

MONTREAT CODE OF GENERAL ORDINANCES

CHAPTER D - STREETS AND PUBLIC WALKWAYS

ARTICLE IV: STREET STANDARDS

(Adopted 7/09/2009)

(Revised 3/11/2010)

Section 1. Town Streets. The following regulations and design standards are intended to provide safe and necessary access to both public and residential areas of the Town of Montreat, and to ensure preservation of the unique character of this community. In the interest of accommodating projected future growth and enabling residents to maintain needed connectivity, town streets will be designed to encourage use by pedestrians, automotive, and alternative transportation.

Section 2. General Requirements. All streets to be built within the planning jurisdiction of the Town shall be constructed as described in this ordinance and shall meet the minimum street construction standards for the Town so that said streets, when completed, may be accepted by resolution of the Board of Commissioners in accordance with G.S. 160A-374. No private streets will be platted within the existing corporate limits of the Town.

Section 3. General Design Principles – Streets. The Comprehensive Plan for the Town encourages development of a balanced network of streets, pathways and trails that accommodate the mobility needs of its residents, visitors and students whether they travel by vehicle, bicycle or foot, while providing safe access to the properties in the community. Equally important, the Plan encourages a highly interconnected system of non-vehicular circulation routes to provide connectivity to community destinations with minimal disturbance to vegetation. Off-street parking is encouraged throughout the Town wherever practicable.

- 1) Streets shall interconnect within a development and with adjoining development. Streets within a new development shall connect to existing streets and rights-of-way. Street stubs shall be provided to the property line to provide for future development. Streets shall be planned with due regard to the designated circulation system as guided by the Comprehensive Plan and any other applicable approved plans.
- 2) Streets shall be designed as the main public space of the Town and shall be arranged so as to encourage pedestrian traffic as well as other alternate forms of transportation.
- 3) Newly constructed thoroughfares or local streets shall be bordered by sidewalks or walking paths on one or both sides as determined by the Comprehensive Pedestrian Master Plan.

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- 4) Streets shall be designed with street trees planted in a manner appropriate to their function. When used, street trees shall compliment the face of the buildings and shade the sidewalk. Street trees should allow the free movement of emergency vehicles.
- 5) Wherever possible, streets should be designed to fit the contours of the land and should minimize removal of significant trees.
- 6) All streets, shall be constructed in accordance with the design and construction standards in this code and shall be maintained for public access whether by easement or by public dedication. Closed, guarded, or gated streets are strictly prohibited.
- 7) The use of traffic calming devices such as raised intersections, lateral shifts, and roundabouts may be encouraged as alternatives to conventional traffic control measures with approval of the Town Administrator and Public Works Director.

Section 4. Street Classifications.

- 1) Thoroughfares. Major streets which serve as collectors of traffic from local streets, carrying it within and out of the Town's jurisdiction.
- 2) Local Streets. Streets which primarily provide access to abutting property, may provide direct connection to a thoroughfare and serve more than ten (10) dwelling units.
- 3) Lane. Minor streets which are primarily pedestrian-oriented and residential in nature, but do not serve more than ten (10) dwelling units.
- 3) “Green” Street. A local street or lane demonstrating a combination of interrelated Low Impact Development (LID) elements designed to retain and treat stormwater runoff, which may provide integral traffic-calming features, that promotes the use of sustainable materials and achieves an overall reduction in environmental impact.
- 4) Cul-de-sacs. A local street or lane having one end open to traffic and the other end permanently terminated by a vehicular turnaround. Cul-de-sacs shall be designed to maintain adequate dimensional access for emergency service equipment as contained in current North Carolina State Fire Code.

Section 5. Street Engineering and Design Specifications. Street designs shall permit the comfortable use of the street by cars, bicyclists, and pedestrians. Pavement widths, design speeds, and the number of vehicle lanes should be minimized. The specific design of any given street must consider the building types which front on the street and the relationship of the street to the Town's street network. New development that adjoins existing publicly

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maintained streets or adjoins existing platted roads shall in either case be required to upgrade those streets to meet the standards of this Section and the Ordinance Regulating the Extension of Public Utilities and Streets. The services of a professional engineer or consultant engaged by the Town may be required to provide recommendations regarding the plans for any proposed street system to be dedicated to the public. Any and all fees associated with additional technical review services retained by the Town concerning the proposed project are the sole responsibility of the applicant. The following specifications shall apply to public infrastructure design:

5.1 Street Materials. 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.

Joint filler shall be a non-extruding joint material conforming to ASTM C1751.

