole covers, and manhole rings or frames.

WATERCOURSE: A lake, river, creek, stream, wash, channel, or other topographic feature on or over which waters flow at least periodically. Watercourse includes specifically designated areas in which substantial flood damage may occur.

For more definitions, refer to Chapter 17 of the Waynesville Land Development Standards: https://www.waynesvillenc.gov/services/ordinances-and-permits

Appendix B – Driveway Permit Form

TOWN OF WAYNESVILLE
DRIVEWAY PERMIT

www.waynesvillenc.gov

Development Services Department
9 South Main Street, Suite 110
Waynesville, NC 28786
T: (828) 456-8647

Public Services Department
129 Legion Drive
Waynesville, NC 28786
T: (828) 456-3706

LOCATION OF PROPERTY: **Building Permit # (*if applicable*)** _____

Address _____

PIN _____

DEVELOPMENT TYPE: Residential Commercial Industrial Other _____

ZONING DISTRICT: _____

DRIVEWAY: Proposed width _____ feet, connects to _____
Street Name

AGREEMENT:

I, the undersigned property owner or applicant on behalf of the named property owner, request permission to construct driveway(s) on public right-of-way at the above location(s) and agree to the following:

- Construct the driveway(s) in absolute conformance with current Town standards and approved plans
- Provide necessary sight distance easements if deemed necessary by the Town
- Promptly repair areas disturbed by construction in Town rights-of-way
- Provide and be responsible for work zone traffic control measures, flaggers, and other warning devices for the protection of traffic in and adjacent to a Town right-of-way
- Maintain driveway(s) in a manner so as not to interfere with or endanger public travel
- Indemnify and save harmless the Town of Waynesville from all damages and claims that may result from this construction
- No signs or objects will be placed on or over the public right of way other than those approved by the Town
- Notify the Town 24 hours in advance to beginning work

I understand that any permit issued based on this application becomes void if construction of the driveway(s) is not completed within one (1) year of the approval date shown on the permit.

Owner _____
Address _____
Phone _____
Signature _____
Date _____

Applicant _____
Address _____
Phone _____
Signature _____
Date _____

PROVIDE A SKETCH OF PROPOSED DRIVEWAY(S) ON REVERSE SIDE OR ATTACH SITE PLAN OF DRIVEWAY LOCATION(S). CALL (828) 456-3706 FOR ADDITIONAL INFORMATION.

CALL (828) 456-8647 TO SCHEDULE AN INSPECTION BEFORE AND AFTER POURING THE DRIVEWAY

Permit issued on (date) _____ **Approved by (Public Services Official)** _____

PRELIMINARY INSPECTION (prior to pour):

- Driveway Width _____ ft.
- Apron Length (*minimum 10 ft from the edge of the traveled way*) _____ ft.
- Apron Material: _____
- Driveway Separation from Other Driveways *(if applicable)* _____ ft.
- Driveway Separation Waived by (*authorized Administrator*) _____
  Engineering documents must be provided.

- Distance Between the Front Wall/Garage Door to the Back of Sidewalk Along the Driveway (*minimum 25 ft to prevent blocking the sidewalk when parking*) _____ ft.

- Is the Street an Alley? Yes No (*circle*) *If yes, see section 9.8.3.D(4) of the LDS.*
- Joint Driveway? (serves **2 abutting properties**) Yes No (*circle*)
- Shared Driveway? (serves **3 or fewer structures**) Yes No (*circle*)
- Drainage Adequate? Yes No (*circle*)
- Curb/Gutter Adequate? Yes No (*circle*)
- Sight Area Maintained (*sight triangle*)? Yes No (*circle*)

Comments: _____

Result: Pass Fail *(circle)* Inspector: _____ Date: _____

FINAL INSPECTION (post pour):

- Apron Width _____ ft.
- Apron Length (*minimum 10 ft from the edge of the traveled way*) _____ ft.
- Apron Material: _____
- Driveway Separation from Other Driveways *(if applicable)* _____ ft.
- Driveway Separation Waived by (*authorized Administrator*) _____
  Engineering documents must be provided.

- Distance Between the Front Wall/Garage Door to the Back of Sidewalk Along the Driveway (*minimum 25 ft to prevent blocking the sidewalk when parking*) _____ ft.

- Is the Street an Alley? Yes No (*circle*) *If yes, see section 9.8.3.D(4) of the LDS.*
- Joint Driveway? (serves **2 abutting properties**) Yes No (*circle*)
- Shared Driveway? (serves **3 or fewer structures**) Yes No (*circle*)
- Drainage Adequate? Yes No (*circle*)
- Curb/Gutter Adequate? Yes No (*circle*)

- Sight Area Maintained (*sight triangle*)? Yes No (*circle*)

Comments: _____

Result: Pass Fail *(circle)* Inspector: _____ Date: _____

DRIVEWAY MUST NOT INTERFERE WITH LIGHTS, TRAFFIC SIGNAL POLES, SIGNS, FIRE HYDRANTS, CROSSWALKS, DRAINAGE SYSTEMS, AND OTHER STREET STRUCTURES OR MUNICIPAL FACILITIES.

Driveway Width:

Required driveway width pertains to the measurement at the sidewalk. At other points the width may vary.

