

02.00 STREETS

02.01 GENERAL

02.01.01 STREET CLASSIFICATIONS

1. *ARTERIAL STREET* – A federal and/or state highway designed primarily for the movement of large volumes of vehicular traffic from one area to another; a thoroughfare.
2. *COLLECTOR STREET* – A public way designed primarily to connect residential streets with arterial streets and/or to provide direct connection between two or more arterial streets and which may be designed to carry significant volumes of vehicular traffic having neither origin nor destination on the street.
3. *MINOR STREET* – A public way used primarily for providing direct access to abutting properties. *MINOR STREETS* are further classified as:
 - A. Residential - those streets whose primary function is to provide direct access to residential property.
 - B. Commercial-Industrial - those streets whose primary function is to provide direct access to commercial-industrial property.
 - C. Cul-de-Sac - a short minor street having one end open to traffic and the other end permanently terminated with a vehicular turnaround. The maximum length of a cul-de-sac is 1200 feet.
4. *STREET, HALF* – A proposed vehicular travelway intended to be developed by constructing one-half of a required multi-lane width with the remainder to be provided at some future date.
5. *STREET, PRIVATE* – A vehicular travelway not dedicated as a public street.
6. The final determination of the classification of streets in a proposed subdivision shall be made by the Planning Board. Streets shall be planned, designed and dedicated as public streets.

02.01.02 STREET NAMES

1. Proposed streets, which are obviously in alignment with others already existing or proposed and named shall bear the names of the existing or proposed ones if the development is zoned the same.
2. In no case shall the names of proposed streets duplicate or be phonetically similar to other existing street names in the jurisdiction irrespective of the addition of a prefix, suffix or word such as street, avenue, place, drive or court.
3. The Union County Communications Department shall approve all street names. Contact the City of Monroe Engineering Department to initiate requests.

02.01.03 TRAFFIC STUDIES

1. Traffic Studies may be required when deemed necessary by the City Engineer to determine the impact of proposed development on existing and proposed roadways.
2. Traffic Studies will be conducted by a Traffic Engineer who is a registered Professional Engineer in the State of North Carolina.
3. Studies include but are not limited to analysis of traffic generated by a proposed project in conjunction with existing land uses and conditions. Daily and peak hour impacts attributed to the project's trip generation shall be estimated and assessed, as well as cumulative impacts associated with other approved or anticipated growth. Parking and on-site access/ circulation adequacies are also evaluated. Mitigation measures are recommended to minimize a project's potential impacts on the surrounding street system.

02.01.03A MITIGATING THE IMPACTS OF DEVELOPMENT ON SELECTED STREETS WITHIN THE CITY OF MONORE

In an effort to promote public safety and to protect public investment in public streets within the City of Monroe, certain development along selected streets may be required to provide off-site roadway improvements. Such improvements may include but shall not be limited to lane widening, and providing turn lanes and acceleration/deceleration lanes. The criteria for determining where and when such improvements may be required are as follows:

1. Streets Where Improvements May be Required:
 - A. All major thoroughfares, as shown on the City's adopted Thoroughfare Plan.
 - B. All minor thoroughfares, as shown on the City's adopted Thoroughfare Plan.
 - C. All major collector streets, as defined by staff.

2. Development Thresholds Triggering Potential Off-Site Improvements:
 - A. Single-family residential subdivisions consisting of more than 75 lots.
 - B. Two family, multi-family, and manufactured home communities consisting of more than 75 units.
 - C. Commercial/retail uses consisting of 25,000+ square feet of gross floor area.
 - D. Industrial uses consisting of 50,000+ square feet of gross floor area or employing 100+ individuals.
 - E. Institutional uses, excluding residential care facilities, designed to accommodate 200+ individuals.
 - F. Residential care facilities designed to accommodate 100+ individuals.
 - G. All other uses projected to generate 500+ trips per day.
3. Factors Affecting the Decision to Require Off-Site Improvements:
 - A. The design capacity of adjacent roadways.
 - B. The latest traffic counts available on adjacent roadways with ADT exceeding 3,000 vehicles per day.
 - C. The proximity of the proposed use to schools, playgrounds, and similar facilities.
 - D. The proximity of the use to intersections and the capability of those intersections to adequately deal with the projected increased traffic.
 - E. Sight distance at all driveway entrances.
 - F. The number and location of driveway entrances proposed.
 - G. The hours of operation of the proposed use.