Concrete Curing Agents shall be free from any impurities which may be detrimental to the concrete and meet Section 1026 of the North Carolina Department of Transportation (NCDOT) Standard Specifications for Roads and Structures.

Aggregate for Portland cement concrete shall meet the requirements for fine and coarse aggregate of Section 1014 of the NCDOT Standard Specifications for Roads and Structures.

Portland cement and admixtures shall meet the requirements of Section 1000 of the NCDOT Standard Specifications for Roads and Structures.

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.

Aggregate Base Course (ABC) shall consist of an approved coarse aggregate produced in accordance with the requirements indicated in Section 520 of the NCDOT Standard Specifications for Roads and Structures.

Bituminous Base Course, Type B25.0B mixture shall conform to Table 2 in Section 4.6 of the latest edition of the Superpave Hot Mix Asphalt/Quality Management System of the NCDOT Pavement Construction Section.

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Bituminous Intermediate Course, Type I 19.0B mixture shall conform to Table 2 in Section 4.6 of the latest edition of the Superpave Hot Mix Asphalt/Quality Management System of the NCDOT Pavement Construction Section.

Bituminous Surface Course SF 9.5A and S 9.5B mixture shall conform to Table 2 in Section 4.6 of the latest edition of the Superpave Hot Mix Asphalt/Quality Management System of the NCDOT Pavement Construction Section.

Tack Coat shall conform to Section 9.31 of the latest edition of the Superpave Hot Mix Asphalt/Quality Management System of the NCDOT Pavement Construction System. Concrete Pavement shall meet Section 700 of NCDOT Standard Specifications for Roads and Structures.

Geotextile Fabric may be used to stabilize a roadway, subgrades, slopes, and for other uses as necessary. At least one week prior to using this fabric, a sample and its associated engineering data shall be submitted to the Town for approval. Areas stabilized with fabric shall be indicated on "as-built" drawings with the manufacturer name and type fabric indicated.

Sidewalk material may vary according to the overall design and character of the development but must be approved by the Town Administrator and Public Works Director.

5.2 Street Signs and Traffic Control Signs. All street and traffic control signs shall be installed by the developer prior to the issuance of any certificates of occupancy. These signs will be maintained by the Town and shall be consistent with the Manual on Uniform Traffic Control Devices (MUTCD). All specialty traffic control and street name signs and posts must comply with appropriate standards for size, reflectivity, location, etc.

5.3 Sidewalks. Sidewalks or walking paths shall be constructed within the street right of way and along one side of all thoroughfares and local streets as determined by the Comprehensive Pedestrian Master Plan.

Sidewalks shall be a minimum of five (5) feet in width. The minimum thickness of a sidewalk constructed of concrete or asphalt shall be four (4) inches. At locations where a driveway crosses a sidewalk, a six (6) inch depth is required. A minimum depth of four (4) inches of ABC is required under all sidewalks. Sidewalks shall have a uniform slope toward the roadway of ¼ inch per foot. The utility strip between the sidewalk and the back of curb shall not be less than ¼ inch per foot nor greater than ½ inch per foot toward the roadway unless approved by the Public Works Director and the engineering

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firm hired by the Town to review the street and sidewalk design. Where no curb and gutter exists on a road that requires sidewalks, the Public Works Director may require curb and gutter installation in addition to the installation of the sidewalk. Sidewalks should be constructed with an adequate planting strip where practical.