- Driveways serving **single family and duplex residences** should have a minimum width of 10 feet and shall not exceed a maximum width of 18 feet.

Non-Residential and Multi-Family Driveways:

a) One-way drives shall have a minimum width of 12 feet and not exceed a maximum width of 18 feet.

b) Two-way drives shall have a minimum width of 18 feet and not exceed a maximum width of 24 feet.

c) Driveways entering industrial property may be up to 36 feet in width with the approval of the Administrator.

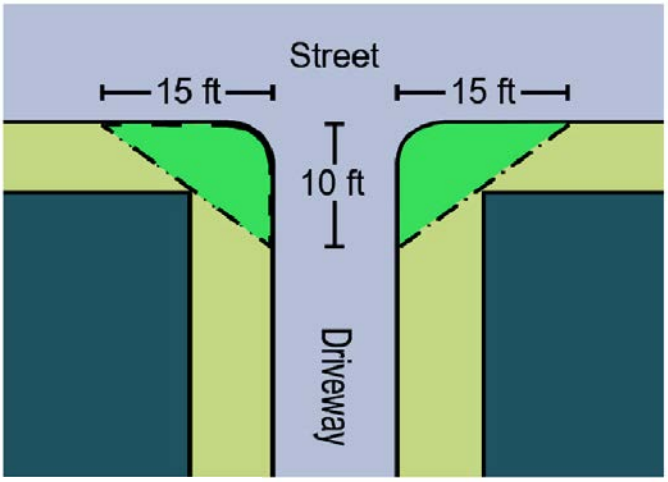
Driveway Spacing:

Access separation between driveways shall be measured from inside edge to inside edge of driveways. Access separation between a driveway and intersecting street shall be measured from the nearest edge of the driveway to the intersection right-of-way lines.

District Category	Applicable Districts	Driveway Spacing (Min)
Residential—Low Density (RL)	CC-RL, EN-RL, FC-RL, HT-RL	40 ft. (75 ft. between driveways and streets)
Residential—Medium Density (RM)	CP-RM, D-RM, HM-RM, SW-RM	No minimum.
Neighborhood Residential (UR)	AC-NR, LL-NR, MS-NR, N-NR, PS-NR, PC-NR, RC-NR, SS-NR, WS-NR	No minimum.
Urban Residential (UR)	EW-UR, H-UR, HM-UR	No minimum.
Neighborhood Center (NC)	PS-NC, RC-NC, NM-BD	100 ft. (100 ft. between driveways and streets) or as determined by AASHTO Standards or NCDOT permit.
Business District (BD)	CBD, SM-BD, H-BD	50 ft. (100 ft. between driveways and streets) or as determined by AASHTO Standards or NCDOT permit.
Regional Center (RC)	RA-RC, DJ-RC, NC-RC	150 ft. (250 ft. between driveways and streets) or as determined by AASHTO Standards or NCDOT permit.
Commercial Industrial (CI)	CI	50 ft. (150 ft. between driveways and streets) or as determined by AASHTO Standards or NCDOT permit.

Example of a Good Driveway

Sight Visibility Triangle



Reference: Land Development Standards, Section 9.8- Driveway Access

SITE DRAWING (or attach the plan)

Appendix C – Land Disturbing Permit

TOWN OF WAYNESVILLE
Development Services Department
PO Box 100
9 South Main Street, Suite 110
Waynesville, NC 28786
Phone (828) 456-8647 • Fax (828) 452-1492
www.waynesvillenc.gov

$25 permit fee
Other fees may apply with additional inspection requirements

Land Disturbing Permit

This form must be accompanied by a site plan, drawn to scale, showing the overall topography of the site, the areas of proposed land disturbance, any surface water, & all erosion control measures.

Property Address: _____ **PIN:** _____

Property Owner(s): _____ **Telephone:** _____

Surface area to be disturbed (square feet or acres): _____

Purpose of the land disturbance: Residential Construction ☐ Commercial Construction ☐

Manufactured Home ☐ Driveway ☐ Other Activity ☐ (Describe) _____

Land Disturbing Specifications (Check and complete all that apply)

- ☐ Disturbed area is 1 acre or greater. If so, a Certificate of Plan Approval from the NC Department of Environmental Quality is required.
- ☐ Disturbed area is located at or above 2,900 feet elevation. If so, Hillside Protection standards apply (Land Development Standards, Section 12.6) Average slope of property _____%
- ☐ Fill slope(s) will be created. If so, indicate maximum slope(s): _____
- ☐ Cut slope(s) will be created. If so, indicate maximum slope(s): _____

For fill or cut slopes, Land Development Standards, Section 12.4.4(B) applies.

- ☐ Regular or intermittent surface water on site. ☐ Designated trout waters on site.

Applicant (*If other than owner*) **Name:** _____ **Telephone:** _____

Office Use Only
This signature authorizes the land disturbing activity described above and in any required attachments. Any deviation from the land disturbing activity described above and in attachments shall require resubmittal, approval, and the issuance of a new Land Disturbing Permit.

_____ _____
Development Services Staff Signature Date

Additional forms can be found at: https://www.waynesvillenc.gov/departments/development-services/permits-and-application-forms

Notes and Revisions Needed