Additional Notes:

1. The City Engineer may require a developer to submit a traffic impact analysis as part of, or in addition to, any other information required for plan approval to determine impacts of the proposed development on existing and proposed roads.
2. Any developer may choose to submit a traffic impact analysis prepared and sealed by a professional engineer demonstrating the sufficiency of adjacent roadways to handle the increased traffic generated by the use.
3. For those projects requesting legislative rezoning, the City Council or Board of Adjustment, whichever approves the permit, pursuant to recommendations by Staff, shall decide whether to require off-site transportation improvements as a condition of permit approval. For those projects requesting a driveway permit from the City, but not requesting legislative rezoning, the City Engineer shall decide whether to require off-site transportation improvements as a condition of permit approval. An appeal from the decision of the City Engineer may be taken by the applicant to the Board of Adjustment.

02.01.04 NCDOT DRIVEWAY PERMIT AND ENCROACHMENT REQUIREMENTS

1. Where proposed streets connect with a roadway maintained by the NCDOT, the Developer shall be required to obtain a Driveway Permit from the NCDOT.
2. The Developer shall obtain an approved Encroachment Agreement prior to beginning work within an NCDOT right-of-way for all utility, sidewalk, and storm drainage improvements.
3. For residential, commercial, and industrial developments, which connect to State-maintained roadways, digital copies of the site plan and a completed NCDOT Driveway Application shall be submitted to the City of Monroe Engineering Department. Once the application is approved by the City of Monroe it will be forwarded to NCDOT for final approval.
4. See Standard 07.01 PERMITS for further information.

02.01.05 CITY OF MONROE DRIVEWAY PERMIT AND OTHER DRIVEWAY INFORMATION

1. For residential, commercial, and industrial developments requiring access from an existing roadway, a completed Driveway Permit (found in Standard 07.07) and a digital copy of the site plan must be submitted to the City of Monroe Engineering Department.
2. Driveway placement shall be in accordance with NCDOT standards or as otherwise defined by this manual.
3. Refer to details 02.04.01 – 02.04.04 for driveway placement information.
4. When the use of a property is changed or altered, a new City of Monroe Driveway Permit or NCDOT Driveway Permit must be obtained prior to the change.
5. Failure to secure a driveway permit prior to construction or change in the use of the property may result in the removal by the City of the driveway(s) or entrance(s) at the expense of the Building Contractor/Property Owner.
6. Refer to Standard 07.07 for City of Monroe Driveway Permit form.

02.02 DESIGN**02.02.01 GENERAL ROADWAY DESIGN REQUIREMENTS**

1. Pavement widths shall be in accordance with Details 02.01.01-02.01.07.
2. Pavement cross-sections shall be in accordance with Details 02.01.01-02.01.07

3. In lieu of utilizing the City of Monroe standard pavement cross-section for residential streets, and as approved by the City Engineer, the Developer may hire a Geotechnical Engineering Firm to perform a CBR test to determine the required cross-section. However, the minimum pavement cross-section shall be 1.5" of Bituminous Concrete Surface Course and either 4" Bituminous Concrete Base Course or 8" of compacted Aggregate Base Course.
4. Curb and gutter shall be constructed in accordance with Details 02.02.01 – 02.02.07 except as provided in Standard 02.02.09.
5. Concrete for sidewalk shall have a minimum compressive strength of 3,600 psi.
6. Planting strips shall be in accordance with Details 02.01.01-02.01.07.
7. Utility separations shall be in accordance with Details 02.01.01-02.01.07.
8. The maximum grade of a new roadway shall be 8%.
9. The minimum grade of a new roadway shall be 1.0% except as allowed at intersections or approved by the City Engineer.
10. The design speed of new minor streets and roadways shall be 25 MPH and 35 mph for new collector streets.
11. The design speed of new arterial streets and roadways shall be a minimum of 45 MPH or as directed by the City Engineer.
12. The minimum centerline curve radius shall be 150 feet.
13. Superelevation of curves shall be in accordance with Standard 02.02.02.
14. The minimum tangent between reverse curves shall be 100 feet.
15. The maximum cut/fill slope shall be 2:1. A 3:1 cut/fill slope is recommended for ease of future maintenance.
16. The K values (crest/sag) for local roadways shall be 20/20. The K values (crest/sag) for collector roadways shall be 45/45. The K values (crest/sag) for arterial roadways shall be 80/120.
17. All proposed streets shall intersect with existing roadways at an angle of 90°. Intersections may be allowed to have a minimum angle of 75° for low volume, extreme conditions subject to the approval of the City Engineer.
18. All proposed residential roadway intersections shall have a minimum edge of pavement radius of 30 feet and a minimum right-of-way radius of 20 feet.