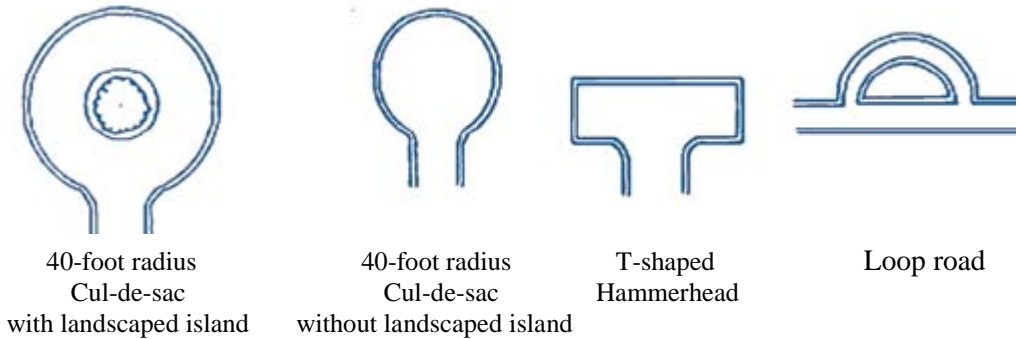
A sidewalk may be constructed so as to provide a gradual meander and to facilitate the installation of landscape material, vegetated stormwater management features, or to avoid existing obstacles such as power poles, fire hydrants, street lights, etc. The design of the sidewalk shall be such that pedestrian safety is provided and the usability of the sidewalk is not affected. The Town is receptive to reviewing alternate designs relative to the provision of pedestrian facilities not outlined herein. Such alternate designs may include greenways or a combination of sidewalks and greenways. The requirement for a sidewalk may be waived by the Public Works Director and Town Administrator.

All new sidewalks shall be constructed of either concrete, asphalt or other approved material. Alternative type materials may be presented to the Public Works Director for consideration. Pervious materials not meeting ADA requirements shall not be allowed due to concerns for pedestrian accessibility/usability and maintenance costs.

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

5.4 Bike Paths. All new developments within the existing town limits may be required to include bike lanes at the direction of Town Council upon recommendation by the Town Administrator and Public Works Director. Bike paths shall be a minimum of four (4) feet in width unless otherwise permitted. Bike lanes and bike paths shall be designed according to the North Carolina Bicycle Facilities Planning and Design Guidelines, published by NCDOT.

5.5 Cul-de-sacs. Cul-de-sacs may be permitted only where topographic conditions and/or exterior lot line configurations offer no practical alternatives for connection or through traffic. If permitted, a cul-de-sac radius shall be at least forty (40) feet or as approved by the Public Works Director and Town Administrator. Alternative termination designs may be submitted for consideration by the Public Works Director and Town Administrator. All alternative designs shall require evaluation for emergency vehicle accessibility by the Fire Chief providing fire protection service for the Town.



Four alternative turnarounds for residential streets

5.6 Intersections. All new streets shall intersect as nearly as possible at right angles and no street shall intersect at less than sixty (60) degrees.

Intersections shall be at least one hundred and fifty (150) feet apart measured from centerline to centerline, except lanes. Where a centerline offset occurs at an intersection, the distance between centerlines of the intersecting streets shall not be less than sixty (60) feet.

Curb radii at street intersections shall be rounded with a minimum radius of fifteen (15) feet. At an angle of intersection of less than 90 degrees, a greater radius may be required. Curb radii shall be designed to reduce pedestrian crossing times along all streets. In general, curb radii should not exceed twenty five (25) feet.

Proper sight lines shall be maintained at all intersections of streets to permit adequate sight distance.

Street trees shall be held twenty (20) feet from intersections to allow turning radius of emergency vehicles.

5.7 Utility Location. All newly installed utilities shall be located underground in either the right-of-way or a public utility easement.

5.8 Curbs and Drainage. Standard curbing is required along all streets with marked on-street parking and around all required landscaping areas and parking lots. Valley curb and gutter shall not be allowed where road grades exceed five percent (5%). Twenty-four (24) inch curb and gutter is required along streets; Eighteen (18) inch curb and gutter is allowed in parking areas. Drainage shall be provided using closed curb and gutter systems or open swales depending on approval of the Public Works Director. All

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storm drainage systems shall be designed in compliance with the requirements of “Article III - Stormwater Management” for the Town of Montreat. All streets proposed for dedication to the Town shall be designed with minimum storm drainage capacity for runoff from the twenty five (25) year storm event. In areas where bridges or major culverts are constructed, or in areas subject to flooding, streets shall be designed with storm drainage capacity for runoff from the fifty (50) year storm event. All drainage grates must be safe for bicyclists. Bicycle-safe drainage grates are Types E, F, and G approved by the NCDOT (Standard Detail 840.03 – Frames, Grates and Hood – for use on Standard Catch Basin).