19. All proposed commercial roadway intersections shall have a minimum edge of pavement radius of 45 feet (50 feet recommended) and a minimum right-of-way radius of 30 feet.
20. Sight triangles shall be in accordance with Detail 02.01.10.
21. Designs such as a “bubble type” configuration along a through road to allow more lots will not be allowed.
22. Any intersection that shall not have a catch basin constructed at the radii of intersections shall maintain a minimum curb return grade of 1.0%.
23. The Developer shall utilize the pavement design cross-sections per Details 02.01.01-02.01.08 unless an alternate design is submitted that is sealed by a Professional Engineer and is accepted by the City Engineer.
24. Street pavement sections and right-of way-widths are to be uniform along the roadway length except when necessary to accommodate turn lanes and islands at entrances. Pavement widths and right of way widths on a cul-de-sac street shall not transition to a lesser typical section as lots decrease in number.
25. The location and design of streets shall be in conformance with the adopted Thoroughfare Plan. Where conditions warrant, right-of-way width and pavement width in excess of the minimum street standards may be required.
26. The Developer may be required to dedicate additional rights-of-way, widen existing roadways, or perform other improvements to existing public streets upon which the property fronts or which provides access to new subdivisions.
27. Street access to adjacent properties may be required. In such situations the subdivider shall build and dedicate the streets to the boundary of their property in accordance with Detail 02.01.11
28. Cul-de-sacs shall not be used to avoid connection with an existing street, to avoid the extension of a thoroughfare or collector street, or to avoid connection to adjoining property.
29. Permanent dead-end streets should not exceed 1200 feet in length unless recommended by the Engineering Department and approved by the Planning Board. All cul-de-sacs or dead-end streets shall be provided with a turnaround meeting City standards.

30. Where a tract of land to be subdivided adjoins a thoroughfare, the subdivider may be required to provide a marginal access street parallel to the thoroughfare or provide for through lots on a local street for the lots to be developed adjacent to the thoroughfare. Where through lots are established, such lots may be prevented from having direct access to the thoroughfare by driveways.
31. Any development of more than 100 residential units or additions to existing developments such that the total number of units exceeds 100 shall be required to provide at least two connections for vehicular access to public streets unless such provision is deemed impractical by the Planning Director and/or City Engineer due to topography, natural features, or the configurations of adjacent developments. An extra public access connection must be added with each additional 300 units.

02.02.02 SUPERELEVATION

THIS STANDARD SHALL ONLY APPLY TO COLLECTOR OR ARTERIAL STREETS DESIGNED TO MOVE LARGE VOLUMES OF TRAFFIC.

1. Design of superelevation shall be governed by the AASHTO *Policy on Geometric Design of Highways and Streets*, latest edition.
2. The minimum superelevation design rate can be calculated by the following:

$$e = (V^2/15R) - f$$

where: e = superelevation rate in ft/ft

V = design speed in MPH

R = radius of curve in ft

f = side friction factor (see AASHTO *Policy on Geometric Design of Highways and Streets*, latest edition)

02.02.03 STORM DRAINAGE

1. Storm drainage designs to be utilized within proposed roadways shall be designed in accordance with Division 04.00 STORM DRAINAGE COLLECTION FACILITIES of this manual.

02.02.04 SUBDIVISION ENTRANCE SIGNS, MARKERS, AND LANDSCAPED AREAS

1. Subdivision entrance markers and landscaped medians may be allowed within the public rights-of-way subject to the following conditions:
 - A. The City will not be responsible for maintenance.
 - B. An entity responsible for maintenance shall be created.

- C. No such improvements shall interfere with sight distance or with normal maintenance requirements.
 - D. In the event of loss, damage, or lack of maintenance, the City of Monroe may remove all improvements and maintain the area in accordance with policy.
 - E. The median or island and its associated travel way are designed to accommodate the anticipated traffic for the type street section in accordance with the standards of AASHTO.
 - F. The applicant shall execute an encroachment agreement to allow placement of the sign within an existing or proposed street right-of-way.
 - G. The light source used to illuminate the sign shall be directed so that it will not be a nuisance or hazard to adjoining property or passing traffic.
 - H. Signs shall be for subdivision identification only and shall not contain a commercial message.
 - I. Proposed landscaped medians shall be 8 feet minimum in width from back of curb to back of curb with a minimum length of 70 feet. The public right-of-way width of the proposed street shall be increased by the width of the median, including curb and gutter.
 - J. Signs located within the right-of-way shall be designed with a low lying brick or masonry skirt, 18 inches maximum in height, and the upper body constructed to breakaway upon impact by a vehicle.
- 2. For proposed streets that will connect to a NCDOT maintained roadway, and subdivisions outside the City limits but within the extraterritorial jurisdiction of Monroe, refer to the Division of Highways Board of Transportation Subdivision Roads Minimum Construction Standards.
 - 3. In addition to the requirements listed by this Section, all entrance signs or monuments shall comply with the sign regulations listed in the City of Monroe Zoning Ordinance and require the issuance of a sign permit prior to installation.
 - 4. Any irrigated island within the roadway shall have sufficient sub-drains connected to the storm drainage system.

02.02.05 OFF-STREET PARKING

1. Off-street parking areas shall be designed and constructed in accordance with all parking and driveway requirements listed in the City of Monroe Unified Development Ordinance.
2. All parking facilities shall be designed and constructed with the proper number of accessibility spaces and van accessible spaces in accordance with the current North Carolina Building Code, Volume 1-C – Accessibility Code, latest edition.
3. Driveway Permits are required for connection to City-maintained roadways and roadways maintained by the North Carolina Department of Transportation (NCDOT). For connection to City-maintained roadways two copies of the site plan shall be submitted to the City of Monroe Engineering Department with a City of Monroe Driveway Application. For connection to State-maintained roadways, a digital copy of the site plan shall be submitted and a completed NCDOT Driveway Application shall be submitted to the City of Monroe Engineering Department. Once the application is approved by the City of Monroe, it will be forwarded to NCDOT for final approval.

02.02.06 SIDEWALK REQUIREMENTS

A. EXISTING AND PROPOSED ROADWAYS

TABLE 02-02

SIDEWALK REQUIREMENTS FOR EXISTING AND PROPOSED ROADWAYS			
Street Type	Both Sides	One Side	None
Arterial	X		
Collector	X		
Commercial	X		
Commercial Cul-de-sac	X		
Residential (with Through Access)	X		
Residential Cul-de-sac serving 11 or more lots		X	
Residential Cul-de-sac serving 10 or less lots			X

Note:

- 1) *Sidewalk requirements do not apply to in-fill residential lot construction.*
- 2) *Sidewalks required along existing arterial and collector roadways for all major residential and commercial subdivisions based on side of lot frontage.*
- 3) *Sidewalk required along existing arterial and collector streets shall be 8 feet minimum in width with the exception of US Highway 74 and Charlotte Avenue. A 10-foot wide concrete multiuse path shall be provided along the south side of US Highway 74 with an 8-foot sidewalk along the north side of the roadway. A 10-foot wide concrete multiuse path shall be provided along the north side of Charlotte Avenue from Seymour Street to the western corporate limits with an 8-foot wide sidewalk along the entire south side as well as the north side east of Seymour Street.*
- 4) *Sidewalk required within residential and commercial developments shall be 5 feet in width.*