5.9 Minimum Width of Shoulder or Berm. The minimum width of a shoulder on a street proposed for dedication to the Town shall be as set forth in “Table 1. Town Street Standards” contained in this Section.

5.10 Centerline Radius. A minimum radius of ninety (90) feet and a minimum tangent of fifty (50) feet shall be provided between reverse curves on all streets. Centerlines may be varied upon approval of the Public Works Director.

5.11 Pedestrian Crosswalks. Where deemed necessary by the Public Works Director, a pedestrian crosswalk at least ten (10) feet in width may be required to provide convenient public access to a public area such as a park, greenway, or place of assembly, or to a water area such as a stream, river, or lake. The pedestrian crosswalks shall be designated as a crosswalk with pavement marking and signage in accordance with the MUTCD and must be approved by the Public Works Director prior to installation. The use of pervious paving materials shall be encouraged for construction of pedestrian crosswalks, wherever practicable, as a Low Impact Design (LID) measure.

5.12 Posted Speed Limits. The Town wide speed limit shall be a maximum of twenty (20) miles per hour unless otherwise posted.

5.13 Specific Requirements. Horizontal Curves - All streets proposed for dedication to the Town where a total center line deflection angle of more than ten degrees (10°) occurs, shall have a circular curve introduced.

Paving: All streets proposed for dedication to the Town shall either be improved gravel roads or shall be paved in accordance with the following minimum standards of the Town Public Works Department hereinafter referred to as the Public Works Department:

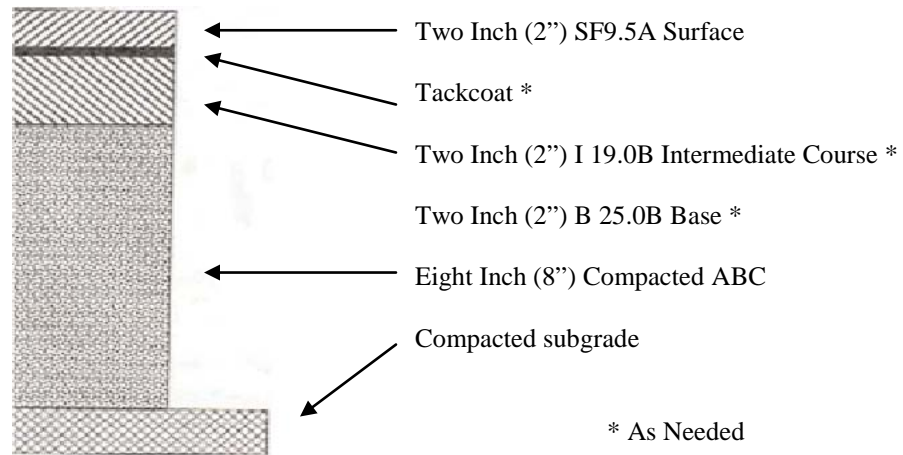
- 1) Earth Cuts and Fills: All earth fills within street right-of-way shall be placed with tested and controlled compaction methods. Compaction must be at least 100% in accordance with the standard (not modified) Proctor Test. Graded

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area of cut within the street right of way shall be tested to be sure that they are also within the 100% compaction requirements for fills. Where found deficient, the top twelve inches (12") shall be removed and replaced using proper compaction methods and equipment to achieve the required 100% compaction requirement. No stone base shall be placed until the Town Street Department has inspected and approved the subgrade. Independent testing laboratory samples will be required to show that tests have been made and the results meet the requirements.

2) Pavement or Stone Base: Crushed stone aggregate base material shall meet the North Carolina Department of Transportation specifications for stabilized stone base and shall have a minimum compacted thickness of eight (8) inches.

Figure 1. Paving Specifications



3) Paving Surface Course - Asphalt paving material shall meet North Carolina Department of Transportation specifications and shall have a minimum compacted thickness of two (2") inches. More stringent requirements may be imposed by the Town Public Works Department for pavement base and surface course where load bearing characteristics of the soil are unstable or otherwise deficient.

Private Streets: There shall be no private streets platted within the Town of Montreat corporate limits.

Conformity to Surrounding Development: The proposed street layout within a subdivision shall be coordinated with the existing street system of the surrounding area.