B. DEVELOPMENT REQUIREMENTS

1. All private and public roads including access ways shall be designed and constructed to facilitate the safe and convenient movement of motor vehicle and pedestrian traffic. Any non-single family lot development and new residential and commercial subdivisions shall provide sidewalk along the property frontage.
2. A certificate of occupancy will not be issued for any use until all sidewalk improvements, in accordance with this section, have been met and are in place and ready for use. The City Manager may grant exceptions to the above requirement for a period of not more than eighteen (18) months, for special or unusual circumstances, providing that the developer or property

owner provides the City with a cash bond or irrevocable letter of credit insuring the installation of the required sidewalk improvements. The City Manager may grant additional extensions of eighteen (18) months upon a finding of just cause and receipt of an additional cash bond or irrevocable letter of credit for the eighteen (18) month extension period to secure installation of the sidewalk improvements. Any cash bond or letter of credit required herein shall be accompanied by detailed documentation of the estimated cost of the remaining sidewalk to be completed. This documentation may be a paving/grading contractor's bid or contract, or similar instrument and shall be subject to approval by the City Engineer. The amount of the cash bond or letter of credit shall be in an amount equal to or more than 120% of the estimated cost to complete the improvements. (Guarantee for required sidewalk improvements in new subdivisions shall be provided in accordance with Section 07.17, Guaranteeing Subdivision Improvement.)

If at any time the City, or other party, constructs the sidewalk to a point that connects to the property for which a cash bond or irrevocable letter of credit has been posted, the developer or property owner must move forward to construct the sidewalk across their property in accordance with City standards within 90 days.

02.02.07 STREET NAME IDENTIFICATION SIGNS & STOP SIGNS

1. In subdivisions located outside the city limits, the subdivider shall install street name signs and stop signs at appropriate locations in accordance with the standards and specifications of the County. Inside the city limits the City shall install standard street name signs and stop signs at appropriate locations in accordance with the City's standards and specifications. The subdivider shall be responsible for the cost of such sign installation in accordance with the City of Monroe's Fee Schedule.

02.02.08 CONSTRUCTION PLANS

1. For Construction Plan Requirements, refer to Standard 01.07 ROADWAY AND STORM DRAINAGE CONSTRUCTION PLAN REQUIREMENTS.

02.02.09 REQUIREMENTS FOR STREET IMPROVEMENTS

1. Except as provided in Standard 02.02.09, all proposed streets shall be graded to the full width of the right-of-way and the 10-foot utility easements and improved with a pavement width and standard curb and gutter section as required for the particular classification of street. All grading, pavement and curb and gutter shall be designed and installed in accordance with City standards and the approved construction plan.
2. In addition, street paving and curb and gutter shall be installed in the following situations:

- A. Any existing street segment that has not been accepted for maintenance by either the City or the North Carolina Department of Transportation, and that is to serve as the required frontage for one or more lots created pursuant to the Unified Development Ordinance, shall be improved and dedicated to the public, as provided for above, in such a way that the street segment meets the standards of this manual for the particular classification of street, including right-of-way width. Such street segment shall be directly connected to the existing public street system by way of at least one public street accepted for maintenance by either the City of Monroe or the North Carolina Department of Transportation. No subdivision shall be permitted on any street that is an “island” not connected directly to the public street system.
 - B. Subdivisions that adjoin existing streets maintained by either the City of Monroe or NCDOT shall dedicate additional street right-of-way necessary to meet the minimum width requirements for the type of classification of the adjoining street. When any part of the subdivision is on both sides of an existing street, the entire minimum right-of-way shall be provided.
 - C. The Planning Board/City Engineer may require roadway improvements including but not limited to pavement, widening of pavement and curb and gutter for turning lanes along any existing or proposed street that forms a significant entrance to a proposed subdivision where in the opinion of the Board/Engineer such improvements are necessary in order to provide for safe vehicular movement into and out of the proposed subdivision.
3. Construction of sidewalks or necessary drainage facilities required by this section shall be accomplished along the entire length of the frontage of the property abutting any publicly maintained street.

02.02.10 EXEMPTIONS FOR REQUIRED STREET IMPROVEMENTS

1. Any deviation to the requirements of the Standard Specifications and Detail Manual shall be considered upon written application by the developer detailing the purpose and justification(s) for the request. A report summarizing the request shall be submitted to the appropriate committee and City Council by the City Engineer for consideration and approval or disapproval as the case may be. Deletion of the infrastructure improvements cannot substantially impair the purposes of the requirements as set forth in the Detail Manual.
2. Single family residential subdivisions with a minimum lot size of one acre where each lot has a minimum of 150 feet of public street frontage and the average street frontage per lot throughout the entire subdivision is at least 200 feet shall be exempt from the curb and gutter requirement of Standard 02.02.08. Such subdivisions shall provide a street graded to the full width of the right-of-way and the 10-foot utility easements with pavement and side ditch sections as specified in this manual for its classification. When

calculating the minimum footage per lot and average frontage per subdivision, lots with full frontage on cul-de-sacs may be excluded.

3. In addition, for certain stub streets which have no frontage lots, improvements shall be required only as shown on Detail 02.01.11. All grading, pavement and curb and gutter or side ditch section shall be designed and installed in accordance with the City of Monroe standards and the approved construction plan.
4. A deviation from the requirements for curb and gutter and sidewalk may be approved by the Monroe City Council in the following circumstances:
 - A. The project involves the extension or construction of a residential street to provide conformity to the existing neighborhood; or
 - B. A roadway is identified as an arterial street as defined in this manual; or
 - C. The deviation is in accordance with the provisions provided by the Unified Development Ordinance; or
 - D. The deviation is in accordance with an approved Stormwater Management Plan where the designer demonstrates that proper runoff conveyance systems addressing erosion and long term maintenance can be provided in lieu of curb and gutter; or
 - E. The deviation is required by other outside Agencies to lessen the impervious impact on environmentally sensitive areas.
4. When the proposed new developed area will be less than 50 percent of the total area of the property under single ownership, sidewalks and drainage facilities may not be required. However, the City Engineer and appropriate City of Monroe Council Committee may require certain improvements be made if they are determined to be in the public interest or needed to ensure public safety.

02.02.11 PRIVATE RESIDENTIAL STREETS

1. Private residential streets shall be gated and meet the guidelines established by Division 01.00 General and meet all requirements established for public street construction including but not limited to construction drawing standards, typical sections, testing, as-built drawings and one-year warranty period.
2. The Engineering Department shall have the authority to inspect, approve or disapprove all private residential street construction and related drainage facilities in accordance with Section 01.08 Inspections.
3. Design of private residential streets shall be completed in accordance with Section 02.02 Design.
4. Construction of private residential streets shall be in accordance with Section 02.03 Construction, Sections 02.03.01 through 02.03.06.

5. Private residential streets may be platted prior to completion with guarantees and/ or surety as provided by Section 07.17 Guaranteeing Subdivision Improvements.
6. Final acceptance of the private residential street construction shall be in accordance with Section 07.10 Final Inspection and Acceptance of Subdivision Construction with a written warranty (0.7.16 Warranty) provided by the developer.
7. The inclusion of gates, structures including brick mailboxes and irrigation systems within private street right-of-ways shall remove the private residential street from future consideration for conversion to a public right-of-way in accordance with the City of Monroe's Policy on Acceptance of Privately Owned Residential Streets until such items are removed.

02.03 CONSTRUCTION

02.03.01 STANDARD SPECIFICATIONS AND PLAN REQUIREMENTS

1. All construction shall be in accordance with the City of Monroe Standard Specifications and Detail Manual. Where a construction item may not be covered by this manual, the NCDOT Standard Specifications for Roads and Structures, latest edition, and the NCDOT Roadway Standard Drawings, latest edition, shall apply.

02.03.02 INSPECTIONS BY DEVELOPER

1. The Developer, his Agent, Engineer, and Contractor shall be responsible for developing a "Quality Control Program" that will be reviewed at the preconstruction meeting.
2. All inspections and testing shall be in accordance with Standard 01.08 INSPECTIONS of this manual.