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Pedestrian Ways: Streets shall be designed or public walkways provided to assure safe and reasonable access to parks, playgrounds, schools, and other places of public assembly. Pedestrian Crosswalks may be required by the Public Works Director.

Street Cross-Section: See “Table 1. Town Street Standards” for cross-section information.

Shoulders: Where concrete curb and gutter are used, the shoulder may be reduced to two feet (2’) on both sides.

Water and Sewer: Water and sewer infrastructure shall be installed according to provisions contained in Chapter E “Utilities” and the Ordinance Regulating the Construction and Financing of Public Improvements for the Town. The main sewerage collector lines must meet the Metropolitan Sewerage District or Buncombe County Health Services Regulations.

Fire Hydrants: Fire Hydrants shall conform to the American Water Works Association Standard for Dry Barrel Fire Hydrants (AWWAC502). Hydrants shall have at least three (3) outlets; one outlet shall be a pumper outlet and other outlets shall be at least two and one-half (2 ½ “) inch nominal size. The street connection shall be not less than six (6) inches in diameter. Hose threads on outlets preferably should conform to National Standard dimensions. A valve shall be provided on connections between hydrants and street mains. Hydrants that operate in a direction opposite to that of the majority shall be considered unsatisfactory. Flush hydrants are considered undesirable because of delay of operation, which is more serious because of the possibility of heavy snow. At no place on the main or artery lines will there be a distance of more than one thousand (1,000) feet between hydrants.

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Table 1. Town Street Standards

Type of Street	Min. R/W Width	Min. Pavement or Gravel Width		⁴ Min. Shoulder Width		Max. Grade	Sight Distance	Design Speed (MPH)
		³ Curb	⁴ No Curb	Cut	Fill			
Thoroughfare	40'	20'	20'	8'	8'	12%	250'	30
Local Street	30'	18'	18'	4'	4'	16%	100'	20
¹ Cul-de-sacs	30'	16'	13'	2'	3'	16%	60'	5
Unpaved Road	30'	16'	16'	2'	3'	16%	60'	15
Lane	30'	16'	16'	2'	3'	16%	60'	15
"Green" Street	30'	14'	14'	*2'	*3'	*14%	*60'	*15

NOTE: For all road types, the minimum cross slope from crown of the road shall be one quarter (1/4) inch per foot.

¹ Cul-de-sacs shall be terminated by a circular right-of-way of not less than a thirty (30) foot radius and a circular pavement width of not less than fifteen (15) foot radius. Incorporation of bioretention areas (rain gardens) in the form of vegetated island depressions within cul-de-sacs shall be encouraged to promote alternative means of treating stormwater flow from the pavement.

² "Green" Street designs allow for utilization of Low Impact Development (LID) concepts demonstrating such features as:

- Interspersed flow-through infiltration planting and bioretention areas;
- Pervious paving materials
- Vegetated/pervious swales
- Varying width, meandering curbless streets; or
- Other alternative designs implementing proven low impact features that are determines to provide comparable safety, functionality and that are in keeping with the character and image of the community

The "Green" Street option is provided to encourage development of a more environmentally sensitive and sustainable transportation infrastructure throughout the Town. All proposed designs must first be submitted to Town Administration for consideration and approval.

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*A “Green” Street design may modify required parameters such as minimum shoulder width, maximum grade, sight distance and design speed from listed tabular values if specifications submitted by the designer are tenable, and subsequent review by the Town confirms the variance is justifiable.

³ Where concrete curb and gutter is used, the shoulder may be reduced to two (2) feet on both sides. Curb cuts shall be incorporated at regular intervals, wherever practicable, to direct stormwater flow to vegetated swales, sheet flow across grassy filter strips, or into other structural stormwater treatment features designed to provide infiltration and prevent a concentrated flow of rainwater.

⁴ Where concrete curb and gutter is not used, pervious shoulder surfacing materials, such as permeable interlocking concrete pavement (PICP), grass/gravel pavers, or concrete grid paver (CGP) systems shall be encouraged when site conditions and topography permit sheet flow of rainwater off the roadway and low impact design is the intended goal, pervious shoulder surfacing materials may be required. A reduction of up to three (3) feet in pavement width is permitted with the application of these pervious systems installed within shoulders at pavement grade level.