02.03.03 INSPECTIONS BY CITY

1. The City shall designate a construction inspector for each subdivision. The inspector shall make daily visits to the job-site to observe the progression of the work and will advise the contractor of any defects that are identified during inspections. However, failure to identify any defects shall not relieve the Developer, his Agent, Engineer and Contractor of their responsibility to complete the work in accordance with the approved plans and specifications and the City of Monroe Standard Specifications and Detail Manual.
2. All inspections and testing shall be in accordance with Standard 01.08 of this manual.

02.03.04 MATERIALS

1. All materials used shall be in accordance with Division 10 of the NCDOT Standard Specifications for Roads and Structures, latest edition.

02.03.05 CONSTRUCTION NOTES

1. All roadway construction methods shall be in accordance with the City of Monroe Standard Specifications and Detail Manual, and the NCDOT Standard Specifications for Roads and Structures, latest edition except where otherwise noted.
2. The Developer is required to perform a subsurface investigation of the proposed site to determine any special considerations prior to construction.
3. Subgrade shall be sloped per typical cross-sections.
4. Subgrade shall be a minimum 95% of the Standard Proctor's (AASHTO T99) maximum dry density (hereinafter referred to as compaction) except the top 12 inches, which shall be at 100% compaction.
5. The subgrade in paved areas shall be proof-rolled with a loaded dump truck with a loaded weight of at least 20 tons. Any identified unstable areas shall be repaired.
6. Areas that rut or pump during the proof-roll shall be undercut to stable soils or an evaluation made by the Developer's Engineer or qualified geotechnical firm to determine if some other method of subgrade stabilization is appropriate. Approved methods of stabilization shall include chemical stabilization of high plasticity clays or excessively wet soils, the use of geosynthetic or geogrid material, or other stabilization methods as approved by the City Engineer.
7. Stone base shall be compacted to 100% of the modified proctor's (AASHTO T-180) max. dry density and proof-rolled prior to placing asphalt.
8. In lieu of stone base course, a bituminous concrete base course, type B25.0 may be substituted Details 02.01.01-02.01.07.
9. Bituminous concrete base course, type B25.0, shall be used in widening strips less than 5 feet in width.
10. Asphalt shall be compacted in accordance with the latest NCDOT Standard Specifications.
11. Finished asphalt surface course shall promote positive drainage to the curb line.
12. All asphalt cuts shall be made with a clean cut when preparing street surfaces for patching or widening strips.

13. Apply tack coat beneath each layer of asphalt plant mix to be placed.
14. No Developer or Contractor shall engage in the placement of asphalt between the dates of December 1 through March 15 due to weather conditions without prior approval from the City Engineer. No proposed street or roadway shall be accepted for maintenance if asphalt is placed during this time period without the expressed written consent of the City Engineer. In no case shall asphalt be placed outside the parameters listed in Division 6 of the NCDOT Standard Specifications for Roads and Structures, latest edition.
15. Surface course asphalt shall be placed on any bituminous asphalt base or intermediate course within one year of placement or when parcels are 80% built out, whichever occurs first.
16. Hauling of asphalt plant mixes shall be in accordance with NCDOT Standard Specifications, latest edition.
17. Curb shall be placed at a minimum grade of 1.0% except at street intersections.
18. All broken curb shall be replaced prior to placing the final asphalt surface course.
19. All curb and gutter shall be backfilled with approved soil within 3 to 5 days following construction.
20. Straight forms shall not be used for forming curb and gutter in curves of radii less than 100 feet.
21. All excess concrete on the front edge (lip) of gutter shall be removed when curb and gutter is poured with a machine.
22. All machine curb and gutter shall have contraction joints located a maximum of every 15 feet and expansion joints located a maximum of every 90 feet. All formed curb and gutter shall have contraction joints according to Detail 02.02.03.
23. All expansion joints for concrete shall be sealed with silicone or polyurethane per NCDOT specifications. Hot applied joint sealer shall not be used. Color must be gray or a color that matches the concrete.
24. When curb and gutter are placed adjacent to sidewalk, the joints shall align.
25. All sidewalks shall be steel troweled and have a light broomed finish.
26. All sidewalks shall have a lateral slope of 2.0% or less.
27. All sidewalks shall have contraction joints located a minimum of 5 feet apart depending on sidewalk width and expansion joints located a minimum of every 45 feet not to exceed 50 feet.
28. All sidewalks shall be a minimum of 4 inches thick, 6 inches thick at driveways.
29. Sidewalks shall be a minimum of 5 feet wide unless otherwise noted on the approved plan.

30. Accessible ramps are required per the Public Right-of-way Accessibility Guidelines, and per Details 02.05.01-02.05.04.
31. When the temperature is projected to drop below 35 degrees F for more than four hours, insulate the concrete to prohibit the concrete surface temperature from dropping below 35 degrees F during the curing period.

02.03.06 ROADWAY CONSTRUCTION TOLERANCES

The following tolerances shall be enforced until the end of the warranty period.

1. Any concrete section of sidewalk or curb and gutter that has a crack that measures greater than 1/8" horizontal separation or measures any vertical separation shall be removed and replaced. No cracks allowed in curb at catch basin transition sections.
2. Any concrete section of sidewalk or curb and gutter that has 3 cracks that measure less than 1/8" horizontal separation within any 15-foot section shall be removed and replaced.
3. Any pavement that has three or more repairs (utility cut repair or failure repair) within any 100-foot section shall be resurfaced between and including the two outer most repairs. Asphalt repairs to be in accordance with City of Monroe Street Cut Pavement Repair Standards.
4. Any ponding in the gutter that is greater than 2.5 feet of longitudinal length for a time period greater than 12 hours following the last rainfall shall be corrected.

02.03.07 ROADWAY ABANDONMENT MUNICIPAL PROCEDURE FOR CONSIDERING A PETITION

1. The Technical Review Committee will consider any request for a street abandonment and report concerns to the City of Monroe Transportation Committee. The Engineering Technician shall place the request to abandon the street on the next available appropriate City of Monroe Council Committee agenda.
2. The appropriate City of Monroe Council Committee will consider said request for a street abandonment and provide appropriate recommendation to City Council. The Engineering Technician shall place the request on the next available City Council agenda after Section I and Section II of the petition application have been completed.
3. Before abandoning any street or alley, the State Statute 160A Section 299 requires that:
 - A. The City Council shall adopt a resolution declaring its intent to abandon the street or alley.
 - B. The City Council shall call for a public hearing on the question.

- C. The resolution of intent shall be published once a week for four successive weeks before the public hearing takes place.
 - D. A copy of the resolution of intent shall be sent by registered or certified mail to all property owners adjoining the street or alley as shown on the county tax records.
 - E. The Street Closing and Public Hearing notice shall be prominently posted, in at least two places along the street or alley. Generally, one sign is placed at each end of the street or alley to be closed.
 - F. At the Public Hearing, any person may be heard on the question of whether or not the closing would be detrimental to the public interest, or the property rights of any individual.
4. If it appears to the satisfaction of the council after the public hearing that:
- A. Abandoning the street or alley is not contrary to the public interest.
 - B. No individual owning property in the vicinity of the street or alley or in the subdivision in which it is located would thereby be deprived of reasonable means of ingress and egress to his property.
 - C. Then council may adopt an order abandoning the street or alley.
 - D. Council shall cause to be recorded the order abandoning said street or alley in the Union County Register of Deeds.
5. Upon adoption of the order abandoning the street or alley:
- A. All right, title, and interest in the right-of-way shall be conclusively presumed to be vested in those persons owning lots or parcels of land adjacent to the street or alley per NCGS 160A-229(c).
 - B. Title of such adjoining landowners, for the width of the abutting land owned by them, shall extend to the centerline of the street or alley, unless altered by plat in accordance with NCGS 160A-299(c).
 - C. The City shall reserve a General Public Utility Easement of sufficient width, over all utilities, which exist in the right-of-way of the street at the time of abandoning unless otherwise approved by Council.
 - D. The City shall reserve Public Storm Drainage Easement of sufficient width, over all storm drainage ditches and structures, which exist in the right-of-way of the street at the time of abandoning unless otherwise approved by Council.

Reference Form 07.18 CUSTOMER PETITION TO PERMANENTLY CLOSE A PUBLIC STREET OR PUBLIC ALLEY